MID-ATLANTIC
FISHERY MANAGEMENT COUNCIL

June 2022 Council Meeting

Tuesday, June 7 – Thursday, June 9, 2022

Hybrid Meeting:
Atlantis Banquets & Events, Hyatt Place Long Island/East End
(431 East Main Street Riverhead, NY 11901, 631-208-0002)
or via Webex webinar

This meeting will be conducted as a hybrid meeting. Council members, other meeting participants, and members of the public will have the option to participate in person at Atlantis Banquets & Events, Hyatt Place Long Island/East End or virtually via Webex webinar. Webinar connection instructions and briefing materials will be available at: https://www.mafmc.org/briefing/june-2022.

Agenda

Tuesday, June 7th

9:00 a.m. – 9:30 a.m. **Update on Northeast Regional Habitat Assessment products (Tab 1)**

9:30 a.m. – 10:00 a.m. **Aquaculture Update (Tab 2)**
- Review the draft MAFMC Aquaculture Policy and Aquaculture in the Mid-Atlantic Region Background Document
- Consider approval of MAFMC Aquaculture Policy

10:00 a.m. – 10:30 a.m. **New Jersey Ocean Acidification Monitoring Network (Tab 3)**
(Dr. Grace Saba, Rutgers University)

10:30 a.m. – 11:30 a.m. **2023 Atlantic Surfclam and Ocean Quahog Specifications (Tab 4)**
- Review recommendations for 2023 specifications
- Recommend changes to 2023 specifications if necessary

11:30 a.m. – 12:00 p.m. **Equity and Environmental Justice Strategy Presentation (Tab 5)**
(Sharon Benjamin, NOAA Fisheries)

-------- Lunch 12:00 p.m. – 1:00 p.m. --------

1:00 p.m. – 2:00 p.m. **Summer Flounder Management Strategy Evaluation Update (Tab 6)**
(Dr. Gavin Fay, UMass Dartmouth, and Dr. Lou Carr-Harris, NEFSC)
- Review of Summer Flounder Management Strategy Evaluation model development and outputs

Council Meeting with the ASMFC ISFMP Policy Board

2:00 p.m. – 5:00 p.m. **Recreational Harvest Control Rule Framework / Addenda for Summer Flounder, Scup, Black Sea Bass, and Bluefish Final Action (Tab 7)**

- Review public comments
- Review SSC evaluation
- Review recommendations from Advisory Panel, FMAT/PDT, and Council staff
- Consider final action

5:00 p.m. ***Council and ASMFC ISFMP Policy Board Adjourn***

Wednesday, June 8th

9:00 a.m. – 10:30 a.m. **Mackerel Rebuilding 2.0 Amendment Final Action (Tab 8)**

- Review RH/S cap and 2023-2025 Mackerel specifications
- Recommend changes to 2023-2025 Mackerel specifications if necessary
- Consider final action

10:30 a.m. – 11:00 a.m. **2023 Longfin Squid Specifications (Tab 9)**

- Review recommendations for 2023 specifications
- Recommend changes to 2023 specifications if necessary

11:00 a.m. – 11:30 a.m. **2023 – 2025 Chub Mackerel Specifications (Tab 10)**

- Review recommendations from the SSC, Monitoring Committee, Advisory Panel, and Staff
- Adopt specifications for 2023-2025

11:30 a.m. – 12:00 p.m. **Unmanaged Commercial Landings Report (Tab 11)**

- Review annual report on landings of unmanaged species

-------- Lunch 12:00 p.m. – 1:00 p.m. --------

1:00 p.m. – 1:30 p.m. **NEFSC Shad and River Herring Update (Tab 12)**

- Review spatial revenue analyses from NEFSC related to River Herring and Shad bycatch

1:30 p.m. – 2:30 p.m. **Atlantic Large Whale Take Reduction Plan Phase II (Tab 13)**

- Update on Phase II of the Atlantic Large Whale Take Reduction Plan and request for input

2:30 p.m. – 3:00 p.m. **Atlantic Sturgeon Bycatch Draft Action Plan (Tab 14)**

- Update and request for input

3:00 p.m. – 5:00 p.m. **Research Set-Aside Program Redevelopment (Tab 15)**

- Review Committee recommendations
- Consider Council action

Thursday, June 9th

9:00 a.m. – 1:00 p.m. **Business Session**

Committee Reports (Tab 16) – SSC

Executive Director's Report (Tab 17) (Dr. Chris Moore)

Organization Reports – NMFS Greater Atlantic Regional Office, NMFS 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

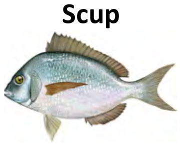
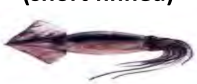
Other Business and General Public Comment

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.

Stock Status of MAFMC-Managed Species

(as of 5/24/22)

SPECIES	STATUS DETERMINATION CRITERIA		Stock Status	Most Recent Assessment
	Overfishing $F_{threshold}$	**Overfished** ½ B_{MSY}		
Summer Flounder 	$F35\%_{MSP}=0.422$	60.87 million lbs	No overfishing Not overfished	Most recent management track assessment was 2021.
Scup 	$F40\%_{MSP}=0.200$	99.23 million lbs	No overfishing Not overfished	Most recent management track assessment was 2021.
Black Sea Bass 	$F40\%_{MSP}=0.46$	15.92 million lbs	No overfishing Not overfished	Most recent management track assessment was 2021.
Bluefish 	$F_{35\%SPR}=0.181$	222.37 million lbs	No overfishing Overfished	Most recent management track assessment was 2021.
***Illex* Squid (short finned)** 	Unknown	Unknown	Unknown Unknown	Most recent benchmark assessment was 2006; not able to determine current exploitation rates or stock biomass.
Longfin Squid 	Unknown	46.7 million lbs	Unknown Not overfished	Most recent assessment update was 2020; not able to determine current exploitation rates.
Atlantic Mackerel 	$F_{40\%}=0.22$	199.6 million pounds	Overfishing Overfished	Most recent management track assessment was 2021.
Butterfish 	$F_{Proxy}=2/3M=0.81$	50.3 million lbs	No overfishing Not overfished	Most recent management track assessment was 2020.
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) 	F_{MSY}=0.2439	175.6 million lbs Female SSB	No overfishing Not overfished	Most recent assessment update was 2018.
Monkfish (Joint mgmt with NEFMC) 	NFMA & SFMA F_{MAX}=0.2	NFMA - 1.25 kg/tow SFMA - 0.93 kg/tow (autumn trawl survey)	Unknown Unknown	Recent benchmark failed peer review and invalidated previous 2010 benchmark assessment results. Operational assessment in 2019 used survey data to scale earlier ABC.

SOURCES: Office of Sustainable Fisheries - Status Report of U.S. Fisheries; SAW/SARC, SEDAR, and TRAC Assessment Reports.

[a] $F_{threshold}$ is calculated as 4.136 times the mean F during 1982 – 2015.

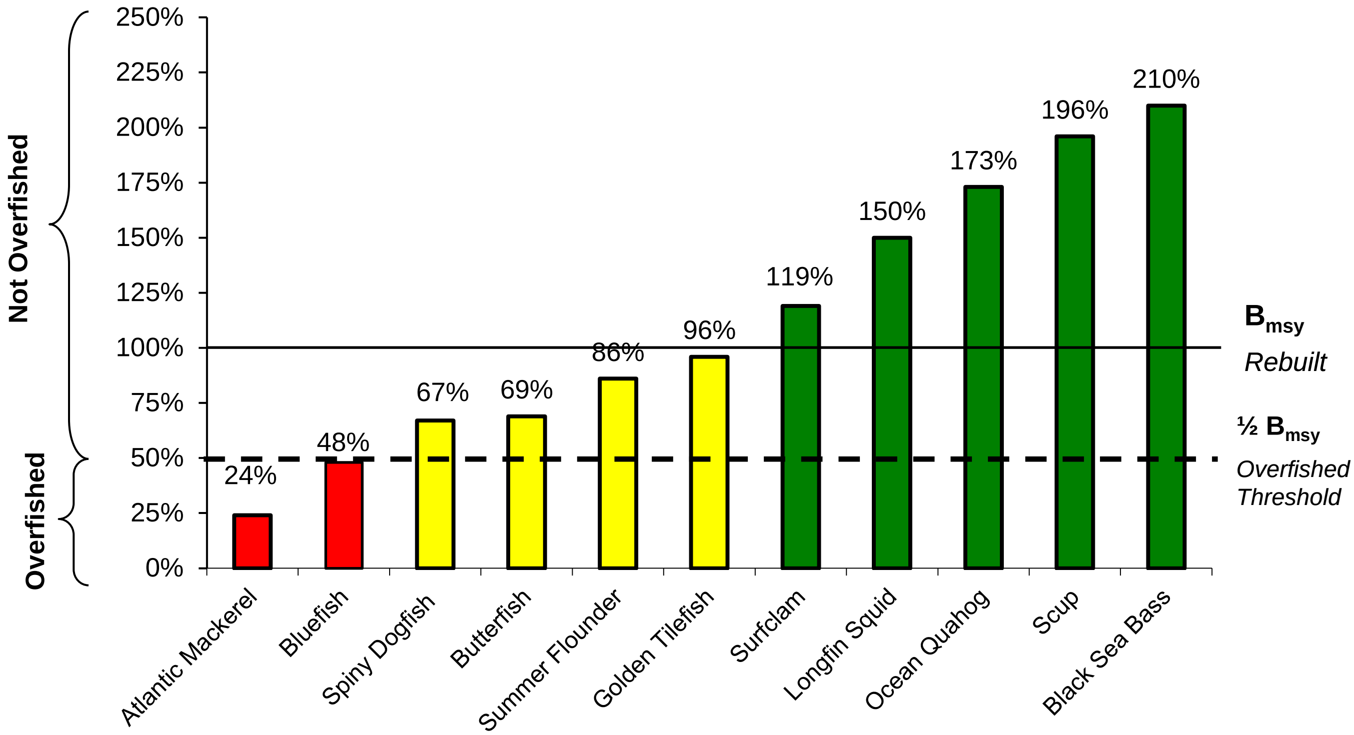
[b] $SSB_{threshold}$ is calculated as $SSB_0/4$.

[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 5/24/22)



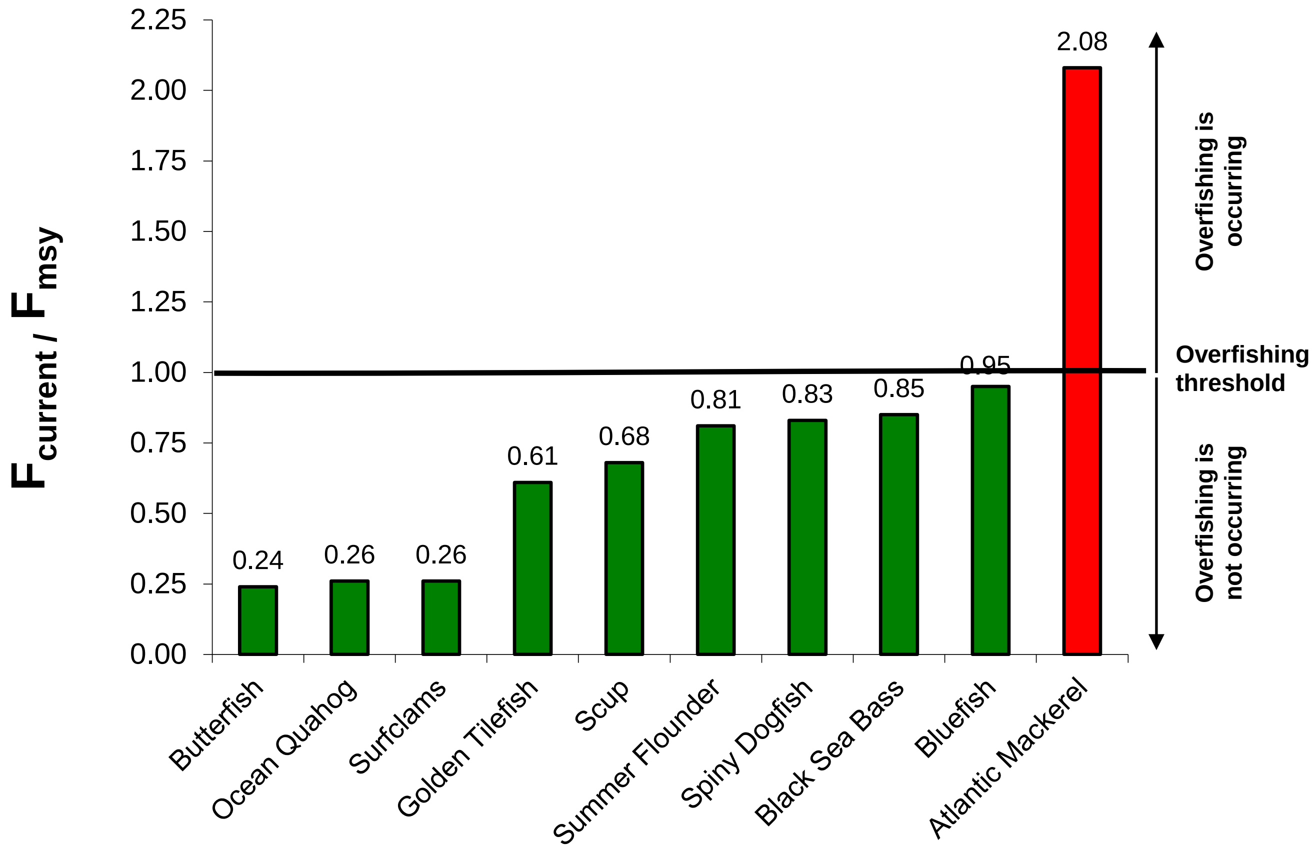
Notes:

- Unknown B_{msy} - *Illex* squid, monkfish (NFMA & SFMA), blueline tilefish (North of Cape Hatteras), and chub mackerel.
- Of the 15 species managed by the Council, 5 are above B_{msy}, 6 are below B_{msy}, and 4 are unknown.

Year of data used to determine stock size	
Atlantic Mackerel	2019
Black Sea Bass	2019
Bluefish	2019
Butterfish	2019
Golden Tilefish	2020
Longfin Squid	2018-2019 (average)
Ocean Quahog	2019
Spiny Dogfish	2018
Surfclam	2019
Scup	2019
Summer Flounder	2019

Fishing Mortality Ratios for MAFMC-Managed Species

(as of 5/24/22)



Year of data used to determine fishing mortality	
Atlantic Mackerel	2019
Black Sea Bass	2019
Bluefish	2019
Butterfish	2019
Golden Tilefish	2020
Ocean Quahog	2019
Spiny Dogfish	2017
Surfclam	2019
Scup	2019
Summer Flounder	2019

Notes:

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

Status of Council Actions Under Development

AS OF 5/24/22

FMP	Action	Description	Status	Staff Lead
Summer Flounder, Scup, Black Sea Bass *and* Bluefish	Recreational Harvest Control Rule Framework/Addenda	The goal of this action is to establish a process for setting recreational bag, size, and season limits for summer flounder, scup, black sea bass, and bluefish such that measures aim to prevent overfishing, are reflective of stock status, appropriately account for uncertainty in the recreational data, take into consideration angler preferences, and provide an appropriate level of stability and predictability in changes from year to year. https://www.mafmc.org/actions/hcr-framework-addenda	The Council and ASMFC Policy Board will consider taking final action on June 7, 2022 after reviewing comments received through the addenda public comment period; input from the SSC; and recommendations from advisors, the FMAT/PDT, and Council staff.	Beaty
	Recreational Reform Initiative Technical Guidance Document	The Council and Policy Board agreed to develop a technical guidance document to address the following topics: (1) identifying and smoothing MRIP outlier estimates, (2) use of preliminary current year MRIP data, and (3) maintaining status quo recreational measures. Some of these topics have been partially developed through the Harvest Control Rule Framework/Addenda. No additional progress has been made on a technical guidance document due to prioritization of the Harvest Control Rule. https://www.mafmc.org/actions/recreational-reform-initiative	The Council and Policy Board will discuss next steps for this document in August 2022. Depending on other workload considerations, it may be possible to develop a draft for review by December 2022.	Beaty
	Recreational Sector Separation and Catch Accounting Amendment	This joint MAFMC/ASMFC 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. https://www.mafmc.org/actions/recreational-reform-initiative	The Council and Policy Board initiated this action in October 2020. No additional progress has been made due to prioritization of the Harvest Control Rule Framework/ Addenda. The Council and Policy Board may consider approval of a scoping	Dancy

FMP	Action	Description	Status	Staff Lead
			document for this amendment by the end of 2022.	
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 modify species separation requirements in these fisheries in the short-term. In addition, staff/NEFSC will explore longer term solutions for monitoring (such as electronic monitoring testing on the clam survey). https://www.mafmc.org/actions/scoq-species-separation	In December 2021 the Council reviewed a white paper and decided to initiate an Amendment. The Council also requested that the staff/NEFSC explore the feasibility of longer-term solutions. An FMAT was formed in January 2022; first meeting upcoming on April 26.	Coakley/ Montañez
Mackerel, Squid, Butterfish	Mackerel Rebuilding 2.0 Amendment	In 2018 the Atlantic mackerel stock was declared overfished based on the results of the 2017 benchmark stock assessment. The Council subsequently developed a rebuilding plan designed to rebuild the stock by 2023. A 2021 management track stock assessment found that the Atlantic mackerel stock continued to be overfished through 2019 and that rebuilding would not occur as previously projected. This action will re-set Atlantic mackerel rebuilding and consider related management measures, including the river herring and shad cap. https://www.mafmc.org/actions/atlantic-mackerel-rebuilding-amendment	The Council held public hearings and collected public comments on this amendment in April and May 2022. The Council will review comments and consider final action during the June Council meeting.	Didden
Omnibus	Omnibus Amendment for Data Modernization	This action will address any regulatory changes needed to fully implement the Agency's Fishery-Dependent Data Initiative (FDDI).	The Council last received an update at the October 2018 meeting. In 2019 the Council took final action on the Commercial eVTR Omnibus Framework jointly with the NEFMC in support of FDDI.	GARFO/NEFSC

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

As of 5/26/2022

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 Published	Approval/ Disapproval Letter	Final Rule Published	Regs Effective	Notes
Excessive Shares Amendment	SCOQ Amd 20	12/9/19	4/24/20	9/25/20						Deeming regs approved 2/10/22
MSB FMP Goals/Objectives and Illex Permits Amendment	MSB Amd 22	7/16/20	3/15/21							EA re-submitted 4/12/22, Deeming regs approved May 19, 2022
Black Sea Bass Commercial State Allocation Amendment	TBD	8/4/21	11/19/21							Council/Board took final action in Feb 2021 and then revised their final action on 8/4/21 based on a remand from the ASMFC Policy Board.
Tilefish Multi-Year Specifications Framework	Tilefish FW 6	8/11/21	7/10/21	4/22/22						
Summer Flounder, Scup, Black Sea Bass Commercial/ Recreational Allocation Amendment	TBD	12/14/21	5/1/22							

Timeline and Status of Current and Upcoming Specifications for MAFMC Fisheries

As of 5/26/22

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				Submitted under the Tilefish Multi-Year Specifications Framework 7
Blueline Tilefish	2022-2024	4/7/21	10/20/21	5/5/22				SIR complete, proposed rule expected soon.(status quo measures).
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	2021-2023	8/10/20	10/14/20	7/2/21	5/26/21	7/22/21	7/22/21	
Butterfish	2021-2022	8/10/20	10/14/20	7/2/21	5/26/21	7/22/21	7/22/21	
Illex Squid	2021-2022	6/17/20	10/14/20	7/2/21	5/26/21	7/22/21	7/22/21	SIR for 2022 ABC Increase to 40,000 MT submitted May 18, 2022
Atlantic Mackerel (including RH/S cap)	2022 (through July 11, 2022, likely extended through 2022)	8/11/21	N/A	N/A	N/A	1/12/22	1/7/22	Emergency action requested by the Council at August 2021 meeting. Emergency actions should lock 2022 catch to near 2021.
Chub mackerel	2020-2022	3/7/19	5/31/19	10/25/19	3/9/20	8/4/20	9/3/20	
Bluefish	2022-2023	8/9/21	10/18/21		12/2/21	2/2/22	2/2/22	
Summer Flounder, Scup, Black Sea Bass	2022-2023	8/9/21	10/4/21	11/5/21	11/24/21	12/23/21	1/1/22	
Spiny Dogfish	2021-2022	10/6/20	12/7/20	2/3/21	3/4/21	5/1/21	5/1/21	
Spiny Dogfish	2022 trip limit adjustment	10/6/21	12/30/21		2/25/22	4/7/22	5/1/22	Includes federal trip limit increase to 7,500 pounds (states may still be evaluating whether to match increase)

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	2022	12/14/21	2/11/22	2/24/22	4/18/22			
Black sea bass rec measures	2022	12/14/21	2/11/22	2/24/22	4/18/22			
Scup rec measures	2022	12/14/21	2/11/22	2/24/22	4/18/22			
Bluefish rec measures	2022-2023	12/13/21	1/23/20	3/19/20	5/25/20	6/29/20	6/29/20	Reviewed in 2021. No changes from prevous year's measures.

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 25, 2022

To: Council

From: Jessica Coakley and Tori Kentner, Staff

Subject: Update on the Northeast Regional Marine Fish Habitat Assessment (NRHA)

The following is included for Council consideration on this subject:

1) Draft NRHA Summary Report

2) Sample of NRHA Metadata Inventory page

3) Sample of the NRHA Atlantic cod Crosswalk "Narrative" of the Habitat Climate Vulnerability Assessment (HCVA), Fish and Shellfish Climate Vulnerability Assessment FSCVA, and Atlantic Coastal Fish Habitat Partnership (ACFHP) habitat dependency assessment for use in fisheries management. (DRAFT)

4) Sample of the NRHA Species Profile for black sea bass (DRAFT)

During this meeting, the Council will receive a presentation from Chris Haak (Monmouth University/NOAA) and Tori Kentner (staff) updating the Council on the work in progress and anticipated deliverables after July 1.

The sample documents provided above are preloaded (and downloadable as pdfs) on the custom R-Shiny application (DRAFT). This site will be the primary vehicle for sharing NRHA results. The NRHA Data Explorer includes tabs for displaying and summarizing fishery independent survey data (e.g., by region, salinity zones), single species and joint model outputs, the NRHA-HCVA crosswalk results, habitat data sets and metadata files, species profiles, reports (e.g., modeling and inshore habitat data report), and other publications. The Draft NRHA Data Explorer can be found here: https://nrha.shinyapps.io/dataexplorer/.

Summary of the Northeast Regional Marine Fish Habitat Assessment (NRHA)

(DRAFT as of May 24, 2022)

Draft Report: May 24, 2022
Final Report Completed:

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Acronyms

ACFHP	Atlantic Coastal Fish Habitat Partnership
CUSP	Continuously Updated Shoreline Product
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
FSCVA	Fish and Shellfish Climate Vulnerability Assessment
GB	Georges Bank
GIS	Geographic Information System
GOM	Gulf of Maine
HAPC	Habitat Area of Particular Concern
HCVA	Habitat Climate Vulnerability Assessment
MHW	Mean High Water
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NRHA	Northeast Regional Habitat Assessment

1.0 Introduction and History of NRHA

In late 2017, a Steering Committee composed of leadership from the major habitat conservation, restoration, and science organizations in the region, met and agreed to identify ways to improve fish habitat science within the region. They concluded that a Northeast Regional Marine Fish Habitat Assessment was needed to describe and characterize estuarine, coastal, and offshore fish habitat distribution, abundance, and quality in the Northeast. The project is working to align habitat science goals and priorities with human and financial resources to develop habitat science products that support an assessment.

The Steering Committee wanted an assessment that:

- Serves as a decision support tool for multiple audiences – for both inshore and offshore habitats, to assess habitat distribution, abundance, quality, species habitat use, and how it is changing in response to changes in climate.
- Provides foundational information to support the designation of essential fish habitat (EFH) for Councils and supports federal EFH assessments and EFH consultations (i.e., better data, better synthesis, more specific habitat information, finer scale information).
- Identifies what habitat areas are rare, sensitive, especially vulnerable to degradation, or are uniquely important to ecosystem function, to help prioritize consultations and conservation.
- Compiles information to support a regional National Fish Habitat Partnership (NFHP)[1] assessment, to identify areas that could be considered for habitat conservation or restoration.
- Addresses NOAA's Habitat Assessment Improvement Plan (HAIP)[2] priorities.
- Characterizes habitats, their services, and vulnerabilities to better inform permitting agencies and industries in decision making with respect to multiple ocean uses (e.g. aquaculture, wild-caught fisheries, energy issues, etc.).
- Supports incorporation of ecosystem principles into fisheries management.

To meet these objectives, the Steering Committee supported the development of a detailed work plan to identify specific products and delivery dates, financial needs, and responsible parties to complete a regional assessment. The Steering Committee leadership specifically identified staff habitat scientists to participate on work plan development teams during July 2018 - December 2018. The completed work plan included specific actions to be addressed, including the identification of contractors and the formation of action teams that would support this work.

2.0 Work Plan and Action Items

Four actions were identified as necessary to describe and characterize estuarine, coastal, and offshore fish habitat distribution, abundance, and quality in the Northeast. These actions will

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[1] National Fish Habitat Partnership's (http://www.fishhabitat.org/about/) mission is to protect, restore and enhance the nation's fish and aquatic communities through partnerships that foster fish habitat conservation and improve the quality of life for the American people.

[2] Habitat Assessment Improvement Plan: https://www.st.nmfs.noaa.gov/ecosystems/habitat/publications/haip/index.

address: 1) Abundance and trends in habitat types in the inshore area, 2) Habitat vulnerability, 3) Spatial descriptions of species habitat use in the offshore area and 4) provide a Habitat Data Visualization and Decision Support Tool. The core work to support these actions is proposed for July 2019 - July 2022, with anticipated project support to maintain and improve products beyond. Action team leads and action team members were identified in June 2019 to support work (see Section 3.0).

More specifically:

1) Abundance and trends in habitat types in the inshore area. This action will map the location and extent of habitat types utilized by the focus species and quantify the aerial coverage, status, and trends of these habitats. It will also compile metrics that may inform an assessment of habitat quality. Key outcomes from this action include A. Location and extent of habitat types as maps (Geographic Information System (GIS) framework; to finest scale practical). B. Quantity of habitat types in the entire region, sub or ecoregions, estuaries, mainstems/tributaries, to finest scale (1 km sq polygons or smaller, where possible). C. Status and trend of habitat types with 1) relative proportion of habitat types to one another, 2) a baseline to track each habitat type, 3) trends in habitat quantity relative to baseline if possible, and 4) development of habitat quality metrics, if possible. D. Written inventory and database of habitats, and habitat use for inshore focus species.

2) Habitat vulnerability. This action will involve Council and Commission staff coordination with, and participation in, the NOAA Habitat Climate Vulnerability Assessment (HCVA). That assessment will use habitat experts to examine fish habitat vulnerability to climate and non-climate stressors. Key outcomes from this action include A. Qualitative evaluation of the vulnerability of specific habitat types to non-climate and climate related stressors based on expert judgment. B. Recommendations from HCVA and staff leads if additional areas for future work are identified through this process.

3) Spatial descriptions of species habitat use in the offshore area. This action will use model-based and empirical approaches to identify, predict, and map habitat use for each of the focus species and track and quantify changes in habitat use over time (e.g., seasonal, annual, and future predicted use). Key outcomes from this action include A. Location and extent of habitat use (spatially depicted) by individual focus species (and, if possible, species groups), including annual, seasonal, and predicted future use. B. Quantify and track changes in habitat use for focus species throughout the region, and for each Ecological Production Unit (EPU): Mid-Atlantic Bight, Georges Bank, Gulf of Maine. C. Identification of most important factors (covariates) driving focus species distribution.

4) Habitat data visualization and decision support tool. Habitat information will be incorporated into a publicly accessible decision support tool, making this information available to partners to visualize habitat location, extent, and use throughout the region, and providing access to relevant data and habitat metrics developed by the assessment.

3.0 The Teams

In addition to the Steering Committee Core work team, and Action Teams, special thanks to the Councils and NOAA Fisheries Office of Habitat Conservation and Office of Science and Technology for the substantial support provided to NRHA. In addition, this work would not be possible without the support of our many partner organizations and co-collaborators who provided data, input, and advice to the project along the way.

The Steering Committee

Mid-Atlantic Fishery Management Council (MAFMC): Christopher Moore
New England Fishery Management Council (NEFMC): Thomas Nies
Atlantic Coast Fish Habitat Partnership: Bob Beal (designee Lisa Havel)
Atlantic States Marine Fisheries Commission: Bob Beal (designee Patrick Campfield)
Duke University, Marine Spatial Ecology: Patrick Halpin
Monmouth University, Urban Coast Institute: Tony McDonald
National Fish Habitat Partnership, Science and Data Committee: Gary Whelan
NOAA Fisheries Offices of Habitat Conservation: Kara Meckley, Lou Chiarella
NOAA NCCOS Marine Spatial Ecology Division: Mark Monaco
NOAA Fisheries Offices of Science and Technology: Peg Brady, Tony Marshak
NOAA Northeast Fisheries Science Center: Thomas Noji (retired), Dan Wieczorak
The Nature Conservancy: Kate Wilke

Our Core Leads Work Team

NEFMC, Michelle Bachman
MAFMC, Jessica Coakley
Monmouth University/NOAA, Christopher Haak
MAFMC (Previously with NOAA/Integrated Statistics), Victoria Kentner
NMFS NEFSC, Laurel Smith

The Action Team Members

Gulf of Maine Research Institute - Kathy Mills
Maryland DNR - Marek Topolski
Massachusetts DMF - Mark Rousseau
NOAA Fisheries GARFO - David Stevenson, Alison Verkade,
NOAA Fisheries NEFSC - Kevin Friedland, Donna Johnson, Ryan Morse, Dave Packer, Vince Saba, Harvey Walsh
NOAA NOS NCCOS - Andrew Leight
The Nature Conservancy - Bryan DeAngelis, Rich Bell, Marta Ribera
The PEW Charitable Trusts - Zack Greenberg
Rhode Island DEM - Eric Schneider
U.S. Fish and Wildlife Service - Julie Devers
U.S. Geologic Service - Stephen Faulkner
Virginia Institute of Marine Sciences - Robert Latour

Other Collaborators and Partners

Other collaborators: David (Moe) Nelson (NOAA NOS), Aaron Kornbluth (PEW), Lisa Havel and Pat Campfield (ASMFC/ACFHP), Karl Vilacoba, Emily Shumchenia and Nick Napoli (MARCO/NROC), Sarah Gaiches and Kim Hyde (NOAA Fisheries NEFSC), Mike R. Johnson (NOAA Fisheries GARFO), and Emily Farr (previously with NOAA Fisheries).

4.0 Process and Outreach

With guidance from the Steering Committee through a detailed work plan, the core work team held regular meetings with members of the inshore and offshore action teams.

Initially, they met independently, but the inshore and offshore action team meetings merged in year 2 as discussions became more commingled, particularly with concepts of integrating and sharing products. Action Team members helped identify data sources, others in the region doing other useful or analogous work, and identified what could be feasibly developed given the data and resources available to do the work. In addition, Action Team members helped with preparation and review of some of the written products and metadata reports. Regular check-ins were held with the Core Leads Team (monthly), Action Teams (3 times per year), and the Steering Committee (twice a year) in an iterative manner.

5.0 Scope and Species

Overall, the scope of NRHA is estuarine, coastal and offshore waters of the Northeast U.S. Shelf, and extends from the North Carolina/South Carolina boundary to the western end of the Scotian Shelf and includes the Mid-Atlantic Bight, Southern New England, Georges Bank, and the Gulf of Maine.

Inshore

The spatial extent of the inshore assessment is defined geographically for comparison with various habitat and fish data sources, and to conceptually indicate the overall scope of the inshore assessment. The inshore boundary of the inshore assessment is based largely on NOAA's Medium Resolution Shoreline. NOAA's continuously updated shoreline product (CUSP) was considered as an alternative, but that product is much higher resolution, encompassing many additional tributaries, and was thought to be unnecessarily detailed for a regional-scale analysis. This page provides an overview of the two shoreline products, plus NOAA's Office of Coast Survey shorelines, linking to the data sources and more detailed metadata: https://shoreline.noaa.gov/data/national.html. The medium resolution shoreline uses Mean High Water (MHW) as the tidal datum.

Tidal fresh salinity zones are encompassed within the inshore assessment extent. One source of salinity data is NOAA's Estuarine Salinity Zones of the United States (Nelson 2015), which was used to support NOAA's Estuarine Living Marine Resource (ELMR) assessment. The salinity zone product divides estuaries of the contiguous United States into three zones as follows: (1) Tidal Fresh Zone (0 to 0.5 parts per thousand); (2) Mixing Zone (0.5 to 25 parts per thousand);

(3) Seawater Zone (25 parts per thousand or greater). Visually comparing the medium resolution shoreline and the salinity zones, the tidal fresh zones are encompassed by the medium-resolution shoreline. The resolution of the salinity zone polygons is coarser, so these data sets will be overlaid for illustrative purposes as needed, but not merged into a single GIS coverage.
The inshore assessment extent also incorporates the 'Estuarine and Marine Wetland' and 'Estuarine Marine Deepwater' wetland types from the U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI). NWI uses the Cowardin system for wetlands classification (Cowardin et al. 1979, FGDC 2013). The Cowardin system has been in use since 1976 and became a National Standard in 1996. An overview of NWI is available at https://www.fws.gov/program/national-wetlands-inventory

Note that some NRHA species occur in riverine and tidal freshwater habitats during portions of their life history. These include Atlantic salmon, alewife, blueback herring, shad, Atlantic sturgeon, winter flounder, and summer flounder. This inshore habitat assessment does not encompass the full extent of habitat occupancy for these species, in large part because other related assessments have already done so. Specifically, two regional assessments that cover the NRHA geographic extent encompass both riverine and estuarine habitats. These include the Atlantic Coast Fish Habitat Partnership's Fish Habitat Conservation Area Mapping and Prioritization Project (https://www.atlanticfishhabitat.org/science-and-data-projects/) and the 2015 National Fish Habitat Partnership assessment (http://assessment.fishhabitat.org/). In addition, management of freshwater areas is beyond the purview of coastal and marine resource managers who are the primary audience for NRHA.

The offshore boundary of the inshore assessment is the state waters boundary, which is also the approximate extent of state trawl surveys.

Offshore

The offshore assessment actions will generally focus on habitat from the coastal bays to the eastern boundary of the EEZ, although data available to support work only extend to the offshore canyon areas at its furthest extent.

Outside the NRHA Region

While important habitat for some species may occur outside the geographic scope for the actions, it is not practical to identify and assess this fish habitat through this assessment in a transboundary way at this time.

Focus Species

The Steering Committee identified 65+ focus fish species for this habitat assessment. All species are highly important to fisheries management organizations within the region.

Table 1. NRHA focal species, by management entity.

MAFMC	Atlantic mackerel, Atlantic surfclam, Black sea bass*, Bluefish* , Blueline tilefish , Butterfish, Chub mackerel, Golden tilefish , Longfin squid, Ocean quahog, Scup*, Shortfin (Illex) squid, Spiny dogfish*, **, Summer flounder*
NEFMC	Acadian redfish, American plaice, Atlantic cod, Atlantic halibut, Atlantic herring*, Atlantic salmon, Atlantic wolffish, Barndoor skate, Clearnose skate, Cusk***, Haddock, Little Skate, Monkfish**, Ocean pout, Offshore hake, Pollock, Red crab, Red hake, Rosette skate, Sea scallop, Silver hake, Smooth skate, Thorny skate, White hake, Windowpane flounder, Winter flounder*, Winter skate, Witch flounder, Yellowtail flounder
ASMFC (not noted above)	American eel, American lobster, Atlantic croaker, Atlantic menhaden, Atlantic striped bass, Atlantic sturgeon, Black drum, Coastal sharks, Cobia, Horseshoe crab, Jonah crab, Northern shrimp, Red drum, Shad and river herring, Spanish mackerel, Spot, Spotted seatrout, Tautog, Weakfish
Highly Migratory (with HAPC designations)	Sandbar shark, Dusky shark
* Also managed by ASMFC. **Jointly managed between MAFMC and NEFMC. *** Not a NEFMC managed species but occurring in the New England region.	

6.0 Data

Species data

Species data from as early as 1963 through 2019 were assembled from federal and state fisheries independent surveys. Most are trawl surveys, but longline, trap, and seine surveys were included as well. Data were pulled from NOAA databases where possible, but most state and regional survey data were obtained directly from project coordinators. Data sets were reformatted for consistency as needed. In general modeling was stage based, so total abundance and biomass per tow was summed individually for juveniles and adults, based on fish length.

Habitat data

Diverse habitat data were assembled to support the project. These data sets can be visualized individually through the NRHA R-Shiny application or via other data portals, and also many were used as model covariates.

- **Sediment and benthic:** Sediment data include coast wide and local data sources that identify grain size by location. Other data products in this category represent habitat classification schemes, based in part on sediment data but also on other sources of information. Data in these categories are in point, polygon, and raster formats.
- **Bathymetry:** In the context of NRHA, bathymetry data are primarily used to describe the water depth at a particular location, although many digital elevation models include submerged as well as upland areas. Similar to the sediment data sets, bathymetry data may be coastwide or local. Various products can be derived from bathymetric surfaces, such as slope, aspect, or indices of bathymetric position. Contour lines connecting locations of equal depth and/or slope can also be generated. Many fishery independent resource surveys collect depth data as a station variable.
- **Temperature:** Water temperature is an important determinant of fish distribution, and therefore useful for NRHA modeling efforts. Temperature data may be taken at the sea surface, throughout the water column, or at the seabed. Temperature data are collected via remote sensing and via direct measurement. Many fishery independent resource surveys collect temperature data as a station variable.
- **Coastal Habitats:** Coastal habitats of interest include submerged aquatic vegetation, oyster reef, tidal marsh, and hard bottom. Submerged Aquatic Vegetation or SAV data document the location of aquatic plants such as eelgrass. Data are typically in polygon format and may include density information. SAV distributions are somewhat dynamic naturally, and there is also a restoration component whereby SAV in an area is deliberately increased via human intervention as a habitat enhancement technique. Thus, the timing over which SAV data were collected is an important data element.
- **Hydrodynamic Data:** Hydrodynamic data describe the movement of water at a particular location and depth, at varying spatial and temporal resolutions. These models may incorporate wave dynamics only, circulation dynamics only, or both.
- **Climate Model Outputs:** Climate models can be used to predict changes in temperature at a particular location, at varying spatial and temporal resolutions. In the context of NRHA, these temperature forecasts can be included in species distribution models to estimate how these distributions could change under various climate scenarios.

Metadata inventory

An inventory as a spreadsheet and as 1-page metadata sheets were created for fishery-independent datasets and some environmental datasets. Those were reviewed by the data originators and action team members and are available in the R-Shiny applications.

Fisheries survey crosswalk

Fishery independent surveys often use similar methods, but differences in gear type, tow duration, season, etc. are important to consider when developing analyses based on multiple datasets. As a first step towards integrating data from multiple surveys, NRHA analysts generated a crosswalk table to document and compare the attributes of each survey.

7.0 Modeling Approaches

Single species and joint species distribution models (SDMs) are a core element of NRHA. Single-species SDMs employed Generalized Additive Modeling (GAM) and Random Forest (RF) methods, derived in part from earlier work including that of Malin Pinsky (Rutgers) and Kevin Friedland (NOAA NMFS NEFSC). Joint SDMs were fitted using a novel statistical approach, the Community-level Basis Function Model (CBFM), a spatio-temporal framework for joint-species distribution modeling wherein species relationships with environmental predictors and their covariance with each other are evaluated simultaneously. See manuscript for CBFM methods details.

Single-species RF models were used for initial exploration and to aid in identifying influential covariates, while GAMs were used for the final models due to their greater transparency and interpretability. The predictions and ecological inferences drawn from single and joint-species models were compared.

8.0 Climate Vulnerability Assessment/NRHA Crosswalk

NOAA Fisheries recently completed the Northeast Habitat Climate Vulnerability Assessment that assesses the vulnerability of 52 marine, estuarine, and riverine habitats in the Northeast U.S. to climate change (Farr et al. 2021). The Northeast HCVA builds on the Northeast Fish and Shellfish Climate Vulnerability Assessment (FSCVA, Hare et al. 2016), which examined fishes' climate vulnerability based on life history. The HCVA complements the FSCVA by improving our understanding of how the vulnerability of habitats will impact fish and shellfish populations that depend on them. The Atlantic Coastal Fish Habitat Partnership habitat-species matrix (Kritzer et al. 2016) identified the importance of nearshore benthic habitats to each life stage of select fish species, which helps elucidate species that may be highly dependent on highly vulnerable habitats that were identified in the HCVA. This portion of NRHA integrates the outputs from the HCVA, FSCVA, and ACFHP assessments for use in fisheries management. The major objectives were to create a habitat-species vulnerability matrix and develop species narratives for 66 managed and forage species in the region.

The matrix identifies the dependence or occurrence of species on specific habitat types while conveying information about species and habitat vulnerability to climate change. Relative dependence of a species on a habitat was indicated for inshore species based on the ACFHP matrix, while simple occurrence was indicated for offshore species not scored in the ACFHP analysis. Habitat associations for offshore species were determined based on EFH designations, scientific literature, and expert knowledge. As the project is ongoing, species that were not included in the ACFHP project and do not have designated EFH may present additional challenges in terms of assigning habitat associations in the matrix. These species are part of the project because they were assessed via the FSCVA and are important components of the ecosystem.

Crosswalking the HCVA and ACFHP assessments presented several challenges. The ACFHP analysis did not identify dependencies on water column habitats, so water column species habitat relationships were added to the crosswalk based on EFH text descriptions, scientific literature, and expert knowledge of the species' life history. In addition, the ACFHP and HCVA analyses did not use the same habitat classifications, with the ACFHP categories being more general, and the HCVA habitat types more narrow. While the HCVA types were able to be nested within the ACFHP categories, some of the HCVA habitat types falling under an ACFHP category do not apply to individual species, and these needed to be removed individually when writing the species narratives. Some ACFHP category names better encompass the cross-walked HCVA habitat types than others. For example, the "seaweed" ACFHP habitat designation was modified to "macroalgae" to more appropriately convey the dependencies on vegetated habitats. Shellfish habitats posed a complicated crosswalk as the HCVA did not include a category for non-reef forming shellfish and expert knowledge was used to sort equivalencies as fish weren't using scallop bed or hard clam bed habitat for sand or mud substrate but for food.

The species narratives describe the species climate vulnerability, the species habitat dependencies or associations across life stages, and the climate vulnerability of those habitats. The information is presented in both text and tables. The initial focus has been on species that are highly dependent on highly vulnerable habitats. Similar to the matrix, the narratives draw from several existing sources of information, including HCVA, FSCVA, and ACFHP results, essential fish designations, and the NRHA species profiles, which describe life history including reproduction, migrations/movement, and habitat use, in addition to food habits, the fishery, and management. The information pulled from these sources allows the narratives to provide a quick reference of a species' particular sensitivities and exposures as well as highlight any unique regional vulnerabilities. Species with different habitat dependency between New England and the Mid-Atlantic have descriptions and tables for each region. Species with identical dependency data for both regions are combined for those sections, and species without data in one region have a range disclaimer or explanatory note on data availability. Companion documents for the species narratives will include a glossary of key terms, expanded habitat descriptions and vulnerability summaries, and an overview of methodology.

The crosswalk will be included in the data sharing R-Shiny application described below. An objective when presenting this work is to highlight species that are highly climate vulnerable, depend on highly climate vulnerable habitats, or both, since these vulnerabilities create particular management challenges. The first 40 species narratives and the associated matrix will be included in the initial NRHA product launch, and the remainder will be added to the application by early 2023.

9.0 Data dissemination and sharing

A custom R-Shiny application is the primary vehicle for sharing NRHA results. R is a free software environment for statistical computing and graphics (https://www.r-project.org/). Shiny is a specific R coding package that allows users to build custom interactive web applications (https://shiny.rstudio.com/). The application includes tabs for displaying and summarizing fishery independent survey data, single species and joint model outputs, the NRHA-HCVA crosswalk results, habitat data sets and metadata files, species profiles, reports and publications, etc. The NRHA application can be found here: https://nrha.shinyapps.io/dataexplorer/.

A diverse array of marine spatial data portals are used for spatial planning and marine management in the northeast U.S. and worldwide. Among these are the Northeast Ocean Data Portal (https://www.northeastoceandata.org/) and the Mid Atlantic Ocean Data Portal (https://portal.midatlanticocean.org/visualize/). The NRHA team will collaborate with these two data portals to launch a curated set of products, and potentially will develop thematic and/or story maps to walk users through results for particular species, or focused on a certain application or location. As management applications arise over time through the Council or Commission processes, the data shared through the portals can be augmented to address these needs.

The recently launched NOAA Fisheries Distribution Mapping and Analysis Portal (DisMAP) provides easy access to information to track and understand distributions of marine species in the U.S. Marine Ecosystems. NRHA leads have held initial discussions with DisMAP staff to explore options for sharing NRHA modeling products via DisMAP, and will continue to engage with them on possible collaboration opportunities.

10.0 Applications

Essential Fish Habitat Applications

Perhaps the most obvious use of NRHA products in federal fisheries management is for the refinement of essential fish habitat designations. The single species and joint habitat models will provide spatially specific estimates of habitat suitability for species and groups of species, along with information about which environmental factors influence distribution. These results can be applied to both the map and text elements of EFH designations. The Mid-Atlantic Fishery Management Council already envisions commencing an EFH Review/Redo in fall 2022. The EFH Review Fishery Management Action Team (FMAT) will consider NRHA model outputs and other information in detail for Council-managed species and recommend whether and how to revise existing designations. NRHA results could also be used to identify subsets of EFH for designation as Habitat Areas of Particular Concern, or HAPC.

Integration of Habitat Science into EAFM and broader IEA Approaches

Information from the habitat assessment will be available to add into summary reports for the region, both at an ecosystem level and for individual species. This includes maps and metrics to track historic habitat use, and how that habitat is changing in the inshore or offshore regions, annually, seasonal, as well as how the habitat use is projected to change over time.

State of the Ecosystem (SOE) reports provide information for Ecosystem Approaches to Fishery Management (EAFM), Ecosystem Based Fishery Management (EBFM) and Integrated Ecosystem Assessment (IEA) approaches. Including multi-species information on ecosystem drivers of species distribution shifts will greatly enhance both the connectivity of various parts of the SOE reports and help to facilitate EAFM, EBFM, and IEA approaches that can be used by both the New England and Mid-Atlantic Fisheries Management Councils.

Habitat and Stock Assessment Applications

High resolution habitat maps that include both static and dynamic aspects of habitat combined with geospatial statistical models have the potential to improve the indices of abundance that go into stock assessments as well as improve survey design. Each single species stock assessment includes a Term of Reference that requires a summary of stock distribution and changes over time. NRHA products can directly address this Term of Reference by providing maps at various spatial and temporal resolutions, as well as environmental covariates and single species model projections of future distributions. The significant environmental covariates for a given assessed species can also be used to determine if environmental regime shifts are occurring that affect the health, condition or recruitment of the species. This was informative at setting the recruitment stanza used for butterfish projections in the 2022 assessment. NRHA work on distribution shifts and environmental covariates are also being applied for the 2023 Atlantic mackerel assessment, and will likely be included in many other single species stock assessments going forward.

11.0 Limitations and Data Gaps

Some of the NRHA species are data limited with low catches in fishery independent surveys (due to low catchability, for example) which has precluded application of modeling approaches. Generally available data for these species are provided in the data explorer.

The NRHA teams discussed other potential work products during development of the three year assessment but needed to focus efforts given available resources. For example, analysts discussed compiling existing habitat status and trends evaluations, particularly for inshore habitat types such as wetlands, but resources were insufficient to complete this work.

12.0 Next Steps

Selected NRHA products incorporate climate change considerations. These include simplified single species Generalized Additive Models that assume future climate scenarios in order to predict species distributions given changes in ocean conditions, for example, increases in water temperature. The CVA-NRHA crosswalk work identifies key areas of vulnerability on which managers can focus their attention. East coast fishery managers are also engaged in determining how to approach decision making strategically, given environmental changes occuring now and into the future through a scenario planning initiative. As appropriate, NRHA products can be used to support this ongoing work. In addition, the joint models are closely aligned with methods being considered for use in a NSF-funded convergence accelerator project, which aims to estimate changing distributions of species and guilds under multiple climate scenarios. We are working with this team to ensure that their products build on NRHA work.

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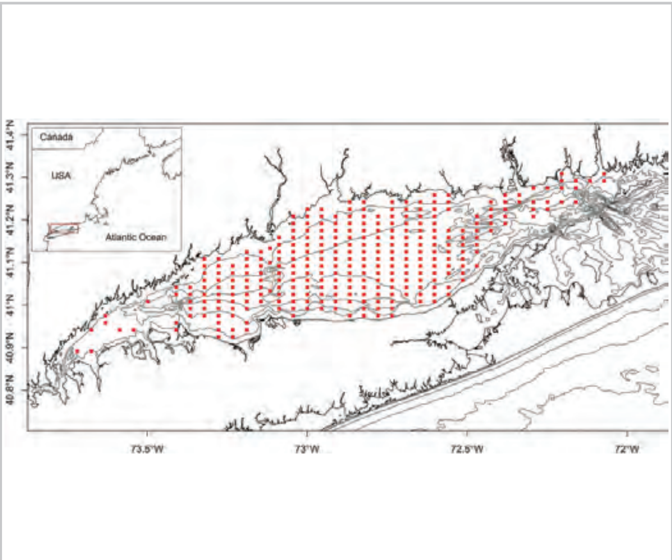
Long Island Sound Trawl Survey

Data Source	Data Type	Date Range	Data Resolution	Data available online?
The Connecticut DEEP Marine Fisheries Program	Trawl: catch and environmental data	1984-Ongoing Spring/Fall	NA	Yes ☐ No ☑

Geographic Range

Long Island Sound New London to Greenwich, Connecticut



Methodology

The Long Island Sound Trawl Survey (LISTS) encompasses an area from New London to Greenwich, Connecticut and includes waters from 5 to 46 meters in depth in both Connecticut and New York state waters. Temperature, salinity and water depth are recorded at each site before the 46-foot-sweep trawl net is deployed for 30 minutes. Upon retrieval of the net, the sample is quickly sorted by species, counted, weighed and further processed as needed to support specific research and monitoring needs.

Overview

The Long Island Sound Trawl Survey is a vital tool Marine Fisheries staff use to measure the abundance and distribution of finfish, squid and other macro-invertebrates (lobster, crabs, horseshoe crabs, whelks) in Long Island Sound, independent of commercial or recreational fishing. By comparing Trawl Survey data with current fishery data (landings, catch/effort, seasonal patterns) each species' harvest can be weighed against its abundance, providing a gauge to determine whether harvest limit targets are being met. The Trawl Survey also provides a measure of recruitment strength (abundance of young fish) entering the population each year, as well as detailed characterization of the size and age composition of several species entering the sound.

To date, the Trawl Survey has documented 99 finfish species and more than 60 invertebrate taxa. Each spring (April, May, June) and fall (September, October) the 50-foot R/V John Dempsey carries its crew of 4-6 scientists and vessel staff on the monthly cruises, sampling 40 stations selected at random from 12 depth and substrate categories (called "strata") between Groton and Greenwich in both Connecticut and New York waters.

Data Caveats

Since 1984, several changes have been incorporated into the Survey. Just a few examples include changes in sampling schedule, using an onboard scale to provide aggregate weights by species and including length data for several species.

Data Access

website: https://portal.ct.gov/DEEP/Fishing/Fisheries-Management/Long-Island-Sound-Trawl-Survey
Contact Person: Kurt Gottschall, 860-447-4314, Kurt.Gottschall@ct.gov

Citation

Connecticut Department of Energy and Environmental Protection. 1984-2020. Connecticut DEEP Marine Fisheries Long Island Sound Trawl Survey, Accessed on [date]

Atlantic Cod

Species Climate Vulnerability:
Atlantic cod (*Gadus morhua*) is projected to be moderately vulnerable to climate change due to exposure to changing ocean temperature and acidification and sensitivity in terms of stock status (overfished with overfishing occurring), slow population growth rates, stock status, and specific early life history requirements (e.g., dependence on specific circulation patterns for larval retention and specific nursery habitats). Atlantic cod are projected to be negatively affected by climate change caused by resulting decreases in recruitment and suitable habitat (Hare et al. 2016). Temperature plays an important role in Atlantic cod recruitment, growth, and survival, and several studies have reported declines in populations in the southern extent of the range due to projected increased temperature (Drinkwater 2005; Fogarty et al. 2008; Pershing et al. 2015; Planque and Fredou 1999).

Habitat Dependence:
A number of estuarine and marine habitats are important to Atlantic cod. These include firm hard bottom habitat (corresponding to the HCVA categories of marine intertidal rocky bottom, marine rocky bottom <200 m, estuarine intertidal rocky bottom, and estuarine subtidal rocky bottom) and loose coarse bottom habitat (corresponding to the HCVA categories of marine intertidal rocky bottom, marine rocky bottom <200 m, estuarine intertidal rocky bottom, and estuarine subtidal rocky bottom). In addition, loose fine bottom habitat (corresponding to the HCVA categories of marine intertidal mud, marine intertidal sand, marine mud <200 m, marine mud >200 m, estuarine intertidal mud, estuarine intertidal sand, estuarine subtidal mud, and estuarine subtidal sand) and structured sand (corresponding to the HCVA categories of marine intertidal sand, marine sand <200 m, estuarine intertidal sand, and estuarine subtidal sand) were identified as important to Atlantic cod. Marine and estuarine water column habitats are important for all life stages, particularly for the survival and distribution of eggs and larvae (Clark et al. 2003). Egg and larval life stages use marine shallow/inner shelf and marine shelf surface water column habitats, while juveniles and adults are primarily demersal and use estuarine water column, marine shallow/inner shelf, and marine shelf bottom water column habitats.

Aquatic vegetation habitat is also critical to the species, as various life stages rely on mesohaline and polyhaline species habitat (corresponding to HCVA classifications marine submerged aquatic vegetation and estuarine submerged aquatic vegetation) and seaweed habitat (corresponding to HCVA classifications of marine kelp, estuarine kelp, marine red, green, and small brown algae and estuarine red, green, and small brown algae).

Habitat Climate Vulnerability:
All habitats ranked as important to Atlantic cod are vulnerable to projected increased sea surface and bottom temperatures (Farr et al. 2021). Marine and estuarine sand and rocky bottom habitats have moderate to high dependence for juvenile, adult, and spawning adult Atlantic cod. These habitats range from low vulnerability to climate

change (e.g., estuarine subtidal rocky bottom) to high vulnerability (marine intertidal rocky bottom and sand). Spawning is known to occur on the continental shelf, and eggs and larvae inhabit the water column both nearshore and offshore. Although the estuarine water column habitat was ranked as highly vulnerable, surface and bottom water column habitats were ranked as low. However, water column habitats were not included in ACFHP's assessment of habitat dependency and finer-scale information on the importance of specific pelagic habitats is needed for the species.

Critical points of high dependency and high vulnerability exist for Atlantic cod with mesohaline and polyhaline species habitat (corresponding to HCVA classifications marine submerged aquatic vegetation and estuarine submerged aquatic vegetation) and multiple intertidal habitats including firm hard bottom habitat, loose coarse bottom habitat, and structured sand habitat.

Mid-Atlantic

While the ACFHP matrix did assess Atlantic cod habitats in the Mid-Atlantic, they are not included in this summary document due to the limited population and resulting absence of a directed commercial fishery for the species in the Mid-Atlantic.

New England

Habitat dependency for Atlantic cod is based solely on the New England region.

<u>Habitat dependence by life stage:</u>

- *Eggs/larvae:*
    - Marine shallow/inner shelf water column habitat.
    - Marine shelf surface water column habitat.
    - Marine water column shelf bottom habitat.
- *Juveniles/Young-of-the-year, and Adults:*
    - Firm hard bottom habitat has high dependence.
    - Loose coarse bottom habitat has high dependence.
    - Loose fine bottom habitat has medium dependence.
    - Mesohaline and polyhaline species habitat has high dependence.
    - Structured sand habitat has high dependence.
    - Marine shallow/inner shelf water column habitat.
    - Marine shelf bottom water column habitat.
    - Estuarine water column habitat.
- *Spawning adults:*
    - Firm hard bottom habitat has high dependence.
    - Loose coarse bottom habitat has high dependence.
    - Loose fine bottom habitat has medium dependence.
    - Mesohaline and polyhaline species habitat has high dependence.
    - Structured sand habitat has high dependence.
    - Marine shallow/inner shelf water column habitat.
    - Marine shelf bottom water column habitat.

<table>
<tr><th colspan="6">Atlantic Cod (New England)</th></tr>
<tr><th></th><th></th><th colspan="4">Life Stage Dependency</th></tr>
<tr><th>Habitat Type</th><th>HCVA Climate Vulnerability Rank</th><th>Egg/ Larvae</th><th>Juvenile/ YOY</th><th>Adult</th><th>Spawning Adult</th></tr>
<tr><td rowspan="3">Firm Hard Bottom</td><td>Marine intertidal rocky bottom- High (juveniles/YOY only)</td><td rowspan="3"></td><td rowspan="3">H</td><td rowspan="3">H</td><td rowspan="3">H</td></tr>
<tr><td>Estuarine intertidal rocky bottom- Moderate (juveniles/YOY only)</td></tr>
<tr><td>Estuarine subtidal rocky bottom- Low

Marine rocky bottom <200m- Low</td></tr>
<tr><td rowspan="3">Loose Coarse Bottom</td><td>Marine intertidal rocky bottom- High (juveniles/YOY only)</td><td rowspan="3"></td><td rowspan="3">H</td><td rowspan="3">H</td><td rowspan="3">H</td></tr>
<tr><td>Estuarine intertidal rocky bottom- Moderate (juveniles/YOY only)</td></tr>
<tr><td>Estuarine subtidal rocky bottom- Low

Marine rocky bottom <200m- Low</td></tr>
</table>

Loose Fine Bottom	Marine intertidal mud- High (juveniles/YOY only) Marine intertidal sand- High (juveniles/YOY only) Estuarine intertidal mud- Moderate (juveniles/YOY only) Estuarine intertidal sand- Moderate (juveniles/YOY only) Estuarine subtidal mud- Moderate Marine mud <200m- Low Marine sand <200m- Low Estuarine subtidal sand- Low		M	M	M
Mesohaline and Polyhaline Species	Marine submerged aquatic vegetation- High Estuarine submerged aquatic vegetation- High		H	H	H
Structured Sand	Marine intertidal sand- High (juveniles/YOY only) Estuarine intertidal sand- Moderate (juveniles/YOY only) Estuarine subtidal sand- Low Marine sand <200m- Low		H	H	H
Marine Water Column, Shallow Inner Shelf	Low	X	X	X	X

Marine Water Column, Shelf Surface	Low	X			
Marine Water Column, Shelf Bottom	Low	X	X	X	X
Estuarine Water Column	High		X	X	

Key: M=medium dependency H=high dependency VH=very high dependency
X: Water column habitat dependency ranking is not available in ACFHP matrix

Species Profile - Black Sea Bass (*Centropristis striata*)

Species range and distribution

Black sea bass range from southern Nova Scotia and the Bay of Fundy (Scott 1988) to southern Florida (Bowen and Avise 1990) and into the Gulf of Mexico.

Habitat characteristics and habitat use by life stage

Eggs and larvae: Eggs and larvae are pelagic, and were more abundant in water depths of 10-90 m and water temperatures of 15-24°C during June-September on the continental shelf from northern NJ to Cape Hatteras between 1978 and 1987 (MARMAP survey data). Berrien and Sibunka (1999) showed that in the Mid-Atlantic Bight, areas with high average egg densities were generally located on the continental shelf in the vicinity of large estuaries including Chesapeake Bay, the Delaware River, and the Hudson River. Black sea bass eggs also occur infrequently in large bays such as Buzzards Bay, MA (Stone et al. 1994), but are rare in Long Island Sound (Merriman and Sclar 1952; Wheatland 1956; Richards 1959), and absent in Narragansett Bay RI (Bourne and Govoni 1988) and Delaware Bay (Wang and Kernehan 1979).

While black sea bass larvae are collected close to shore on the continental shelf, they rarely occur within estuaries. Able et al. (1995) speculated that most larvae settle in near shore continental shelf habitats and then move into estuarine nurseries where post-settlement stage juveniles can be abundant.

Young-of-the Year Juveniles: Larvae hatch from eggs at 1.5-2.1 mm TL and settle to the bottom as early juveniles at 10-16 mm TL (Kendall 1972; Fahay 1983; Able et al. 1995) primarily in nearshore shelf areas on shells (eg surfclams) and sandy substrates, then move into estuarine nursery areas on shallow (<50 m, mostly <20 m) shellfish, sponge, amphipod habitats, also seagrass beds, cobble habitats, and man-made structures. They are rarely found on non-vegetated sandy intertidal flats and beaches and in deeper, muddy bottom. In offshore areas, recently settled fish occur in accumulations of shell on sand substrata, complex micro-topographies on exposed clay, on rocky reefs, and on wrecks (Able et al. 1995).

Juveniles appear to be most abundant in oceanic waters and polyhaline regions of many estuaries, but can occur at salinities as low as 8 ppt (Drohan et al. 2005). Juveniles can be relatively common in estuaries south of Cape Cod, and are found in estuaries such as Narragansett Bay, Long Island Sound, the Hudson-Raritan estuary, Great Bay (NJ), Delaware Bay, Chesapeake Bay and tributaries, as well as many estuaries farther south (see references cited in Drohan et al. 2005).

Within estuaries, young fish use shallow shellfish (oyster and mussel), sponge (including *Microciona prolifera*), amphipod (*Ampelisca abdita*), seagrass beds (especially *Ruppia* sp.), and cobble habitats as well as manmade structures such as wharves, pilings, wrecks, reefs, crab and conch pots (see references cited in Drohan et al. 2005). Early juveniles are rare on unvegetated sandy intertidal flats and beaches (Allen et al. 1978) as well as deeper, muddy bottoms (Richards 1963b). According to Able and Fahay (2010), YOY juveniles are more frequently collected along with large amounts of shell hash (especially surfclams). In the Great Bay estuary (NJ) they occur at a variety of sites that include shells, amphipod tubes, and deep channels with rubble, also in marsh creeks and around pier pilings. Lab studies show a preference for oyster shells over barren sand substrate (Able and Fahay 1998). There seems to be a high degree of habitat fidelity during the summer and fall in the estuary (Able and Hales 1997). Temperature and oxygen seem to be especially important components of the habitat. In the lab, they occasionally buried in sand at 6°C and below 4°C they stopped feeding (Hales and Able 1995). Mortality increased sharply at 2-3°C.

The following is a detailed account of YOY juvenile growth, and inshore-offshore movements in New Jersey as reported by Able et al. (2005). "In New Jersey coastal waters larvae first appear in July but can occur into November. Recently settled individuals (15-24 mm total length [TL]) were collected at an inner continental shelf site and an adjacent estuary from July through October. By fall, fishes from these areas were 18-91 mm TL, and many had moved offshore from New Jersey estuarine waters and other estuaries to inner continental shelf waters between southern Massachusetts and Cape Hatteras. Subsequently, they continued to move offshore and during their first winter, they were concentrated near the shelf or slope break in the southern portion of the mid-Atlantic Bight. Some age 0+ individuals moved back into New Jersey estuaries in early spring, at sizes approximating those of the previous fall (150-96 mm TL). Thus, black sea bass reach relatively small sizes after 12 months of growth partly because little or no growth occurs during their first winter. This year class reached sizes of 78-175 mm TL by midsummer and 134-225 mm TL by the following fall."

Older Juveniles: Similar to YOY juveniles and adults, older juveniles are associated with structurally complex bottom habitats, display high site fidelity, use shallow estuarine habitats at age 1+ (<10 m) and are also found in deeper estuarine channels. Juveniles <19 cm T are common on the shelf at depths of 100-140 m in the spring at bottom temperatures between 9-12°C and at 5-50 m and 15-21°C in the fall (NEFSC survey data reported in Drohan et al. 2005). Juvenile black sea bass have been collected at temperatures as high as 27°C in Chesapeake Bay (Geer 2002). Growth is faster at intermediate salinities, suggesting that most suitable habitats are in lower reaches of estuaries (Berlinsky et al. 2000). In laboratory studies, 100% mortality was recorded at 2-3°C, increased use of shelter and burial at temperatures below 6°C, and reduced feeding at 4°C (Able and Hales 1997).

Adults: Adults are strongly associated with structured habitats such as rocky reefs, cobble/rock fields, stony coral and sponge patches (in the South Atlantic), exposed stiff clay, and mussel beds (Drohan et al. 2005). They use shelters, appear to remain near complex structures during the day, and move to adjacent soft-bottom habitats to feed at night (Steimle and Figley 1996). Juveniles and adults migrate to over-wintering habitats on the outer shelf in the fall and return inshore in the spring (see below). Primary summer habitats on the nearshore shelf are <60 m deep; black sea bass may also occupy complex habitats in lower reaches of large estuaries (~5 m depth). At temperatures near 6°C adults become inactive and rest in holes and crevices (Adams 1993). They are also known to burrow into soft sediments during especially cold winters off NC/SC coast (Parker 1990). Based on NEFSC trawl survey data, depth and temperature preferences on the shelf in spring are 70-140 m and 9-14°C, and 10-40 m/16-28°C in the fall (Drohan et al. 2005).

Migrations

In the Mid-Atlantic Bight juvenile and adult black sea bass migrate from nearshore continental shelf habitats to outer shelf over-wintering areas as bottom temperatures decline in the fall. Juveniles begin to move into deeper warmer offshore water as temperatures decline below 14°C, and few individuals are collected in shallow areas when temperatures fall below 6°C (Able and Fahay 1998; Klein-MacPhee 2002). During warmer winters, juveniles may successfully over winter in deeper waters of lower Chesapeake Bay (MAFMC 1996; Chesapeake Bay Program 1996). In the Mid-Atlantic Bight, juveniles return to nearshore and estuarine habitats in the spring and are collected as early as March in the Chesapeake Bay region (Kimmel 1973). Larger fish appear to migrate earlier than smaller fish (Kendall 1977).

Tag returns from fish tagged in Nantucket Sound (Massachusetts) suggest that fish migrate south to the outer shelf near Block Canyon (south of Rhode Island) and then move southwest along the outer shelf toward Norfolk Canyon off Virginia (Kolek 1990). Acoustically tagged fish east of Sandy Hook, NJ, remained in the study area for 1-6 months and dispersed from the area in greater numbers in early summer (early June) and late fall (October-December) (Fabrizio et al. 2013a). Dispersal in early summer may have been larger males going to nearby spawning and feeding areas.

In a more recent tagging study, fish tagged in SNE moved south along the shelf break as far as Virginia, reaching the outer shelf in 4-9 weeks (Moser and Shepherd (2009). In the central MAB (middle of Long Island to Chesapeake Bay), tagged fish reached the shelf break in 3 weeks. In both cases, winter habitats were 140-150 m deeper than shelf areas occupied in the summer. Movement was initiated when bottom temperatures were between 10 and 12°C. Return migration in the spring is faster and more directed. Despite mixing among local groups during winter on the outer shelf, fish generally return to the area of previous summer residence, but degree of site fidelity was lower for fish that travel farther, i.e., the fish did not display strict "homing behavior."

Miller et al. (2016) performed a GAM analysis of spring NEFSC bottom trawl survey data from the MAB in relation to bottom temperatures, salinity, and shelf water volume and concluded that all three factors were significant features of over-wintering habitats. North of Hudson Canyon, temperatures >8°C had a positive effect on catch; south of Hudson Canyon the preferred temperature range was 7.9-15.7°C, with a peak at 12.5°C. Spring bottom temperatures in the north never get high enough to limit offshore migration. A temperature/salinity fronts on the outer shelf limits the extent of offshore migration and is preferred habitat, presumably due to upwelling, surface convergence and high productivity.

Within the stock area, distribution changes on a seasonal basis and the extent of the seasonal change varies by location. In the northern end of the range (New York to Massachusetts), black sea bass move offshore crossing the continental shelf, then south along the edge of the shelf (Moser and Shepherd 2009). By late winter, northern fish may travel as far south as Virginia, but most return to the northern inshore areas by May (NEFSC 2017). Black sea bass originating inshore along the Mid-Atlantic coast (New Jersey to Maryland) head offshore to the shelf edge during late autumn, traveling in a southeasterly direction. They return inshore in spring to the general area from which they originated (NEFSC 2017).. Black sea bass in the southern extent of the stock (Virginia and North Carolina) move offshore in late autumn/early winter. Given the proximity of the shelf edge, they transit a relatively short distance, due east, to reach over-wintering areas (NEFSC 2017).

Climate change

A GAM analysis of NEFSC trawl survey data by Bell et al. (2015) showed that the center of biomass (COB) of BSB and scup in spring when fish are offshore moved north by 150-200 km between 1972 and 2008 and remained in north during 2008-2012. Fish size was a significant variable in the fall, but not temperature. BSB were spatially segregated in the fall, with larger individuals located further north. The COB is further south when the number of juveniles in survey catches is high, further north when more adults are caught.

Food habits

Black sea bass are generalist carnivores. Primary prey are arthropods (45%) with 19% Cancer crabs and 16.5% other decapod crabs (Byron and Link 2010). Geographic region and fish size are important variables. Larger fish consume more sand lance and other fish, smaller ones eat more polychaetes, amphipods, miscellaneous arthropods, and mollusks. As reported by Drohan et al (2005), juveniles <20 cm consume almost exclusively crustaceans. YOY (<10 cm) eat amphipods and decapods, e.g. sand shrimp and rock crabs. Older juveniles eat euphausiids and decapods (hermit crabs, rock crabs). Adults consume mostly crustaceans, but they make up a smaller component of diet than for juveniles.

Reproduction and maturity

Black sea bass are protogynous hermaphrodites, with some fish changing sex from female to male as they increase in age and size. Age of sexual transition varies with latitude with females maturing and undergoing sexual transition at greater ages in northern latitudes (McGovern et al. 2002). Fish in the Mid-Atlantic Bight begin to mature at age 1 (8-17 cm TL) and 50% are mature at 2-3 yrs and ~19 cm SL (O'Brien et al. 1993). The majority of fish less than 19 cm are females, while larger fish are transitional individuals or males (Mercer 1978).

Primary spawning habitats appear to be located in the nearshore continental shelf at depths of 20-50 m (Breder 1932; Kendall 1972; Musick and Mercer 1977; Wilk and Brown 1980; Eklund and Targett 1990; Berrien and Sibunka 1999). Gravid females are common on the continental shelf and generally not found in estuaries (Allen et al. 1978). Fish may spawn on sand bottoms broken by ledges and move to structurally complex habitats in deeper water after spawning (Kolek 1990; MAFMC 1996). Kolek (1990) showed that some tagged black sea bass return to the spawning grounds in Nantucket Sound and suggested that the animals may home to spawning grounds. Fabrizio et al. (2013b) reported that the home ranges of tagged black sea bass in the MAB were large, but highly variable, ranging from 0.14 to 7.36 km2. Mature males are territorial and have smaller home ranges than females, sub-ordinate males, and fish in transition. In the Mid-Atlantic Bight, black sea bass spawn from April through October (Able and Fahay 1998; Reiss and McConaughay 1999).

Stock structure and status

The black sea bass population is currently managed as three separate stocks: Mid-Atlantic, South Atlantic,and the Gulf of Mexico. The geographic dividing line for the Mid- and South Atlantic stocks is located at Cape Hatteras, North Carolina. An operational assessment that incorporated new recreational harvest estimates was peer reviewed in August 2019. The assessment found that the black sea bass stock north of Cape Hatteras, NC was not overfished and overfishing (2021). For current details on stock status: https://www.fisheries.noaa.gov/national/status-stocks-reports

Fishery

Black sea bass are highly sought by both commercial and recreational fishermen throughout the Mid-Atlantic. Fisheries change seasonally with changes in fish distribution. Fish pots and handlines are more common inshore and in the more southern commercial fisheries. When fish move offshore, they are primarily caught in trawl fisheries targeting summer flounder, scup, and *Loligo* squid. Recreational fisheries generally occur during the period that sea bass are inshore (May to September), but season duration varies among the states.

Management

The black sea bass population is currently managed as three separate stocks by the Mid-Atlantic, South Atlantic, and Gulf of Mexico fishery management Councils. The management unit for the northern stock of black sea bass (*Centropristis striata*) is U.S. waters in the western Atlantic Ocean from Cape Hatteras, North Carolina northward to the U.S.-Canadian border. Since the fishery management plan's approval in 1997, the black sea bass commercial fishery has operated under a quota. The recreational fishery is restricted by a coastwide recreational harvest limit. NOAA Fisheries, the Mid-Atlantic Fishery Management Council, and the Atlantic States Marine Fisheries Commission cooperatively manage the black sea bass fishery north of Cape Hatteras. Annual catch limits are divided between the commercial and recreational fisheries. The commercial catch limit is further divided among the states based on historical harvests. Specific management measures for the commercial fishery include minimum size limits, minimum mesh requirements for trawls, a moratorium on entry into the fishery, and closed seasons.

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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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 24, 2022

To: Council

From: José Montañez, Staff

Subject: Aquaculture Policy and update

At the June 2022 Council meeting, the Council will review the draft MAFMC Aquaculture Policy and Aquaculture in the Mid-Atlantic Region Background Document and consider approval of MAFMC Aquaculture Policy. Both documents were reviewed and edited by the Ecosystem and Ocean Planning Committee (EOPC Meeting via Webinar, Tuesday, May 10, 2022). On May 10, 2022, the EOPC passed the following motion by consent (see item #2 for additional details):

> *Recommend that the Council approve the Draft Aquaculture Policy as modified by the EOP Committee.*

The following materials are enclosed on this subject:

1) May 10, 2022 EOPC Meeting Summary.

2) March 31, 2022 Memo to the EOPC.

3) Aquaculture in the Mid-Atlantic Region Background Document (Draft; EOPC edits as of May 10, 2022, are marked in grey text).

4) MAFMC Aquaculture Policy (Draft; EOPC edits as of May 10, 2022, are marked in grey text).

Draft Meeting Summary
Ecosystem and Ocean Planning Committee Meeting

Via Webinar
May 10, 2022

The Mid-Atlantic Fishery Management Council's (Council) Ecosystem and Ocean Planning Committee (EOPC) met via webinar on May 10, 2022, to review two aquaculture draft documents prepared by staff. The first document entitled "Aquaculture in the Mid-Atlantic Region," provides information on current and future aquaculture activities in the Mid-Atlantic region. This background document contains information on the process for permitting aquaculture projects, and the potential impacts of aquaculture on marine fish species and their habitats. The second document is entitled, "Mid-Atlantic Fishery Management Council Aquaculture Policy." As the interest in aquaculture activities grow in the Mid-Atlantic, it becomes more important that the MAFMC implement policies to ensure that aquaculture activities in the Mid-Atlantic are developed in a manner that is compatible with the protection of MAFMC-managed species and their habitats, and with commercial and recreational fishing activities. The purpose of this policy is to communicate the MAFMC perspective on sustainable marine aquaculture within the region.

This report Committee report summarizes the EOPC recommendations for revisions and approval of the policy document. The EOPC recommendations will be presented to the Council at the June Council meeting.

Meeting Participants
Committee Members: Kate Wilke (Chair), Adam Nowalsky (Vice Chair), Michelle Duval, Pat Geer, Kris Kuhn, Tom Schlichter, Sarah Winslow, and Jerome Hermsen (GARFO). Council Staff: Jose Montanez and Jessica Coakley. Others: Gray Montrose (VCPC), Megan Kelly, Will Poston, and Andrew Scheld (VIMS).

Agenda Items and Key Outcomes

Meeting opened at 1:05 pm. Scope and purpose of meeting were reviewed. Staff gave a presentation on the content of both draft documents. Suggested changes to the draft documents were provided by the EOPC.

Aquaculture in the Mid-Atlantic Region Background Document

Staff indicated to the EOPC that the following minor edits were needed: 1) add some missing references; 2) add a date to the document to differentiate it from potential future updates. The Committee agreed with these changes.

It was noted by an EOPC member that Table 1 is missing some species that are currently cultured in North Carolina. Staff indicated that these will be added to the document.

MAFMC Aquaculture Policy Document

The EOPC suggested some minor edits to the document for clarity.

The EOPC added the following additional principle to the policy document:

7. General principle: The collection of baseline scientific data (e.g., baseline environmental surveys) should be a necessary part of the permitting process and should include completion of a comprehensive seafloor survey (e.g., mapping, penetration profiling), robust hydrological (e.g., measure local currents and waves) and water quality surveys (e.g., analyze the water's nutrients, dissolved oxygen levels, as well as plankton diversity and relative abundance), and other environmental surveys as needed. Research plans should be required as part of permit issuance and should be completed prior to aquaculture activities commencing.
    a. Research plans should be developed to assess the current baseline and support ongoing monitoring.
    b. Research plans should be developed to assess and monitor impacts of the proposed project, including species responses to aquaculture activities. These should address regional impacts and species of concern.
    c. Research plans should identify any existing research/surveys available (existing data), and supplement with additional data/monitoring as needed.

EOPC Motion

Recommend that the Council approve the Draft Aquaculture Policy as modified by the EOP Committee.
Duval/Winslow
Motion approved by unanimous consent.

Other Issues

The EOPC briefly discussed the issue of "marking and traceability." There may be a value in further differentiating a product that is wild caught versus cultured. Tagging/identification of aquaculture raised species may be required and markings should not conflict with existing commercial/recreational tagging/identification programs.

Meeting adjourned at 2:50 pm.

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: March 31, 2022

To: Ecosystem and Ocean Planning Committee (EOPC)

From: José Montañez, Staff

Subject: EOPC Webinar (May 10, 2022; 1:00 to 3:00 p.m.): Mid-Atlantic Fishery Management Council Aquaculture Policy and Aquaculture in the Mid-Atlantic Region Background Document (Drafts)

Mid-Atlantic Fishery Management Council (MAFMC) staff developed a document entitled "Aquaculture in the Mid-Atlantic Region," which provides information on current and future aquaculture activities in the Mid-Atlantic region. This background document contains information on the process for permitting aquaculture projects, and the potential impacts of aquaculture on marine fish species and their habitats. In addition, staff developed a draft MAFMC Aquaculture Policy. As the interest in aquaculture activities grow in the Mid-Atlantic, it becomes more important that the MAFMC implement policies to ensure that aquaculture activities in the Mid-Atlantic are developed in a manner that is compatible with the protection of MAFMC-managed species and their habitats, and with commercial and recreational fishing activities. The purpose of this policy is to communicate the MAFMC perspective on sustainable marine aquaculture within the region.

When developing these documents, MAFMC staff used the existing aquaculture policy and aquaculture background documents developed by the New England Fishery Management Council (NEFMC). The "Aquaculture in the New England Region" background document involved collaborative efforts by staff from the NEFMC, Greater Atlantic Regional Fisheries Office, MAFMC, and Northeast Fisheries Science Center. In addition, the NEFMC Aquaculture Policy was an exhaustive multi-year process with multiple Habitat Committee, Plan Development Team, and Habitat Advisory Panel meetings, culminating in the adoption of the policy by the NEFMC Council in December 2020.

At the May 10, 2022 meeting, the EOPC will review the drafts and make recommendations for any revisions and approval of the policy document. EOPC recommendations will then be presented to the Council at the June Council meeting.

Aquaculture in the Mid-Atlantic Region

Prepared by: Mid-Atlantic Fishery Management Council

11 May 2022

Contents

Document scope

This document is intended to provide an overview of aquaculture activities in the Mid-Atlantic region and information related to their potential effects on Mid Atlantic Fishery Management Council (MAFMC) managed species and habitats. The document also provides an overview of the current aquaculture permitting and authorization process in the region and the review process in place designed to consider and avoid or minimize potential negative effects to MAFMC managed species and habitats. This document briefly summarizes how aquaculture operations may interact with other human activities, including fishing, but does not directly address protected species considerations associated with aquaculture activities. The discussion does not attempt to assess the full benefits and costs of aquaculture against alternate uses.

Activity overview

What is aquaculture?

Aquaculture is defined as the controlled cultivation and harvest of aquatic organisms, including finfish, shellfish, and plants (Goldburg et al. 2001). Another definition is the organized rearing, feeding, propagation, or protection of aquatic resources for commercial, recreational, or public purpose (FAO 2018), with mariculture occurring in nearshore and marine environments. NOAA considers aquaculture to be "the breeding, rearing, and harvesting of fish, shellfish, algae, and other organisms in all types of water environments" (NOAA 2019). Operations of interest to the Council from the perspective of habitat, fish, and fisheries effects would be considered mariculture, but for simplicity the term aquaculture is used throughout. Enhancement of wild stocks is a close cousin to aquaculture but is outside the scope of this document. To the extent that enhancement requires aquaculture activities to occur, such issues would be covered by the permitting requirements described below.

Species cultured

Currently cultivated species in the Mid-Atlantic include the Eastern oyster, quahog or hard clam, bay scallop, striped bass, hybrid striped bass, Russian sturgeon, mussels, soft shell clams, and sugar kelp (**Table 1**). Other species of interest for potential future culture include black sea bass (*Centropristis striata*), surfclam (*Spisula solidissima*), blue crab (*Callinectes sapidus*), tautog (*Tautoga onitis*), steelhead trout (*Oncorhynchus mykiss*), yellowfin tuna, bluefin tuna, seaweeds, urchins, and others.

Areas where aquaculture occurs

Aquaculture activities in Mid-Atlantic can occur onshore, and in nearshore and offshore waters. For the purposes of this document, we only discuss onshore aquaculture activities that utilize systems with discharge into coastal or marine waters. We refer to nearshore marine aquaculture activities as those that occur in rivers, sounds, estuaries, and other protected or semi-protected nearshore areas within the coastal zone. We refer to offshore aquaculture activities as those that occur in exposed open ocean environments in both the coastal zone[1] and Exclusive Economic Zone (EEZ[2]).

Onshore Aquaculture Activities in the Mid-Atlantic primarily consist of hatchery facilities that produce seed and juvenile molluscan shellfish, and to a lesser extent juvenile finfish, for planting on nearshore aquaculture operations for further grow out and harvest. Interest in the use of onshore aquaculture systems for all stages of marine fish culture is growing in the region.

Nearshore Aquaculture Activities in the Mid-Atlantic primarily consist of molluscan shellfish aquaculture sites utilizing bottom planting, off-bottom, and suspended and floating culture methods. Nearshore molluscan shellfish aquaculture is expected to continue to increase in the region. There are also multiple pilot scale projects focused on macroalgae cultivation using suspended methods in nearshore waters. The potential for significant increases in nearshore commercial scale fish aquaculture production in the region are uncertain. This is primarily due to high summer water temperatures in nearshore waters that can exceed the tolerance for many cultured fish species.

Offshore Aquaculture Activities There are currently no offshore aquaculture activities occurring in Federal waters off the Mid-Atlantic coast. Interest in offshore aquaculture activities in both the coastal zone and EEZ has grown in recent years, with interest primarily focused on fish, shellfish (e.g., bay and sea scallops), and seaweeds.

[1] The coastal zone are the waters that extend seaward to the outer limit of State title and ownership under the Submerged Lands Act (43 U.S.C. 1301 et seq.).

[2] The Exclusive Economic Zone are the waters under federal jurisdiction, which typically extend from 3-200 nautical miles from the shoreline.

Table 1. Summary of cultured species, locations, and gear types in the Mid-Atlantic.

Species	Mid-Atlantic states where cultured	Typical culture methods	Relative economic importance
Eastern Oyster *Crassostrea virginica*	NY, NJ, DE, MD VA, NC	Traditional bottom planting, also floating and off-bottom gear (e.g., cages, racks, bags for nursery, intermediate grow out, and grow out; nearshore intertidal and subtidal. Nursery rearing in upwellers, downwellers, and tanks	Major species in most Mid-Atlantic states. Shellfish aquaculture in the Inland Bays in DE is new
Hard clam *Mercenaria*	NY, NJ, DE, MD, VA, NC	On-bottom (broadcast-planted directly onto the bay bottom; no containment); under nets or in mesh bags; nursery rearing	High in NY, NJ, and VA. Secondary species in NC. Low in MD. Shellfish aquaculture in the Inland Bays in DE is new
Bay Scallop *Argopecten irradians*	NY, MD,VA, NC	Off-bottom (e.g., cages, racks, bags) that may be resting on the bottom or suspended in the water column. Lantern nets or surface floats estuarine, intertidal, and subtidal	Limited number of growers in NY and MD. Lesser species in NY and NC. Pilot scale in VA
Striped Bass *Morone saxatilis*	NY, NC	Hatchery, land-based tanks (onshore)	Low. Sporadic production
Hybrid Striped Bass *Morone saxatilis/M. chrysops*	NC	Hatchery, land-based tanks (onshore)	Low but there has been recent growth in number of growers.
Russian Sturgeon *Acipenser gueldenstaedtii*	NC	Hatchery, land-based tanks (onshore)	Only one facility.
Mussel *Lampsilis spp.*	NC	Bottom planting; Nursery rearing in upwellers, downwellers, and tanks; estuarine subtidal	Lesser species
Blue Mussels *Mytilus edulis*	MD	On-bottom. Off-bottom suspended lines	No culture occurring at this time
Soft Shell Clams *Mya arenaria*	MD	On-bottom under nets or bags Off-bottom cages	Mainly experimental culture at this time
Sugar Kelp *Saccharina latissima*	NY	Lines suspended from submerged arrays or dropped from moored rafts; nearshore subtidal and offshore subtidal	Multiple pilot scale projects

Aquaculture permitting and authorization process in the Mid-Atlantic

This section provides an overview of the federal and state aquaculture permitting and authorization process in the Mid-Atlantic region, highlighting places in the permitting process where opportunities exist for input on concerns related to adverse effects to MAFMC managed species and habitats from proposed aquaculture activities.

The marine aquaculture permitting process is complex. The specific federal and state agency permits and authorizations an aquaculture project proponent may be required to obtain can vary significantly based on factors such as the species intended to be cultured, the location where the project is proposed, and the scale of the project. Generally, the review and permitting of projects proposed within the EEZ are initiated at the federal level and the review of projects proposed in the coastal zone are initiated at the state level. There are many similarities between the factors state and federal agencies consider when reviewing proposed aquaculture activities and often a high level of coordination between agencies. One important distinction between federal and state authorizations is that, unlike state licenses/or leases which generally grant exclusive use to the cultured organisms within a defined area, federal agencies don't have authority to provide licenses/or leases for aquaculture and only provide permits for the construction and operation of aquaculture facilities.

Federal agency aquaculture permitting and authorization

The specific federal agency permits and authorizations an aquaculture project proponent may be required to obtain generally vary based on the type of operation. The majority of aquaculture projects in the Mid-Atlantic will be required to obtain a permit from the U.S. Army Corps. of Engineers (USACE) under Section 10 of the Rivers and Harbors Act of 1899 for the placement of culture gear or "structures" in the water. A small number of aquaculture activities that involve the placement of fill (shells or other material) may also be required to obtain a permit from USACE under Section 404 of the Clean Water Act. Some aquaculture activities proposing the discharge of pollutants may also require a National Pollutant Discharge Elimination System (NPDES) permit from the EPA (U.S. Environmental Protection Agency; or delegated state agency) under Section 402 of the Clean Water Act. A NPDES permit is required for aquaculture activities that fall under the EPA criteria for Concentrated Aquatic Animal Production Facilities (CAAP). CAAPs generally include aquaculture operations used to rear fish or other aquatic animals which occur in both onshore facilities (hatcheries and land-based fish production systems) and open water facilities (net pens and submerged cages used for fish culture) and meet specific feeding and production thresholds.

USACE and EPA permits each have specific requirements that must be incorporated into the construction and deployment phases of an aquaculture project, as well as day-to-day operation and maintenance activities. Some requirements will apply to all aquaculture operations, while others may be specifically tailored to individual operations. Other federal agencies, such as the U.S. Food and Drug Administration (FDA) and the U.S. Department of Agriculture (USDA), also have oversight of aspects of aquaculture activities such as the use of drugs, pesticides, and biologics and animal health considerations. These agencies have established regulations related to the approval of drugs, pesticides, and biologics used on aquatic animals as well as regulations associated with the source and health of cultured aquatic animals. The United States Coast Guard (USCG) is the principal authority for establishing and maintaining aids (e.g., safety) to navigation in U.S. waters.

For additional information, please refer to the "Guide to Permitting Marine Aquaculture in the United States (NOAA 2022). This guidance document outlines the key requirements necessary to obtain federal permits to conduct commercial aquaculture activities and provides an overview of federal statutes and regulations governing aquaculture in the United States.

Project review

While the review of projects proposed in the coastal zone are generally initiated at the state level, such projects would require both state and federal agency authorization prior to operation. Projects proposed in the EEZ are only required to obtain federal agency permits; however, coastal states that can demonstrate a potential coastal effect from a project proposed in the EEZ can request to review federal permit applications under their federal consistency authority granted through the coastal zone Management Act (CZMA). Thus, both state and federal agencies are involved with project review at some level, regardless of where they occur.

Beyond the CZMA, federal permitting agencies also coordinate compliance with other related federal laws as part of the review and authorization process. If a federal permitting agency determines a proposed project may have an adverse effect on certain public interests as outlined by federal law, they are required to consult with the federal agencies responsible for the implementation of those laws prior to issuing permits (**Table 2**). This includes consultation with NOAA Fisheries Greater Atlantic Regional Office (GARFO) about projects that may have an adverse effect on areas designated as Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). A summary of the federal laws that federal permitting agencies are required to consider and the associated consultation requirements with each are summarized in **Table 2**. The EFH consultation process is described in greater detail below.

In addition to coordination with federal and state agencies, federal permitting agencies also are responsible for coordinating opportunities for public comment on permitting actions. USACE and EPA each have general requirements related to the timing and extent of public comment opportunities and the level of public review an individual aquaculture project will be required to undergo to obtain permits. While there are similar requirements built into the state agency review process, due to the need for federal permits and authorizations for aquaculture projects proposed in the coastal zone and the EEZ, and the nexus between federal permitting actions and consultation with NMFS under the MSA, it is during the federal permitting and authorization process where formal opportunities for input from the MAFMC and fishing communities/stakeholders on potential impacts to MAFMC species and habitats primarily occur. Some projects deemed to have significant impacts must receive expanded review under the requirements of the National Environmental Policy Act (NEPA) prior to the issuance of federal agency permits. The NEPA process is described in greater detail below.

Table 2. Federal agency review of aquaculture projects and relevant applicable laws.

Consultation or Review	**Description of the Requirement**
Endangered Species Act	Section 7(a)(2) of the ESA requires federal agencies to consult with the NOAA Fisheries, the U.S. Fish and Wildlife Service, or both, before taking any action that may affect an endangered or threatened species or their critical habitat to ensure their actions are not likely to jeopardize any listed species or result in the destruction or adverse modification of designated critical habitat.
Magnuson-Stevens Fishery Conservation and Management Act	The EFH provisions (305(b)(2)) of the MSA require federal action agencies to consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH. As part of the EFH Consultation process, federal action agencies must prepare a written EFH Assessment describing the effects of that action on EFH (50 CFR 600.920(e)(1)). NOAA Fisheries issues conservation recommendations to the action agency based on this assessment.
National Historic Preservation Act	Section 106 of the National Historic Preservation Act (36 CFR Part 800) requires any federal agency issuing a permit to account for potential effects of the proposed aquaculture activity on historic properties, e.g., shipwrecks, prehistoric sites, cultural resources. If a proposed aquaculture activity has the potential to affect historic properties, these details must be provided by the applicant as part of the application package.
Fish and Wildlife Coordination Act	The Fish and Wildlife Coordination Act requires any federal agency issuing permits to consult with the U.S. Fish and Wildlife Service and NOAA Fisheries if the proposed aquaculture activities could potentially harm fish and/or wildlife resources. These consultations may result in project modification and/or the incorporation of measures to reduce these effects.
National Marine Sanctuaries Act	Section 304(d) of the National Marine Sanctuaries Act (NMSA) requires any federal agency issuing permits to consult with NOAA's National Marine Sanctuary Program (NMSP) if the proposed aquaculture activity is likely to destroy or injure sanctuary resources. As part of the consultation process, the NMSP can recommend reasonable and prudent alternatives. While such recommendations may be voluntary, if they are not followed and sanctuary resources are destroyed or injured in the course of the action, the NMSA requires the federal action agency(ies) issuing the permit(s) to restore or replace the damaged resources.

Consultation or Review	**Description of the Requirement**
Marine Mammal Protection Act	The Marine Mammal Protection Act (MMPA) prohibits take, including the harassment, hunting, capturing, or killing of marine mammals, except under certain circumstances. Section 118 establishes the Marine Mammal Authorization Program (MMAP), which provides an annual exemption for the incidental take of a non-endangered and non-threatened marine mammals in a commercial fishing operations having frequent or occasional interactions with marine mammals (listed as Category I and Category II fisheries under the List of Fisheries, LOF, which is published annually and is available on the NOAA Fisheries website and in the Federal Register. To be eligible for the exemption, any commercial vessel or non-vessel gear (e.g., aquaculture facilities) engaging in a Category I or II fishery must obtain a MMPA certificate from NOAA Fisheries. The MMPA does not allow for directed take or harassment of marine mammals. This Certificate must be present on the fishing vessel or on the person during fishing operations at all times. The MMPA also requires that permit holders carry an observer during fishing operations if requested, and that they adhere to all other applicable Take Reduction Plan regulations. Regardless of Categorization (I, II, or III), commercial fisheries must report every incidental death or injury of marine mammals that results from commercial fishing operations (including aquaculture) within 48 hours of returning to port.
National Environmental Policy Act	NEPA requires federal agencies to prepare either an Environmental Impact Statement (EIS) or Environmental Assessment (EA) for any federal action affecting the quality of the human environment, unless it is determined the activity is categorically excluded from NEPA.
Coastal Zone Management Act	CZMA encourages coastal states to develop and implement coastal zone management plans as a basis for protecting, restoring, and establishing a responsibility in preserving and developing the nation's coastal communities and resources. Coastal states with an approved coastal zone management program are authorized to review certain federal actions affecting the land or water uses or natural resources of its coastal zone for consistency with its program. Under the CZMA, a state may review: activities conducted by, or on behalf of, a federal government agency within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone; an application for a federal license or permit; and any plan for the exploration or development or, or production from, any area that has been leased under the Outer Continental Shelf Lands Act for offshore minerals exploration or development. The CZMA requires federal agency activities to be consistent to the maximum extent practicable with the enforceable policies of a state's approved coastal zone management program.

EFH consultation

If EPA or USACE determines during the permitting and authorization process that a proposed aquaculture project may result in adverse effects to EFH, they must prepare a written EFH Assessment describing the effects of the activities on EFH (50 CFR 600.920(e)(1)). The level of detail required in an EFH Assessment is commensurate with the complexity and magnitude of the potential adverse effects of the action, 50 CFR 600.920 (e)(2). For example, assessments for relatively simple actions that may adversely affect EFH are generally brief. Actions that may pose a more serious threat to EFH, or that involve a more complex range of potential adverse effects, justify a correspondingly more detailed EFH Assessment that includes information, such as an analysis of alternatives, the results of on-site inspections, literature reviews and the views of recognized experts.

NOAA Fisheries biologists (GARFO in this region) review the EFH assessment and provide conservation recommendations to federal agencies on means to avoid, reduce, or offset these adverse effects. These conservation recommendations are intended to be included on federal agency permits as special conditions or integrated into the project plans, as appropriate. Conservation recommendations may include provisions for the use of turbidity and erosion controls, time of year (TOY) restrictions, or other specific criteria to minimize adverse impacts on EFH.

National Environmental Policy Act (NEPA) review

While all permitting actions that the EPA or USACE determine may result in adverse effects must undergo some level of agency consultation and public review, the National Environmental Policy Act lays out specific requirements for permitting agencies when they anticipate that an action could significantly affect the quality of the human environment. If a determination of significance is made, the agency must document its consideration of those impacts in an EIS. If the impacts are uncertain, an agency may prepare an EA to determine whether a finding of no significant impact could be made or whether an EIS is necessary. In some cases, federal agencies can determine the level of analysis they will be required to undertake based on how the activities compare to past agency actions or during pre-permitting discussions with partner federal agencies. In other cases, the determination is made after an application is submitted based on considerations raised during the project review process by the permitting agency, the public, and/or consulting agencies.

If more than one federal agency authorization is required, such as in the case of fish aquaculture activities requiring both a Section 10 permit from USACE and a NPDES permit from EPA, a lead agency may be designated to undertake the NEPA review process.

Mid-Atlantic state agency permitting and authorization

The specific state agency review and permits required for aquaculture projects within the coastal zone varies between the Mid-Atlantic states. In some cases, states have developed joint federal/state permit applications for aquaculture activities and the state and federal review process is conducted concurrently under a single application.

New York

The New York State Department of Environmental Conservation (NYSDEC) has permitting and regulatory authority for all types of mariculture activities occurring in the state. Generally, mariculture operations are reviewed and approved through issuance of either a marine hatchery permit or an on/off-bottom culture permit depending on the activity. Given the different jurisdictional and regulatory responsibilities of NYSDEC and the other state and federal agencies with mariculture oversight (USACE – NY District, NYS Department of State's Coastal Management Program), and the local governments administering programs that provide most of the access to underwater lands for mariculture, inter-governmental and inter-agency coordination is necessary.

The most active mariculture access programs include the Suffolk County Aquaculture Lease Program in Peconic and Gardiners Bays (SCALP), the Town of Islip's Bay Bottom Licensing Program in Great South Bay, and the Town of Brookhaven's Mariculture Leasing Program in Bellport and Moriches Bays. SCALP is the most extensive program, with 5- and 10-acre sites potentially available for leasing throughout the program's current 30,000-acre cultivation zone. The Town programs consist of 1 to 5-acre parcels sited within defined areas ranging from 7 to 290 acres. NYSDEC also has its own Temporary Marine Area Use Assignment (TMAUA) program that offers access to 5-acre parcels of state-owned underwater lands of Long Island and Block Island Sounds for off-bottom shellfish culture only (i.e., shellfish cultured in containment: cages, racks, bags, etc.). However, this program is largely inactive since the SCALP and Town programs provide access to the more protected coastal bays most attractive for siting mariculture operations. Private underwater land ownership is one other mechanism by which applicants can gain access for siting certain mariculture operations, whether as the owner or a lessee.

While NYSDEC has done a more comprehensive programmatic evaluation of SCALP based on all available marine resource data collected from throughout the program's cultivation zone, Town programs' sites, TMAUAs and private underwater lands are evaluated individually for any potential conflicts with marine resources, or with other user groups, as part of the permit application review process.

In addition to completing a permit application, applicants must also submit a cultivation/operational plan detailing all aspects of their proposed mariculture activities and documentation of their access to the underwater lands used for this purpose. Additional information on permitting requirements can be found at: https://www.dec.ny.gov/permits/96310.html#Aquaculture and https://www.dec.ny.gov/regs/2494.html.

New Jersey

The focus of aquaculture in New Jersey is on the culture of bivalve shellfish, primarily hard clams and oysters. The basic components of shellfish aquaculture include: on-shore hatcheries where larvae are spawned and raised; leased grounds within the NJ coastal zone for grow out; deployment of maintenance of the gear and product (shellfish); and harvest once the shellfish product reaches market size. In New Jersey, the Atlantic Coast and Delaware Bay Sections of the Shellfisheries Council have statutory authority to issue a commercial shellfish lease to provide bottom for use in the planting and cultivating of shellfish, including grow out of hatchery reared seed.

The New Jersey Department of Environmental Protection (NJDEP), Bureau of Shellfisheries requires a commercial shellfish license on the Atlantic Coast for the cultivation and harvest of shellfish. Shellfish harvested under a commercial license can only be sold to certified dealers. A commercial shellfish aquaculture permit and hatchery/nursery permit can be obtained through the NJDEP, Bureau of Marine Water Monitoring (BMWM). These permits require the submission of an application through the BMWM as well as an Operational Plan encompassing on-farm activities and harvest or husbandry procedures. An Aquatic Farmer License Application through the New Jersey Department of Agriculture, Office of Aquaculture Coordination for molluscan and bivalve shellfish can also serve as the required Operational Plan. One component of the required Operational Plan is the submission of maps containing currently active leases. Maps for the Atlantic Coast may be accessible through the NJDEP, Bureau of Shellfisheries. Additional information about aquaculture development in New Jersey, including licensing process can be found at: https://www.jerseyseafood.nj.gov/aquaculture.html. Structural aquaculture within an existing commercial shellfish lease area will require additional State permits issued through the NJDEP's Division of Land Resource Protection and a tidelands license through NJDEP's Bureau of Tidelands Management. Federal permits for this activity are required from the USACE.

Pennsylvania

The Pennsylvania Department of Agriculture licenses parties propagating and dealing species which live on or in the water, including but not limited to all game fish, fish bait, baitfish, amphibians, reptiles, and aquatic organisms. More information on aquaculture licensing and regulations in Pennsylvania can be found at: https://www.agriculture.pa.gov/Animals/AHDServices/licenses-certificates/Aquaculture%20Licensing/Pages/default.aspx.

Delaware

The Delaware Bay

The Delaware Department of Natural Resources and Environmental Control (DNREC), Division of Fish & Wildlife (DDFW) has regulatory authority as it pertains to the leasing of shellfish grounds in the of the Delaware Bay. The DNREC advertises, on an annual basis, the general locations of shellfish grounds that are available for lease and are not currently subject to a valid lease. Any person wishing to lease shellfish grounds shall make application to DNREC by way of forms provided by the DNREC. If more than 1 application is received for the same grounds, a competitive sealed process would ensue. The terms of each lease shall begin on January 1 and run through December 31. Leases are to be renewed on an annual basis and any leases not renewed would revert back to available for leasing. Any new shellfish grounds can be no less than 50 acres nor greater than 100 acres in size.

Delaware's Inland Bays

The DNREC, through its DDFW, issues leases for shellfish aquaculture in the state's Inland Bays. Leasing in the Inland Bays is for commercial shellfish aquaculture. Applicants submit applications to the DDFW for up to five combined acres (in whole-acre increments) in Rehoboth and Indian River Bays, and/or an additional 5 acres in the Little Assawoman Bay. Applications and instructions are maintained on the Division's Inland Bays' shellfish aquaculture webpage https://dnrec.alpha.delaware.gov/fish-wildlife/fishing/shellfish-aquaculture/. Also, on this page is a link to a map that shows leases granted, lease acres pending, and areas available for leasing. Leases are granted for a 15 year term and are renewed annually. In the Inland Bays, DNREC has developed Shellfish Aquaculture Development Areas (SADA). Applications for leases within the SADA have expedited permitting with DNREC's Wetlands & Subaqueous Lands Section and USACE, having already undergone some public processes.

Maryland

Prior to conducting commercial shellfish aquaculture activities in Maryland waters, an individual or business entity must apply for and obtain a state lease and federal permit for the proposed shellfish aquaculture activities. Maryland DNR serves as the primary point of contact for applicants in submitting a Joint Application for State Commercial Shellfish Aquaculture Lease and USACE Federal Permit. Applicants who intend to culture shellfish directly on-bottom and not in containers are required to submit an application for a Submerged Land Lease. Applicants who intend to culture shellfish off-bottom and in containers are required to submit an application for a Water Column Lease. The shellfish lease review and approval process includes a comprehensive assessment of legal and resource impacts associated with the proposed project and also requires a public notice and provides an opportunity for a 30 day public comment on the project. In addition to issuing shellfish leases, and depending on the type of shellfish aquaculture activity, an operator may be required to apply for and obtain other permits from Maryland DNR including, shellfish import permit, shellfish hatchery/nursery permit and/or a shellfish aquaculture harvester permit/registration card. More information on aquaculture licensing and regulations in Maryland can be found at:
https://dnr.maryland.gov/fisheries/pages/aquaculture/index.aspx.

The Maryland Department of Natural Resources' authority for issuing shellfish leases and other associated permits is granted through the Annotated Code of Maryland, Natural Resources Article, §4-11A (Aquaculture).

Virginia

Aquaculture shellfish (oysters and clams) leases (on-bottom) and aquaculture permits (floats, water column and on-bottom, if no lease) are issued by the Virginia Marine Resources Commission (VMRC; the state of Virginia marine resources agency). Applications for leases up to 250 acres in size can be requested through VMRC. VMRC conducts a public interest review of all lease and permit requests. Leased bottomlands also allow for the placement of bottom cage structures (no more than 12-inches above the substrate) without any additional permits from the USACE, Norfolk District. Aquaculture activity that requires a permit is handled through a Joint Permit Application (JPA) process (http://leg5.state.va.us/reg_agent/frmView.aspx?Viewid=33ffb005797~5t.pdf&typ=40&actno=005797&mime=application/pdf) with the USACE to provide a single application process for such requests. Bottom leases are valid for ten year terms and are renewable. Permits for aquaculture activity are issued for five year terms and are also renewable. For additional information on permitting requirements visit: https://mrc.virginia.gov/Shellfish_Aquaculture.shtm.

VMRC has not received any request for algae production or fish production within enclosures, but such requests would require a permit through the JPA process through the agencies Habitat Management Division in consultation with the agencies Fisheries Management Division. The agency just recently received our first scallop aquaculture (suspended water column) request, which will also be handled through the JPA process.

It is state policy to avoid impacts to submerged aquatic vegetation (SAV) beds for lease requests and permit activity; however, the agency does have an SAV impacts guideline document that can allow for permitted activity with appropriate mitigation and/or compensation methods.

North Carolina

Aquaculture is considered a form of agriculture and the North Carolina Department of Agriculture and Consumer Services (DACS; https://www.ncagr.gov/MARKETS/AQUACULTURE/license.htm) is designated as the lead state agency in matters pertaining to aquaculture. The DACS issues the aquaculture licenses. The license is for any person who owns or operates an aquaculture facility for the purpose of possession, production, transportation, sale, or commercial grow out. Twenty-two species are approved for propagation and production, with no shellfish species listed. Possession of any species other than those on the list is not allowed except with special written permission from the Wildlife Resources Commission (WRC). Three of the 22 species have specific restrictions that also must be approved through the WRC.

The North Carolina General Assembly (GA) supports shellfish aquaculture and encourages shellfish aquaculture development in ways that are compatible with other public uses. The GA established standards that provide for the leasing of public bottom for the cultivation and production of shellfish. The GA gives the Marine Fisheries Commission (MFC) the authority to make rules and take all steps necessary to improve cultivation, harvesting, marketing of shellfish in North Carolina both from public and private beds. The GA also gives the MFC jurisdiction over the conservation of marine and estuarine resources including the regulation of aquaculture facilities which cultivate or rear marine and estuarine resources. The MFC has adopted rules for shellfish leases including addressing adjacent riparian rights, marking, renewal, reporting, transferring, and terminating shellfish leases. Through this authority, the North Carolina Division of Marine Fisheries (DMF) houses the Shellfish Lease and Aquaculture Program (SLAP) for the purposes of administering shellfish aquaculture within the State of North Carolina.

The SLAP administers shellfish leases in public trust waters for shellfish aquaculture (in brackish and higher salinity waters) which have existed in North Carolina for over 150 years. Public trust resources are land and water areas, whether publicly or privately owned, which are subject to Public Trust Rights as defined under North Carolina law. Shellfish leases are divided into two types: bottom and water column. You must have a bottom lease to have a water column lease. The water column lease can be granted over the entire footprint of a bottom lease, or on a portion of the lease. A shellfish franchise is similar to a bottom lease except that they are recognized submerged lands claims.

In addition to State regulations, shellfish leases are also required to meet federal permitting standards under the USACE Nationwide Permit 48 Regional Conditions for Commercial Shellfish Aquaculture Activities. Once an application is deemed complete, a site investigation is completed to ensure compliance with state and federal laws and MFC rules. Then, a 30 public comment period is followed by a public hearing before a final decision on approval is made.

Aquaculture operations are allowed to cultivate finfish approved by the North Carolina Division of Marine Fisheries by means of the Aquaculture Operation Permit issued by the division. It allows Aquaculture Operation Permit holders to possess, sell, purchase, or transport approved finfish species in compliance with all conditions of the permit including record-keeping requirements designed to track the movement of finfish as an aquaculture product from its source to the consumer (https://files.nc.gov/deq/documents/2022-01/FF-10-2022_Finfish%20Aquaculture%20Exemptions_Final.pdf?VersionId=Kt9WzqG4r4YdMjy7zIM5jM_qdCMsFyDW and https://deq.nc.gov/news/press-releases/2022/01/12/new-aquaculture-permit-conditions-facilitate-cultivation-more-finfish-species).

Potential impacts of aquaculture activities on MAFMC-managed species and their habitats

The following summary provides information that has been documented on the potential impacts, both negative and positive, posed by aquaculture activities to MAFMC managed species and EFH, and includes references to various best management practices (BMPs) and the aforementioned regulatory framework used to safeguard coastal resources. It is important to note that the science of marine aquaculture is advancing rapidly and new information and techniques are emerging that can help to improve the understanding of the effects of aquaculture on the environment, including the best means to mitigate negative effects and bolster positive effects. This summary is not an exhaustive literature review of scientific information on this complex topic. Rather, it is a synthesis of relevant information intended to provide the MAFMC and partners with a general understanding of the environmental effects of marine aquaculture of importance to the interests of the MAFMC.

Summary of impacts

The impacts of aquaculture activities on MAFMC-managed species and their habitats can be positive, neutral, or negative, primarily depending on the system used, the species being cultured, the ecological setting, and the experience level of the operators. For example, excess nutrients, organic matter, and suspended solids from finfish aquaculture effluents can exacerbate eutrophication in nearshore receiving water bodies when nutrient inputs exceed the capacity of natural dispersal and assimilative processes. On the other end of the spectrum, some forms of aquaculture have been used to mitigate eutrophication by sequestering nutrients in nearshore waters (e.g., shellfish and algae culture). In some cases, evaluating whether the impacts from aquaculture activities on EFH will be positive or negative is more complicated. Further, many of the effects are interrelated and can lead to indirect effects on managed species and other ecosystem components. Therefore, the positive and negative effects of aquaculture activities to fisheries and EFH need to be considered concurrently when attempting to provide informed input on proposed aquaculture projects.

Positive impacts

Positive impacts of aquaculture operations include carbon and nutrient sequestration, acidification regulation, improved water clarity, coastal protection, and habitat provisioning (Gentry 2019). The majority of these are associated with shellfish and algae aquaculture, however habitat provisioning associated with equipment used for marine fish culture is widely documented (Gentry 2019). In general, shellfish and algae aquaculture has positive impacts on EFH, providing ecosystem services and habitat related benefits in the estuary including mitigation of land-based nutrients and increased habitat for fish, shellfish, and crustaceans (Shumway 2011).

- Bivalves sequester nutrients from the water column for shell and tissue formation. Both bivalve and algal culture can help reduce eutrophication through the uptake of nutrients, and bivalve aquaculture can help improve water quality through filtration and grazing (Cerco and Noel 2007, Rose et al. 2015). Thus, bivalve and algal culture can control phytoplankton bloom intensity in shallow waters (Gallardi 2014) and may present a viable strategy to mitigate eutrophication caused by agricultural and residential runoff (Petersen et al. 2016).

- Aquaculture gear has been documented to attract structure-oriented species and increase biomass and biodiversity on an otherwise minimally structured bottom. This “reef effect” may result in a localized increase in biomass and local biodiversity at varying trophic levels. For example, juvenile fish are commonly observed utilizing aquaculture gear as nursery habitat. They in turn serve as a food source to higher trophic levels, including other fish. Suspended mussel culture has been documented to temporarily enhance populations of large macroinvertebrates and benthic fishes, including ecologically and commercially important species (Costa-Pierce and Bridger 2002, D’Amours et al. 2008b, Forrest et al. 2009, McKindsey et al. 2011). For example, lobsters have been found to be attracted to the presence of anchor blocks and mussel farm gear. This increase in lobster abundance may be attributed to increased refuge availability and food supply created by bivalves themselves, as well as other species drawn to the aquaculture gear (D’Amours et al. 2008a). Certain species of kelp have also been found to grow heavily on blue mussel longlines (McKindsey et al. 2006). DeAlteris et al. (2004) found that species diversity around aquaculture gear is equal to that of SAV, and greater than non-vegetated seabed.

In some cases, the effects from aquaculture activities on EFH can be viewed as both positive and negative. For example:

- Cages or cultch associated with aquaculture operations placed on soft sediments may be viewed as habitat conversion, however, conversion may have positive impacts if increased structural complexity is desired at the proposed site due to historic loss of structure from other anthropogenic activities. This issue would have to be considered on a project-specific basis.

- As described above, shellfish and algae culture can help regulate the abundance of phytoplankton in shallow areas which can lead to reduced turbidity and improved light penetration; however, improved light conditions may encourage the growth of nuisance algae (Cranford et al. 2003, Cranford et al. 2006, Gallardi 2014, Kaspar et al. 1985, McKindsey et al. 2006, Newell 2004).

Balancing the potential positive and negative effects of aquaculture activities on fisheries and EFH and incorporating acknowledgement of ecosystem services into the review of proposed projects has the potential to improve environmental performance and sustainable management of aquaculture. However, when possible, conditions designed to protect sensitive habitats and bolster positive impacts should be included in permits issued under state and federal laws and regulations to ensure benefits are not negated by poor management.

Adverse effects

The MSA defines an adverse effect to EFH as any impact that reduces quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810(a)). Researchers have identified several potential impacts to fisheries and EFH from marine aquaculture, which are described below for finfish and shellfish operations. The individual and cumulative risk of these specific adverse effects occurring as a result of aquaculture activities, and the magnitude of the impacts when they do occur, will vary by location (i.e., onshore, near-shore, and offshore) and by production format and species (i.e., fish, shellfish, algae). In some cases, the likely impacts from aquaculture activities are well understood and proper siting protocols, standardized operating procedures, and BMPs can be put in place to reduce or eliminate risk. In other cases, the impacts are not well understood and managers are required to err on the side of caution and use their best professional judgment when considering how activities may impact the environment and the most appropriate means to avoid or minimize those impacts.

Marine fish aquaculture activities

Marine fish culture can lead to the range of adverse effects. These include degradation of water quality resulting from the discharge of effluents containing uneaten feed and waste products (including drugs, chemicals, and other inputs); habitat degradation (including alteration of sediment composition and chemistry from settling wastes; alteration to benthic habitats, and changes to infaunal species composition); introduction of invasive species; impacts from the escape of cultured organisms (i.e., trophic and gene pool alterations); and the spread of pathogens and parasites from cultured to wild marine organisms. A significant consideration associated with finfish aquaculture is the potential for impacts on water quality and the seafloor environment adjacent to culture facilities from the discharge of effluents containing unused feed, metabolic fish wastes, and other inputs.

- Net pen and land-based flow through fish aquaculture often requires nutrient rich feeds. Depending on the efficiency of feeding and/or level of effluent treatment, this can introduce excess nutrients into coastal systems, in some cases exacerbating eutrophication. According to global studies, aquaculture's contribution to nitrogen in areas adjacent to net pens ranged broadly from none to significant levels (Price et al. 2013). When nutrient inputs associated with excess feed and waste do occur, they tend to be episodic and limited to the area adjacent to pens (Nash 2003). Beyond ensuring operations are sited in well-flushed locations, other methods for reducing the impact of feed and other wastes on water quality include improved diet formulations and selection of raw materials, treating effluent water, and recovering dead or uneaten fish (Talbot and Hole 1994). Recent advances in technology to monitor and refine feeding rates/feeding delivery could improve feed consumption which in turn could result in a reduction of environmental impacts (Føre et al. 2018, Kumar et al. 2018). Offshore areas may be less susceptible to these impacts because waters are normally nutrient deficient and fish wastes and other pollutants can dissipate more rapidly in deeper and better-flushed offshore areas than they can in nearshore areas (Gentry et al. 2019, Rust et al. 2014).

- Reviews have identified changes to sediment chemistry associated with solid feed and fish waste accumulation on the bottom below and around marine fish aquaculture facilities, if net pens are placed at high densities in semi-enclosed waterbodies with inadequate flushing. An assessment of a coastal Maine site with sandy mud sediments and low current velocity suggested that changes in sediment chemistry were localized to the area under the net pens (Findlay et al. 1995). These impacts can be avoided through proper siting (Buschmann et al. 2008, Findlay and Watling 1997, Hixson et al. 2014, Klinger and Naylor 2012). Many modern facilities utilize underwater cameras to monitor operations so they can avoid overfeeding and quickly identify and respond to issues (Rust et al. 2014, Herbeck et al. 2013, Talbot and Hole 1994).

- Pharmaceutical drugs, biologics[3] and other chemicals used for the treatment of disease and pests in cultured fish have also been associated with impacts to water quality. The use of pharmaceutical drugs, biologics, and other chemicals for use in marine aquaculture in the U.S. is rare and declining (Rust 2014). This decline is largely attributed to improved husbandry and use of vaccines (Asche and Bjorndal 2011; Forster 2013). Vaccines have been

[3] Biologics include vaccines, bacterins (suspension of killed or attenuated bacteria for use as a vaccine), and probiotics.

successfully used to prevent a variety of bacterial diseases in finfish and are considered the safest prophylactic approach to management of aquatic animal health as they pose minimal risk to the environment, especially with regards to impacts to fisheries and EFH. All drugs and therapeutic chemicals for use on fish destined for human consumption must be approved by the USDA APHIS and FDA (FDA 2012).

The occurrence and extent of these impacts depends on a variety of factors that should be considered during the review process, including, feed quality, digestion, and metabolism, feeding rate, biomass of fish, and species. In addition, site characteristics such as cage design, depth, currents, existing water quality or nutrient levels, and benthic features also influence nutrient dispersion and impacts (Nash 2003, Rust 2014). Over the last several decades, advances in technology, improved facility siting, better feed management, and stricter regulatory requirements have greatly reduced the risk of impacts to water quality and the seafloor environment from fish aquaculture activities (Price et al. 2015, Rust et al. 2014). Effluent discharges are highly regulated by EPA and aquaculture operators are required to adopt best management practices, including integrating advanced feed management strategies, optimally formulated diets, environmental monitoring, and reporting (EPA 2017).

A regionally relevant example of how best management practices, combined with advances in production methodology, have limited the risk of environmental impacts from marine fish aquaculture can be found in Maine, where Atlantic salmon have been grown in open-net pens since the 1970s. Salmon farmers in Maine worked in cooperation with state and federal regulators and the environmental community to develop a series of BMPs that establish operational and monitoring requirements designed to minimize their environmental footprint. As a result, water quality impairments have been significantly reduced via the use of vaccines and integrated pest management, and the minimal to non-existent use of antibiotics and growth enhancers (Maine Seafood Guide – Salmon 2019).[4] Improvements in feed efficiency have reduced effects on dissolved oxygen, turbidity, and nutrient loading (Price et al. 2015). Thermal baths have largely replaced the use of chemical treatments for sea lice infections, and biological delousing with cleaner fish is also being explored as a preventive treatment for parasites (UNH).[5] In 2016, Maine-raised salmon were upgraded from "avoid" to "good alternative" by the Monterey Bay Aquarium Seafood Watch Program,[6] which rates seafood according to whether it supports a healthy ocean.

The use of integrated multi-trophic aquaculture by adding other organisms such as invertebrates and seaweeds to the aquaculture system is also being evaluated to lessen environmental impacts from marine fish aquaculture facilities in New England. These systems are intended to mimic natural trophic relationships, where wastes and excess nutrients from cultured fish are consumed by shellfish or assimilated by seaweed (Buck et al. 2017, Rust et al. 2014).

[4] https://seagrant.umaine.edu/maine-seafood-guide/salmon/
[5] https://scholars.unh.edu/cgi/viewcontent.cgi?article=2543&context=thesis
[6] https://www.seafoodwatch.org/

Marine shellfish aquaculture activities

Impacts to water quality, sediments and benthic habitats from marine shellfish aquaculture have also been documented. The impacts of specific concern to the MAFMC include changes to benthic habitat as a result of pseudofeces deposition, the effects of mechanical harvesting, conversion of soft sediment habitat to hard bottom shellfish reef, displacement of cultured organisms, sedimentation and loading of organic waste to the water column and benthic sediments, and disruption of the benthic community and impacts to SAV located near shellfish aquaculture operations.

- Shellfish release pseudofeces, a byproduct of filtering food from the water column. If allowed to accumulate, the increased deposition of organic matter to the benthos can degrade sediment quality (Forrest et al. 2009, Gosling 2015), increase turbidity, and deplete dissolved oxygen. This is particularly true in areas with poor tidal flushing where organic material can build up under aquaculture sites (Dumbauld et al. 2009). These impacts are likely to be negligible in areas with high tidal flushing where sediment buildup is not localized (Dumbauld et al. 2009).
- The placement and retrieval of off-bottom gear and mechanical and hydraulic harvest methods can result in a release of suspended sediment and organic matter into the water column through increased erosion, transport, and sediment shear and direct physical disturbance. The increased turbidity and physical disturbance associated with these activities may have impacts on benthic communities and demersal fish species (Dumbauld et al. 2009, Forrest et al. 2009, Smith et al. 2006). These impacts are greater for operations located in areas with fine grain sediments that area easily re-suspended into the water column (Chamberlain et al. 2001, Crawford et al. 2003, da Costa and Nalesso 2006, Shumway 2011). Areas with low tidal flushing (~5 cm^{s-1}) are more likely to experience benthic habitat changes due to the accumulation of organic waste and its accompanying effects described above (Crawford et al. 2003).

- Studies have also shown that bivalve aquaculture (via biodeposition, using both suspension and bottom-culture methods) has the ability to alter diverse benthic communities dominated by suspension feeders into one dominated by opportunistic deposit feeders, such as polychaetes, scavengers, carnivores, and hydrogen sulphide-tolerant species. Hydrologic regime, culture density, and culture method influence the magnitude of effects (Callier et al. 2009, Dumbauld et al. 2009, Fabi et al. 2009, Forrest et al. 2009, Fréchette 2012, Gallardi 2014, Hartstein and Rowden 2004, Kaspar et al. 1985). A recent study in Rhode Island assessed the long-term disturbance from oyster cage aquaculture and found significant differences in the benthic community structures and the presence or absence of opportunistic species between aquaculture sites and sites with no aquaculture present (Duball et al. 2017). However, studies on the effects of hydraulic dredging in nearshore leased shellfish beds in fine to very fine sand in Long Island Sound, Connecticut, showed no significant differences between dredged and non-dredged treatments over a several month period for the benthic community as a whole, nor were there any major effects on sediment biogeochemistry (Goldberg et al. 2012, 2014, Meseck et al. 2014). In a study to better quantify the ecological benefits and impacts of oyster aquaculture in the Chesapeake Bay, VA, researchers sampled water quality, sediment quality, benthic macrofaunal communities , and oysters at four oyster aquaculture sites located on the western shore. Differences in water quality, sediment quality, and macrofauna structure between areas within and outside the farm footprint at each evaluated site were rare. In instances where differences existed, they were small in magnitude and varying direction (i.e., negative versus positive impacts) (Kellogg et al. 2018).

- Habitat conversion can be a concern with some types of shellfish aquaculture, specifically the shift from soft to hard bottom due to the addition of gear or cultch or other fill material. As noted previously, this may benefit certain structure-oriented species (e.g., black sea bass), but harm species that prefer soft bottom (e.g., summer flounder). However, if increased structural complexity is desired at the proposed site due to historic loss of structure from other anthropogenic activities the conversion may be viewed as beneficial (Gallardi et al. 2014).

- SAV is susceptible to damage caused by aquaculture; impacts vary based on gear used for both grow out and harvest. Dumbauld and McCoy (2015) found no change in eelgrass due to the presence of on-bottom oyster beds. Mechanical harvesting commonly associated with bottom culture resulted in significantly less eelgrass coverage along harvested sites compared to unharvested sites. As aquaculture operations have the potential for adverse effects to eelgrass through displacement of SAV habitat and physical disturbance, on-bottom shellfish aquaculture activities should not be conducted on or in immediate proximity to existing eelgrass beds (Ford and Carr 2016); this is an existing best practice in many areas as detailed in the state permitting overview. A buffer between eelgrass meadows and bottom-planted aquaculture sites can limit physical displacement and turbidity effects. Hand-harvest methods were found to be the least disruptive (Dumbauld et al. 2009, Stephan et al. 2000). SAV may also be affected by floating or suspended culture equipment that results in light limitation. Ferriss et al. (2019) found a negative effect of off-bottom aquaculture on eelgrass density, percent cover and reproduction, along with a neutral effect on biomass and growth. Adequate spacing between off-bottom cages, bags, or longlines may mitigate this effect.

While adverse effects to EFH are possible from shellfish aquaculture, the overall risk of impacts to fisheries and EFH can be minimized or eliminated through proper management and siting (Crawford et al. 2003, Dumbauld et al. 2009, Forrest et al. 2009, Gallardi 2014, Gosling 2015, Kaiser et al. 1998, Shumway 2011). Best management practices are now in place for shellfish aquaculture along the U.S. East Coast (Flimlin 2010) and there is a robust federal and state regulatory process in place designed to limit the specific concerns. This is especially true for the Mid-Atlantic, where many states have established mandatory siting criteria, such as the exclusion of siting new aquaculture sites on sensitive habitats such as eelgrass.

Interactions between MAFMC species and aquaculture activities

If not properly managed, some marine aquaculture activities have the potential to result in direct adverse effects to species managed by the MAFMC, beyond the indirect effects associated with habitat impacts. These include impacts associated with the escape of cultured organisms, the introduction of invasive or non-native species; and the spread of pathogens and parasites from cultured to wild marine organisms (Naylor et al. 2005).

The escape of cultured fish from aquaculture facilities is a significant concern related to aquaculture. The likelihood of escapes from aquaculture operations, and the severity of the impacts associated with escapement, will vary depending on the species being cultured, siting guidelines, structural engineering and operational design, management practices (including probability for human error), adequacy of biosecurity and contingency plans, frequency of extreme weather events, and direct interactions with predators such as sharks and marine mammals that may compromise the integrity of fish enclosures.

- There are substantial concerns that nonnative fish used in aquaculture can escape and become established in the wild, competing with wild fish for food, habitat, mates, and other resources. Most introduced species do not become invasive; however, beyond aquaculture applications, naturalization of introduced non- native species that results in invasion and competition with native fauna and flora has emerged as one of the major threats to natural biodiversity (Bax et al. 2003, D'Antonio et al. 2001, Olenin et al. 2007, Wilcove et al. 1998). Some non-native species have been documented to alter the physical characteristics of coastal habitats and may thus affect population, community, and ecosystem processes (Grosholz 2002). Northeast states, EPA, and USACE highly restrict the use of non-native species in aquaculture, which largely mitigates this concern. One notable exception is the culture of "naturalized" species such as European Oysters and Steelhead Trout that have been present in New England waters for over a century. NOAA Fisheries' Aquaculture policy supports the use of only native or naturalized species in federal waters unless best available science demonstrates that the use of non-native or other species in federal waters would not cause undue harm to wild species, habitats, or ecosystems in the event of an escape.

- Even when native species are utilized, genetic diversity could be affected if hatchery-raised fish spawn with wild conspecifics. Interbreeding could result in the loss of fitness in the population due in part to the loss of genetic diversity. Genetic risks would depend on the number of escapes relative to the number of wild fish, the genetic differences between wild and escaped fish, and the ability of escaped fish to successfully spawn in the wild (Price et al. 2015). Naylor et al. (2005) suggest that the risks of escaped cultured salmon impacting wild salmon are greater where the populations of farmed salmon are higher than native populations. Changes in the genetic profiles of wild populations have been found in several rivers in Norway and Ireland, where interbreeding of wild and farmed fish is common. Large-scale experiments in Norway and Ireland show highly reduced survival and lifetime success rates of farmed and hybrid Atlantic salmon compared to wild salmon (Thorstad 2008). Means of decreasing the genetic risks associated with escapes includes the required use of wild broodstock with a genetic makeup that is similar to local wild populations and the use of sterile fish created through techniques such as hybridization, chemical sterilization, polyploidy (Price et al. 2015). These strategies come with trade-off such as increased production costs and the inability to benefit from selective breeding.

Another concern to MAFMC managed species is impacts from the spread of endemic and introduced pathogens and parasites from cultured populations to wild populations. Risks posed by pathogens and parasites are harder to quantify than those posed by competition or predation, as a single individual transferred to a recipient population can have dramatic consequences. Further, these agents can be spread by water, independent of any escape of cultured individuals. The risk and prevalence of disease in aquaculture operations is influenced by many factors, including immune status, stress level, pathogen load, environmental conditions, water quality, nutritional health, life history stage, and feeding management. The type and level of husbandry practices and disease surveillance will also influence the potential spread of pathogens to wild stocks.

- Cultured organisms are often more susceptible to diseases because they are kept at higher densities, which both increases their rate of contact and may induce stress. Research suggests that fish pathogens may be transferred from farmed to wild fish and that nonnative pathogens may be introduced when fish are moved from different areas (Rust et al. 2014). Effluent treatment and the use of static tanks to hold potentially infected broodstock are effective measures to control the risk of transmission from on shore systems. Nearshore and offshore operations have the greatest potential for exchange of pathogens between cultured and wild organisms as they bring cultured organisms into close contact with their wild cohorts, and a diverse community of potential intermediate hosts to parasites or pathogens. These conditions provide an opportunity for parasites or pathogens with direct and indirect life cycles to proliferate in and near the pen where they may become major causes of disease in both wild and cultured hosts.

- Some studies suggest that high host densities in net pens promote transmission and growth of the parasite sea lice (*Lepeophtheirus salmonis* - a parasitic copepod). The rapid decline of wild populations of pink salmon on the Canadian Pacific Coast in 2002 was hypothesized to be the result of sea lice infections associated with salmon farms in the area (Krkošek et al. 2007). However, Marty et al. (2010) conducted an extensive review of data on farmed and wild populations and found the productivity of wild salmon was not negatively associated with either farm lice numbers or farm fish production, and all published field and laboratory data support the conclusion that something other than sea lice caused the population decline in 2002. In contrast a 2011 study found sea lice abundance on farms to be negatively associated with productivity of both pink and coho salmon in the Broughton Archipelago of British Columbia (Krkošek et al. 2011). Improved facility design engineering and buffer zones between aquaculture facilities and natural stocks, fallowing periods, and other measures have been employed to reduce the risk of disease transfer between cultured fish and wild populations (Krkošek 2005).

- Shellfish can also carry veterinary diseases that may have adverse impacts on or decimate natural shellfish populations and cultured stocks (Carnegie, 2016). Common shellfish culture practices in the Mid-Atlantic often involve the movement of shellfish between water bodies (hatchery sites, nursery sites, and final planting/harvest site). When moved, shellfish can potentially spread disease to natural populations and cultured stocks in the receiving waters or exacerbate disease levels where the pathogens may already exist. Mid-Atlantic states have specific protocols that must be followed when introducing and transplanting cultured species into wild environments to minimize the incidence of disease transfer. These often include pathogen screening guidelines and certification programs for movement of germplasm, embryos, larvae, juveniles, and broodstock. Some Mid-Atlantic states outright restrict the importation of seed stocks from other states, where others impose geographic restrictions on the source of seed and brood stock. In the case of aquaculture operations in federal waters, the Gulf of Mexico Fishery Management Council specified in their Fishery Management Plan for Regulating Offshore Marine Aquaculture that prior to stocking animals in an aquaculture system in federal waters of the Gulf, the permittee must provide NOAA Fisheries a copy of a health certificate signed by an aquatic animal health expert certifying cultured animals were inspected and determined to be free of World Organization of Animal Health reportable pathogens (OIE 2003) or additional pathogens that are identified as reportable pathogens in the National Aquatic Animal Health Plan (GMFMC 2012).

- While regulatory restrictions and screening can limit the risk of pathogenic transmission, some of the most notable impacts from diseases and parasites are associated with unintentional or deliberate introductions in violation of existing requirements. Burreson et al. (2000) used molecular methods to show that the parasite *Haplosporidium nelsoni* (popularly known as MSX), which has decimated populations of the eastern oyster (*Crassostrea virginica*) along the Atlantic coast of the United States, may have originated from translocations of Pacific oyster, *Crassostrea gigas*, from Japan. However, the means of MSX introduction, whether from illegal introduction of Pacific oysters, fouling of oysters on ship bottoms, or from ballast water, is unknown (NRC 2004).

Potential interactions with other coastal and marine activities

Commercial and recreational fishing and boating activities may be affected by aquaculture activities if they are not sited to avoid productive fishing or vessel transit areas. Generally, an aquaculture lease provides the lessee exclusive rights to permitted organisms within the lease area, but does not restrict other activities. This therefore directly prevents the commercial and recreational harvest of cultured species within the lease area. While this does not directly restrict the harvest of other species within the lease area, many forms of commercial fishing may not be compatible with some aquaculture activities. For example, the Maine lobster industry requested a temporary ban on new aquaculture leases in 2019 because of concerns that new leases may interfere with their ability to harvest lobster with fixed bottom fishing gear/pots (Bangor Daily News 2019). Rod and reel fishing is generally still possible (e.g., on a kelp or shellfish lease). To avoid conflicts between fishing and aquaculture, baseline environmental surveys of proposed sites are needed to avoid overlap with productive resource areas.

Recreational and commercial boating (i.e., sailing, rowing, water skiing, jet skiing, kayaking, stand up paddleboarding) may be affected by aquaculture operations if the activities are not properly sited. Bottom gear and bottom planting methods are generally not viewed as a conflict with navigation. Power boating, sailboating, jet skiing, and rowing are unlikely to be compatible with floating gear, but kayaking and paddleboarding would generally not be restricted. Depending on the depth of the aquaculture gear, boating may not be affected by suspended culture activities as most configurations are a minimum of 8' below the surface. Through the federal review and authorization process, as well as state review processes, a navigational assessment is conducted and projects with potential conflicts undergo additional review by the USCG and USACE. USACE requires aquaculture activities to be sited outside of federal navigation channels and has established thresholds related to the square footable of floating gear that can be authorized under statewide general permits.

Renewable energy and aquaculture could potentially be co-located. For example, the possibility of siting aquaculture farms within wind farms has been proposed in Germany (Gimpel et al. 2015, Buck et al. 2004). However, the installation of aquaculture facilities may prevent boating and fishing within wind energy areas, depending on the configuration.

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Mid-Atlantic Fishery Management Council
Aquaculture Policy

Draft 12 May 2022

Introduction

NOAA Fisheries defines aquaculture as the breeding, rearing, and harvesting of fish, shellfish, algae, and other organisms in all types of water environments. Aquaculture activities occur in onshore, nearshore, and offshore environments. Construction and operation of aquaculture facilities can have both positive and negative impacts on marine habitats, species, and fisheries. Various state and federal agencies are involved in permitting aquaculture projects. Potential impacts are considered during the siting and environmental review process, and in many cases can be mitigated via project siting or design choices. The Mid-Atlantic Fishery Management Council's (MAFMC) Aquaculture Background Document provides more information on current and future aquaculture activities in the Mid-Atlantic region, the process for permitting aquaculture projects, and the potential impacts of aquaculture on marine fishery species and their habitats.

As required under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) implementing regulations (CFR Part 600 Subpart J), the MAFMC designates essential fish habitat (EFH) for each of the species it manages, and for some species and in some locations, identifies habitat areas of particular concern (HAPC). Part 600 Subpart K of the MSA regulations detail NOAA Fisheries and Regional Fishery Management Council responsibilities to consult with federal agencies when their activities may affect EFHs. Beyond habitat considerations, as a steward of the species it manages, the MAFMC has an interest in ensuring that these species are not negatively affected by non-fishing activities occurring in the marine environment. The MAFMC also has an interest in promoting safe operation of commercial and recreational fisheries for these species. To this end, the MAFMC provides input, guidance, and policies (MAFMC Policy on Impacts of Fishing Activities on Fish Habitat) on the conduct of other marine activities in a way that promotes compatibility with fishing.

Given the MAFMC's regulatory responsibilities, interests, and expertise, the MAFMC is committed to consulting with NOAA Fisheries, other federal and state agencies, and aquaculture developers to ensure that aquaculture activities in the Mid-Atlantic are developed in a manner that is compatible with the protection of MAFMC-managed species and their habitats, and with commercial and recreational fishing activities. This includes but is not limited to providing input on project siting or design, based on the following list of considerations and best management practices (BMPs). Consultation should take an "early and often" approach, whenever possible, to communicate concerns during the design phase, thus increasing opportunities for modification, rather than mitigation, of impacts. Given that MAFMC-managed species and their EFH occur both nearshore and offshore, projects in various locations and of both smaller and larger scales are of interest to the MAFMC. Because individual aquaculture operations do not occur in isolation from one another, or from other types of development, it is very important to consider the potential for cumulative effects to species under management, habitats, and fisheries when siting and designing projects. Cumulative effects analyses are the responsibility of the lead federal agency preparing the National Environmental Policy Act (NEPA) document, but the MAFMC will commit to raising specific concerns for possible incorporation into those analyses. The MAFMC recognizes that, like wild capture fisheries, aquaculture contributes to food production and food security, and that aquaculture is a valid and valuable use of the coastal zone and the exclusive economic zone (EEZ).

The primary audience for this policy is the MAFMC itself, as it engages in these consultations. Secondary audiences include NOAA Fisheries, other federal agencies (including those responsible for enforcing permit conditions), state agencies, fishermen, aquaculture developers, and other members of the public.

Specific considerations and best management practices

The remainder of this policy is organized around general, higher-level principles for project design, followed by specific considerations and BMPs. The general principles encompass the MAFMC's major areas of concern. The lists of specific considerations are not exhaustive but provide examples of best practices. Generally, projects should comply with local, state, and federal permitting guidelines, and adhere to existing BMPs relevant to the type of operation being considered (see background document for a list of BMP resources). Where BMPs cannot be met, proponents should provide a rationale as to why in the application materials.

1. General principle: Aquaculture projects should be sited and designed in the context of ecosystem functions and services, including biodiversity, with no degradation of these beyond their resilience.
    a. Siting should consider the intersection between aquaculture facilities and designated EFH and HAPC and avoid installations in areas where adverse effects are more than minimal or more than temporary. Developers and action agencies should document how conclusions regarding magnitude and duration of impacts were reached.
    b. Siting should consider interactions with fishery management areas including those designated for habitat and spawning protection and consider whether installation compromises achievement of these conservation objectives, with a particular focus on maintaining function of important and essential habitats.

c. Siting should consider oceanographic conditions such as currents, waves, and the potential for severe weather. For projects producing effluents, modeling should be conducted to ensure adequate dispersal of wastes. In addition, structures should be designed to withstand routine and historic weather events to minimize the risk of escapement of cultured animals and formation of marine debris from storm related damage.
d. Siting should avoid marsh and seagrass habitats to minimize adverse effects on these habitats. Allow for a buffer between these habitats and any infrastructure where possible, as recommended by state and federal resource managers. If sensitive habitats such as seagrasses cannot be avoided, consider whether an alternative type of gear could be used to minimize effects. Specific to seagrasses, since these habitats are reduced relative to their historic distribution but recovering in some locations due to water quality improvements, siting should ideally avoid locations where these habitats historically occurred. Current site conditions should be confirmed via on-site inspection. State resource managers can provide information about past habitat distributions. Because resource managers are interested in the restoration of habitat value associated with seagrass, operators should communicate if they notice that seagrasses are regrowing at the site, so that operational impacts to seagrasses can be minimized.
e. Siting should avoid habitat types and other resources including existing shellfish beds that could be sensitive to the discharge of organic material or effluent from aquaculture operations. Even if facilities are installed in the water column, discharges could affect both the water column and seabed near or below the facility.
f. Siting should avoid areas where coral and sponge habitats occur, including within the MAFMC's coral protection zones. Anchoring of vessels and grow out structures, as well as deposition of organic material, could negatively impact deep-sea corals and sponges, which are in many cases long-lived and fragile. These habitats are spatially rare and therefore possible to avoid. NOAA Fisheries can serve as a resource in terms of identifying coral habitats.
g. In addition to relying on existing data, site surveys may be required to determine exactly where specific habitats occur.

2. General principle: Adopt operational practices that minimize adverse environmental effects wherever possible.
   a. All proposed gear and structures should be designed and secured in a manner sufficient to withstand routine and episodic site conditions in order to reduce the risk of creating marine debris or other hazards that could result in negative interactions with sensitive habitats, vessels, and/or marine species.

b. If the addition of unconsolidated materials or fill (e.g., sediments, cultch) is proposed, ensure they are compatible with those naturally occurring at the site.
c. Minimize indirect impacts (i.e., increased turbidity and siltation in adjacent areas, access through sensitive areas, etc.) associated with maintenance and harvest activities.
d. Gear maintenance and husbandry practices should be conducted in a manner that minimizes the potential for culled and fouling organisms to negatively impact sediment and water quality or exacerbate the spread of invasive species.
e. Disease testing and other practices should be adopted to minimize the risk of the introduction or spread of shellfish or fish diseases or parasites that could negatively impact wild populations.
f. Whenever possible, use only native or naturalized species unless the best available science demonstrates that the use of non-native or other species would not cause undue harm to wild species, habitats, or ecosystems, in the event of an escape to ensure genetic fitness of wild populations would not be diminished.
g. Emergency response plans should be developed to minimize the likelihood of escapement in the event of gear damage or natural disaster.
h. Gear and any in-water structures should be removed completely if a facility is taken out of service.

3. General principle: Development should consider the cumulative effects of multiple aquaculture facilities on the ecosystem, within the context of ecosystem change and resilience.
   a. Resilience refers to both the aquaculture operation itself and the associated ecosystem perturbations.
   b. Consider whether there is a synergistic relationship with other ocean uses.

4. General principle: Aquaculture operators should contribute positively to local and regional coastal communities. This could include actions such as:
   a. Creating jobs in coastal communities.
   b. Supporting traditional fishing communities.
   c. Revitalizing working waterfronts.
   d. Restoring depleted species and habitats.
   e. Supporting efforts to reduce runoff and improve coastal water quality at both local and regional scales.
   f. An invoice should accompany all cultured species through each sales transaction, including transactions at the place of the final sale to the consumer to verify the origin of the cultured species.
   g. The MAFMC recommends the aquaculture industry demonstrate, in part, its stewardship of Mid-Atlantic Region waters by:

    i. Actively educating its member institutions about necessary regulations and permits;
    ii. Actively participating in research and monitoring to improve the understanding of aquaculture's relationship to coastal and marine ecosystems; and
    iii. Participating in cooperative research to enhance knowledge of cultured species.

5. General principle: Aquaculture should be developed in the context of other sectors, policies, and goals.
    a. Planning and zoning should consider safety and compatibility with other marine operations.
    b. Siting and project design should consider coastal access for other users of the area.
    c. Aquaculture siting should rely on high-quality information about both regional and local environmental conditions and the distribution and characteristics of other human uses in the area.
    d. Facilities should be sited to avoid well-known vessel transit lanes, including those used by fishermen.
    e. Facilities should be sited to avoid fishing grounds if adverse interactions are expected, considering such factors as the number of individuals participating in commercial or recreational fishing, the type of fishing gear used, the number of fishing days, and the amount of harvest. Developers should consider multiple years of fishery usage data to determine overlaps, as fishing activities can vary over time.
    f. Facilities should be physically marked to be visible from a vessel approaching the site, in accordance with state and U.S. Coast Guard guidelines. Facilities should also be marked on electronic navigational charts as appropriate.
    g. Pilot or demonstration-scale projects are encouraged to better evaluate impacts of novel types of operations (e.g., species not previously cultured in the region, or in locations not previously used for aquaculture).
    h. Analysis of projects under the NEPA should address Executive Order (EO) 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This order provides guidelines to ensure that potential impacts on these populations are identified and mitigated, and that these populations can participate effectively in the NEPA process (EO 12898).

6. General principle: Clear and ongoing communication between all parties is important. These parties include fishery management councils, commercial and recreational fishermen, developers, regulating and consulting agencies, and members of the public.

a. Information about the project should be provided to the public (including the MAFMC and its stakeholders) during the project design phase to allow for early input and mitigation of impacts to fish habitats and fisheries.
b. Aquaculture developers should consult with the fishing community, early and often, when identifying potential sites. Organizations like the MAFMC, NOAA Fisheries, Atlantic States Marine Fisheries Commission (ASMFC), or state agencies may be able to provide information on spatial distribution of fishing activity at broad scales, but local fishing organizations will be important contacts when determining use patterns at spatial scales relevant to aquaculture projects.
c. Permitting agencies should consider the need for public scoping sessions during the siting process to understand the concerns that stakeholders may have.
d. Permitting agencies and developers should describe how project design choices avoid or mitigate impacts on fish, fish habitats, and fisheries.
e. Developers should provide advisories about at-sea construction, survey, and maintenance operations to mariners.

7. General principle: The collection of baseline scientific data (e.g., baseline environmental surveys) should be a necessary part of the permitting process and should include completion of a comprehensive seafloor survey (e.g., mapping, penetration profiling), robust hydrological (e.g., measure local currents and waves) and water quality surveys (e.g., analyze the water's nutrients, dissolved oxygen levels, as well as plankton diversity and relative abundance), and other environmental surveys as needed. Research plans should be required as part of permit issuance and should be completed prior to aquaculture activities commencing.
    a. Research plans should be developed to assess the current baseline and support ongoing monitoring.
    b. Research plans should be developed to assess and monitor impacts of the proposed project, including species responses to aquaculture activities. These should address regional impacts and species of concern.
    c. Research plans should identify any existing research/surveys available (existing data), and supplement with additional data/monitoring as needed.

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 27, 2022

To: Council

From: Mary Sabo, Council Staff

Subject: Presentation on New Jersey Ocean Acidification Monitoring Network

On Tuesday, June 7th, the Council will receive a presentation from Dr. Grace Saba (Rutgers University) about ongoing efforts to develop a comprehensive, statewide ocean acidification monitoring network in New Jersey. An overview of the presentation is provided below.

Recommendations for Developing a Statewide New Jersey Ocean Acidification Monitoring Network

Summary:
Acidification in coastal shelf systems can have significant societal ramifications that range from economic losses and ecological consequences. In studying the effects of ocean acidification (OA) on organisms, it was found that acidification can have strong, negative impacts on survival and calcification, and milder, but still negative, impacts on growth, development, energy allocation, acid-base equilibrium, and reproduction. A vulnerability study found that because of a combination of New Jersey's economic dependence on vulnerable commercial species and the presence of OA drivers in the area, southern New Jersey was determined to be one of the most socially vulnerable regions to OA effects. New Jersey's climate change and ocean acidification efforts were advanced by Executive Order 89 which was signed into law by Governor Murphy in 2019. It directed NJDEP to write the Statewide Climate Change Resiliency Strategy with a Coastal Resilience Plan, and the first Scientific Report on Climate Change. As a result of these concerns, the Bureau of Climate Resilience and Bureau of Marine Water Monitoring combined efforts to create the NJ Coastal Management Program (NJCMP) OA Team that has been collaborating with experts at Rutgers University to develop an OA action plan for New Jersey. Given the nature of state OA initiatives that rely on risk assessments informed by scientific monitoring results, the NJCMP OA Team and Rutgers University recognized the development of a comprehensive, statewide monitoring network in New Jersey as a "first order" action. This presentation will discuss monitoring gaps in the state and how a planned monitoring network would address those gaps.

Grace K. Saba, Ph.D.
Assistant Professor

Center for Ocean Observing Leadership
Department of Marine and Coastal Sciences
Rutgers University

Lab website: https://marine.rutgers.edu/saba-research/

MID-ATLANTIC | FISHERY MANAGEMENT COUNCIL

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 20, 2022

To: Council

From: Jessica Coakley, Staff

Subject: Atlantic Surfclam and Ocean Quahog 2023 Specifications Review

As part of the 2021-2026 multi-year specification process for Atlantic surfclam and ocean quahog, the Scientific and Statistical Committee (SSC) and Council review the most recent information available to determine whether modification of the 2023 specifications is warranted.

The following is included for Council consideration on this subject:

1) Report of the May 2022 SSC Meeting – See Committee Reports Tab

2) Staff Recommendations Memo (dated April 11, 2022)

3) Surfclam and Ocean Quahog Advisory Panel Fishery Performance Report (April 2022)

4) Surfclam Fishery Information Document (April 2022)

5) Ocean Quahog Fishery Information Document (April 2022)

Neither staff nor the SSC recommended any changes to the 2023 specifications for surfclam and ocean quahog.

To maintain status quo measures for 2023, the Council would need a motion recommending the surfclam minimum size be suspended by the Regional Administrator (i.e., an annual requirement in the regulations).

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: April 25, 2022

To: Chris Moore, Executive Director

From: Jessica Coakley, Staff

Subject: 2023 Specifications Review for Surfclam and Ocean Quahog

As part of the 2021-2026 multi-year specification process for Atlantic surfclam and ocean quahog, the Scientific and Statistical Committee (SSC) and Council will review the most recent information available to determine whether modification of the 2023 specifications is warranted. The NMFS Northeast Fisheries Science Center provided an update of the commercial fishery data for surfclam and ocean quahog to support this review. The 2021 clam survey was not completed; therefore, no survey data was available for review this year. The survey is scheduled to be conducted in 2022.

Based on a review of the information provided, staff recommends no change to the 2023 fishing year specifications. To maintain status quo measures for 2023, the Council would need a motion recommending the surfclam minimum size be suspended by the Regional Administrator (i.e., an annual requirement in the regulations). The Greater Atlantic Regional Fisheries Office reviewed the landings information and biological sampling data for surfclams since the previous size analysis (August 2020 through July 2021) and determined the proportion of surfclams in the fishery smaller than 4.75 inches does not exceed the 30 percent trigger for the minimum size requirement.

In 2023, the Council will again review available information and may consider modifications to the 2024 specifications, if warranted.

Atlantic Surfclam and Ocean Quahog Fishery Performance Report

April 2022

The Mid-Atlantic Fishery Management Council's (Council) Atlantic Surfclam and Ocean Quahog (SCOQ) Advisory Panel (AP) met via webinar on April 19, 2022 to review the Fishery Information Documents and develop the following Fishery Performance Report. The primary purpose of this report is to contextualize catch histories for the Scientific and Statistical Committee (SSC) and Council by providing information about fishing effort, market trends, environmental changes, and other factors. A series of trigger questions listed below were posed to the AP to generate discussion of observations in these fisheries. Please note: Advisor comments described below are not necessarily consensus or majority statements; in those cases, the differences in opinions are noted.

Advisory Panel members present: Thomas Dameron, Peter deFur, Peter Himchak, David O'Neill, Samuel Martin, Jeffrey Pike, Monte Rome, Guy Simmons, and David Wallace.

Others present: Jessica Coakley and José Montañez (Council staff), Doug Potts (GARFO), Peter Hughes (Council member), Wendy Gabriel and Ed Houde (SSC Members), and Emily Roberts, Peter Kendall, and K. Whitmore.

Trigger questions:

1. What factors have influenced recent catch (markets/economy, environment, regulations, other factors)?
2. Are the current fishery regulations appropriate? How could they be improved?
3. What would you recommend as research priorities?
4. What else is important for the Council to know?

Critical Issues (not in any priority order)

Regulations for shellfish safety ("model ordinance regs.") have been updated by the FDA. However, NOAA Fisheries has not addressed these FDA changes on Georges Bank, which has hampered the ability of the clam fishing industry to access some fishing areas unnecessarily. NOAA Fisheries/GARFO has not yet coordinated with the FDA and acted to modify these unnecessary shellfish safety area closures in a timely manner. The AP requests the Council send a letter to NOAA Fisheries and the appropriate public heath safety groups (in NOAA and FDA) to prioritize addressing this issue.

COVID-19: Sales to restaurants (foodservice) was very low year-on-year for 2020 and in 2021, with the expectation that the effects of this may be ongoing and/or longer lasting. The clam industry has seen a ramp up in the food service industry demand, so they don't see COVID as a huge issue in 2022 in this sector of the industry. The demand is high but there are limitations in terms of the amount of product available (i.e., able to sell more than can be produced). Industry anticipates that as if inventories grow, they would be able to sell the addition product. The clam industry does not have an excess of inventory right now.

Research: It is important that the Mid-Atlantic Council, and their representatives on the Habitat Committee and Habitat Plan Development Team (PDT), continue to support any research projects that would increase harvest opportunities within the Great South Channel Habitat Management Area (GSCHMA). The lack of access in this area is a challenge for the industry and has negatively impacted catch rates. The advisors would like to see the Councils continue to work on this issue. Industry members are frustrated with their lack of ability to work through the Exempted Fishing Permit program. The time components of the access areas (seasonal restrictions for cod) should be revisited. The SCOQ AP recognizes that the Councils have taken initial steps in this discussion, but this continues to be an issue and the industry does not feel it is being addressed. The AP requests that the MAFMC make this issue a priority under their responsibilities to the SCOQ Fishery Management Plan. The AP also recommends that the MAFMC follow up with NEFMC to conduct a cross Council workshop to, 1) review the management process in the GSCHMA, 2) better understand what research is being conducted in the area, 3) describe the process for ongoing management of these areas (as things change related to climate), and 4) develop a common understanding what this means for the process of managing these clam access areas in the GSCHMA. It is unclear what is essential in these areas and what data might be needed to address modifications to these clam access/HMA areas going forward. One of the areas that is presently allowed to be fished by clam vessels in the GSCHMA is called the Fishing Rip. This area, although open to fishing, is not a viable location due to the how hard the bottom structure is with boulders; it destroys gear. This highlights the critical nature of collecting and analyzing accurate data to identify effective areas for clam vessels to harvest surfclam.

In terms of MSA reauthorization, stronger requirements to review the EFH designations and any associated management measures (e.g., gear restricted areas, habitat closures) should be included in the statute to ensure these provisions are more responsive to the climate-related changes to the quality of the fish habitat, as well as changing conditions in the clam fisheries and other fisheries the Council manages.

Research should support a structure of ongoing Essential Fish Habitat (EFH)/HMA review that is responsive to new data collection, regardless of the source, and climate-driven species distributional changes. The development of a question driven process to periodically review EFH/HMA status is needed and is not presently in place.

Access to Fishing Grounds: The development of wind energy and aquaculture areas, protected marine areas and historic monuments, and other offshore ocean uses have become an even more critical issue for our industry. All these activities have the potential to reduce safe access to historically used fishing ground resulting in a greater concentration of fishing effort in smaller areas. There is a tremendous amount of overlap between the wind leases areas, wind call areas, and the current and potential future surfclam fishing grounds. This also has the potential to impact fishery independent survey operations.

Other Important Issues

The SCOQ AP would like to request that surfclam and ocean quahog AP members have two seats on Fishery Management Act Teams (FMATs) for issues related to these fisheries.

Quotas

The advisors would like to see status quo quotas and the suspension of the surfclam minimum size limit for the upcoming fishing years. Surfclam are not overfished and overfishing is not occurring (in 2019).

Market/Economic Conditions

For surfclam and ocean quahog, there used to be occasional landings in Ocean City, MD, but with fuel prices and trucking issues they are not occurring anymore. It used to be significant but is no longer. Cape May and Wildwood, NJ are no longer significant. Most of the fleet is fishing out of Pt. Pleasant and Atlantic City, NJ, Oceanview, NY, and New Bedford and Fairhaven, MA. Hyannis, MA (surfclam only) landings have been recently reduced over the last few months. Cape Charles, VA is a revived port of landings targeting surclams off the Virginia coast. Trucking costs and the distance needed to travel to harvest clams has put greater economy on scale and location.

Increasing foreign imports and foreign competition puts a constraint on price, and the price cannot be increased to absorb all the additional costs and still be competitive in the marketplace. Clearwater (clam company in Canada) has been sold to a new syndicate, so it has gone from a public to private entity – they are selling their product in the U.S. and it is competing with domestic product. This is exerting additional pressure on the marketplace. The limits to demand for clams in the market is driven by many market factors including foreign seafood competition, other products in the marketplace (e.g. chicken, etc.), shifting toward healthier market products (e.g. clam sushi, etc. versus a fried or cream-based product), and competition with other ingredients, as clams typically are not a center of the plate product. There are also some complicating factors related to U.S. relationships with China and the EU/Europe in terms of marketing and sales, including trade tariffs. Massachusetts and Washington State clam landings can export now to certain European markets if on the FDA register – as other states are added, federal clams landed in those states could also export to Europe. Exports for surfclam will be limited because there are not enough surfclam to meet domestic demand.

COVID-19 dominated issues related to the market and economic conditions. It is unclear how and when this will change the markets going forward. Processors looked into ways to adjust to current market conditions with ready-to-eat product lines as the fresh retail and restaurant sales declined; although processors are expecting increases in going forward.

Because of COVID, LaMonica Fine Foods created an online retail store to sell directly to consumers.

In 2021 and the start of 2022 the Bumble Bee Seafoods clam processing factory in Cape May experienced continued demand resulting from the COVID pandemic. Volume increased due to Shelter In Place orders, and new consumers purchased canned clams to try recipes at home. However, many retailer shelves are now empty and customer orders are being cut due to an overall shortage of raw material (ocean quahogs) for the plant to process due to several factors, including weather, unavailability of vessels to harvest the clams and crew shortages. Clam supply is improving slowly but at much higher cost driven by rising fuel prices. The supply shortages have also made it difficult to retain talented employees critical to the supply. Steeply rising cost coupled with supply shortages will continue to make 2022 a very challenging year.

Environmental Conditions

Many species (including surfclam and ocean quahog) are moving northward and into deeper waters. This movement is temperature driven. Historically, about half the quota for quahog used to be taken in the Southern area. Surfclam are increasing in these Southern areas, possibly because of the faster growth rates for surfclam settling when compared to quahog. The natural shift in the stock distribution northwards has driven the movement of the fishery. For more details, see the Surfclam Fishery Information Document.

General Fishing Trends

The landings per unit effort (LPUE) is not indicative of stock abundance because it only reflects the fishing occurring in a few ten-minute squares (see Fishery Information Documents). The LPUE has leveled off in recent years. The LPUE continues to be higher on Georges Bank and there are 4 permitted vessels in the open portion of the Georges Banks closed area. Vessels fishing in Nantucket Shoals (which tend to be smaller vessels) are operating on seasonal closures - and must fish in other areas when access is not available.

Fleet Capacity

Fleet capacity continues to stay static. The overall quotas are not being harvested. The driving factors are not from the marketplace. The issues are related to an inability to catch the quota to meet demand. While some processors indicated they are unable to demand the prices at which the products are sold because of contractual agreements, because the vendors essentially dictate the prices to the processors, other have indicated that in the current high demand environments that consumers/purchasers are willing to pay more for the product and are negotiable. Fishing restrictions and regulations have limited the amount of capitalization that can be done in this fishery. The fleet continues to age, and there have been limited new builds, which has resulted in increased maintenance time spent to refurbish vessels.

Optimum Yield (OY)

The industry was comfortable with a maximum OY (maximum quota) of 3.4 million bushels for surfclam in terms of production. For ocean quahog a maximum OY of 6 million bushels is reasonable in terms of production. Considerations for optimum yield should be a priority. The industry/management should try to achieve those levels of production; regulations/closures such as Nantucket Shoals for surfclam and Georges Bank for quahogs have impacted the ability to achieve OY to meet demand. Regulations for shellfish (model ordinance) on Georges Bank have hampered the ability to access some of these areas unnecessarily; NMFS has not acted and removed some of these closures and worked with the FDA on this issue in a timely manner.

Wind Development

The clam advisors are concerned about the BOEM (Bureau of Ocean Energy Management) wind farm leasing process and potential impacts to historically important fishing areas. The industry's opportunities to engage with developers on wind array siting relative to the most productive clam fishing beds has not been productive.

This resistance in cooperation lends to the notion that the clam fishery and the ocean wind developers cannot coexist as the developers have made no attempt to give the clam industry any consideration in their layout of their arrays and the spacing between the turbines which will make it unsafe for clam vessels to work within wind farms. Siting is critical in terms of ensuring reasonable fishing access. It has been the experience of the clam industry that any communications by BOEM, wind energy developers, or state regulators is purely perfunctory and true mitigation efforts will not be made.

In the New England and Mid-Atlantic region, offshore wind development is out of control. The industry feels that no matter how hard they try to engage with developers on these issues, their input is not being considered or incorporated into the siting and development process. The spatial and operation requirements of the fishery (considering things like weather, tides, safety, etc.) need to be accounted for to ensure access to the wind arrays, but at present that is not happening. These arrays become de-facto Marine Protected Areas and the Councils and industry have nothing to say about how the fishing grounds are managed within the arrays. **Unlike finfish, clams do not move, so once the vessels cannot fish in an area those resources are lost to the fishery and the value it brings to the economy. These areas are also likely to be lost to survey data further impacting the biomass estimates of the fishery**.

The Council needs to consider the biological impacts on the fishery itself, and other cumulative environmental effects that may occur. These should include things like productivity of the resource, larval displacement, scour and sediment suspension, hydrographic changes, and effects of sounds and other pressures on the zooplankton community (which includes food for clams). In addition, in water structures from offshore wind or other types of closures (e.g., GSCHMA) will result in vessels having to travel further and having a larger carbon footprint.

Science and Research Initiatives

Industry continues to do research with the Science Center for Marine Fisheries (SCeMFiS), an industry, university, and National Science Foundation (NSF) supported research center and that has several completed, ongoing and recently funded research projects: http://scemfis.org

There are ongoing projects led by Rutgers University to identify economic impacts and develop economic models associated with wind energy development on the surfclam industry.

There is an ongoing RODA Knowledge Trust project (funded by NYSERDA) for surfclam and ocean quahog (as well as some other fisheries) designed to identify economic exposures of lost access for harvesters, processer and shoreside facilities of as a result of future build out of wind energy lease sites.

Research Priorities

The AP feels that MAFMC and NEFSC needs to consider how the fisheries independent surveys will take place within wind energy arrays once constructed.

Atlantic Surfclam Fishery Information Document

April 2022

This Fishery Information Document provides a brief overview of the biology, stock condition, management system, and fishery performance for Atlantic surfclam with an emphasis on 2021. Data sources for Fishery Information Documents are generally from unpublished National Marine Fisheries Service (NMFS) survey, dealer, vessel logbook, and permit databases and should be considered preliminary. For more resources, including previous Fishery Information Documents, please visit https://www.mafmc.org/surfclams-quahogs.

Key Facts

- There has been no change to the status of the Atlantic surfclam stock. The stock was not overfished and overfishing was not occurring in 2019.
- The total ex-vessel value of the 2021 federal harvest was approximately $24 million, higher than the $23 million in 2020.
- In 2021, there were 8 companies reporting purchases of surfclam and/or ocean quahog in 5 states outside of Maine.
- Overall, surfclam landings per unit effort has declined over time as more dense areas are fished down, including declines on Georges Bank. The fishery appears to continue to shift its effort Northward.

Basic Biology

Information on Atlantic surfclam biology can be found in the document titled, "Essential Fish Habitat Source Document: Surfclam, *Spisula solidissima*, Life History and Habitat Requirements" (Cargnelli et al. 1999).[1] An electronic version is available at the following website: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast. Additional information on this species is available at the following website: https://www.fishwatch.gov/. A summary of the basic biology is provided below.

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

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

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

Status of the Stock

The most recent assessment of the Atlantic surfclam (*Spisula solidissima*) stock is a management track assessment of the existing 2016 benchmark Stock Synthesis (SS) assessment (SAW 61; NEFSC 2017).[2,3] This management track assessment indicated the stock was not overfished and overfishing was not occurring (Figures 1-2). Retrospective adjustments were not made to the model results. Spawning stock biomass (SSB) in 2019 was estimated to be 1,222 ('000 mt) which is 119% of the biomass target ($SSB_{MSY\ proxy}$ = 1,027; Figure 1). The 2019 fully selected fishing mortality was estimated to be 0.036 which is 25.8% of the overfishing threshold proxy (F_{MSY} proxy = 0.141; Figure 2).

Management System and Fishery Performance

Management

There have been no major changes to the overall management system since the Individual Fishing Quota (ITQ) system was implemented in 1990. The Fishery Management Plan (FMP) for Atlantic surfclam (*Spisula solidissima*) became effective in 1977. The FMP established the management unit as all Atlantic surfclam in the Atlantic EEZ. The FMP is managed by the Mid-Atlantic Fishery Management Council (Council), in conjunction with the NMFS as the Federal implementation and enforcement entity. The primary management tool is the specification of an annual quota, which is allocated to the holders of allocation shares (ITQs) at the beginning of each calendar year as specified in Amendment 8 to the FMP (1988). In addition to the Federal water fishery, there is a small fishery prosecuted in the state waters of New York, New Jersey, and Massachusetts. The FMP, including subsequent Amendments and Frameworks, is available on the Council website at: https://www.mafmc.org/.

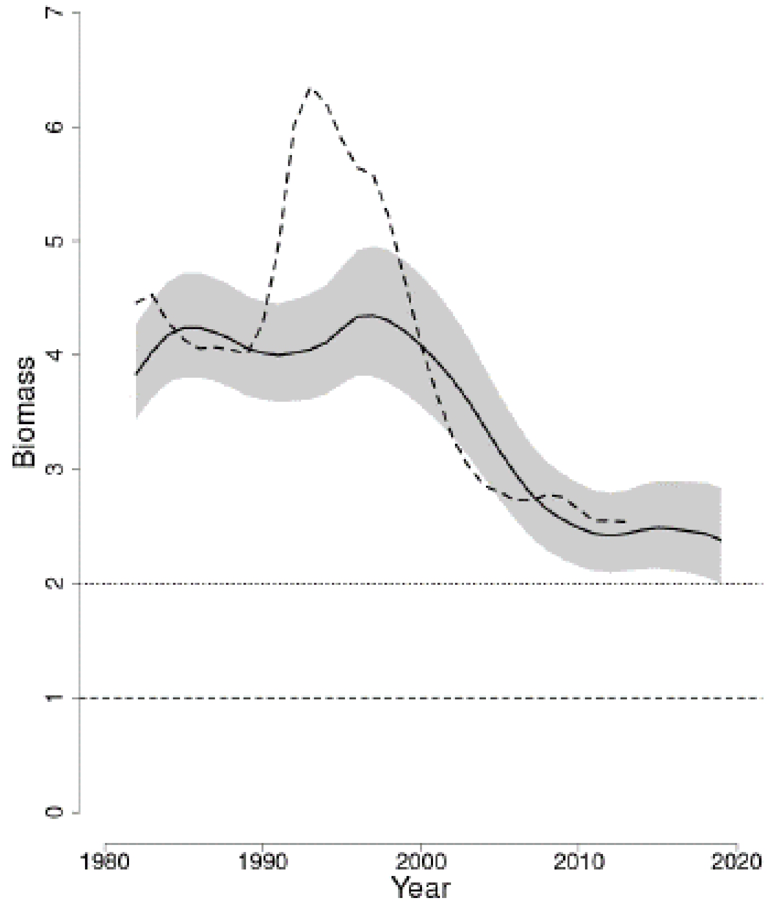

Figure 1. Trends in spawning stock biomass of Atlantic surfclam between 1982 and 2019 from the current (solid line) and previous (dashed line) assessment and the corresponding $SSB_{Threshold}$ (½ $SSBMSY_{proxy}$; horizontal dashed line) as well as SSB_{Target} ($SSB_{MSY\ proxy}$; horizontal dotted line) based on the 2020 assessment. Units of SSB are the ratio of annual biomass to the biomass threshold ($SSB/SSB_{Threshold}$). The approximate 90% lognormal confidence intervals are shown.[3]

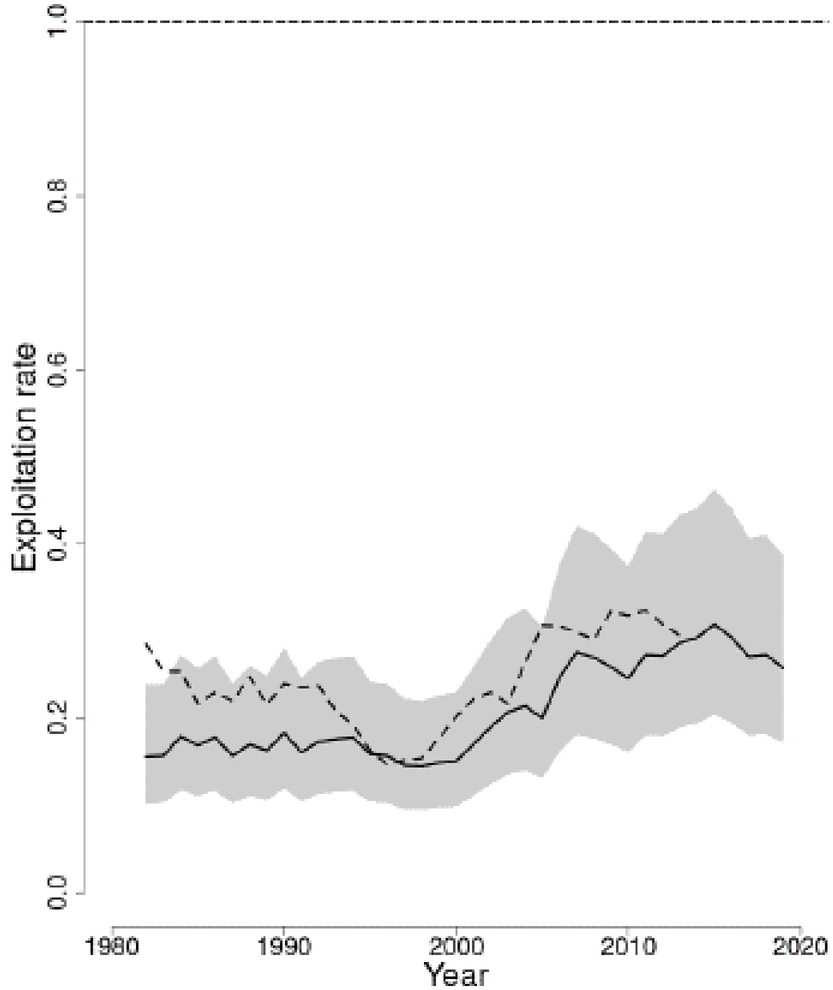

Figure 2. Trends in the fully selected fishing mortality (F_{Full}) of Atlantic surf-clam between 1982 and 2019 from the current (solid line) and previous (dashed line) assessment and the corresponding $F_{Threshold}$ ($F_{MSY\ proxy}$=0.141; horizontal dashed line), based on the 2020 assessment. Units of fishing mortality are the ratio of annual F to the F threshold ($F/F_{Threshold}$). The approximate 90% lognormal confidence intervals are shown.[3]

Commercial Fishery

The commercial fishery for surfclam in Federal waters is prosecuted with large vessels and hydraulic dredges. Surfclam landings and commercial quotas are given in Table 1 and Figure 3. The areas where surfclam are found is shown in Figure 4. The distribution of the fishery has changed over time, as shown in Figures 5-8, with a shift to increased landings in Southern New England and Georges Bank areas. In 2020, COVID-19 impacted the fishing sector - information on those impacts can be found here and in recent fishery performance reports: https://media.fisheries.noaa.gov/2021-02/Northeast-COVID-19-Impact-Snapshot-webready.pdf.

Table 1. Federal surfclam quotas and landings: 1999-2022. Landings for state waters are approximated as total landings - EEZ landings and may not accurately reflect state landings. SSC determined OFLs and ABCs included.

Year	OFL (mt)	ABC/ ACL (mt)	Total Landings (mt meats; w/state waters)	EEZ Landings (mt meats)	EEZ Landings[a] ('000 bu)	EEZ Quota ('000 bu)	% Harvested
1999	NA	NA	26,677	19,577	2,539	2,565	99%
2000	NA	NA	31,093	19,788	2,566	2,565	100%
2001	NA	NA	31,237	22,017	2,855	2,850	100%
2002	NA	NA	32,645	24,006	3,113	3,135	99%
2003	NA	NA	31,526	24,994	3,241	3,250	100%
2004	NA	NA	26,463	24,197	3,138	3,400	92%
2005	NA	NA	22,734	21,163	2,744	3,400	81%
2006	NA	NA	25,779	23,573	3,057	3,400	90%
2007	NA	NA	27,091	24,915	3,231	3,400	95%
2008	NA	NA	25,223	22,510	2,919	3,400	86%
2009	NA	NA	22,396	20,065	2,602	3,400	77%
2010	129,300	96,600	19,941	17,984	2,332	3,400	69%
2011	114,000	96,600	20,044	18,839	2,443	3,400	72%
2012	102,300	96,600	18,393	18,054	2,341	3,400	69%
2013	93,400	96,600	18,924	18,551	2,406	3,400	71%
2014	81,150	60,313	18,834	18,227	2,364	3,400	70%
2015	75,178	51,804	18,517	18,154	2,354	3,400	69%
2016	71,512	48,197	18,202	18,039	2,339	3,400	69%
2017	69,925	44,469	17,690	16,902	2,192	3,400	64%
2018	Not specified[b]	29,363[b]	17,114	16,269	2,110	3,400	62%
2019	74,281[c]	56,419[c]	16,502	14,986	1,943	3,400	57%
2020	74,110[c]	56,289[c]	12,897	12,034	1,560	3,400	46%
2021	51,361	47,919	808[e]	12,351[d]	1,602[d]	3,400	47%
2022	48,202	44,522	NA	NA	NA	3,400	NA

[a] 1 surfclam bushel is approximately 17 lb. [b] Revised previous 2018 values due to new stock assessment. [c] Revised previous 2019-2020 values due to new analyses. [d] Preliminary, incomplete 2021 data. Source: NMFS clam vessel logbook reports.[3] [e] Due to incomplete/unavailable CAMS data in 2021, the Total for 2021 is not accurate.

Figure 9 provides the distribution of surfclam landings in “important” ten minute squares (TMSQ). Important means that a square ranked in the top 10 TMSQ for total landings during any five-year period (1980-1984, 1985-1989, ...). Data for 2021 are incomplete and preliminary and included in the last time block.

Additional information of the length composition of port sampled surfclam, and their associated sample sizes by area, are available in the stock assessment reports and management track assessment provided.[3]

Port and Community Description

When Amendment 13 to the FMP was developed, the Council hired Dr. Bonnie McCay and her associates at Rutgers University to describe the ports and communities that are associated with the surfclam and ocean quahog fisheries. The researchers did an extensive job characterizing the three main fisheries (non-Maine ocean quahog, Maine ocean quahog, and surfclam). The McCay team characterizations of the ports and communities are based on government census and labor statistics and on observations and interviews carried out during the late 1990s and in the fall of 2001. The description of the fishing gear, areas fished, etc. are fully described in Amendment 13.

Communities from Maine to Virginia are involved in the harvesting and processing of surfclam and ocean quahog. Ports in New Jersey and Massachusetts handle the most volume and value, particularly Atlantic City and Point Pleasant, New Jersey, and New Bedford, Massachusetts. There are also landings in Ocean City, Maryland, and the Jonesport and Beals Island areas of Maine.

Additional information on "Snapshots of Human Communities and Fisheries in the Northeast" can be found at: https://fish.nefsc.noaa.gov/read/socialsci/communitySnapshots.php.

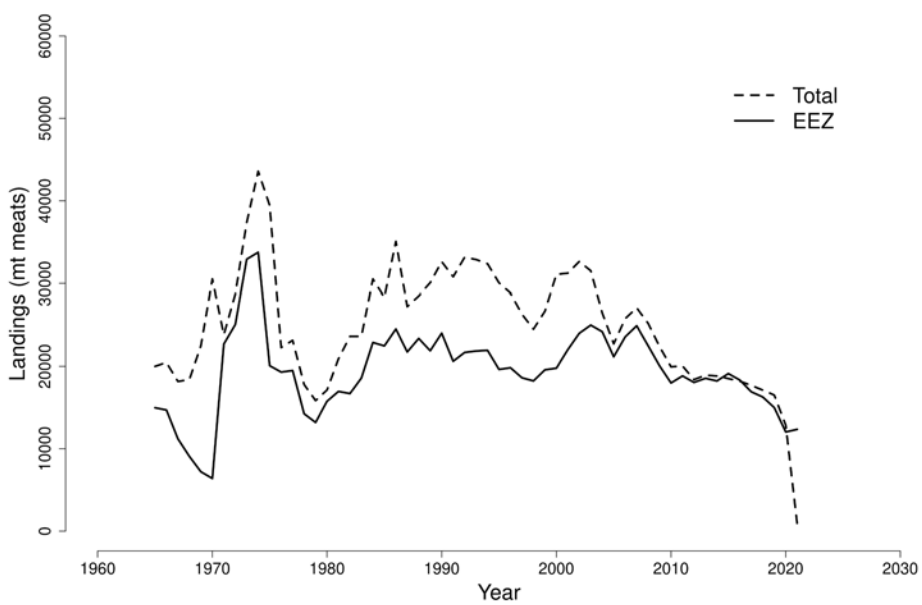

Figure 3. Surfclam landings (total and EEZ) during 1965-2020, and preliminary 2021.[4] Note: Due to incomplete/unavailable CAMS data in 2021, the Total for 2021 is not accurate.

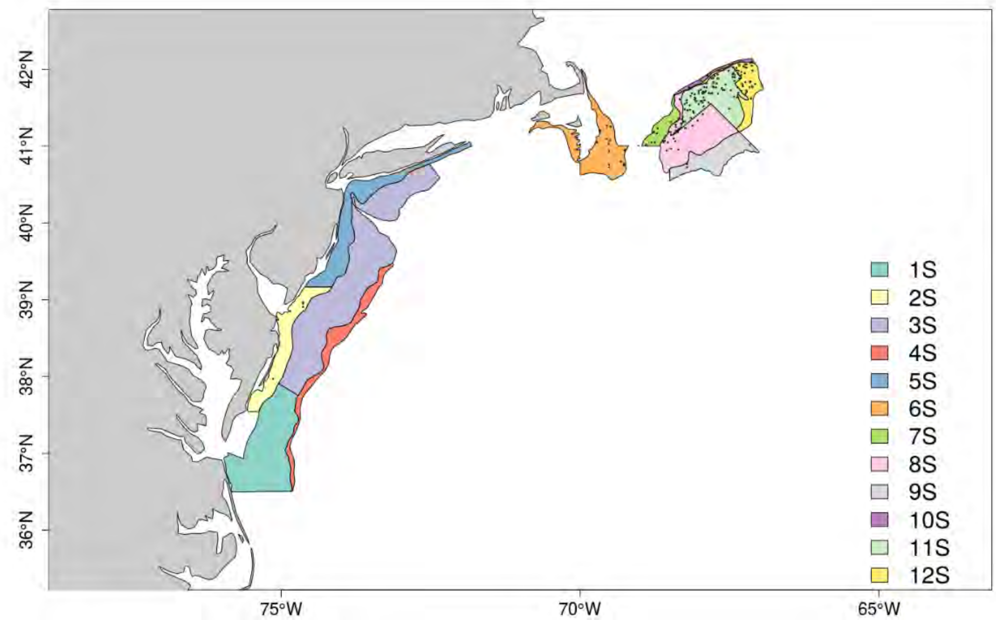

Figure 4. Surfclam stock assessment regions and NEFSC shellfish survey strata. The shaded strata are where surfclam are found.

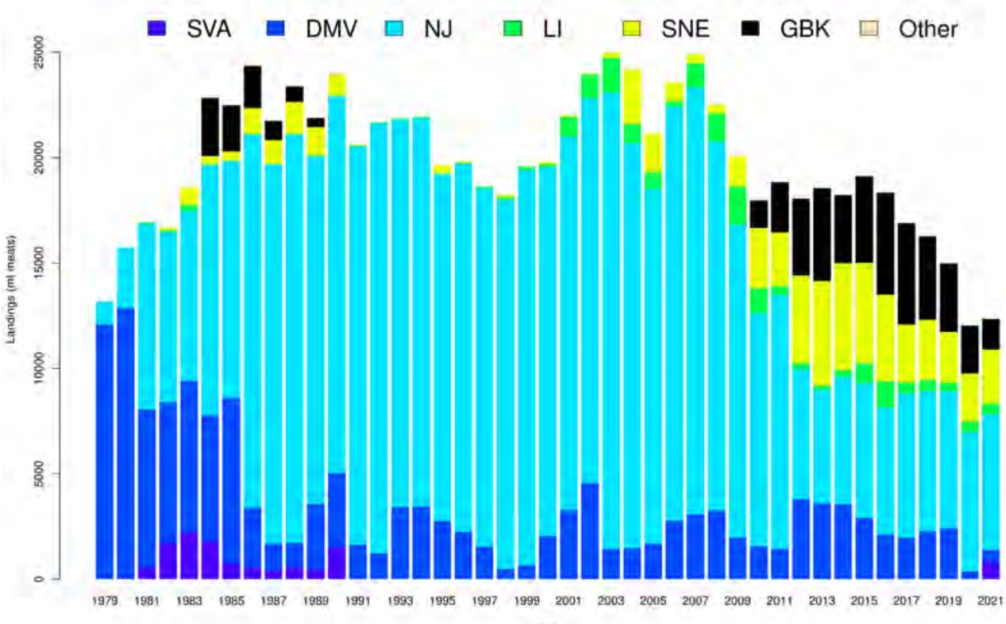

Figure 5. Surfclam landings from the US EEZ during 1979-2020, and preliminary 2021.[4]

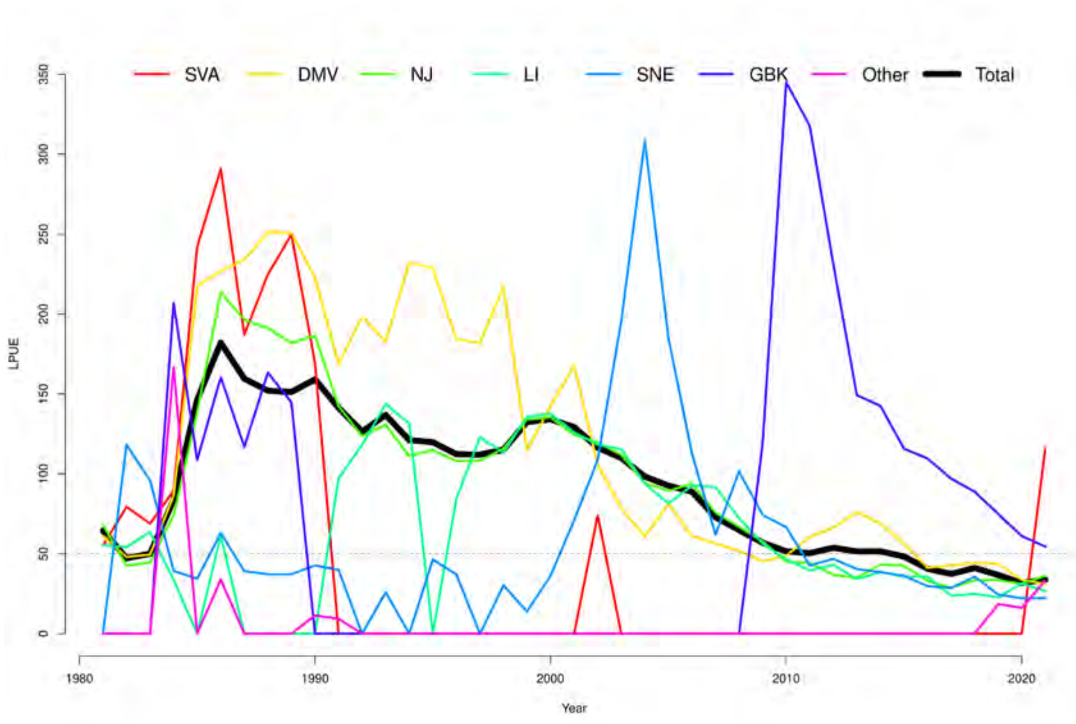

Figure 6. Nominal landings per unit effort (LPUE in bushels landed per hour fished) for surfclam, by region, during 1981-2020, and preliminary 2021. LPUE is total landings in bushels divided by total fishing effort.[4]

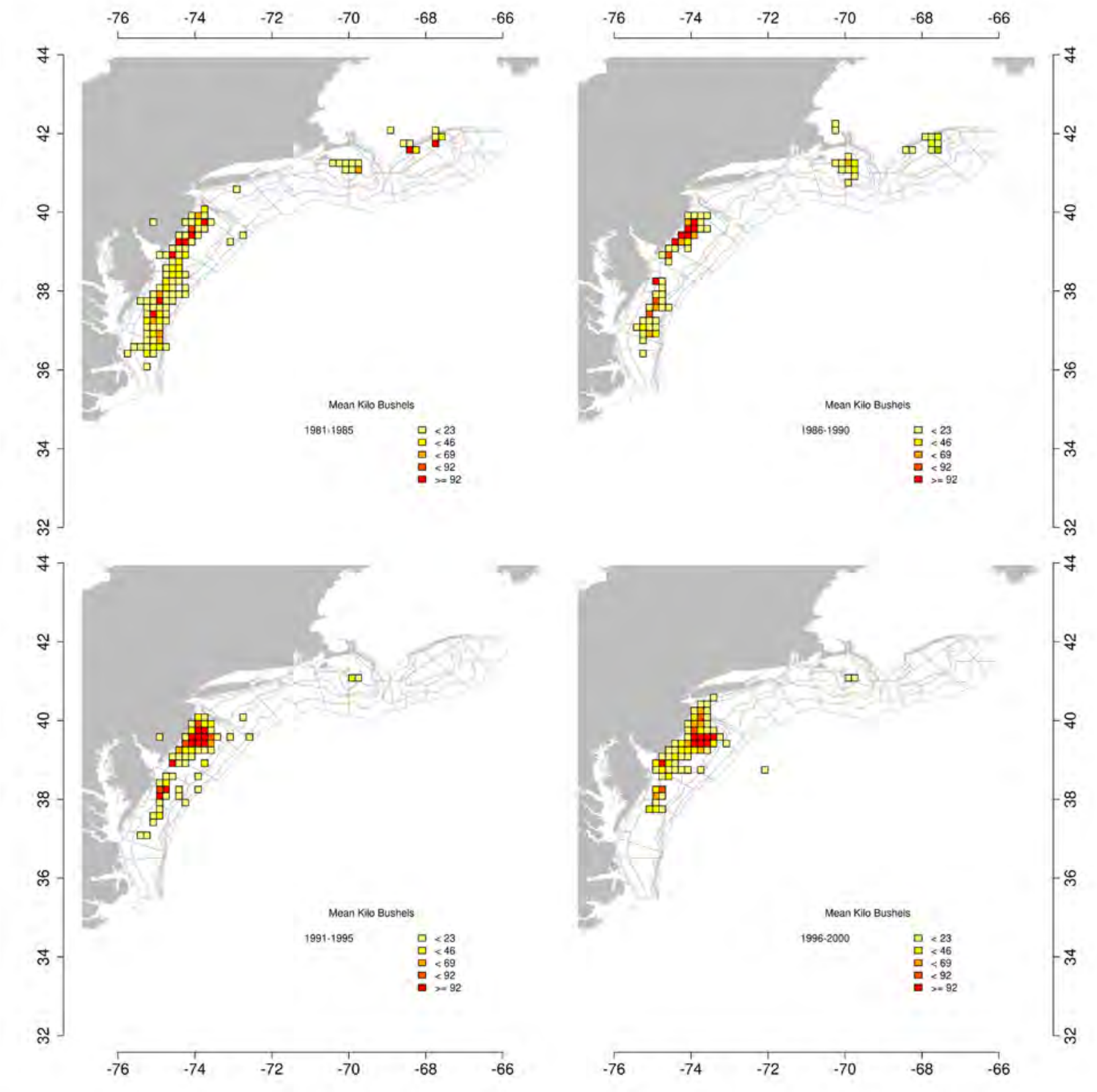

Figure 7. Average surfclam landings by ten-minute squares over time, 1981-2000. Only squares where more the 5 kilo bushels were caught are shown.[3]

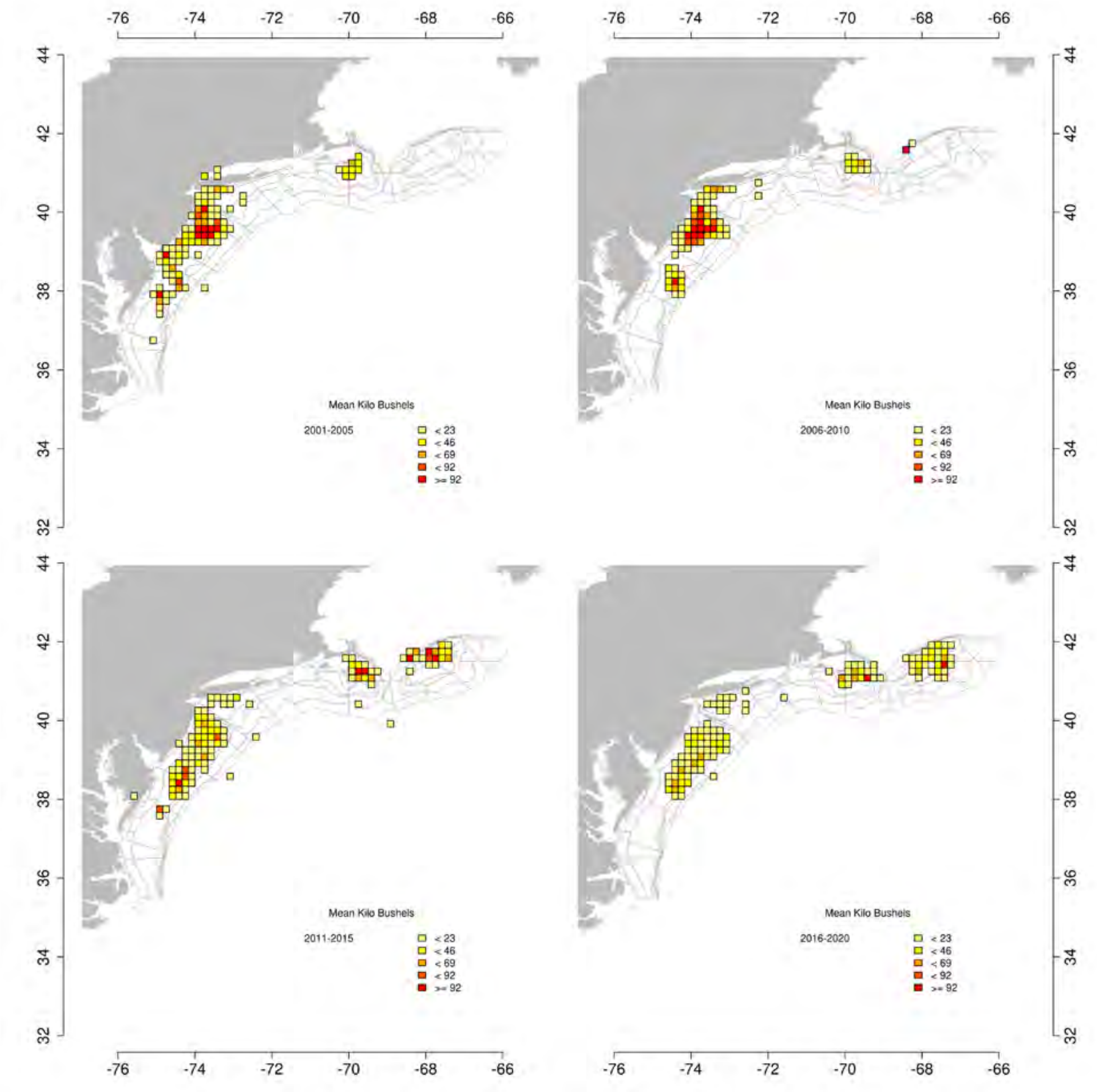

Figure 8. Average surfclam landings by ten-minute squares over time, 2001-2020. Only squares where more the 5 kilo bushels were caught are shown.[4]

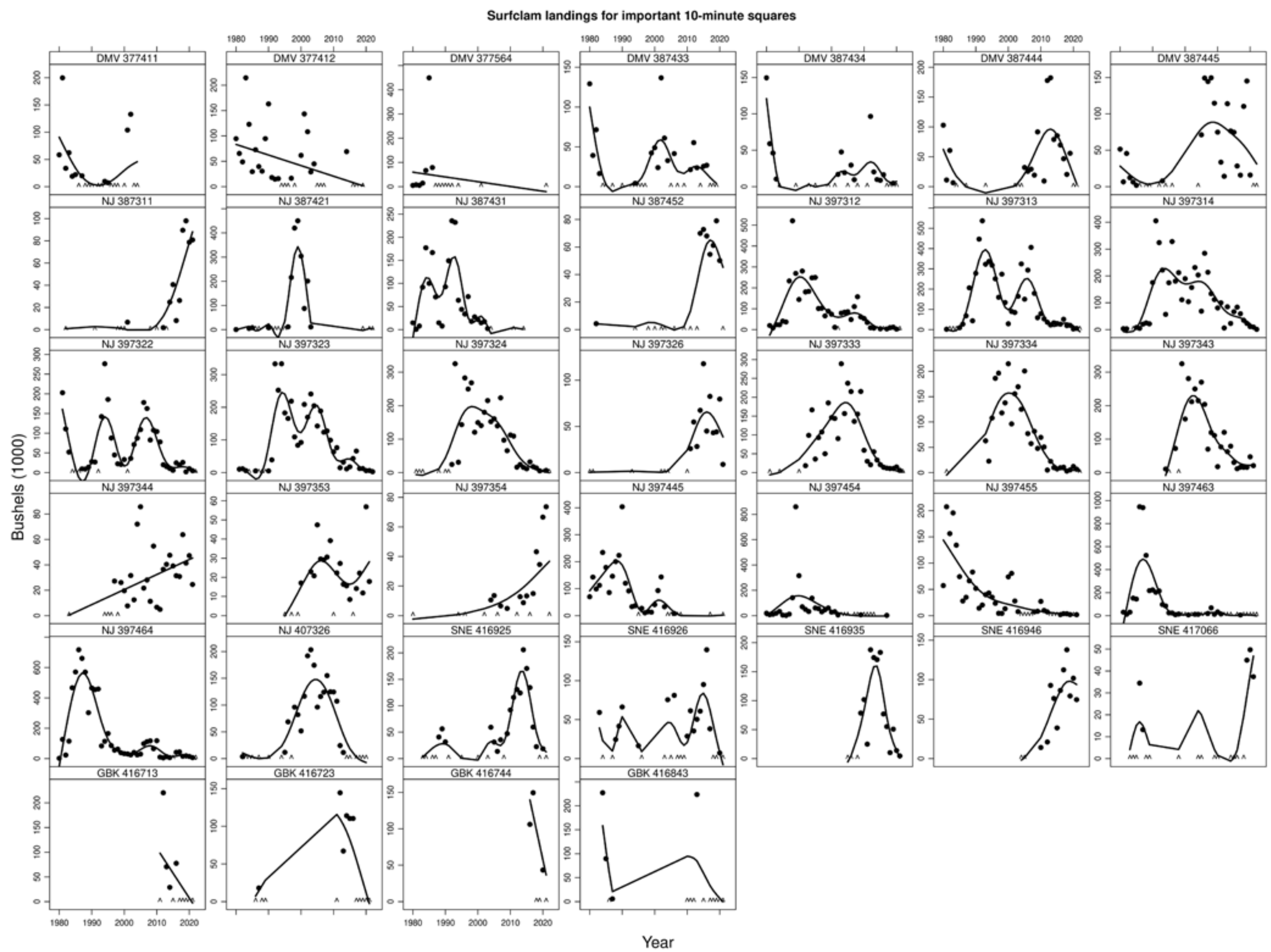

Figure 9. Annual surfclam landings in "important" ten minute squares (TNMS) during 1980-2017 based on logbook data. Important means that a square ranked in the top 10 TNMS for total landings during any five-year period (1980-1984, 1985-1989, ...). Data for 2021 are incomplete and preliminary. To protect the privacy of individual firms, data are not plotted if the number of vessels is less than 2. Instead, a "^" is shown on the x-axis to indicate where data are missing. The solid dark line is a spline intended to show trends. The spline was fit too all available data, including data not plotted.[4]

Federal Fleet Profile

The total number of vessels participating in the surfclam fishery has remained relatively stable in the recent decade, with vessels shifting between harvesting surfclam or surfclam and ocean quahog (Table 2). The average ex-vessel price of surfclams reported by processors was $14.90 in 2021, slightly higher than the $14.48 per bushel seen in 2020. The total ex-vessel value of the 2021 federal harvest was approximately $24 million, which is higher than $23 million in 2020. Industry has described several factors that have affected their industry. Trips harvesting surfclam have increased in length as catch rates have declined. The distribution of LPUE in bushels per hour over time is shown in Figures 6 and 11-12.

Processing Sector

Even though this document describes the surfclam fishery, the information presented in this section regarding the processing sector is for both surfclam and ocean quahog as some of these facilities purchase/process both species.

In 2021, there were 8 companies reporting purchases of surfclam and/or ocean quahog in 5 states outside of Maine. Employment data for these specific firms are not available.

In 2021, these companies bought approximately $24 million worth of surfclam and $18 million worth of ocean quahog.

Area Closures

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

Fishing areas can also be closed for public health related issues due to environmental degradation or the toxins that cause parayltic shellfish poisoning (PSP). PSP is a public health concern for surfclam. PSP is caused by saxitoxins, produced by the alga *Alexandrium fundyense* (red tide). Surfclam on Georges Bank were not fished from 1990 to 2008 due to the risk of PSP. There was light fishing on Georges Bank in years 2009-2011 under an exempted fishing permit and LPUE in that area was substantially higher (5-7 times higher) than in other traditional fishing grounds, although those LPUEs have recently declined.

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

New England Fishery Management Council's Omnibus Essential Fish Habitat (EFH) Amendment 2 (OHA2) implemented measures that restricted access to the Great South Channel and Georges Shoal Habitat Management Areas. The surfclam fishery and mussel dredge fishery can operate in specific exemption areas year-round or seasonally in specific exemption areas. For additional information see: https://www.fisheries.noaa.gov/action/habitat-clam-dredge-exemption-framework.

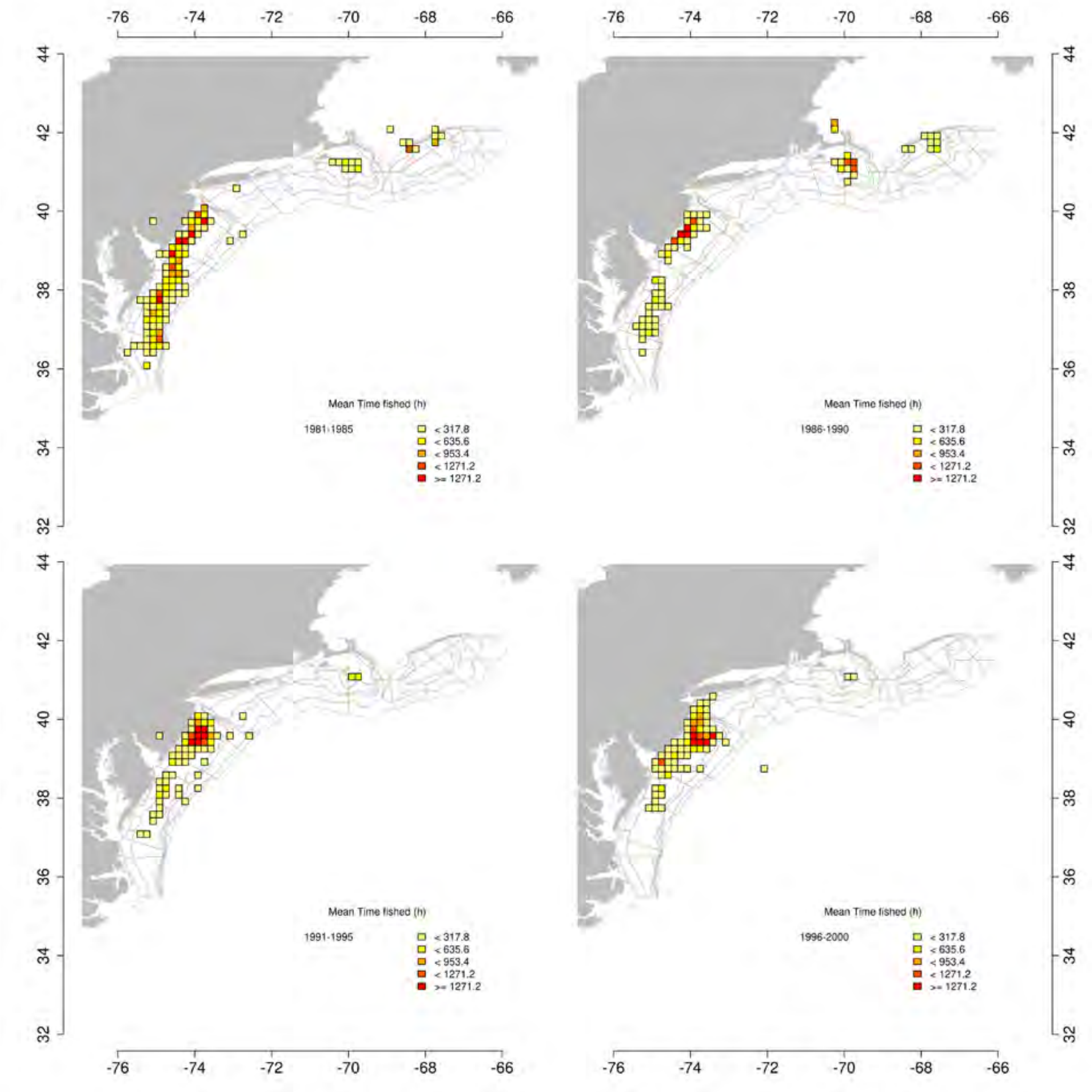

Figure 11. Average surfclam landings per unit effort (LPUE; bu. h^{-1}) by ten-minute squares over time, 1981-2000. Only squares where more the 5 kilo bushels were caught are shown.[4]

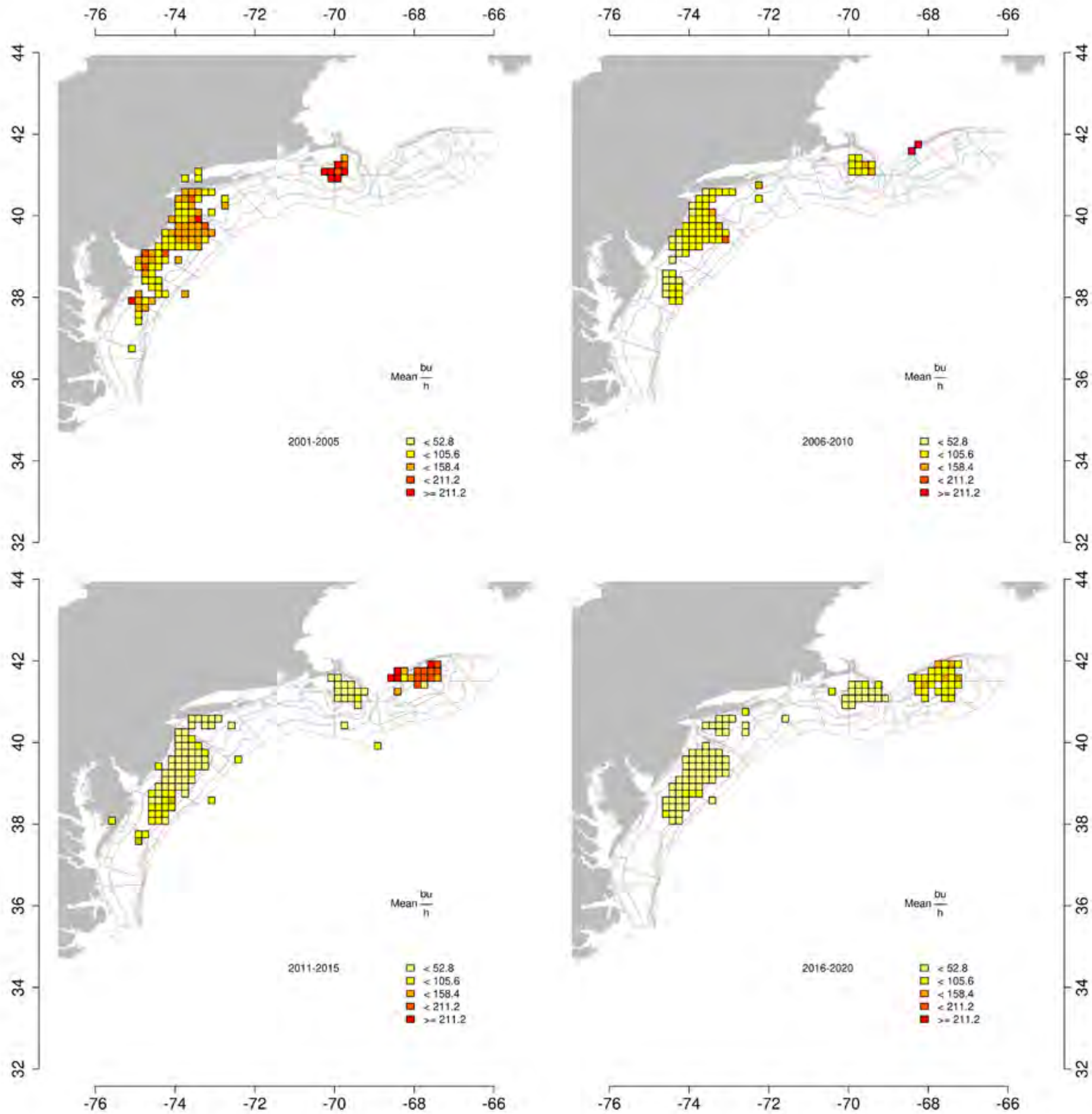

Figure 12. Average surfclam landings per unit effort (LPUE; bu. h-1) by ten-minute squares over time, 2001-2020. Only squares where more the 5 kilo bushels were caught are shown.[4]

Table 2. Federal fleet profile, 2012 through 2021.

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Harvesting BOTH surfclam & ocean quahog	13	7	7	6	8	14	8	7	8	10
Harvesting only surfclam	29	33	31	31	30	26	31	36	35	31
Total Vessels	42	40	38	37	38	40	39	43	43	41

Source: NMFS clam vessel logbooks.

References

1. Cargnelli, L., S. Griesbach, D. Packer, and E. Weissberger. 1999. Essential Fish Habitat Source Document: Atlantic Surfclam, *Spisula solidissima*, Life History and Habitat Characteristics. NOAA Tech. Memo. NMFS-NE-142.

2. Northeast Fisheries Science Center. 2016. 61st Northeast Regional Stock Assessment Workshop (61st SAW) Assessment Summary Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 16-13; 26 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at http://www.nefsc.noaa.gov/publications.

3. Hennen, Dan. Personal Communication. June 14, 2020. NOAA Fisheries, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543.

4. Hennen, Dan. Personal Communication. March 30, 2022. NOAA Fisheries, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543.

Ocean Quahog Fishery Information Document

April 2021

This Fishery Information Document provides a brief overview of the biology, stock condition, management system, and fishery performance for ocean quahog with an emphasis on 2021. Data sources for Fishery Information Documents are generally from unpublished National Marine Fisheries Service (NMFS) survey, dealer, vessel logbook, and permit databases and should be considered preliminary. For more resources, including previous Fishery Information Documents, please visit http://www.mafmc.org/surfclams-quahogs.

Key Facts

- There has been no change to the status of the ocean quahog stock. The stock was not overfished and overfishing was not occurring in 2019.
- The total ex-vessel value of the 2021 federal harvest was approximately $18 million, higher than the $16 million in 2020.
- In 2020, there were 8 companies reporting purchases of surfclam and/or ocean quahog in 5 states outside of Maine.
- The fishery appears to continue to shift its effort Northward, and has shown increased effort in the Southern New England and Geroges Bank area in recent years.

Basic Biology

Information on ocean quahog biology can be found in the document titled, "Essential Fish Habitat Source Document: Ocean Quahog, *Arctica islandica*, Life History and Habitat Requirements" (Cargnelli et al. 1999).[1] An electronic version is available at the following website: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast. Additional information on this species is available at the following website: https://www.fishwatch.gov/. A summary of the basic biology is provided below.

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

Ocean quahog are one of the longest-living, slowest growing marine bivalves in the world. Under normal circumstances, they live to more than 100 years old. Ocean quahog have been aged well in excess of 200 years. Growth tends to slow after age 20, which corresponds to the size currently harvested by the industry (approximately 3 inches). Size and age at sexual maturity are variable and poorly known. Studies in Icelandic waters indicate that 10, 50, and 90 percent of female ocean quahog were sexually mature at 40, 64 and 88 mm (1.5, 2.5 and 3.5 inches) shell length or approximately 2, 19 and 61 years of age. Spawning occurs over a protracted interval from summer through autumn. Free-floating larvae may drift far from their spawning location because they develop slowly and are planktonic for more than 30 days before settling. Major recruitment events appear to be separated by periods of decades.

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

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

Status of the Stock

The most current assessment of the ocean quahog (*Arctica islandica*) stock is a management track assessment of the existing 2017 benchmark Stock Synthesis (SS) assessment (SAW 63; NEFSC 2017).[2,3] Based on the previous assessment the stock was not overfished, and overfishing was not occurring. The management track assessment updates commercial fishery catch data, and commercial length composition data, as well as the analytical SS assessment model and reference points through 2019. No new survey data have been collected since the last assessment. Stock projections have been updated through 2026.

Based on this updated assessment, the ocean quahog stock is not overfished and overfishing is not occurring (Figures 1-2). Retrospective adjustments were not made to the model results. Spawning stock biomass (SSB) in 2019 was estimated to be 3,651 ('000 mt) which is 172.8% of the biomass target ($SSB_{MSY\ proxy}$ = 2,113; Figure 1). The 2019 fully selected fishing mortality was estimated to be 0.005 which is 25.5% of the overfishing threshold proxy ($F_{MSY\ proxy}$ = 0.019; Figure 2).

Management System and Fishery Performance

Management

The Fishery Management Plan (FMP) for ocean quahog (*Arctica islandica*) became effective in 1977. The FMP established the management unit as all ocean quahog in the EEZ. The FMP is managed by the Mid-Atlantic Fishery Management Council (Council), in conjunction with NMFS as the Federal implementation and enforcement entity. The primary management tool is the specification of an annual quota, which is allocated to the holders of allocation shares (Individual Transferable Quotas - ITQs) at the beginning of each calendar year as specified in Amendment 8 to the FMP (1988). In addition to the Federal waters fishery, there is a small fishery prosecuted in the state waters of Maine. The FMP, including subsequent Amendments and Frameworks, are available on the Council website at: http://www.mafmc.org.

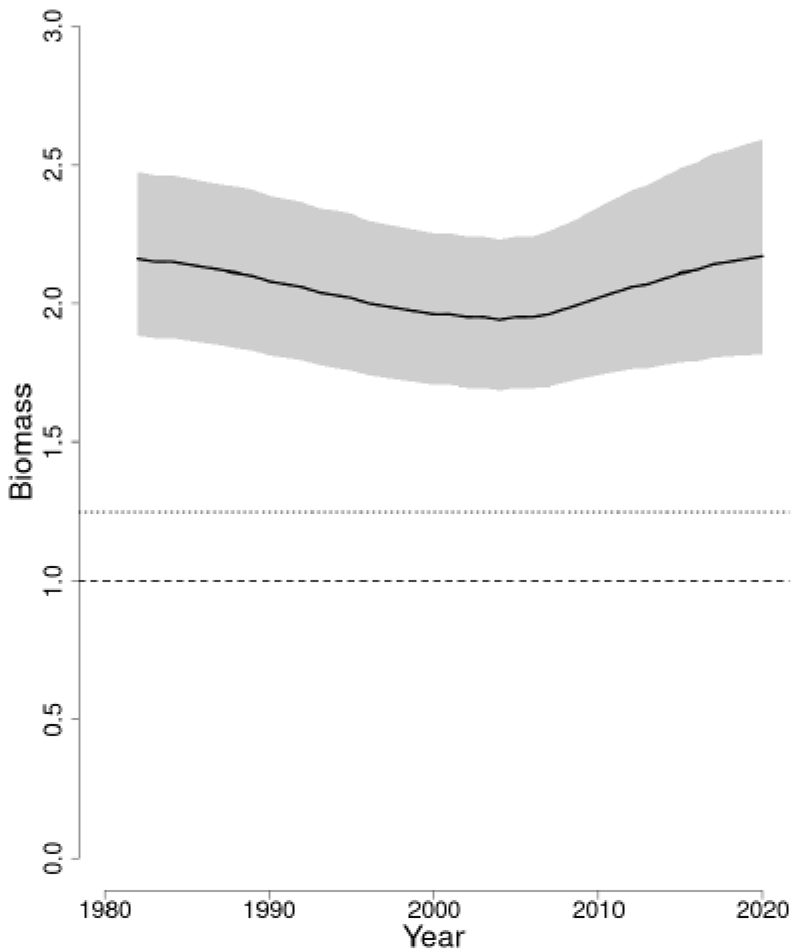

Figure 1. Trends in spawning stock biomass of ocean quahog between 1982 and 2020 from the current (solid line) and previous (dashed line) assessment and the corresponding $SSB_{Threshold}$ (horizontal dashed line) as well as SSB_{Target} ($SSB_{MSY\ proxy}$; horizontal dotted line) based on the 2020 assessment. Units of SSB are the ratio of annual biomass to the biomass threshold ($SSB/SSB_{Threshold}$). The approximate 90% lognormal confidence intervals are shown.[3]

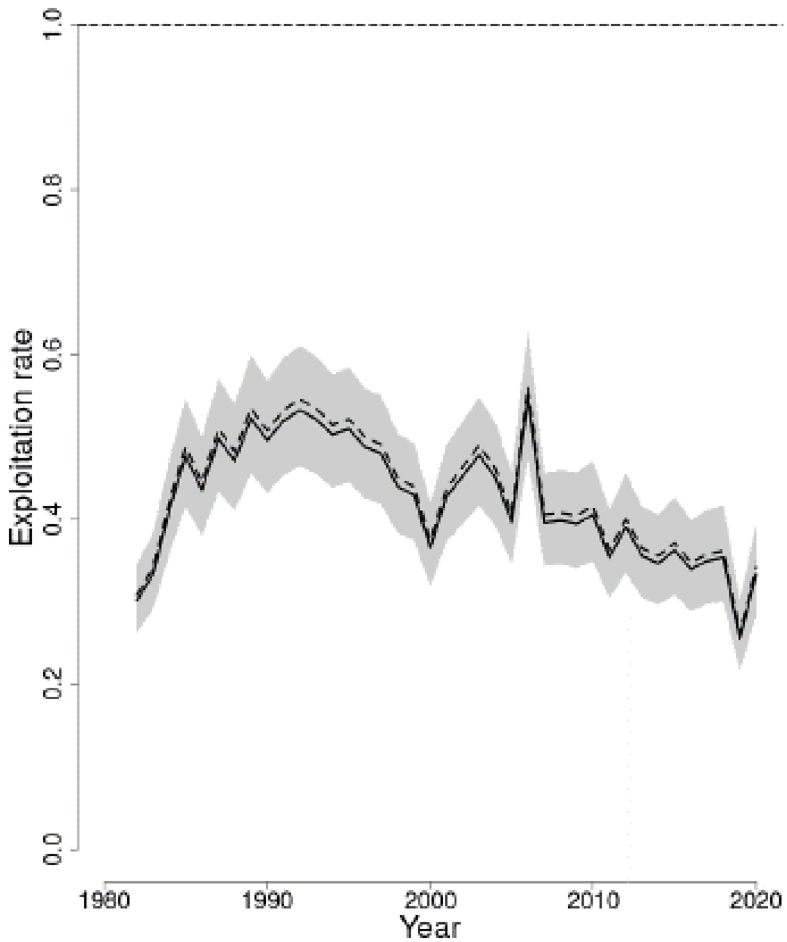

Figure 2. Trends in the fully selected fishing mortality (F_{Full}) of ocean quahog between 1982 and 2020 from the current (solid line) and previous (dashed line)assessment and the corresponding $F_{Threshold}$ ($F_{MSY\ proxy}$=0.019; horizontal dashed line), based on the 2020 assessment. Units of fishing mortality are the ratio of annual F to the F threshold ($F/F_{Threshold}$). The approximate 90% lognormal confidence intervals are shown.[3]

Commercial Fishery

The commercial fishery for ocean quahog in Federal waters is prosecuted with large vessels and hydraulic dredges and is very different from the small Maine fishery prosecuted with small vessels (35-45 ft) targeting quahog for the local fresh, half shell market. Ocean quahog landings and commercial quotas are given below in Table 1 and Figure 3. In 2020, COVID-19 impacted the fishing sector - information on those impacts can be found here and in recent fishery performance reports: https://media.fisheries.noaa.gov/2021-02/Northeast-COVID-19-Impact-Snapshot-webready.pdf.

The areas where ocean quahog are found is shown in Figure 4. The distribution of the fishery has changed over time (Figures 5-8). The bulk of the fishery from 1980-1990 was being prosecuted off the Delmarva but is now being prosecuted in more Northern areas. Figure 9 provides the distribution of ocean quahog landings in "important" ten minute squares (TMSQ). Important means that a square ranked in the top 10 TMSQ for total landings during any five-year period (1980-1984, 1985-1989, ….). Data for 2021 are incomplete and preliminary, and included in the last time block. Additional information of the length composition of port sampled ocean quahog, and their associated sample sizes by area, are available in the stock assessment reports and data updates.[4]

Port and Community Description

When Amendment 13 to the FMP was developed, the Council hired Dr. Bonnie McCay and her associates at Rutgers University to describe the ports and communities that are associated with the surfclam and ocean quahog fisheries. The researchers did an extensive job characterizing the three main fisheries (non-Maine ocean quahog, Maine ocean quahog, and surfclam).

The McCay team characterizations of the ports and communities are based on government census and labor statistics and on observations and interviews carried out during the late 1990s and in the fall of 2001. The description of the fishing gear, areas fished, etc. are fully described in Amendment 13.

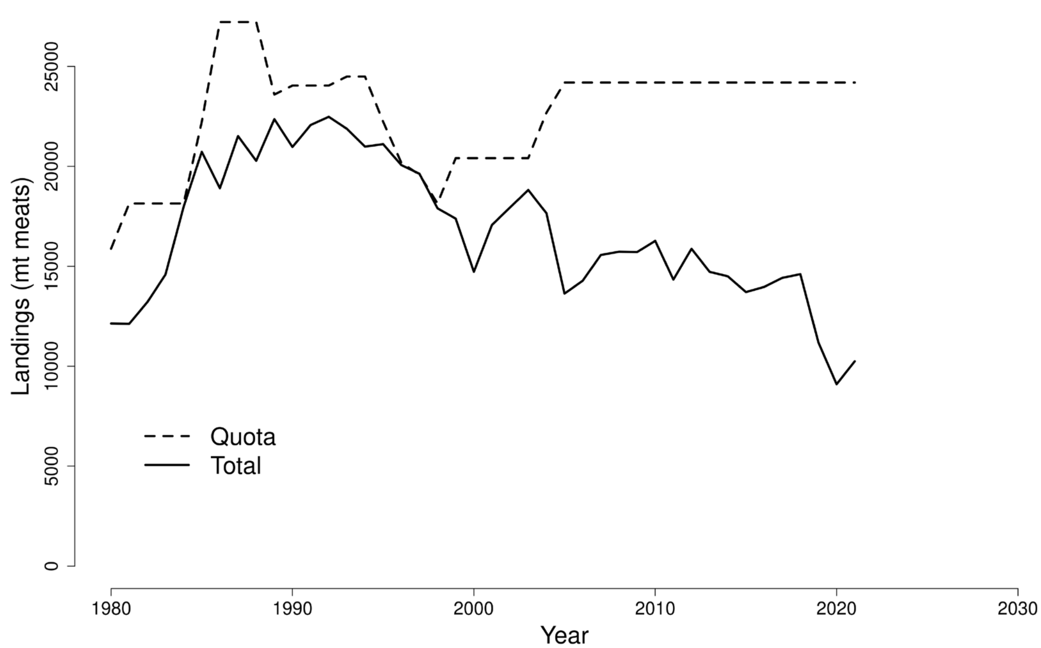

Figure 3. Ocean quahog landings (total and EEZ) during 1965-2020, and preliminary 2021.[4]

Table 1. Federal ocean quahog quotas and landings: 1999-2022. SSC determined OFLs and ABCs included.

Year	OFL (mt)	ABC/ ACL (mt)	EEZ Landings[a] (mt meats)	EEZ Landings[a,b] ('000 bu)	EEZ Quota ('000 bu; excludes 100,000 ME bu)	% Harvested
1999	NA	NA	17,381	3,832	4,500	85%
2000	NA	NA	14,723	3,246	4,500	72%
2001	NA	NA	17,069	3,763	4,500	84%
2002	NA	NA	17,947	3,957	4,500	88%
2003	NA	NA	18,815	4,148	4,500	92%
2004	NA	NA	17,655	3,892	5,000	78%
2005	NA	NA	13,635	3,006	5,333	56%
2006	NA	NA	14,273	3,147	5,333	59%
2007	NA	NA	15,564	3,431	5,333	64%
2008	NA	NA	15,727	3,467	5,333	65%
2009	NA	NA	15,710	3,463	5,333	65%
2010	NA	NA	16,271	3,587	5,333	67%
2011	34,800	26,100	14,332	3,160	5,333	59%
2012	34,800	26,100	15,864	3,497	5,333	66%
2013	34,800	26,100	14,721	3,245	5,333	61%
2014	Not specified	26,100	14,498	3,196	5,333	60%
2015	Not specified	26,100	13,709	3,022	5,333	56%
2016	Not specified	26,100	13,965	3,079	5,333	58%
2017	Not specified	26,100	14,417	3,178	5,333	59%
2018	61,600	44,695	14,606	3,220	5,333	60%
2019	63,600	46,146	11,178	2,464	5,333	46%
2020	63,100	45,783	9,101	2,006	5,333	38%
2021	44,960	44,031	10,246[c]	2,259[c]	5,333	42%
2022	45,001	44,072	NA	NA	5,333	NA

[a] Column excludes Maine Landings which have varied from 48-387 mt per year from 1998-2021 (see assessment for additional details on the Maine fishery). [b] 1 ocean quahog bushel is approximately 10 lb. [c] Preliminary, incomplete 2021 data. Source: NMFS clam vessel logbook reports.

Communities from Maine to Virginia are involved in the harvesting and processing of surfclam and ocean quahog. Ports in New Jersey and Massachusetts handle the most volume and value, particularly Atlantic City and Point Pleasant, New Jersey, and New Bedford, Massachusetts. There are also landings in Ocean City, Maryland, and the Jonesport and Beals Island areas of Maine. The small scale Maine fishery is entirely for ocean quahog, which are sold as shellstock for the half-shell market. The other fisheries are industrialized ones for surfclam and ocean quahog, which are hand shucked or steam-shucked and processed into fried, canned, and frozen products.

Additional information on "Snapshots of Human Communities and Fisheries in the Northeast" can be found at: https://www.nefsc.noaa.gov/read/socialsci/communitySnapshots.php.

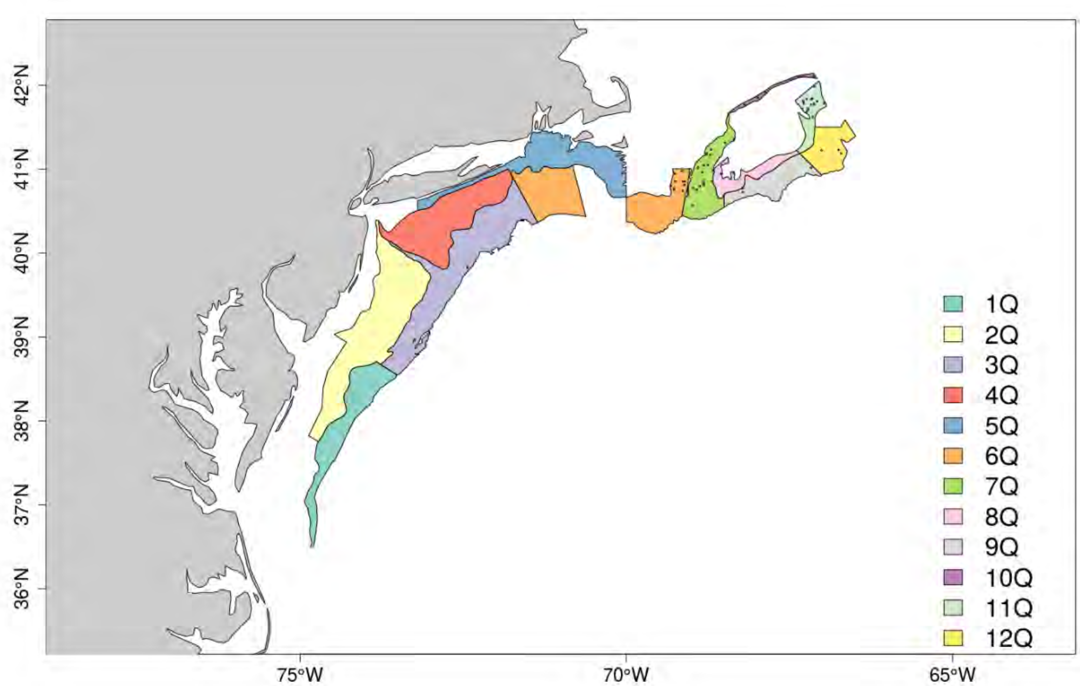

Figure 4. Ocean quahog stock assessment regions and NEFSC shellfish survey strata. The shaded strata are where quahog are found.

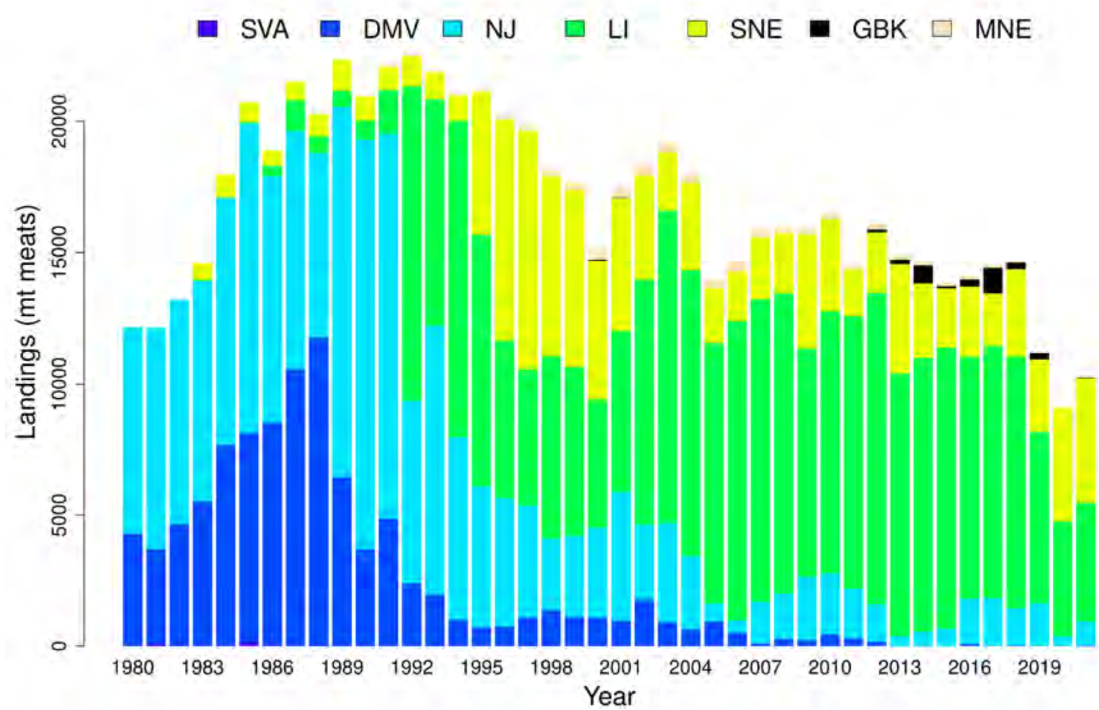

Figure 5. Ocean quahog landings from the US EEZ during 1980-2020, and preliminary 2021.[4]

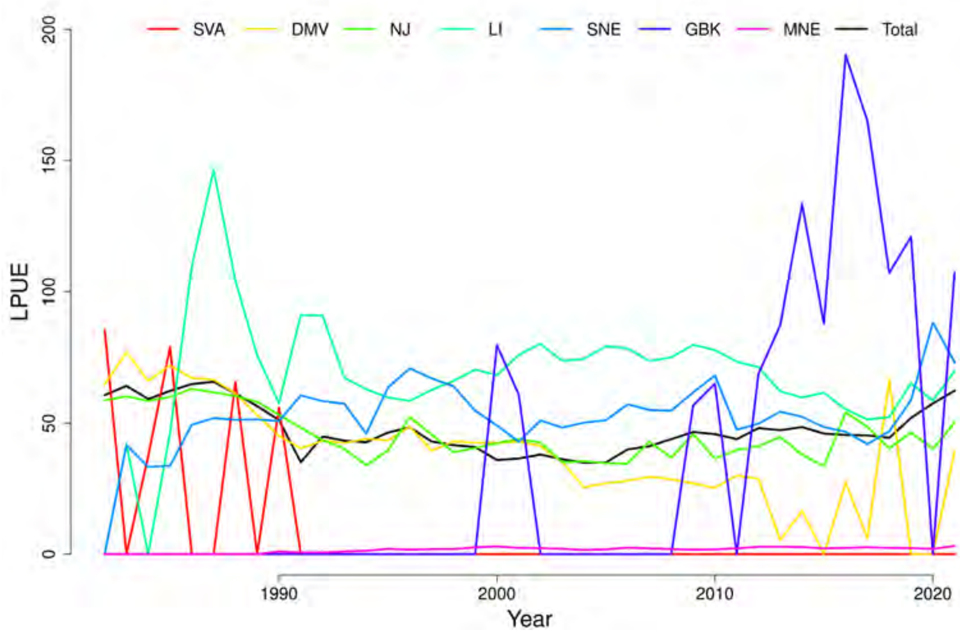

Figure 6. Nominal landings per unit effort (LPUE in bushels landed per hour fished) for ocean quahog, by region, during 1981-2020, and preliminary 2021. LPUE is total landings in bushels divided by total fishing effort.[4]

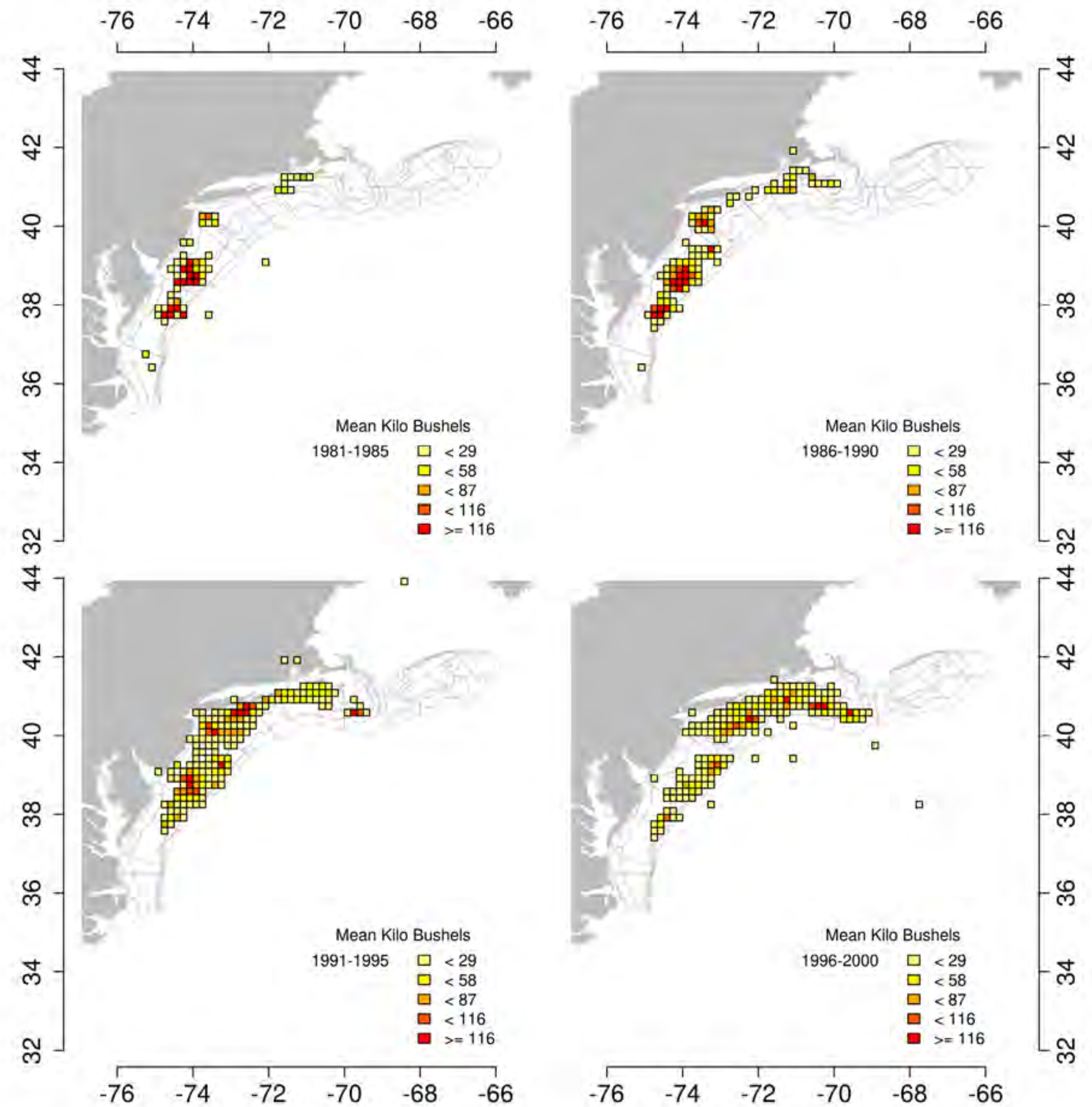

Figure 7. Average ocean quahog landings by ten-minute squares over time, 1981-2000. Only squares where more the 5 kilo bushels were caught are shown.[4]

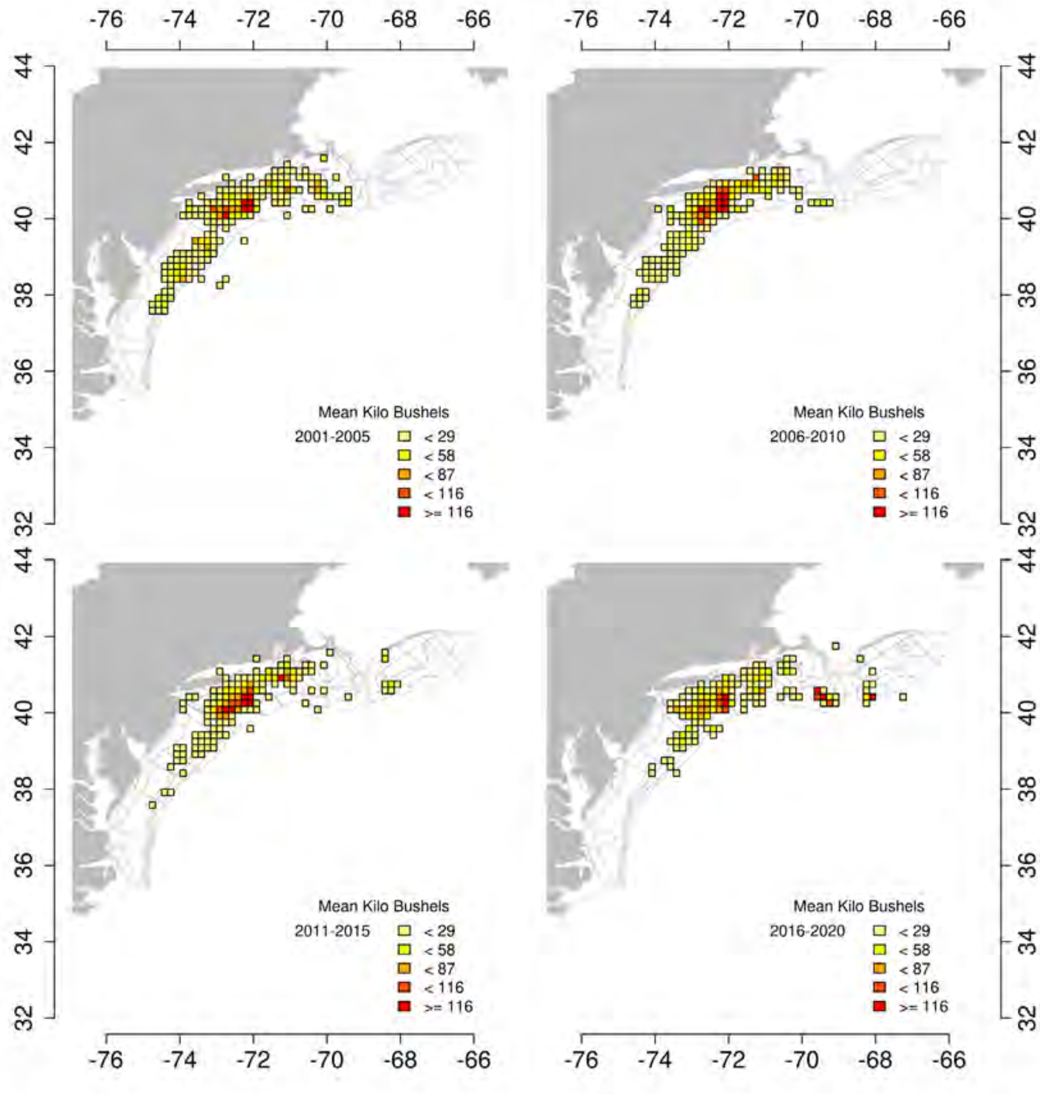

Figure 8. Average ocean quahog landings by ten-minute squares over time, 2001-2020, and preliminary 2021. Only squares where more the 5 kilo bushels were caught are shown.[4]

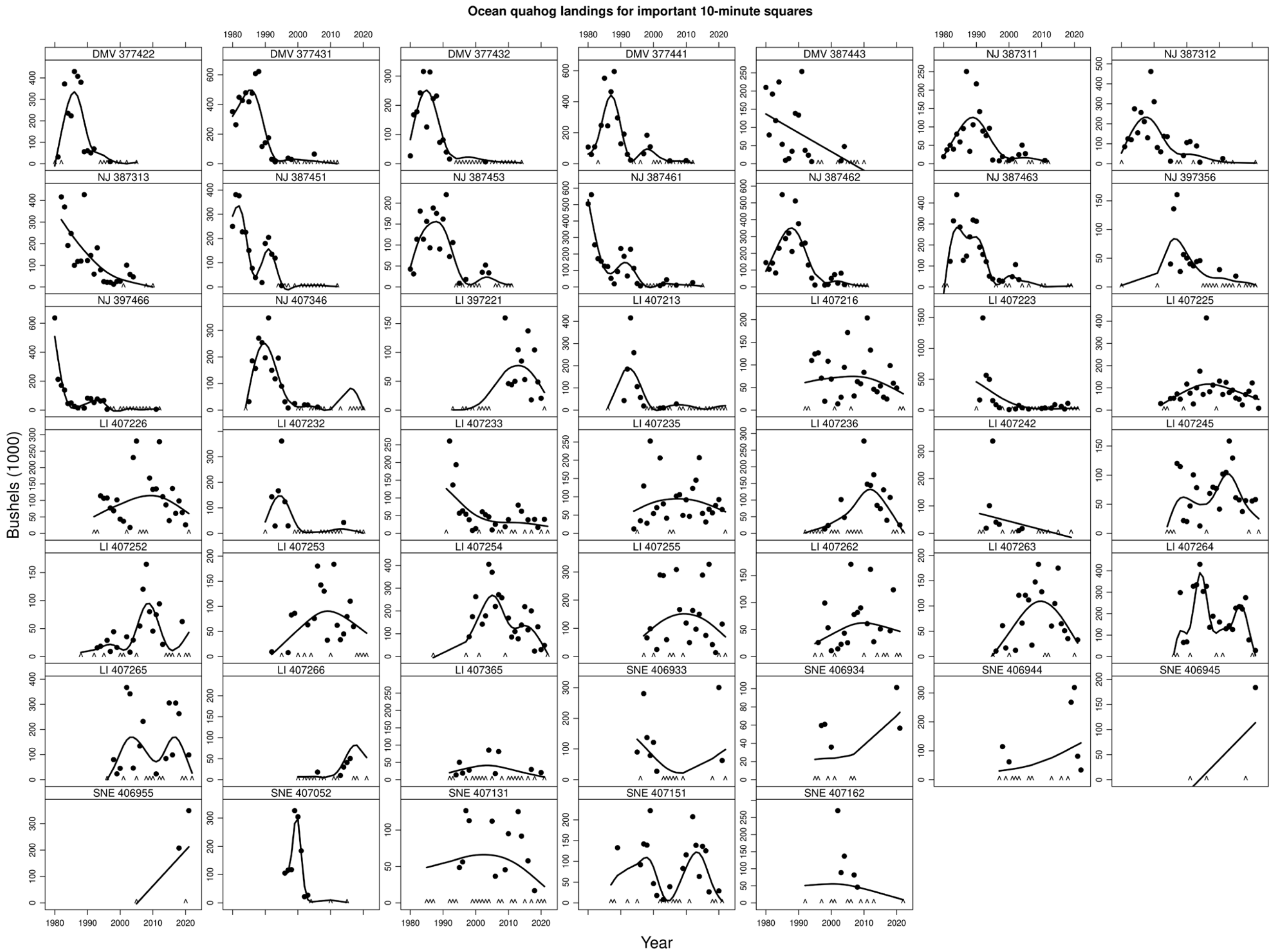

Figure 9. Annual ocean quahog landings in "important" ten minute squares (TNMS) during 1980-2017 based on logbook data. Important means that a square ranked in the top 10 TNMS for total landings during any five-year period (1980-1984, 1985-1989…). Data for 2021 are incomplete and preliminary. To protect the privacy of individual firms, data are not plotted if the number of vessels is less than 2. Instead, a "^" is shown on the x-axis to indicate where data are missing. The solid dark line is a spline intended to show trends. The spline was fit too all available data, including data not plotted.[4]

Federal Fleet Profile

The total number of vessels targeting ocean quahog outside of Maine has remained about the same in recent years; with 19 vessels in 2012 increasing to 22 in 2017, then declining to 16 in 2019 (Table 2). The distribution of LPUE in bushels per hour over time for the non-Maine fishery is shown in Figures 6 and 10-11.

The Maine ocean quahog fleet numbers started to decline when fuel prices soared in mid-2008, and a decline in the availability of smaller clams consistent with the market demand (i.e., half-shell market), and totaled 3 vessels in 2021 (Table 2). The average ex-vessel price of non-Maine ocean quahog reported by processors in 2021 was $7.79 per bushel, slightly lower than the 2020 price ($7.81 per bushel). In 2021, about 2.3 million bushels of non-Maine ocean quahog were landed, an increase from 2.0 million bushels in 2020. The total ex-vessel value of the 2021 federal harvest outside of Maine was approximately $18 million, higher than the $16 million in 2020. In 2021, the Maine ocean quahog fleet harvested a total of 17,387 Maine bushels, a 86% decrease from the 124,839 bushels harvested in 2006, but a slight increase from the prior year (2019; 16,621 bushels). Average prices for Maine ocean quahog had declined substantially over time but have recently show an increasing trend. In 2003, there were very few trips that sold for less than $37.00 per Maine bushel, and the mean price was $40.66. Prices have since been lower. In 2021, the mean price was $39.44 per Maine bushel. The value of the 2021 harvest reported by the purchasing dealers totaled $0.69 million.

Processing Sector

Even though this document describes the ocean quahog fishery, the information presented in this section regarding the processing sector is for both surfclam and ocean quahog as some of these facilities purchase/process both species.

In 2021, there were 8 companies reporting purchases of surfclam and/or ocean quahog in 5 states outside of Maine. Employment data for these specific firms are not available.

In 2021, these companies bought approximately $24 million worth of surfclam and $18 million worth of ocean quahog.

Area Closures

Fishing areas can also be closed for public health related issues due to environmental degradation or the toxins that cause paralytic shellfish poisoning (PSP). PSP is a public health concern for ocean quahog. PSP is caused by saxitoxins, produced by the alga Alexandrium fundyense (red tide).Surfclam and ocean quahog on Georges Bank were not fished from 1990 to 2008 due to the risk of PSP. There was light fishing on Georges Bank in years 2009-2011 under an exempted fishing permit and LPUE in that area was substantially higher (5-7 times higher) than in other traditional fishing grounds.

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

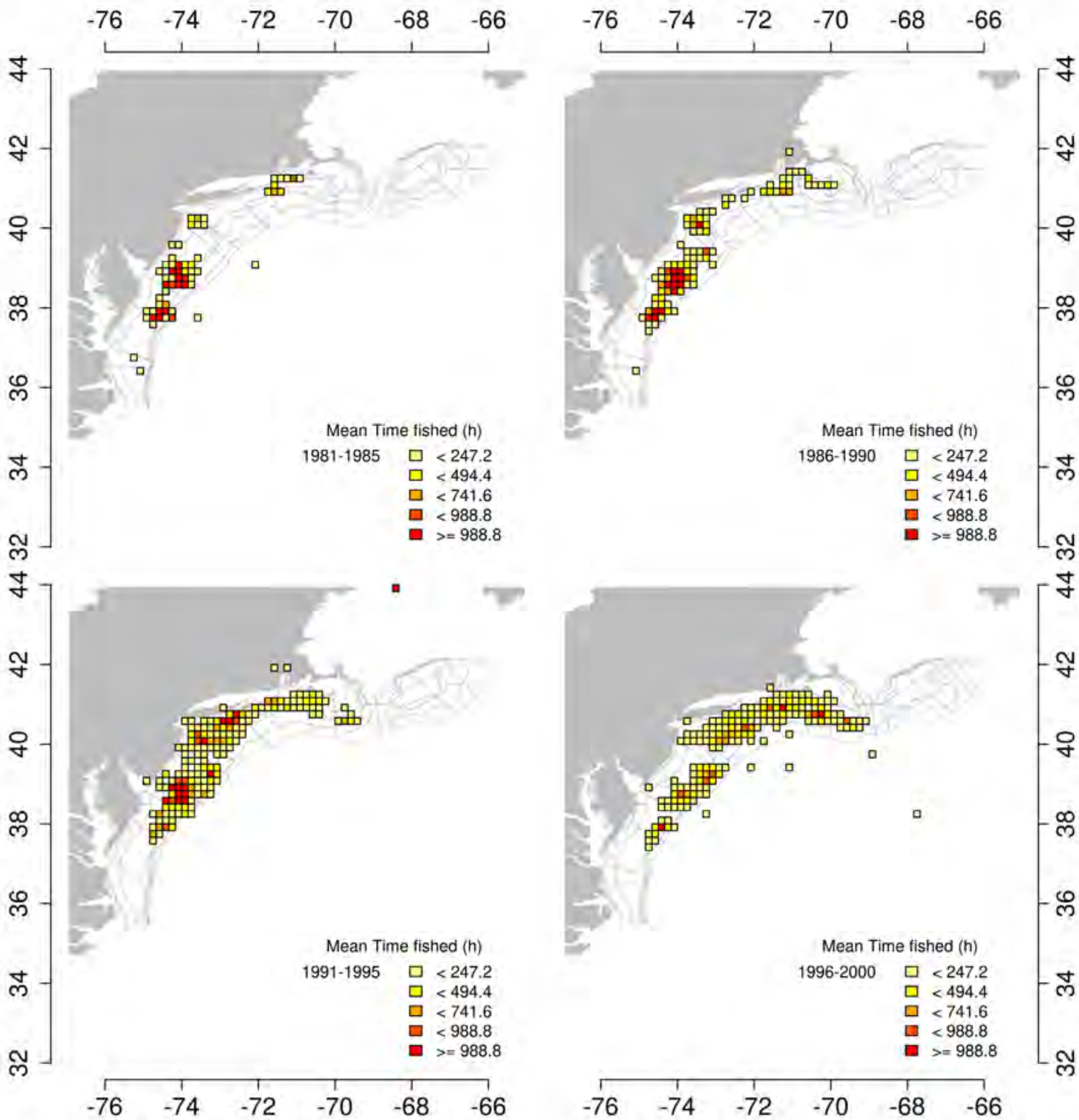

Figure 10. Average ocean quahog landings per unit effort (LPUE; bu. h^{-1}) by ten-minute squares over time, 1981-2000. Only squares where more the 5 kilo bushels were caught are shown.[4]

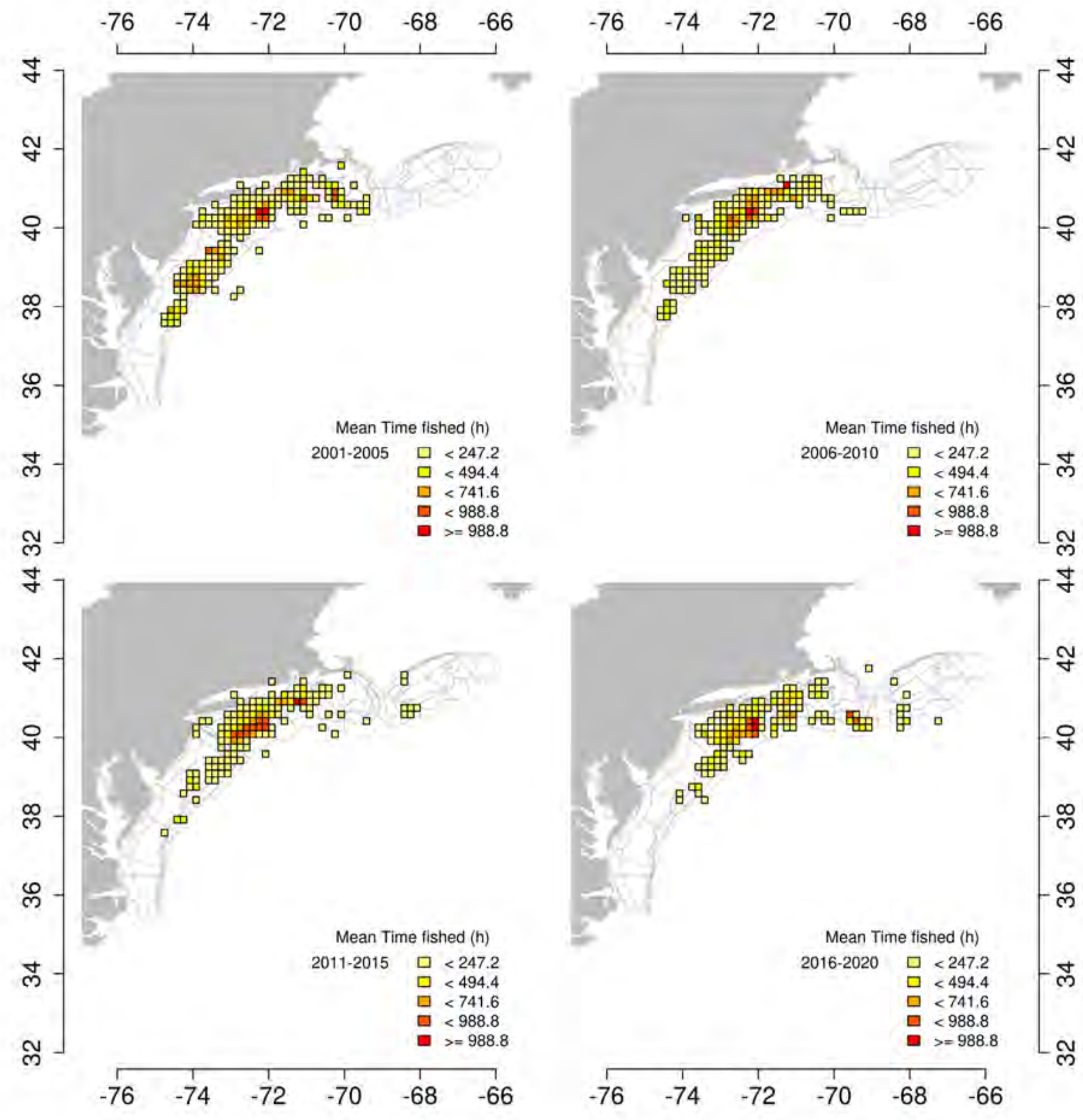

Figure 11. Average ocean quahog landings per unit effort (LPUE; bu. h-1) by ten-minute squares over time, 2001-2020 and preliminary 2021. Only squares where more the 5 kilo bushels were caught are shown.[4]

Table 2. Federal fleet profile, 2012 through 2021.

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Non-Maine Vessels Harvesting BOTH surfclam & ocean quahog	12	13	7	7	6	8	14	8	7	10
Non-Maine Vessels Harvesting only ocean quahog	7	6	9	9	10	9	8	8	8	6
Total Non-Maine Vessels	19	19	16	16	16	17	22	16	15	16
Maine Ocean Quahog Vessels	13	12	11	9	8	8	8	8	6	3

Source: NMFS clam vessel logbooks.

References

1. Cargnelli, L., S. Griesbach, D. Packer, and E. Weissberger. 1999. Essential Fish Habitat Source Document: Ocean Quahog, *Arctica islandica*, Life History and Habitat Characteristics. NOAA Tech. Memo. NMFS-NE-148.

2. Fisheries Science Center. 2017. 63rd Northeast Regional Stock Assessment Workshop (63rd SAW) Assessment Summary Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 17-09; 28 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at http://www.nefsc.noaa.gov/publications.

3. Hennen, Dan. Personal Communication. June 14, 2020. NOAA Fisheries, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543.

4. Hennen, Dan. Personal Communication. March 30, 2022. NOAA Fisheries, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543.

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 26, 2022

To: Council

From: José Montañez, Council Staff

Subject: NOAA Fisheries Draft Equity and Environmental Justice Strategy

NOAA Fisheries is currently soliciting public comments on a Draft Equity and Environmental Justice Strategy. During the June Council Meeting, the Council will receive a presentation on the draft strategy from Ms. Sharon Benjamin (NOAA Fisheries Greater Atlantic Regional Fisheries Office). The following briefing materials are enclosed behind this tab:

- Announcement: NOAA Fisheries Invites Public Comment on New Draft Equity and Environmental Justice Strategy (5/4/22)
- Draft Equity and Environmental Justice Strategy – Executive Summary (the full report is available online here)
- Frequently Asked Questions – Equity and Environmental Justice

Comments on the draft strategy will be accepted online through August 19, 2022.

NOAA Fisheries Invites Public Comment on New Draft Equity and Environmental Justice Strategy

May 04, 2022

Comments will be accepted online until August 19 as well as at national webinars and in-person meetings.

NOAA Fisheries shared its first-ever draft Equity and Environmental Justice Strategy and invited public comments through August 19. In addition to accepting written comments, we will host four webinars on the strategy, where comments will be accepted. Additional in-person meetings and opportunities to comment via phone will be announced on a rolling basis, once those plans are finalized.

"NOAA Fisheries is focused on serving all communities more equitably and effectively, and this strategy will provide the framework to do just that," said Assistant Administrator for NOAA Fisheries and NOAA's Acting Assistant Secretary for Oceans and Atmosphere, Janet Coit.

“We are committed to advancing equity and environmental justice, including equal treatment, opportunities, and environmental benefits for all people and communities, while building on continuing efforts and partnerships with underserved and underrepresented communities,” she added.

Goals and Objectives

The agency identified three overarching, long-term goals in the strategy. They are:

- Prioritize identification, equitable treatment, and meaningful involvement of underserved communities
- Provide equitable delivery of services
- Prioritize equity and environmental justice in our mandated and mission work

The agency also identified six short-term objectives in the strategy. They are:

- Provide an empowering environment within the agency to support multiple equity and environmental justice approaches at NOAA Fisheries
- Incorporate equity and environmental justice in agency policies and plans
- Achieve equity in research and researching equity
- Outreach and engage equitably
- Equitably distribute benefits
- Ensure inclusive governance

This national strategy is the result of guidance from recent Executive Orders, the White House Environmental Justice Advisory Council, the Department of Commerce’s Equity Action Plan, NOAA’s Climate Council and agency leadership, enthusiastic staff participation, and a clear and growing need indicated by underserved communities. The strategy also builds on our previous equity and environmental justice efforts to provide guidance for incorporating and prioritizing EEJ in ongoing and future activities in support of our mission.

“While we are making progress in addressing equity and environmental justice, we know that we have much more work to do to embed EEJ into our day-to-day efforts,” said NOAA Fisheries Deputy Assistant Administrator for Regulatory Programs, Sam Rauch, who also convened and led the agency’s EEJ Working Group. “By focusing on these goals and objectives we will provide more equitable stewardship of the nation's ocean resources and their habitat.”

How You Can Help

NOAA Fisheries’ science, conservation, and management activities serve a diverse array of communities across the United States and territories. However, not all communities have equal opportunities and access to agency-led services. Through this call for public comment, we seek assistance in several areas, including help to identify:

- Who the agency's underserved communities are
- How the agency can reduce barriers to underserved communities
- How the agency can better incorporate equity and environmental justice into our daily activities
- How we can improve equity in our programs and policies now, with our current resources, and in the future
- Help evaluating whether the draft recommendations for action are on target

How to Provide Comment

You can provide comments online. You can also comment at webinars, by phone, and at in-person meetings. The webinars will be held on:

May 24, 2022 4 pm Eastern
Register for May 24 webinar

June 21, 2022 at 6 pm Eastern
Register for June 21 webinar

June 30, 2022 at 7 pm Eastern
Register for June 30 webinar

July 19, 2022 at 4 pm Eastern
Register for July 19 webinar

Achieving Our Goals

To achieve our initial equity and environmental justice goals, each of the agency's national program offices and geographic regions will incorporate EEJ into a step-down implementation plan. These plans will be specific and responsive to the needs of underserved communities and allows for the input of underserved communities. Each program, science center, and regional office will set equity and environmental justice as a Priority Area or milestone in annual strategic planning starting in 2023. And, the agency's step-down implementation plans will include metrics describing equity and environmental justice actions. Our progress will be publicly reported annually in an EEJ Scorecard.

"To be clear, this strategy does not endorse business as usual and is not a rebranding of existing activities. Rather, this national strategy describes the path that NOAA Fisheries will take to incorporate EEJ into the vital services we provide to all stakeholders," said Coit.

NOAA Fisheries

Equity and Environmental Justice Strategy

Executive Summary

NOAA Fisheries endeavors to serve stakeholders equitably by engaging underserved communities in the science, conservation, and management of the nation's ocean resources and their habitat. This national strategy builds on NOAA Fisheries' previous equity and environmental justice efforts to provide guidance for incorporating and prioritizing EEJ in ongoing and future activities in support of NOAA Fisheries' mission.

NOAA Fisheries' science, conservation, and management activities serve a diverse array of communities across the United States and Territories. Recognizing that not all communities have equal opportunities and access to NOAA Fisheries' services, we identified three overarching goals (Table 1). This national strategy requires step-down implementation plans and annual progress reports to ensure improvements in five core areas: Policy, Research, Outreach, Benefits, and Governance. A sixth core area, Empowering Environment, provides agency staff with the support and tools necessary to implement changes (Table 1).

Identifying and recognizing underserved communities, as well as addressing access barriers they face, will allow NOAA Fisheries to more equitably and effectively serve all communities. Focusing on these six core objectives will provide more equitable stewardship of the nation's ocean resources and their habitat.

This national strategy is the result of guidance from recent Executive Orders, the Department of Commerce's Equity Action Plan, NOAA's Climate Council and NOAA Fisheries' leadership, as well as enthusiastic staff participation and a clear and growing need indicated by underserved communities. To be clear, it does not condone business as usual and is not a rebranding of existing activities. Rather, this national strategy describes the path that NOAA Fisheries will take to incorporate EEJ into the vital services we provide to all stakeholders.

Table 1. NOAA Fisheries’ three overarching goals and six core EEJ objectives

<table>
<tr><th colspan="5">NOAA Fisheries’ Equity and Environmental Justice Goals</th></tr>
<tr><td colspan="2">Prioritize identification, equitable treatment, and meaningful involvement of underserved communities.</td><td>Provide equitable delivery of services.</td><td colspan="2">Prioritize EEJ in our mandated and mission work.</td></tr>
<tr><th colspan="5">Objectives</th></tr>
<tr><td colspan="5">Empowering Environment:
Provide the institutional support, including training and resources, needed to implement multiple EEJ approaches at NOAA Fisheries. Internal leadership and management will identify EEJ as priorities and encourage staff to consider EEJ in every aspect of their work.</td></tr>
<tr><td>Incorporate Equity and Environmental Justice in Policy and Plans:
Ensure that our policies promote equal opportunities for all and do not create unintended inequities or unequal burdens for underserved communities.</td><td>Equity in Research and Researching Equity:
Identify underserved communities, address their needs, and assess impacts of management decisions.</td><td>Outreach and Engage Equitably:
Build relationships with underserved communities to better understand their needs, and improve information sharing with all stakeholders.</td><td>Equitably Distribute Benefits:
Distribute benefits equitably among stakeholders by increasing the access to opportunities for underserved communities.</td><td>Inclusive Governance:
Provide for the meaningful involvement of underserved communities in the decision-making processes.</td></tr>
</table>

The full report is available online at the link below.

NOAA Fisheries Draft Equity and Environmental Justice Strategy (PDF, 39 pages)

NOAA Fisheries' Draft Strategy
for Advancing Equity and Environmental Justice

NOAA Fisheries invites feedback on our draft Equity and Environmental Justice Strategy.
Comments are due August 19, 2022.

Frequently Asked Questions (FAQs)

What is NOAA Fisheries' draft Equity and Environmental Justice (EEJ) Strategy?

NOAA Fisheries' draft EEJ Strategy provides a framework to incorporate EEJ into our daily activities. It identifies step-down implementation plans at the regional level; seeks to remove barriers to EEJ; and seeks to promote equity in all we do at NOAA Fisheries.

Who/what are the driving forces behind the development of this draft strategy?

NOAA Fisheries' draft EEJ Strategy builds on executive orders promoting equity, recommendations from the White House Environmental Justice Advisory Council, action items from the Department of Commerce Equity Action Plan, and guidance from the NOAA Climate Council. In addition, this strategy is driven by strong support from NOAA Fisheries' leadership, enthusiastic staff participation, and a clear and growing need from underserved communities.

Is this strategy a new effort within NOAA Fisheries?

No, this strategy builds on NOAA Fisheries' previous equity and environmental justice efforts to provide guidance for incorporating and prioritizing EEJ in ongoing and future activities in support of the NOAA Fisheries' mission.

Have Tribal Nations been consulted?

Yes, early in the process, we held two consultation webinars open to members of Tribal Nations.

Does NOAA Fisheries' have the budget resources to support implementation of this strategy?

Many of the actions contained in this strategy can be accomplished within current resources. Some cannot be. That is why the President included a specific request for additional funding for NOAA Fisheries for Equity and Environmental Justice work in both his FY 2022 and FY 2023 proposed budgets. So while some actions can be taken immediately, others will depend on Congressional funding of the President's FY 2023 budget and may not be implementable in the near term. Some would take even longer to implement. The actions we are able to take immediately will be identified in the implementation plans.

What's NOAA Fisheries EEJ Working Group and what's its focus?

To advance our commitment to EEJ, NOAA Fisheries convened the Equity and Environmental Justice Working Group (EEJ WG). This group includes members from Headquarters, Regional Offices, and Science Centers. The EEJ WG's charge is to:

- Provide input on Fisheries' responses to executive orders and NOAA requests focused on equity, environmental justice, and support for underserved communities;
- Share information about Fisheries' efforts to embed EEJ into our external and programmatic work; and
- Create a strategy that identifies current initiatives, envisions a more equitable future, and outlines a roadmap to that goal.

What are NOAA Fisheries' current EEJ initiatives?

Within NOAA Fisheries, at least 167 programs or initiatives promote EEJ. These efforts include:

- Empowering Environment: Activities that provide the institutional support, including training and resources, needed to implement multiple EEJ approaches at NOAA Fisheries.
- Policy & Plans: Activities that ensure that our policies promote equal opportunities for all and do not create unintended inequities or unequal burdens for underserved communities.
- Research & Monitoring: Activities that identify underserved communities, address their needs, and assess impacts of management decisions.
- Outreach & Engagement: Activities that build relationships with underserved communities to better understand their needs, and improve information sharing with all stakeholders.
- Benefits: Activities that distribute benefits equitably among stakeholders by increasing the access to opportunities for underserved communities.
- Inclusive Governance: Activities that support the meaningful involvement of underserved communities in the decision-making processes.

What are the Executive Orders that promoted NOAA Fisheries to form the EEJ working group?

There are 4 Executive Orders we are responding to:

- EO 13985: Advancing Racial Equity and Support for Underserved Communities Through the Federal Government
- EO 14008: Tackling the Climate Crisis at Home and Abroad
- EO 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations
- EO 13175: Consultation and Coordination With Indian Tribal Governments

How are you defining 'equity'?

As defined in Executive Order 13985, equity means the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality.

How are you defining 'environmental justice'?

Environmental Justice is the fair treatment and meaningful involvement of all people, regardless of race, color, gender, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies including but not limited to:

- Equitable protection from environmental and health hazards;
- Equitable access to decision-making processes;
- Equitable opportunity for disadvantaged communities that have been historically marginalized.

How are you defining 'underserved communities'?

Underserved communities have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life. These include geographic communities as well as populations sharing a particular characteristic such as: women and girls; Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders, and other persons of color; persons facing discrimination or barriers related to gender identity; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality.

Is this effort just a re-branding of existing activities?

No, this national strategy describes the path that NOAA Fisheries will take to incorporate EEJ into the vital services we provide to all stakeholders.

The Draft Equity and Environmental Justice Strategy may be found online at the NOAA Fisheries website at: https://www.fisheries.noaa.gov/feature-story/noaa-fisheries-invites-public-comment-new-draft-equity-and-environmental-justice.

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 26, 2022

To: Council

From: Brandon Muffley, Council staff

Subject: Summer Flounder Management Strategy Evaluation: Model Development and Outputs – Background and Meeting Materials

On Tuesday, June 7, 2022, Drs. Gavin Fay (UMass Dartmouth) and Andrew (Lou) Carr-Harris (NEFSC) will present on the two simulation models being developed to support the Mid-Atlantic Fishery Management Council's (Council) recreational summer flounder management strategy evaluation (MSE)[1]. The two models, an operating/biological model and an implementation/economic model, are part of the MSE simulation loop (Figure 1) and are designed to provide an understanding of the management system and the response in summer flounder stock dynamics to management changes. This process allows for the comparison in performance between different management strategies in their robustness and associated trade-offs in achieving different management objectives. Both models build off existing modeling frameworks that have been extensively peer-reviewed but also represent significant advancements to evaluate the uncertainties and drivers of the summer flounder stock and potential changes in angler behavior in response to changing management measures and stock availability.

The Council and Atlantic State Marine Fisheries Commission Summer Flounder, Scup and Black Sea Bass Board (Board) last received an update and provided feedback on the summer flounder MSE during the joint December 2021 meeting[2]. Since that update, there have been two core stakeholder workshops – one on March 1, 2022 via webinar (https://www.mafmc.org/council-events/2022/summer-flounder-mse-workshop-3) and a second on May 2–3, 2022 conducted as a hybrid meeting (https://www.mafmc.org/council-events/2022/summer-flounder-mse-workshop-4). During these workshops the core group continued to refine and finalize the performance metrics and management scenarios to be evaluated within the MSE. The group also reviewed and provided feedback on simulation model development, draft model outputs, and considered weighting approaches for the different performance metrics as part of the trade-off

[1] To find more information about the entire summer flounder MSE project, please see: https://www.mafmc.org/actions/summer-flounder-mse.
[2] The staff memo presented as part of the December 2021 Briefing Book can be found at: https://www.mafmc.org/s/Tab05_Summer-Flounder-MSE_2021-12.pdf.

considerations. A fifth and final core group workshop will be held via webinar in late June to review final model results, finalize trade-off weighting, provide feedback regarding the MSE process, and develop any recommendations for Council/Board consideration.

During this time, the technical work group continued to develop and improve the two simulation models. The technical work group considered and incorporated alternative data sources, conducted a variety of model calibration and validation runs, evaluated different stock dynamics and angler behavior uncertainties, and improved the code and communication between the models. The technical work group has also worked to address and incorporate core group feedback to finalize the following:

- Quantifiable performance metrics to evaluate the success in achieving the four different management objectives
- Management scenarios across different regional or coastwide scales with a range of size, season, and possession limit considerations
- Alternative operating model options to incorporate critical uncertainties (e.g., data, biology, climate) to evaluate how different management scenarios perform under alternative assumptions about the "true" summer flounder population

The models are currently configured to evaluate seven different management scenarios across 17 different performance metrics and three different alternative model options.

There are no specific Council actions or decisions expected for the June meeting. The plan is to provide the Council and Board an overview of the MSE simulation model framework and how/where the operating model and economic model fit into the process and work together to provide results for management consideration. The presentations will provide details on the respective model(s) underlying structure, basic function, included data elements, key assumptions, and the types of outputs and information produced. Some MSE "results" may be presented in order to demonstrate the different types of model outputs and communicate how they could be used, but any results are not considered final and are likely to change. The goal of these presentations is intended to serve two purposes – one, to help introduce and familiarize the Council and Board with the models and the types of outputs and information that can be provided and two, to save time and be more efficient at our meeting in August. It is anticipated that final results and recommendations will be presented for Council and Board consideration at the joint meeting in August. By presenting the modeling information in June, we won't need to spend as much time covering those details in August and can focus the discussion on results, implications, and next steps.

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

Materials behind the tab:

- Overview of the Summer Flounder MSE Simulation Model Specifications (by G. Fay)
- Overview of the Summer Flounder Recreational Demand Model (by A. Carr-Harris)
- Public comment received 5/24/2022

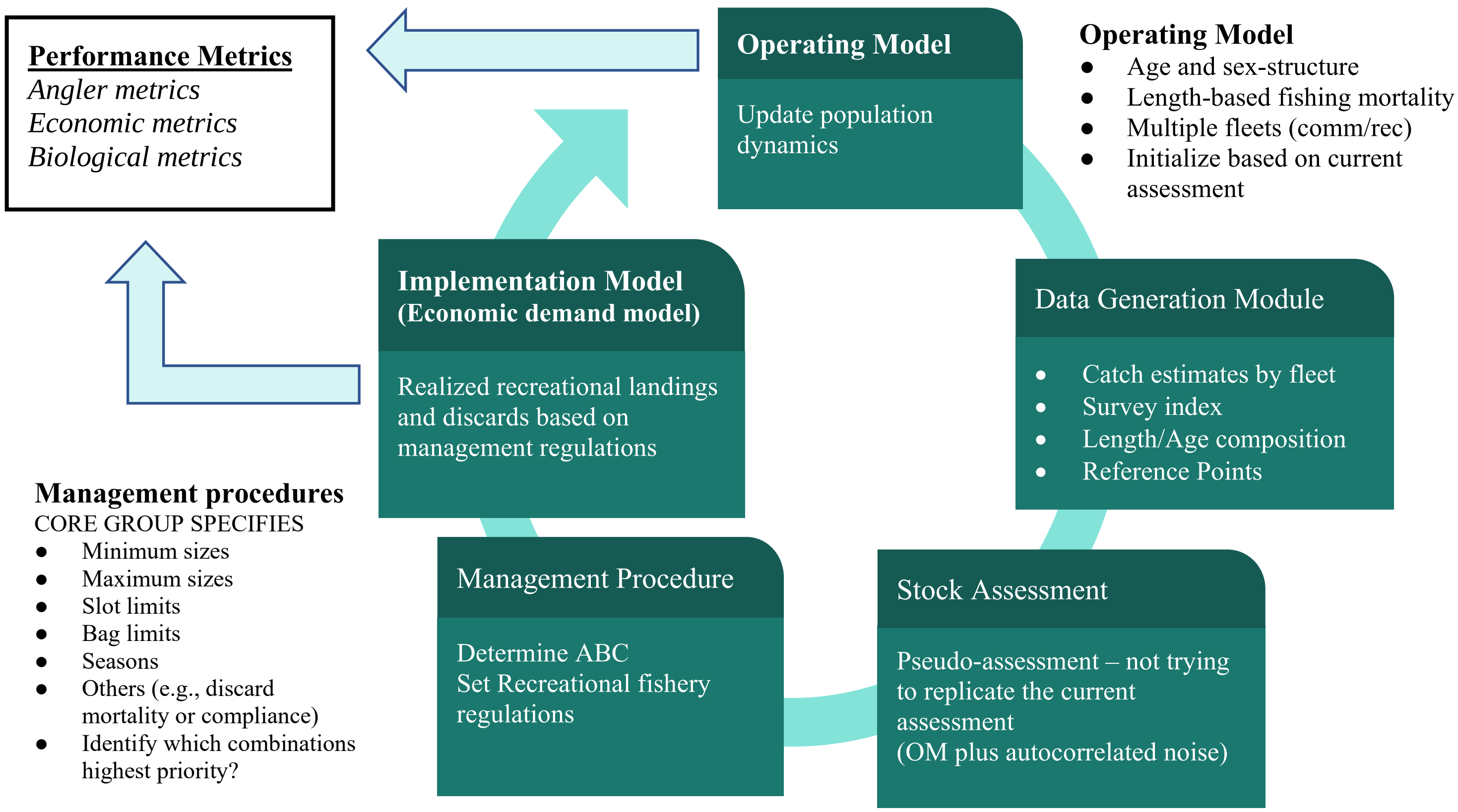

Figure 1. Conceptual model of the recreational summer flounder management strategy evaluation (MSE) simulation model framework including operating and economic model inputs and outputs (figure modified from presentation by Dr. Gavin Fay, UMass Dartmouth).

EAFM summer flounder recreational discards Management Strategy Evaluation: Simulation modeling specifications

May 2022

Gavin Fay
School for Marine Science and Technology, University of Massachusetts Dartmouth, 836 South Rodney French Boulevard, New Bedford, MA 02744
gfay@umassd.edu

1. Purpose

This document provides description of the technical specifications and experimental design for the simulation framework employed as part of the MAFMC's Management Strategy Evaluation (MSE, e.g. Bunnefeld et al. 2009) for discarding in the summer flounder recreational fishery.

2. Simulation framework overview

The MSE simulation framework consists of a set of coupled model systems to emulate *in silico* the dynamics of the fishery and fishery management system for summer flounder, with a focus on the regulations for and response of the recreational fishery, as an experimental design to assess likely consequences of a set of management alternatives (here, different specifications for recreational fishing regulations, including bag limits, minimum size, and season length) for a set of performance metrics that address a range of social, economic, and conservation management objectives, given uncertainties in summer flounder population dynamics, scientific estimates of stock status, and the response of recreational fishers to changing conditions in summer flounder availability and regulations. The purpose of the MSE is to compare the relative performance of these alternatives against the stated objectives, and quantify the tradeoffs among objectives that arise for the different cases considered.

The set of management alternatives, performance metrics, and scenarios considered were developed through the Council's stakeholder engagement process for the project, with both a core group of stakeholders and guidance from a technical working group. These processes resulted in selection of 3 scenarios, and 7 management alternatives to be tested for each of those scenarios. A set of 100 simulations were conducted for each combination of scenario and management alternative. In each simulation, an **operating model**, representing the population dynamics of the summer flounder stock, its response to fishing, and the dynamics of the recreational fishery, was projected forwards in time by applying a **management model** that emulates the results of scientific stock assessments, applies management buffers in advice for scientific uncertainty, and allocates allowable catch to both commercial and recreational fishing sectors. The behavior of recreational fisheries in response to the chosen management alternative at the state level given the operating model stock size and length structure is then derived using a **recreational demand model**, and then the summer flounder population dynamics are updated via recruitment, growth, natural and fishing mortality based on the predicted levels of removals from both the commercial and recreational fishing fleets. More details on the sequence of model time steps are provided below following description of each model component. This feedback loop procedure is applied repeatedly over the course of the simulation, to reflect the influence of management decisions on the stock dynamics. At the end of each projection period, results are summarized for both the summer flounder stock and the fishery performance, and a set of performance metrics is calculated from the 100 simulations for the particular combination of scenario and management alternative.

During projections we distinguish between advice time steps and model time steps (annual) to reflect the fact that the management advice is not updated each year, the management advice (ABC) is updated every 2 years. In reality, the MAFMC's Scientific and Statistical Committee updates ABC recommendations every year, however these recommendations usually follow the results of ABC calculations determined from projections that were conducted at the time of the last stock assessment. For ease of implementation in the MSE the ABC for all years within an advice time step (2 years) was set at the same level.

In a given simulation, at each advice time step the following sequence of operations is implemented:

1. Calculate the current true operating model OFL based on the most recent year's fishing pattern
2. Apply the management model to:
   a. Generate the result of a new stock assessment in the form of an estimated OFL
   b. Calculate the ABC based on the estimated OFL and application of the MAFMC's risk policy.
   c. Determine the magnitude of commercial landings and discards given the current allocation to each sector (55% of ABC to commercial, then split according to current [2019] proportion by landings and discards)
3. For each year within the advice time step:
   a. Calculate the expected operating model vulnerable biomass and operating model size structure for the next year.
   b. Apply the recreational demand model given the recreational regulations in the management alternative being applied, and the current operating model population size structure to generate the values for that year's number of trips by state, and total numbers of fish released and kept by the recreational fishery.
   c. Update the operating model population dynamics to calculate the following year's numbers at age given the commercial allocation of the ABC and the realized recreational landings and discards at length from the output of the recreational demand model.

d. Increment the year by 1.

3. Operating model

The operating model represents the 'truth' in the simulation, in that it describes the dynamics and behavior of the summer flounder population and the fishery in response to changing management advice through the course of the simulation. Unlike a stock assessment projection, the MSE operating model framework thus allows for evaluation of management performance against a known population, rather than an estimated one that is subject to uncertainty and incomplete observation.

Three operating model scenarios were considered, 1) a 'base-case' scenario described below, and two alternatives reflecting key uncertainties that were identified as being important to understand behavior of management against. These focused on: 2) uncertainty in the MRIP estimates of the magnitude of recreational catch and its implications for understanding of stock size (and sustainable yield), and 3) changes over time in the regional availability of summer flounder to the recreational fishing sector.

The operating model consists of both a population dynamics model, and a fishing model. The fishing model includes both commercial and recreational fishing, but as the focus of the project is on the recreational component, the commercial fishing dynamics were modeled very simply to allow for more focus on the project objectives. The recreational fishing dynamics were driven by an economic model of recreational demand fit to angling preference data from a choice experiment. Details of how the models were coupled and description of the inputs and the outputs of the recreational demand model are provided below, the technical specifications are more fully described in the accompanying recreational demand technical document (Carr-Harris 2022).

3.1. Population Dynamics Model

The operating model population dynamics model consisted of an age- length- and sex-structured model, conditioned on the avaulable information for summer flounder to emulate summer flounder population and fishery dynamics. Full technical specifications for the generalized version of the model are detailed in Fay et al. (2011) and (Wayte et al. 2009). This operating model has been used extensively to evaluate the performance of assessment methods and management strategies (e.g. Fay et al. 2011; Little et al. 2014; Klaer et al. 2012; Fay and Tuck 2011, Fay 2018), including a previous application to summer flounder (MAFMC 2018). Advantages of adapting this existing software for the project included the explicit accounting of length based fishing mortality, to be able to represent the way in which the recreational fishery is managed, the ease of conditioning to available stock-specific information (being able to leverage results of summer flounder stock assessments). Using an existing, already-tested tool also allowed for project resources to be more efficiently allocated to the aspects of the summer flounder recreational fishing dynamics that were the focus of the research questions rather than in software development.

Where possible, life history and stock-recruitment parameter values were taken from the most recent summer flounder stock assessment report (NEFSC 2019) and in consultation with the technical working group. Specific operating model details are outlined below, and summarized in Figure 1.

3.1.1. Age and length structure

Age classes 0-7 were modeled for each sex, with age 7s as a plus group. A sex ratio at recruitment (age 0's) of 50% females and 50% males was assumed. 2cm length bins, from 10cm to 92cm.

3.1.2. Natural mortality

Age-specific, time-invariant values for the rate of natural mortality (*M*) were specified according to the most recent stock assessment (averaging $0.25 yr^{-1}$). The same natural mortality at age schedule was applied to both males and females.

3.1.3. Growth

Growth of summer flounder was assumed to follow von Bertalanffy growth equations using schedules developed for SAW66 (NEFSC 2019), with separate growth patterns for males and females (Figure 1). Length at age was calculated at both the beginning of the year and mid-year, for summary statistics and vulnerable biomass calculations respectively. A single weight-at-length relationship (Lux and Porter 1996) was used to determine weights at age, as was calculated in the most recent summer flounder assessment (NEFSC 2021). Growth curve parameters and weight-at-length relationships were combined with estimates of population age structure and values for fishery selectivity (see below) to ensure the operating model dynamics produced expected size and age compositions for 2019 that are consistent with recent observations from the system. Figure 2.

3.1.4. Maturity

A logistic maturity at length relationship for both females and males was estimated, to determine a derived maturity at age schedule that matched that used in the 2021 assessment. Maturity at length was modeled as invariant over time. Figure 1.

3.1.5. Stock-Recruitment

To replicate the stock-recruit dynamics of the current assessment for summer flounder, which assumes deviations from an annual average recruitment, an average recruitment (R_0) for the population was set based on the median of the posterior distribution from the current assessment, with the steepness parameter *h* of the Beverton-Holt stock-recruit relationship set to 1.0. Annual recruitment deviations were modeled assuming a log-standard deviation of 0.8, matching that in the 2021 summer flounder stock assessment. Recruitment deviations during MSE projections were assumed to be uncorrelated over time (e.g. annual recruitments are random draws from the distribution and not related to previous year's recruitment).

3.1.6. Fleet structure

Four fishing fleets were modeled: 1) commercial landings, 2) commercial discards, 3) recreational landings, and 4) recreational discards. As mortality from discarded fish were modeled as separate fleets, all fishing fleets were modeled with full retention (retention = 1 across all size classes). Selectivity at length for the commercial fleets in all years, and for the recreational fleets in the initial year were derived based on logistic (landings fleets) and double-logistic (discard fleets) curves fit to emulate the selectivity at age schedules from the 2021 stock assessment to approximate the general behavior of the fishery. As with the growth parameters, the selectivity estimates were used in the model to predict the catch at age and catch at length distributions for 2019 given the 2019 age structure, to validate the operating model with a goal of producing catch at length and catch at age distributions that were similar to the true data for summer flounder from 2019.

Recreational selectivity for projection years other than in the first year were derived from the output of the recreational demand model, which simulates outcomes for the size distributions of kept and released fish. Selectivity in these years therefore was computed by dividing the catch at length from the recreational demand model by the numbers at length available to the recreational fishing fleets. derived from the operating model prediction for next year, given the expected commercial catches. An assumed discard mortality rate is applied to the recreational demand model output of the numbers of released fish, to compute the recreational discard fleet catch.

This mortality level was fixed at 10% (i.e. the recreational discard removals (catch) at length was 10% of the number of releases).

3.1.7. Initial conditions

The numbers-at-age in the first year of the projection (2019) were determined from the available draws from the posterior distribution from the most recent (2021) summer flounder stock assessment. The 2019 catch data by fleet from the 2021 summer flounder stock assessment were used to generate the operating model predictions for the first year of simulation projections. Catches in subsequent years during MSE projections were based on the output of the management and recreational demand models within the MSE closed loop simulations.

3.1.8. Biological reference points

At each time step, the recreational fishing selectivity and the relative magnitude of catches across fishing fleets varies. Thus, annual values for the true population dynamics model reference points were calculated (biomass at maximum sustainable yield, maximum sustainable yield, , as the basis for application of the management model and for performance metric summaries. These reference points were calculated based on the current Fishing Mortality reference point proxy of $F_{35\%}$, the fishing mortality level resulting in spawning biomass per recruit 35% of that with no fishing. These quantities were calculated based on equilibrium assumptions rather than the results of a population projection. In each year, a true value for the population dynamics model OFL was calculated based on applying the true fishing mortality target to the expected population age structure in the subsequent model year based on the most recent model year's fishing pattern. This true OFL was thus the basis for the calculation of the estimated OFL in the management model (see Section 4 below).

3.2. Recreational demand model

The operating model population length structure (sex aggregated) was passed to the recreational demand predictive model, which was calibrated to the number of fishing choice occasions in 2019. This model (full details in Carr-Harris 2022) uses estimates of angler preferences by state and region, expectations for catch per trip (based on the operating model population stock size relative to 2019), the size structure of the population, and a set of recreational fishing regulations for each state (as defined by the management alternatives) to simulate values for the number of summer flounder fishing trips in a given year, the expected numbers of fish kept and released during these trips, and their size structure. The output of the recreational demand prediction model includes the numbers at length of fish kept and released for the year - these are fed back to the population dynamics model (thus including both changes in total catch and time-varying selectivity for the recreational fishing fleets). As detailed above, the recreational demand model was run in each year of the projections to obtain a new estimate of recreational catches, even when the management advice (ABC) was not updated.

3.4. Alternative operating model scenarios

Two alternative operating model scenarios to the base-case described above were considered. These were chosen by the core stakeholder working group and technical working group to represent hypotheses for a particular aspect of uncertainty for the summer flounder fishery, to investigate the robustness of the chosen management alternatives to these properties. They do not thus represent a full suite of uncertainties for the system but rather represent a targeted approach to understanding how the likely management outcomes may vary given these assumptions thought to be important system drivers.

3.4.1. Magnitude of MRIP catch estimates

To understand the implications of bias in the MRIP estimates of recreational catch, the lower bounds of the 95% confidence intervals for MRIP estimates of catch by state and wave were used as the basis for calibrating the recreational demand model rather than the point estimates. The population dynamics model was also adjusted in this scenario to reflect the expectations for stock size given a lower magnitude of historical recreational catches. The initial (2019) numbers at age and average recruitment were scaled based on the results of sensitivity analyses conducted during the 2019 benchmark assessment for summer flounder (NEFSC 2019).

3.4.2. Changes in spatial availability

This scenario reflects expected changes over time in the spatial distribution of summer flounder, which could result in further changes to the availability of fish to anglers in each state. This scenario adjusted the expected catch per trip by geographic region during application of the recreational demand model, based on projected proportions of summer flounder biomass by region from the NOAA Fisheries bottom trawl survey. This scenario thus allows for both the annual change in expected catch per trip as a result of variations in stock size, and a gradual shift northward of the stock, resulting in the northern regions having progressively more fish available on average over time and the southern region having fewer fish available over time. While a simplistic implementation, this scenario does allow for the general effect and consequent interactions with management performance that a shifting stock could likely induce. No adjustment was made to the relative availability by region of individual length classes.

4. Management Model

The management model emulates results of the scientific stock assessment process and the determination of ABCs, and was designed to reflect the believed scientific uncertainty associated with OFLs for summer flounder. At each advice time step, an estimated OFL is generated from the operating model based on the operating model true OFL that would be obtained based on applying the target fishing mortality to the modeled population vulnerable biomass given perfect knowledge of the current fishing pattern among fleets. The estimated OFL was generated from the true value assuming lognormal random variation with CV 60% (which reflects the value used by the SSC as representing the degree of scientific uncertainty associated with the OFL), and autocorrelation in OFL estimation errors (differences between the true OFL value and the estimated value) over advice time steps to reflect the tendency for stock assessments close in time to have similar results (e.g. Wiedenmann et al. 2015). This approach simplifies the modeling of the monitoring and assessment process, and thus does not capture everything associated with the assessment procedure. However, it is difficult to replicate in simulation the decision process associated with conducting a stock assessment, and the technical working group decided this simpler approach both allowed for appropriate capture of the general properties of an assessment (estimation error) with rationale for agreed-upon magnitude of uncertainty in assessment results (by using the uncertainty in OFL that the SSC uses for actual decision-making for summer flounder), and meant that differences in model behavior among management alternatives could be better ascribed to the different management specifications rather than additional interactions among the monitoring data and assessment process.

We distinguish between advice time steps and model time steps (annual) to reflect the fact that the management advice is not updated each year (i.e. a full assessment is not conducted every year). In reality, the MAFMC's Scientific and Statistical Committee updates ABC recommendations every year, however these recommendations usually follow the results of ABC calculations determined from projections that were conducted at the time of the last stock assessment. For ease of implementation in the MSE the ABC for all years within an advice time step (2 years) was set at the same level. Following calculation of the estimated OFL, the ABC was calculated by applying the Council's risk policy assuming the current SSC OFL CV determination of 60%. As the output of the modeled assessment process only constitutes an estimated OFL and not an estimate of stock status relative to the B_{MSY} reference point, a P^* value of 0.4 was applied to the estimated OFL to derive the ABC in all advice years. This approach approximates the application of the MAFMC risk policy but does not account for changing perceived tolerance in risk of exceeding the OFL based on estimates of stock size.

Following calculation of the ABCs, the magnitude of commercial catches were determined based on the current implementation of allocation between commercial and recreational sectors. The MSE simulations assumed that the commercial fishery always utilized its quota during the simulations, so the calculated commercial catch was input directly into the operating model population update. This is in contrast to the recreational catches, which were input based on the application and output of the recreational demand model.

5. Projections

The operating models were projected forward in time over a 26 year period. 100 simulations / realizations were conducted for each combination of operating model scenario and management alternative, with each of the 100 simulations differing based on: 1) the starting age structure (different draw from the posterior); 2) sequence of annual recruitment deviations; 3) observation/estimation errors for the OFL and resulting consequences for management advice; 4) simulated outcomes for angler behavior based on recreational regulations; and 5) a small amount if implementation error in the magnitude of catches among fleets. As the effects of these differences are linked through the coupled model structure and feedback loops, each of the 100 simulations represents a different realization of possible outcomes for the stock and fishery given a particular management specification. The same 100 set of draws from the 2019 age structure and time series of recruitment deviations were used in each scenario. At the conclusion of the 26 year projection period, a set of quantities are saved for the simulation, to be used to calculate performance metrics.

6. Management alternatives

Seven management alternatives were considered, each corresponding to a specification for the set of recreational regulations in place for the simulations. These alternatives were considered fixed over time - simulations used the same settings for the recreational regulations throughout the projection period. Thus there was no feedback from the assessment and monitoring components (management model) of the MSE to decisions regarding the recreational regulations to put in place in a given year (i.e. simulated managers did not update regulations based on information from the simulated fishery). Thus the simulations evaluated the general expectations for managing a certain way, rather than the efficacy or ability of the recreational fishery management system to respond to uncertain information, and the ability to make robust decisions based on this information. Alternatives considered included changes to size limits, bag limits, and season lengths, and are summarized in Table 1.

7. Performance metrics

We calculated a set of performance metrics, based on those specified by both the core stakeholder group and the technical advisory group. Calculations of these relied on information derived from the population dynamics model, the recreational demand model, and the management model. For magnitude-based metrics, these were calculated using the average over time for the projection period in a given simulation. For frequency-based metrics (e.g. proportion of years in which F is above F_{MSY}, a single value for each simulation was calculated given the realized time series. Performance metrics were summarized as the distribution over simulations for a given scenario/management alternative combination, and also as values across simulations to obtain a single value for each metric. These two methods of summarizing the results allow for different treatments when visualizing outputs and performing tradeoff analyses. Performance metrics calculated are summarized in Table 2.

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Table 1. Management alternatives considered in the MSE, consisting of sets of regulations applied in the recreational fishery. Alternatives vary with respect to bag limit, size limit(s), and season length.

Options with Current Regional Breakdown
1. Status quo – using 2019 regs as baseline (regs essentially same in 2019-2021)
2. Size limit change – status quo regulations (possession and season) for each state, but drop the minimum size by 1 inch (not going lower than 16 inches) within each state
3. Season change - status quo regulations for each state (possession and size) but open season for all states of April 1-Oct 31
Options with Different Regional Breakdown
4. 3 region option (MA-NY, NJ, DE-NC – same as regions used in black sea bass) a. MA-NY: 5 fish @ 18” May 1-Sept 30 b. NJ: 4 fish @ 17” May 1-Sept 30 c. DE-NC: 4 fish @16” All year
Coastwide Options
5. 3 fish @ 17” and season from May 1-Sept 30
6. 1 fish @ 16”-19” (ie., up to 18.99 inches) and 2 @ 19” and greater and season from May 1-Sept 30
Slot Limit Option
7. 3 fish at 16”-20” with season of May 1-Sept 30

Table 2. Performance metrics calculated in the MSE corresponding to specified management objectives

Management Objective 1: Improve the quality of the angler experience

Performance Metrics:
1) Ability to retain a fish
    a. Percent of trips that harvest at least one fish
    b. Change from baseline (ie., status quo) in harvest per trip
2) Angler welfare
    a. Changes in consumer surplus/angler satisfaction at the trip/individual level
3) Ability to retain a trophy fish
    a. Proportion/number of fish caught greater than 28 inches

Management Objective 2: Maximize the equity of anglers' experience

Performance Metrics:
1) Ability to retain a fish
    a. Change in percent chance of retaining a fish, by state/region
    b. Difference in percent chance of retaining a fish, by state/region
2) Retention rate
    a. Change in ratio of landed : discarded fish, by state/region
    b. Difference in ratio of landed : discarded fish, by state/region

Management Objective 3: Maximize stock sustainability

Performance Metrics:
1) Stock status: Reference points
    a. % chance of stock is overfished relative to spawning stock biomass (SSB) target (note: SSB reference point includes both male and female biomass)
    b. % chance of overfishing relative to Fmsy threshold
2) Stock status: Overall population
    a. Change in SSB relative to status quo (i.e., stock grow, decline compared to status quo)
    b. Discard mortality
        i. # of discards per trip, by state/region
    c. Change in total removals (harvest and dead discards) compared to status quo
3) Stock status: Female spawning stock biomass
    a. % of female catch

Management Objective 4: Maximize the socio-economic sustainability of fishery

Performance Metrics:
1) Fishing effort
    ▪ # of trips relative to status quo (increase or decrease in trips), by state/region
2) Angler welfare
    ▪ Changes in consumer surplus/angler satisfaction at the state/region level
3) Fishery investment
    ▪ Changes in fishery investment measured by: sales, income, employment, and GDP produced by supporting businesses at the state-level or higher

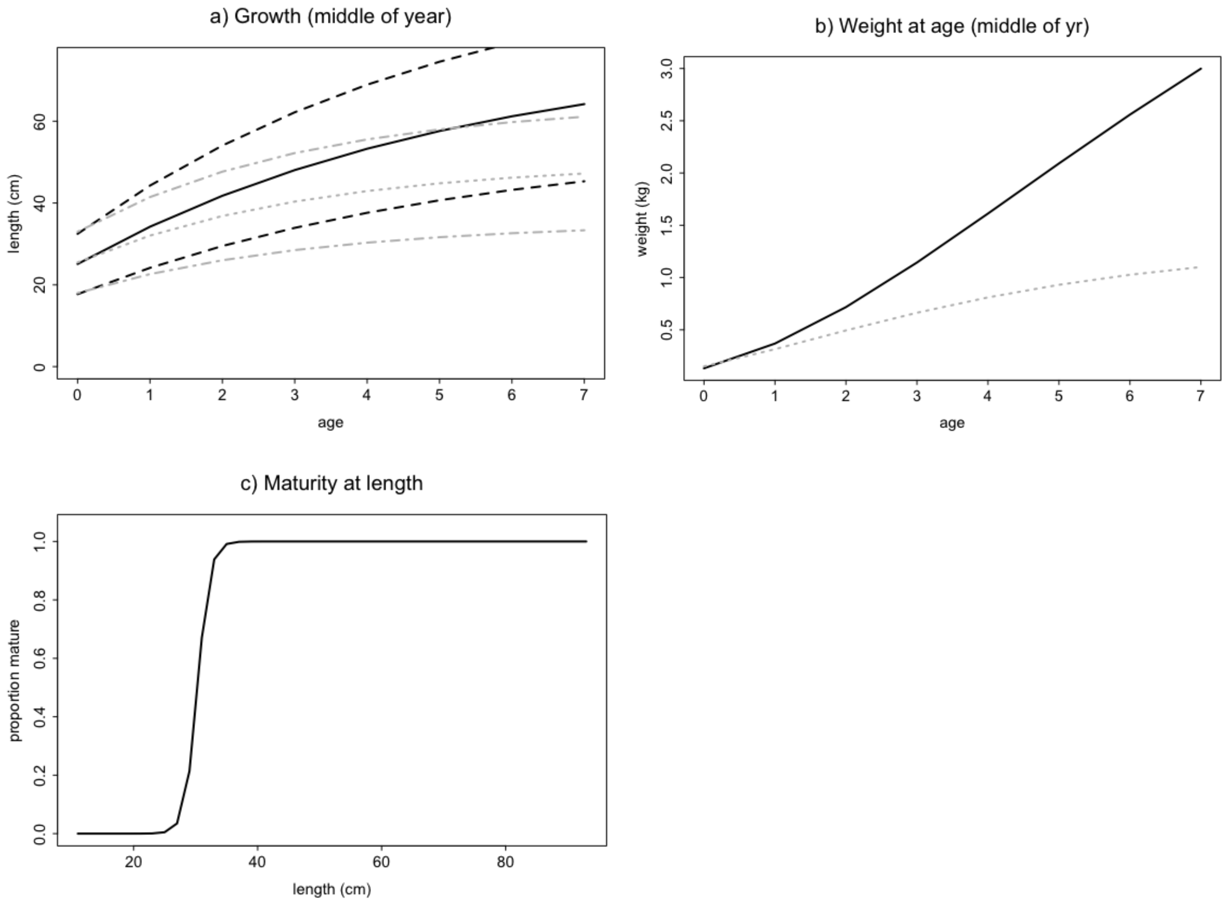

Figure 1. Operating model specifications for summer flounder showing a) mean (solid line) and standard deviation (dashed line) of length at age, b) weight at age (solid line females, dashed line males), c) maturity at length.

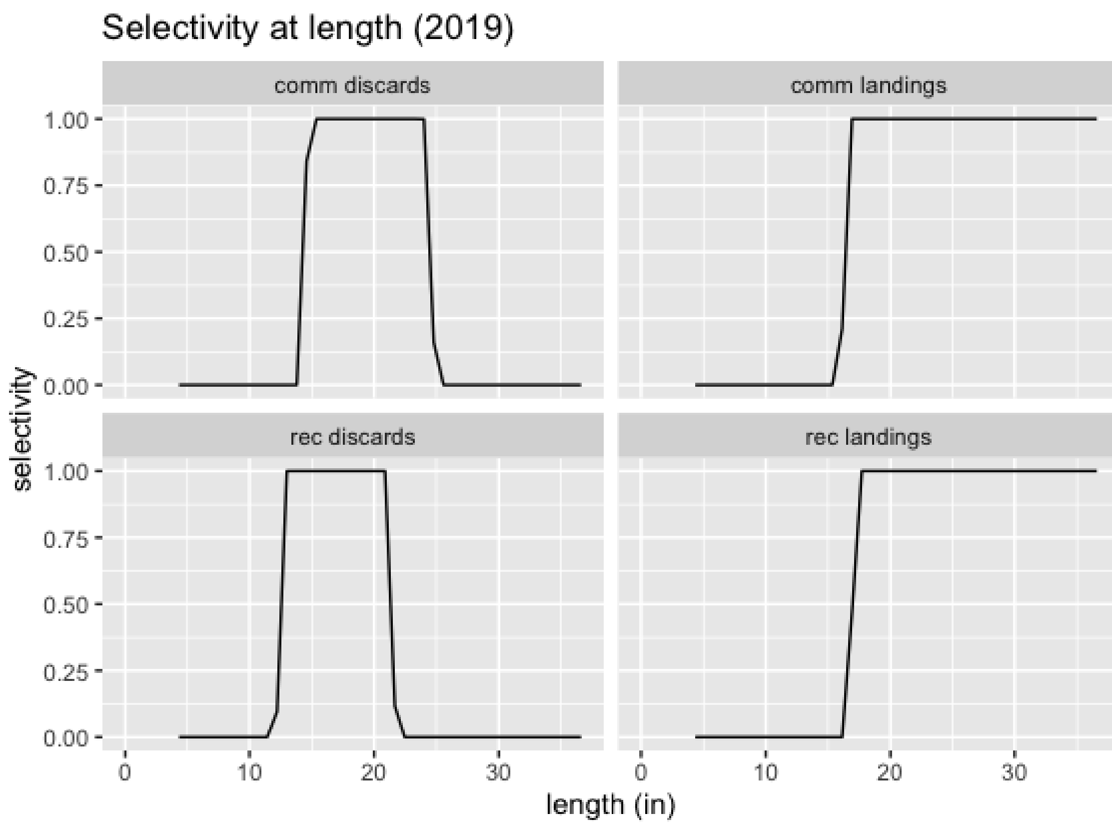

Figure 2. Operating model specifications for summer flounder showing selectivity at length for all years for the commercial fishing fleets and for the initial year for the recreational fleets.

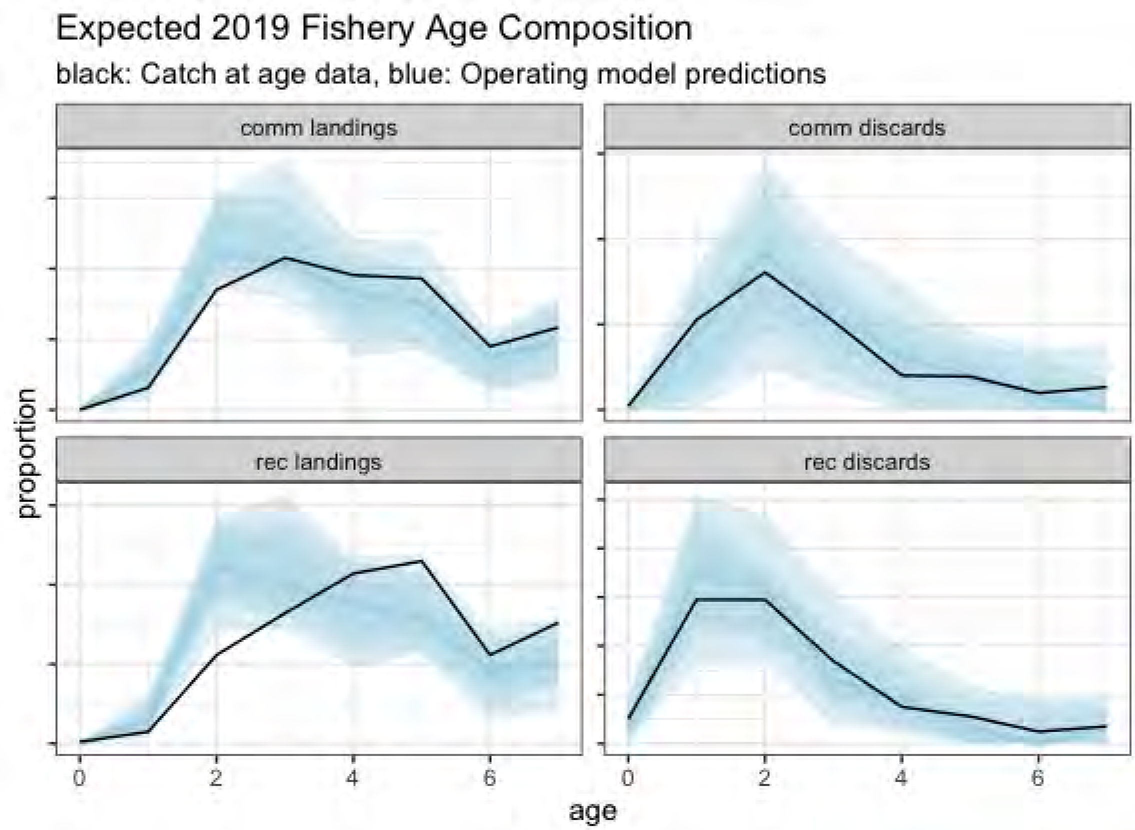

Figure 3. Operating model predictions for 2019 catch at age by fleet compared to the 2019 data.

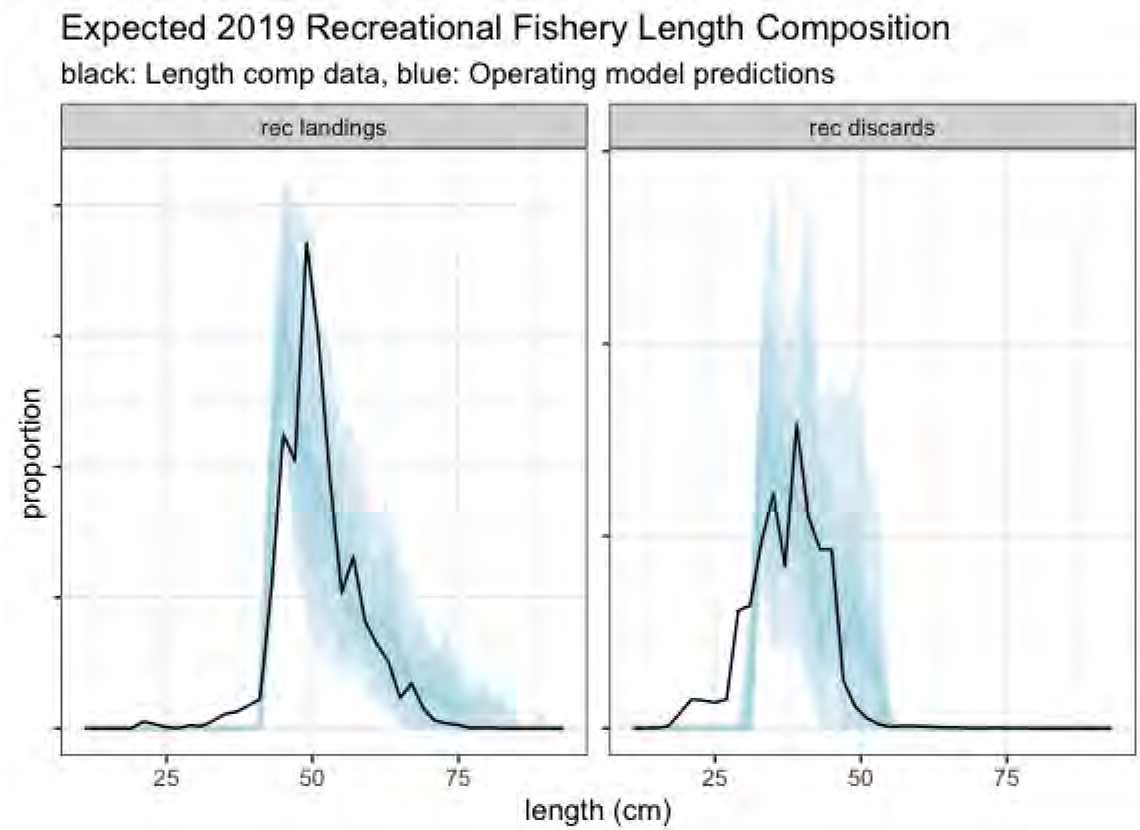

Figure 4. Operating model predictions for 2019 catch at length for the recreational fleets compared to the 2019 data.

Summer Flounder Recreational Demand Model: Overview, Data, and Methods

Andrew (Lou) Carr-Harris
Northeast Fisheries Science Center
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1 Introduction

This document describes the data and methods underlying the summer flounder (fluke) recreational demand model (RDM). The RDM was built to predict the impact of stock conditions and management measures (bag, size, and season limits) on angler effort, angler welfare, the local economy, and recreational fishing mortality. As part of the fully integrated bio-economic model[1], it provides the key link between projected population abundances, regulations, and expected recreational fishing mortality.

The RDM is composed of three main components: an angler behavioral model, a calibration sub-model, and a projection sub-model, each of which are described in detail below. The angler behavioral model uses stated preference survey data to estimate angler preferences for harvesting and discarding fluke and other primary species. These results parameterize the calibration and projection sub-models. The calibration sub-model replicates coast-wide fishing activity in a baseline year using trip-level data in order to set the number of simulated fishing trips (choice occasions) entering the projection sub-model. The projection sub-model re-simulates the fishery conditional on the projected stock structure, i.e., the output from the biological operating model, and the management scenario of interest and computes expected impacts to angler effort, angler welfare, the local economy, and fishing mortality.

2 Choice experiment survey

The stated preference choice experiment (CE) data used to estimate angler preferences come from an angler survey administered in 2010 as a follow-up to the Access Point Angler Intercept Survey (APAIS), an in-person survey that collects information from anglers at publicly accessible fishing sites as they complete their fishing trips. The APAIS is one of several surveys used by the Marine Recreational Information Program (MRIP) to produce catch and effort estimates for recreational marine species across the United States. Anglers who participated in the APAIS in coastal states from Maine to North Carolina during 2010 were asked to participate in the voluntary follow-up CE survey. Those willing to participate were sent CE survey materials via mail or email shortly after the intercept interview. A total of 10,244 choice experiment surveys were distributed, of which 3,234 were returned for an overall response rate of 31.5%.

[1] For an overview of the integrated bio-economic model, please see the June 2022 Council meeting briefing book materials at: https://www.mafmc.org/briefing/june-2022.

The survey instrument contained three sections. Section (A) collected information about respondents' fishing experiences in the past year and species preferences, as well as the factors that influence their decision to fish. Section (B) contained a set of choice experiment questions (Figure 1). In these questions, respondents were presented with three hypothetical multi-attribute fishing trip options. Trip A and Trip B varied and contained different species-specific bag and size limits, catch and keep of fluke and other primary species, and total trip costs. Trip A provided a range for numbers of fluke caught and kept rather than single value as in Trip B. Trip C was an option to go fishing for other species and was added as an attempt to capture target species substitution. Respondents were asked to compare and choose their favorite among the three trip options or opt to not saltwater fish. Lastly, section (C) gathered demographic information including gender, birth year, education, ethnicity, and income. Given regional differences in species availability, survey versions were developed for four sub-regions: (i) coastal states from Maine through New York, (ii) New Jersey, (iii) Delaware and Maryland, and (iv) Virginia and North Carolina. The four survey versions differed in the species other than fluke and black sea bass included in Sections A and B.[2]

3 Experimental design

For each regional version of the survey, multiple sub-versions that differed in levels of the trip attributes shown within and across choice questions were administered. Trip attribute levels were chosen based on historical catch and trip expenditure data and corroborated with focus group feedback. They were then randomized across choice questions using an experimental design that sought to maximize the statistical efficiency of the ensuing model parameters. Each experimental design was specified to produce a total 128 choice questions. Because 128 is too many questions for a single respondent to answer, questions were randomly allocated into 16 subsets such that each respondent was presented with eight choice questions.

[2] In terms of the CE attributes in Section B, the Maine to New York version included fluke, black sea bass, and scup; the New Jersey version included fluke, black sea bass, scup, and weakfish; the Delaware and Maryland version included fluke, black sea bass, and weakfish; and the Virginia and North Carolina version included fluke, black sea bass, weakfish, and red drum.

SECTION B: SALTWATER FISHING TRIPS

The following questions help us understand tradeoffs made by anglers when they go fishing.
Compare Trip A, Trip B, and Trip C in the table below, then **answer** questions **1A** and **1B**.
Compare only the trips on this page. Do **not** compare these trips to trips on other pages in this survey.

Trip Features		Trip A	Trip B	Trip C
Summer Flounder (Fluke)	Regulations	1 Fluke, 16" or larger	3 Fluke, 18" or larger	Go fishing for striped bass or bluefish
	Fish Caught	3 to 13 Fluke, 22" TL	1 Fluke, 15" TL	
	Fish Kept	1 Fluke	0 Fluke	
Black Sea Bass	Regulations	20 Bl. S. Bass, 14" or larger	30 Bl. S. Bass, 9" or larger	
	Fish Caught	30 Bl. S. Bass, 12" TL	10 Bl. S. Bass, 9" TL	
	Fish Kept	0 Black Sea Bass	10 Black Sea Bass	
Scup (Porgy)	Regulations	20 Scup, 12.5" or larger	5 Scup, 13" or larger	
	Fish Caught	3 Scup, 16" TL or larger	40 Scup, 6" TL or smaller	
	Fish Kept	3 Scup	0 Scup	
Weakfish	Regulations	0 Weakfish of any size	5 Weakfish, 12" or larger	
	Fish Caught	7 Weakfish, 15" TL	1 Weakfish, 18" TL	
	Fish Kept	0 Weakfish	1 Weakfish	
Total Trip Cost		$160	$160	$45

Definitions:
- **Regulations:** The legal minimum size restriction and bag limit for this trip.
- **Fish caught:** The number of fish caught on this trip and the total length (TL) of those fish.
- **Fish kept:** The number of fish you can legally keep on this trip.
- **Total trip cost:** ***Your portion*** of the costs associated with this trip, including bait, ice, fishing equipment purchase or rental, daily license fees, boat rental fees, boat fuel, trip fees, and round trip transportation costs associated with traveling to and from the fishing location. Travel costs may include vehicle fuel, car rental, tolls, airfare, and parking.

1A Choose your favorite trip. (Please mark only **one** trip with a ☑ or a ☒.)

Trip A ☐
Trip B ☐
Trip C ☐
I would not go saltwater fishing ☐

Figure 1. Example choice experiment question from the New Jersey survey version.

4 Choice experiment sample

A total of 3,234 people completed or partially completed the mail or web version of the survey. Of these respondents, 2,941 answered at least one of the eight choice experiment questions. We removed from the sample respondents who universally choose the zero-cost, “Do not go saltwater fishing” option or the pelagic trip (Trip C) as their favorite trip. Johnston et al. (2017) note that such choice patterns can be interpreted as scenario rejection whereby “respondents do not interpret scenarios as intended and thus value something different from the intended item or outcome."[3] We also excluded from analysis respondents who indicated that the survey was not completed by the person to whom it was addressed. The remaining sample consisted of 2,448 anglers.

Table 1 displays some demographic characteristics of sample anglers by region. Sample anglers were predominantly male (90-93% across regions) and Caucasian (94-96% across regions). The average age was just under 53. Roughly one quarter to one third of the sample in each region attained a bachelor's degree or higher. Between 60% and 70% of the sample in each region had household incomes ranging from $20,000 to $100,000, while between 26% and 30% had household incomes above $100,000. Lastly, the average number of days spent fishing during the previous calendar year (2009) varied from 20 to 28 across regions, with New Jersey anglers fishing considerably more frequently in the past year than anglers in other regions.

Table 1. Demographic characteristics of choice experiment sample.

Characteristic	ME-NY	NJ	DE/MD	VA/NC
% male	92.7	93.2	91.0	90.0
% Caucasian	95.6	95.7	94.5	94.5
Mean age	52.8	52.8	52.9	52.2
Education				
% with high school graduate or GED	33.1	42.4	43.7	28.8
% with some college but no degree or associate's degree	34.7	30.5	28.0	36.8
% with bachelor's degree or higher	32.1	27.0	28.2	34.2
Household income				
% less than $20,000	6.9	2.0	7.1	4.6
% between $20,000 and $100,000	62.7	69.5	67.0	69.0
% over $100,000	30.3	28.4	25.7	26.3
Mean # fishing trips taken during 2009	21.1	27.7	18.6	20.1

Sample anglers were recruited from the APAIS, which occurs at publicly accessible fishing sites only. Therefore, anglers fishing from private access points were excluded from the sampling design. If these excluded anglers have different preferences than those who fish from

[3] Key parameter estimates from choice models that included these participants were similar in sign, significance, and magnitude to those presented in this document.

publicly accessible fishing sites, then the estimated choice model parameters would not represent the preferences of the population. To understand the extent to which each fishing mode is represented in our sample and how the distribution of fishing effort by mode aligns with the distribution of fishing effort in the population, Table 2 compares MRIP estimates of fishing effort for the primary species by mode to the distribution of fishing effort indicated by our sample. Compared to the population, shore trips are underrepresented in the sample while party and charter boat trips are overrepresented. The percent of private boat trips in the sample closely matches the population and in both cases and accounts for the lion's share of all trips. So while the sample does not mirror the population distribution of fishing effort by mode, it does encompass directed effort from all four fishing modes.

Table 2. Percent of trips taken for primary species by mode during 2009.

	MRIP	CE sample
ME-NY		
Shore	40.3	16.7
Party boat	2.0	24.0
Charter boat	1.5	4.0
Private boat	56.2	55.3
NJ		
Shore	34.9	22.6
Party boat	2.1	21.8
Charter boat	1.3	3.9
Private boat	61.6	51.7
DE/MD		
Shore	37.8	28.6
Party boat	1.3	11.6
Charter boat	0.9	4.4
Private boat	60.0	55.4
VA/NC		
Shore	46.4	30.6
Party boat	0.1	3.6
Charter boat	0.2	3.5
Private boat	53.3	62.4

Notes: Primary species include fluke and black sea and other species that varied by survey version: the ME-NY survey also included scup, the NJ version also included scup and weakfish, the DE/MD version also included weakfish, and the VA/NC also included weakfish and red drum. The MRIP columns shows percentages of all trips taken for the primary species, while the CE sample column shows percentages of all trips taken for the primary species as indicated by sample respondents.

5 Behavioral model framework

Choice experiment data can be used to evaluate consumer preferences for, behavioral response to, and welfare impacts from marginal changes in non-market goods or attributes (Louviere, Hensher, and Swait 2000). The primary purpose of collecting our choice experiment data was to identify the relative importance to recreational anglers of keeping and releasing fluke such that economic and behavioral impacts of regulatory changes could be assessed.

We analyzed our CE data using random utility models (McFadden 1973), which decompose the overall utility angler n receives from trip alternative j ($j = A, B, C, or\ no\ trip$) into two components: V_{nj}, a function that relates observed fishing trip attributes x_{nj} to utility, and ε_{nj}, a random component capturing the influence of all unobserved factors on utility. Angler utility can be expressed as

$$\begin{aligned} U_{nj} &= V_{nj} + \varepsilon_{nj} \\ &= \beta_n' x_{nj} + \varepsilon_{nj}, \end{aligned} \tag{1}$$

where β_n' is a vector of preference parameters measuring the part-worth contribution of trip attributes x to angler n's utility, and ε_{nj} is an independent and identically distributed Type I extreme value error term. Under the random utility framework, an angler will select alternative i if it provides maximum utility over all alternatives available to him or her in a given choice occasion, i.e.

$$U_{ni} > U_{nj} \; \forall \, j \neq i. \tag{2}$$

We estimated panel mixed logit models, which allow for unobserved preference heterogeneity—a recommended best-practice for stated preference analysis (Johnston et al. 2017)—through estimation of parameter distributions for the attributes specified as random. Allowing preferences to vary across individuals is the primary advantage of the mixed logit over the basic multinomial logit (MNL) model, which assumes that individuals have the same preferences. Panel mixed logit estimation also resolves some behavioral limitations of the MNL model, including the independence of irrelevant alternatives property and the assumption that unobserved factors that influence decisions are uncorrelated over repeated choice situations (Hensher and Greene 2003).

The probability that angler n chooses alternative i is obtained by integrating the logit formula over the density of β (Train 2003):

$$P_{ni} = \int \frac{e^{\beta' x_{ni}}}{\sum_{j=1}^{J} e^{\beta' x_{nj}}} f(\beta) d\beta. \quad (3)$$

These probabilities are approximated via simulation in which repeated draws of β are taken from $f(\beta|\theta)$, where θ refers to the mean and covariance of this distribution. For each draw, the logit formula is calculated for all choice scenarios (up to eight) faced by individual n. Then, the product of these calculations is taken, giving the joint probability of observing individual n's sequence of choices. The average of these calculations over all draws is the simulated choice probability, $\check{P}_{ni}$. The estimated parameters are the values of θ that maximize the simulated log likelihood function,

$$LL = \sum_{n=1}^{N} \sum_{t=1}^{T} \sum_{j=1}^{J} d_{ntj} \ln(\check{P}_{ntj}), \quad (4)$$

where $d_{njt} = 1$ if individual n chose alternative j in choice scenario t and zero otherwise.

We specified the utility associated with fishing trip alternatives A and B as a linear additive function of the number of fish kept and released by species and the trip cost. For Trip A, the midpoint of the range of fluke catch depicted in the choice experiment was used to calculate numbers of fluke kept and released. The utility associated with Trip C, a fishing trip for other species, was specified as a function of the trip cost and a constant term (*fish for other species*) that measures the utility of a pelagic trip relative to the utility from the other alternatives. The utility associated with the non-fishing, "I would not go saltwater fishing" alternative (alternative D), was specified as a function of a constant term (*do not fish*) that captures preferences for not fishing. To allow for diminishing marginal utility of catch (Lee, Steinback, and Wallmo 2017), keep and release attributes entered the model as their square root. The estimated models assumed that all non-cost parameters were normally distributed, while the cost parameter was treated as fixed to facilitate welfare calculations (Revelt and Train 2000).

6 Behavioral model results

Results from the panel mixed logit model, estimated separately for each regional survey sub-version, are shown in Table 3. Mean parameters measure the relative importance of each trip attribute on overall angler utility, while standard deviation parameters measure the extent to which preferences vary across the sampled population.

The estimated mean parameters are generally of the expected sign. Across the regional models, the mean parameters on *trip cost*, the marginal utility of price, are negative and significant and intuitively suggest that higher trip costs reduce angler utility. Mean parameters on all keep variables are positive, significant, and higher in magnitude than their corresponding release parameter. This means that each species is predominantly targeted for consumption rather than sport, which aligns with input from recreational fishery stakeholders. The magnitude of the summer flounder keep parameters relative to the keep parameters on other primary species suggests that anglers value keeping fluke more than they value keeping black sea bass, scup, weakfish, or red drum.

The signs and significance of the release parameters vary by species and region. For example, only in the VA/NC model is the mean parameter on $\sqrt{SF\ released}$ positive and significant, suggesting that anglers in this region value catching and releasing summer flounder. Additionally, in two of the three regional models, the parameter on $\sqrt{WF\ released}$ is positive and significant. Catching and releasing scup reduces utility for anglers in New Jersey according to the parameter on $\sqrt{scup\ released}$. Perhaps these anglers perceive catching and having to release scup as a nuisance when fishing for larger and more valuable target species.

Baseline levels of non-fishing utilities, captured by the parameters on *do not fish*, are negative and significant. This mean that, when given the option, anglers get more utility from fishing than not fishing. In contrast, the parameters on *fish for other species* suggest that anglers place a relatively high value on trips for striped bass and bluefish (or striped bass, bluefish, cobia, and Spanish mackerel in the VA/NC model). This follows from Trip C being most frequently selected as the favorite trip, which aligns with the fact that striped bass are the most heavily targeted recreational species in the region. Lastly, with the exception of $\sqrt{BSB\ released}$ in the ME-NY and NJ models, the significance of standard deviations parameters confirms that preferences for keeping and releasing fish vary across the population, i.e., that marginal changes in catch will affect different anglers differently.

Table 3. Estimated utility parameters from mixed logit models.

	ME-NY		NJ		DE/MD		VA/NC	
Mean parameters	*Estimate*	*St. Err.*	*Estimate*	*St. Err.*	*Estimate*	*St. Err.*	*Estimate*	*St. Err.*
trip cost	-0.012***	0.000	-0.008***	0.000	-0.009***	0.000	-0.007***	0.000
$\sqrt{\text{SF kept}}$	0.535***	0.061	0.721***	0.064	0.776***	0.048	0.507***	0.031
$\sqrt{\text{SF released}}$	-0.068	0.045	0.007	0.041	0.043	0.033	0.105***	0.021
$\sqrt{\text{BSB kept}}$	0.273***	0.033	0.175***	0.032	0.239***	0.027	0.178***	0.018
$\sqrt{\text{BSB released}}$	-0.021	0.024	0.010	0.024	-0.009	0.019	0.025**	0.013
$\sqrt{\text{scup kept}}$	0.078***	0.020	0.096***	0.021				
$\sqrt{\text{scup released}}$	-0.015	0.015	-0.033**	0.016				
$\sqrt{\text{WF kept}}$			0.367***	0.055	0.360***	0.042	0.231***	0.029
$\sqrt{\text{WF released}}$			0.096**	0.043	0.061*	0.035	0.034	0.023
$\sqrt{\text{RD kept}}$							0.428***	0.036
$\sqrt{\text{RD released}}$							0.081***	0.023
do not fish	-2.398***	0.233	-1.877***	0.257	-2.838***	0.231	-3.573***	0.231
fish for other species	1.272***	0.172	1.049***	0.198	0.606***	0.151	0.493***	0.116
St. dev. parameters								
$\sqrt{\text{SF kept}}$	0.692***	0.079	0.630***	0.079	0.516***	0.061	0.457***	0.043
$\sqrt{\text{SF released}}$	0.358***	0.058	0.125	0.104	0.258***	0.047	0.230***	0.034
$\sqrt{\text{BSB kept}}$	0.245***	0.048	0.283***	0.048	0.311***	0.037	0.189***	0.031
$\sqrt{\text{BSB released}}$	0.080	0.058	0.053	0.051	0.139***	0.029	0.087***	0.031
$\sqrt{\text{scup kept}}$	0.096*	0.058	0.128***	0.040		0.000		0.000
$\sqrt{\text{scup released}}$	0.077***	0.028	0.120***	0.027		0.000		0.000
$\sqrt{\text{WF kept}}$			0.220**	0.111	0.251***	0.094	0.283***	0.058
$\sqrt{\text{WF released}}$			0.223***	0.081	0.220***	0.052	0.142***	0.046
$\sqrt{\text{RD kept}}$				0.000		0.000	0.472***	0.062
$\sqrt{\text{RD released}}$				0.000		0.000	0.324***	0.033
do not fish	2.193***	0.198	1.969***	0.173	2.246***	0.164	2.676***	0.181
fish for other species	1.652***	0.129	1.799***	0.144	1.752***	0.114	1.839***	0.090
No. anglers	443		357		581		1067	
No. choices	3451		2764		4494		8332	
LL	-3221.809		-2797.016		-4227.267		-8051.496	
LL(0)	-3753.301		-3203.314		-4814.363		-9215.204	
Pseudo R^2	0.327		0.270		0.321		0.303	
AIC/n	1.877		2.039		1.889		1.938	
BIC/n	1.914		2.095		1.918		1.959	

Notes: *,**, and *** represent significance at the 10%, 5%, and 1% level of significance, respectively. SF = summer flounder, BSB = black sea bass, WF = weakfish, RD = red drum.

7 Recreational demand model

7.1 Overview

To assess the effect of alternative fluke management measures and stock conditions on fishing effort, angler welfare, the local economy, and fishing mortality, we integrate the utility parameters in Table 3 with historical catch, effort, and trip expenditure data to create the recreational demand model. The RDM measures behavioral and economic responses to changes in fishing conditions through simulation of individual choice occasions, i.e., sets of fishing and non-fishing opportunities for hypothetical decision makers. Similar models have been developed for the Northeast U.S. recreational fluke fishery (Holzer and McConnell 2017) and for managing the recreational Gulf of Maine cod and haddock fishery (Lee, Steinback, and Wallmo 2017).

The RDM is multipart algorithm that simulates individual choice occasions mirroring those depicted in the CE survey. Each choice occasion consists of three multi-attribute options: a fluke trip, a pelagic trip, and an option of not going saltwater fishing. The algorithm assigns to each choice occasion attribute levels and utility parameters and calculates the expected utility, probability, and willingness-to-pay of the three options. These metrics are calculated twice: first, in the baseline scenario under which harvest, discards, and trip cost per choice occasion reflect fishery conditions in the baseline year; and then again in subsequent projection scenarios when harvest and discards per choice occasion reflect alternative management measures and stock conditions. Differences in expected utility, trip probability, and willingness-to-pay between baseline and projection scenarios form the basis for determining the impact of alternative management and stock conditions on fishing effort, angler welfare, the local economy, and fishing mortality.

7.2 Calibration sub-model

The first of the two-part simulation algorithm involves calibrating the recreational demand model to a baseline year (Appendix Figure 1). In essence, we attempt to replicate observed state-level aggregate outcomes, i.e., harvest and discards, using trip-level data. We calibrate the model to 2019 because it was the most recent year in which input recreational data was unaffected by COVID-related sampling limitations and because management measures remained relatively consistent across all states from 2019-2021.

The calibration sub-model begins by assigning choice occasions a trip costs drawn at random from state-level distributions. Cost distributions were created from recent trip expenditure survey data (Lovell et al. 2020) and weighted in proportion to the estimated number of directed fluke trips taken from shore, private boats, and for-hire boats in a given state in 2019.

Choice occasion are then assigned numbers of fish caught by species drawn at random from baseline-year catch-per-trip distributions. According to MRIP data, directed trips for fluke also tend to catch black sea bass, as the correlation in catch-per-trip between the two species is positive and significant across the study area. This is likely due to the two species cohabitating similar fishing grounds and having bottom-dwelling natures that make them susceptible to similar fishing gears. We account for this catch-per-trip correlation through copula modeling. Copulas are functions that describe the dependency among random variables and allow us to simulate correlated multivariate catch data that enter the demand model. We fit negative binomial distributions to each catch series (Terceiro 2003) and enter the estimated mean and dispersion parameters into a t-copula function. With this function we are able to simulate catch data with a correlation structure approximating the observed correlation between the two series. This approach provides the flexibility to generate correlated catch-per-trip data with any specified correlation structure and marginal catch parameterization. Catch-per-trip of other species included in the model is assumed independent and these distributions are fitted (negative binomial) to MRIP catch data.[4]

The calibration sub-model then distributes catch into harvest and discard bins. To do so, it draws a value d_{fs} from $D{\sim}U[0,1]$ for every fish species f caught in state s on a given choice occasion. Fish are harvested (discarded) if d_{fs} is higher (lower) than d_{fs}^{*}, where d_{fs}^{*} is the value for which simulated harvest-per-choice occasion of species f in state s approximates the MRIP-based estimate of harvest-per-trip in the baseline year.[5] These d_{fs}^{*} values, identified outside the simulation model, are the value of the catch-at-length cumulative distribution function evaluated at the minimum size limit. We implemented this method because harvest is the key determinant of the probability a choice occasion results in a fluke trip, and these probabilities in aggregate determine the number of choice occasions that enter the ensuing projection sub-model.

[4] Catch-per-trip data for all species included in the simulation are based on recreational fishing trips that caught or primarily targeted fluke.
[5] Fluke fishing is assumed to stop once the bag limit is reached, i.e., there are no additional discards after a choice occasion reaches the limit.

Therefore, approximating MRIP-based estimates of harvest in the baseline years ensures that the calibration sub-model generates an appropriate number of choice occasions. The whole process up to this point is repeated 10 times, providing multiple draws per choice occasion that reflect angler expectations about catch and trip cost.

Having a vector of attributes x_{ni} anchored on 2019 catch and recent trip expenditure data, we then assign to each choice occasion n a draw from the distribution of estimated utility parameters in Table 3 and calculate the utility of option i as $\beta_n' x_{ni}$. Expected utility is taken as $\beta_n' x_{ni}$ averaged over the 10 draws of catch and costs and is used to calculate choice probabilities conditional on β_n:

$$p_{ni} = \frac{e^{\beta_n' x_{ni}}}{\sum_{j=1}^{J} e^{\beta_n' x_{nj}}}. \tag{5}$$

The calibration model generates N_s^0 choice occasion for each state s, where the sum of the conditional probabilities of taking a fluke trip over the N_s^0 choice occasions equals the MRIP-based estimate of total directed fluke trips in state s during 2019. The number of choice occasions N_s^0 remains fixed throughout subsequent projection sub-model iterations. Expected total harvest and discards is computed as the sum of probability-weighted harvest and discards over the N_s^0 choice occasions.

Output from the calibration sub-model and MRIP-based estimates of harvest in 2019 are displayed in Table 4. Calibration statistics come from re-running the model 30 times, generating and drawing from new fluke and black sea bass catch-per-trip and utility parameter distributions at each iteration. MRIP point estimates and variance statistics are based on the weighting, clustering, and stratification of the survey design. Given the relative importance of harvest and the general insignificance of discards on angler utility, Table 4 compares simulated and MRIP-based estimates of harvest on directed summer flounder trips in numbers of fish for each state and species and omits discards. Simulated harvest statistics for a given species are available only for states in which that species' catch attributes entered the corresponding utility model.

The calibration sub-model was designed to approximate estimated actual harvest, and thus simulated harvest for each species-state combination approximate the MRIP-based estimates. Given that expected harvest is the key determinant of the probability of taking a fluke trip, this bolsters confidence that the calibration model generates an appropriate number of choice occasions to enter the ensuing projection sub-model.

Table 4. Harvest in numbers of fish on directed fluke trips from the calibration sub-model and MRIP. 95% confidence intervals in brackets.

State	Calibration sub-model	MRIP 2019
	Summer flounder harvest	
Massachusetts	54,896 [54615, 55177]	55,386 [23325, 87447]
Rhode Island	220,799 [219764, 221834]	213,592 [51594, 375590]
Connecticut	92,581 [91951, 93211]	89,843 [54911, 124776]
New York	563,376 [559579, 567173]	561,173 [318178, 804167]
New Jersey	1,075,530 [1069815, 1081245]	1,108,158 [736178, 1480138]
Delaware	89,045 [88593, 89497]	91,025 [56129, 125921]
Maryland	77,650 [77195, 78105]	79,371 [25346, 133396]
Virginia	150,361 [149794, 150928]	149,785 [66148, 233423]
North Carolina	33,391 [33280, 33502]	34,895 [13536, 56253]
	Black sea bass harvest	
Massachusetts	52,917 [52587, 53247]	54,178 [20329, 88028]
Rhode Island	207,900 [206767, 209032]	214,471 [118736, 310206]
Connecticut	157,294 [156091, 15849]	153,564 [84144, 222985]
New York	567,622 [562454, 572790]	556,955 [349796, 764115]
New Jersey	123,443 [121616, 125270]	123,860 [65887, 181833]
Delaware	13,672 [13469, 13875]	14,348 [4518, 24178]
Maryland	12,515 [12311, 12718]	13,272 [2407, 24136]
Virginia	32,112 [31675, 32549]	31,597 [-11867, 75062]
North Carolina	0	0
	Scup harvest	
Massachusetts	31,467 [31247, 31687]	31,515 [9304, 53726]
Rhode Island	368,228 [365533, 370923]	366,744 [72937, 660551]
Connecticut	355,442 [352371, 35851]	439,359 [-65705, 944423]
New York	1,074,804 [1067309, 1082300]	1,085,926 [687,805, 1,484,048]
New Jersey	3,452 [3090, 3815]	2,458 [-524, 5440]
	Weakfish harvest	
New Jersey	33,540 [32687, 34393]	32,668 [-10985, 76322]
Delaware	3,162 [3107, 3216]	3,185 [52, 6317]
Maryland	0	20 [-19, 60]
Virginia	6,903 [6790, 7015]	6,765 [158, 13372]
North Carolina	350 [344, 355]	682 [-594, 1958]
	Red drum harvest	
Virginia	0	0
North Carolina	0	0

7.3 Population adjustments to recreational catch-at-length and catch-per-trip

The RDM predicts fishery outcomes under new management measures and explicitly relates projected fluke population abundances from the biological operating model with numbers and sizes of fluke caught by recreational anglers. For example, greater numbers of fluke in the ocean should lead to higher catch-per-trip, holding all else constant. Similarly, if the size distribution of fluke changes, one would expect the size distribution of fish encountered by anglers to change as well. To account for these links, we incorporate in the RDM two approaches based on angler targeting behavior.

We determine state-level angler targeting behavior for fluke by computing recreational selectivity-at-length, or the proportion of the fluke population by length class caught by anglers. This metric requires population numbers-at-length and recreational catch-at-length distributions, the latter of which we create using historical catch data adjusted by the d^*_{fs} values identified in the calibration sub-model model. The unadjusted catch-at-length distribution is:

$$f(m_s) = \frac{c_{ms}}{\sum_1^L c_{ls}} \; \forall \, m \in 1 \ldots L, \tag{6}$$

where $\sum_1^L c_{ls}$ the MRIP-based estimate of total fluke catch and c_{ms} is the sum of fluke harvested and discarded within a length bin in state s.[6]

Preliminary analysis revealed a divergence between the probability $f(m_s)$ at and above the 2019 minimum size limit while accounting for the possession limit and expected catch-per-trip, and MRIP-based estimates of the percent of fluke catch that was harvested. This discrepancy could be due to under- or over-sampling of fluke harvest- or discards-at-length in the available recreational catch data. We therefore adjust $f(m_s)$ based on the d^*_{fs} values for fluke calculated in the calibration sub-model. Using $f(m_s)$, we first compute the relative probability of

[6] Numbers of fluke harvested by length are computed by multiplying estimated proportions of harvest-at-length, derived from 2018 and 2019 MRIP estimates, by the MRIP-based of estimate of total harvest in 2019. Numbers of fluke discarded by length are computed similarly; however, we calculate proportions fluke discarded-at-length in 2018 and 2019 using raw MRIP data supplemented by volunteer angler logbook data on discard lengths. The resulting proportions fluke discarded-at-length are multiplied by the MRIP-based estimate of total discards in 2019 to arrive at 2019 fluke discards-at-length.

catching a length-m fluke among fluke shorter than, and equal to or longer than the 2019 minimum size limit in state s, respectively:

$$f_{\underline{l}}(m_s) = \frac{f(m_s)}{\sum_{l=1}^{min.size-1} f(l_s)} \forall \ m \in 1 \dots min.size - 1, \tag{7}$$

$$f_{\bar{l}}(m_s) = \frac{f(m_s)}{\sum_{l=min.size}^{L} f(l_s)} \forall \ m \in min.size \dots L. \tag{8}$$

We then distribute d_{fs}^* and $(1 - d_{fs}^*)$ across the relative probability weights assigned to the corresponding sizes by the unadjusted catch-at-length size distribution to create $F(l_s)^*$:

$$F(l_s)^* = \begin{cases} \sum_{l=1}^{m} f_{\underline{l}}(m_s)\, d_{fs}^* & : m < min.size\ limit \\ d_{fs}^* & : m = min.size\ limit \\ \sum_{l=min.size+1}^{m} f_{\bar{l}}(m_s)\,(1 - d_{fs}^*) & : m > min.size\ limit \end{cases} \tag{9}$$

The resulting probability distribution $f(l_s)^*$ preserves the value of the catch-at-length cumulative distribution function that explains landings in the baseline year (d_{fs}^*) while redistributing the remaining probability in proportion to the observed catch-at-length probability. Using $f(l_s)^*$, we then compute an adjusted catch-at-length distribution:

$$f(m_s)^* = \textstyle\sum_1^L c_{ls}\, f(l_s)^* = \frac{c_{ls}^*}{\sum_1^L c_{ls}} \ \forall \ c \in 1 \dots L, \tag{10}$$

We then use $f(m_s)^*$ and estimated population numbers-at-length distribution from the stock assessment in the baseline year to compute recreational selectivity. Following Lee, Steinback, and Wallmo (2017), we rearrange the Schaefer (1954) catch equation and solve for recreational selectivity of length-l fluke in state s the baseline year:

$$q_{ls} = \frac{c_{ls}^{*}}{N_l} \tag{11}$$

where c_{ls}^{*} is adjusted catch of length-l fluke and N_l is estimated population numbers-at-length from the stock assessment. Stock assessment numbers-at-age estimates for 2019 were converted to numbers-at-length using commercial trawl survey age-length indices.

Having computed q_{ls} for a representative year, c_{ls}^{*} can be computed for any stock structure $\widetilde{N}_l$. Rearranging Equation (11) and dividing c_{ls}^{*} by total catch gives the probability of catching a length-l fluke conditional on the projected stock structure $\widetilde{N}_l$:

$$\widetilde{f(c_s)}^{*} = \frac{q_{ls}\widetilde{N}_l}{\sum_l^L q_{ls}\widetilde{N}_l} = \frac{\tilde{c}_{ls}^{*}}{\sum_l^L \tilde{c}_{ls}^{*}}. \tag{12}$$

Assuming constant q_{ls}, Equation (12) shows the relationship between the projected size distribution of fluke in the ocean the size distribution of fluke caught by recreational anglers. In the fully integrated bio-economic model, $\widetilde{N}_l$ is output from the biological operating model and is incorporated into the projection sub-model via Equation (12).

In addition to population-adjusted recreational catch-at-length distributions by state, Equation (12) provides total expected recreational catch by state, $\sum_l^L \tilde{c}_{ls}^{*}$, which we use to generate population-adjusted fluke catch-per-trip distributions. For each state s we scale the estimated mean parameters from the baseline-year fluke catch-per-trip distributions by $\sum_l^L \tilde{c}_{ls}^{*}/\sum_1^L c_{ls}$, where $\sum_1^L c_{ls}$ is the MRIP-based estimate of total fluke catch in the baseline year. The adjusted mean catch-per-trip parameters therefore reflect expected trip-level changes in fluke catch brought on by changes in population abundance. We also adjust the dispersion parameter of the projected fluke catch-per-trip distributions such that their coefficients of variation remain at baseline-year levels. These adjusted marginal catch-per-trip parameters are combined with baseline-year black sea bass marginal parameters and integrated into the estimated copula function to create new, population-adjusted joint catch-per-trip distributions.

7.4 Projection sub-model

After the catch-per-trip and catch-at-length distributions are adjusted based on projected numbers-at-length from the biological operating model, the projection sub-model proceeds by re-simulating outcomes under the alternative management scenarios for each of the N_s^0 choice occasions. First, it assigns to each choice occasion the β_n', trip cost, and numbers of scup, red drum, or weakfish determined in the calibration sub-model. It then draws fluke and black sea bass catch-per-trip values from the population-adjusted catch-per-trip distributions. Fluke harvest and discards per choice occasion are determined by drawing lengths from $\widetilde{f(c_s)}^*$ and checking them against the alternative size and bag limit. Black sea bass catch, also re-drawn from population-adjusted catch-per-trip distributions, is allocated to the harvest or discard bin based on the d_{fs}^* approach from the calibration sub-model. The process up to this point is repeated 10 times and utilities are calculated at each iteration. Expected utility is taken as the average utility over the 10 draws and choice occasion probabilities are calculated from Equation (5). As in the calibration sub-model, projected total numbers of directed fluke trips is the sum of the probability of taking a fluke trip over the N_s^0 choice occasions and expected total harvest and discards is the sum of probability-weighted harvest and discards over the N_s^0 choice occasions.

We measure both market and non-market values of changes in fishery conditions. The market value of recreational marine fishing is in part generated by angler trip expenditures filtering though the regional economy. Angler expenditures spur direct, indirect, and induced effects, which together represent the total contribution of marine angler expenditures on the regional economy. Direct effects occur as angler spend money at retail and service industries in support of their trip. In turn, angler spending produces indirect effects as retail and service industries pay operating expenses and purchase supplies from wholesalers and manufacturers. The cycle of secondary industry-to-industry spending continues until all indirect effects occur outside the region. Induced effects occur as employees in direct and indirect sectors make household consumption purchases from retailers and services industries. We measure the total contribution of marine angler expenditures on the regional economy using economic multipliers from the Northeast U.S. marine fishing input-output model (Lovell et al. 2020). Specifically, we measure the effect of changes in aggregate angler expenditures on (i) the gross value of sales by affected businesses, (ii) labor income, (iii) contribution to region GDP, and (iv) employment in recreational fishing-related industries. The first three metrics are measures in dollars, whereas the latter is measured in numbers of jobs. We compute these metrics on a state-by-state basis and assume that spending on durable fishing equipment, i.e., equipment that is not purchased on a trip-by-trip basis like boats, insurance, rods, or reels, which also contributes to the local economy, remains constant. When fishing conditions become more attractive to anglers, perhaps due to a relaxation of regulations, our model will predict an increase in overall angler expenditures that stems from an overall increase in directed fishing trips. Aggregate angler expenditures are computed in the projection sub-model as the probability-weighted sum of trip costs across choice occasions.

The non-market value of changes in recreational fluke fishery conditions occurs through trip-level changes in expected harvest and discards, attributes of which lack explicit markets that directly reveal their value. We measure these angler welfare impacts by computing the change in consumer surplus (CS), or the difference in expected utility in dollar terms between the baseline management scenario (scenario 0) and the alternative management scenario (scenario 1) (Hoyos 2010), i.e.,

$$\Delta E(CS_n) = \frac{\ln\left(\sum_{j=1}^{J} e^{V_{nj}^1}\right) - \ln\left(\sum_{j=1}^{J} e^{V_{nj}^0}\right)}{-\beta_{trip\ cost}} \tag{13}$$

where V_{nj}^1 and V_{nj}^o are expected utilities in the baseline and alternative scenarios and $\beta_{trip\ cost}$ is the marginal utility of price.

8 Summary

To recap, the calibration sub-model uses angler utility parameters and historical catch, effort, and trip cost data to simulate a number of individual choice occasions that, when aggregated, approximate observed harvest in the baseline year. This number of choice remains fixed in the subsequent projection sub-model. The RDM then takes projected numbers-at-length in year t from the operating model, $\widetilde{N}_{lt}$, and adjusts the catch-per-trip and catch-at-length distributions via Equation (12). Conditional on these population-adjusted trip-level catch outcomes and an alternative management scenario of interest, the projection sub-model re-simulates the fishery and computes expected angler effort, angler welfare, impacts to the local economy, and total harvest and discards. Expected total harvest and discard values feed back into the operating model, which subsequently produces $\widetilde{N}_{lt+1}$, the input for the RDM in year $t + 1$. This cycle continues for each year of the time horizon and over multiple iterations.

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Appendix

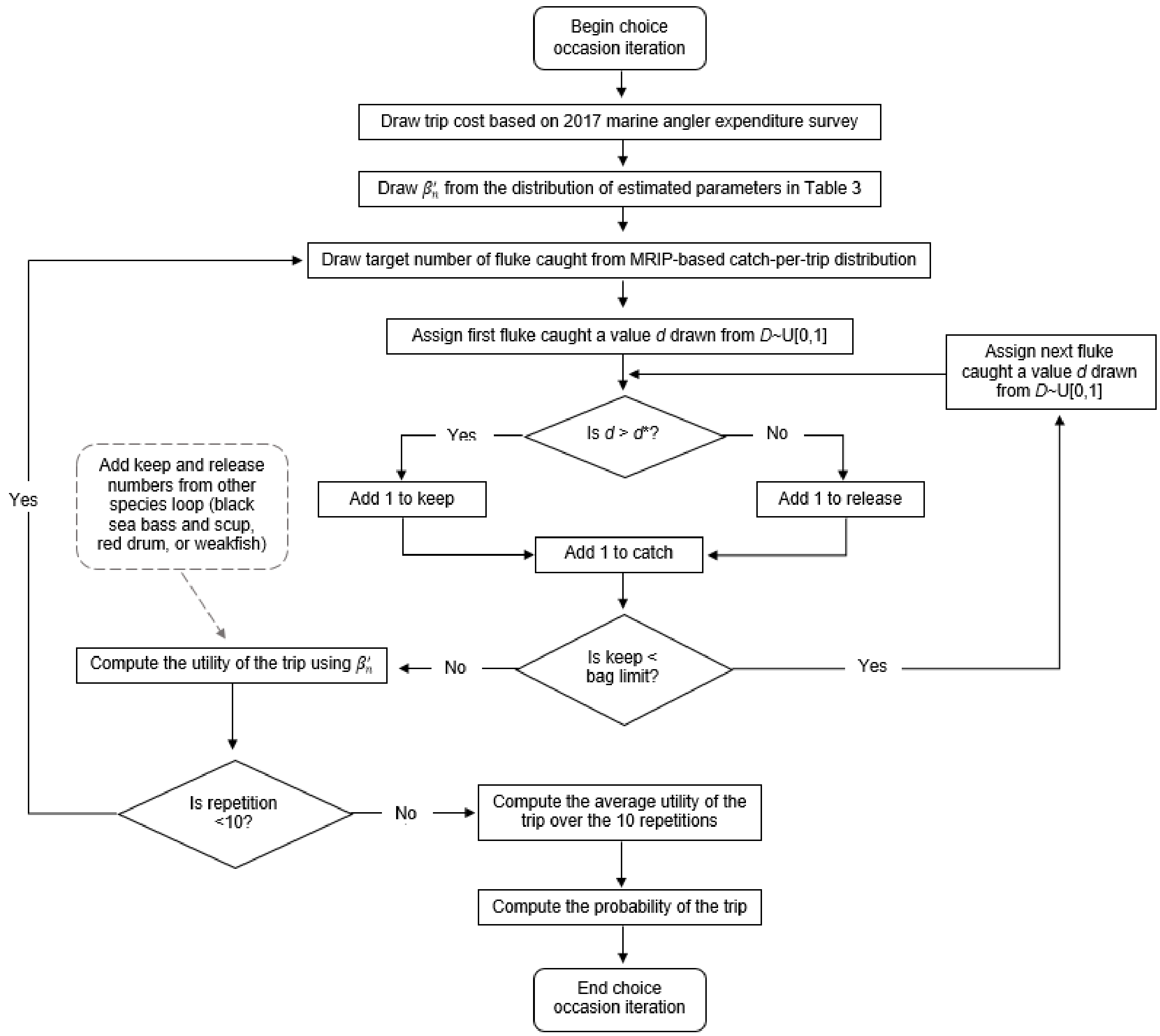

Figure A1. Calibration sub-model algorithm. Only the loop for summer flounder is shown in detail.

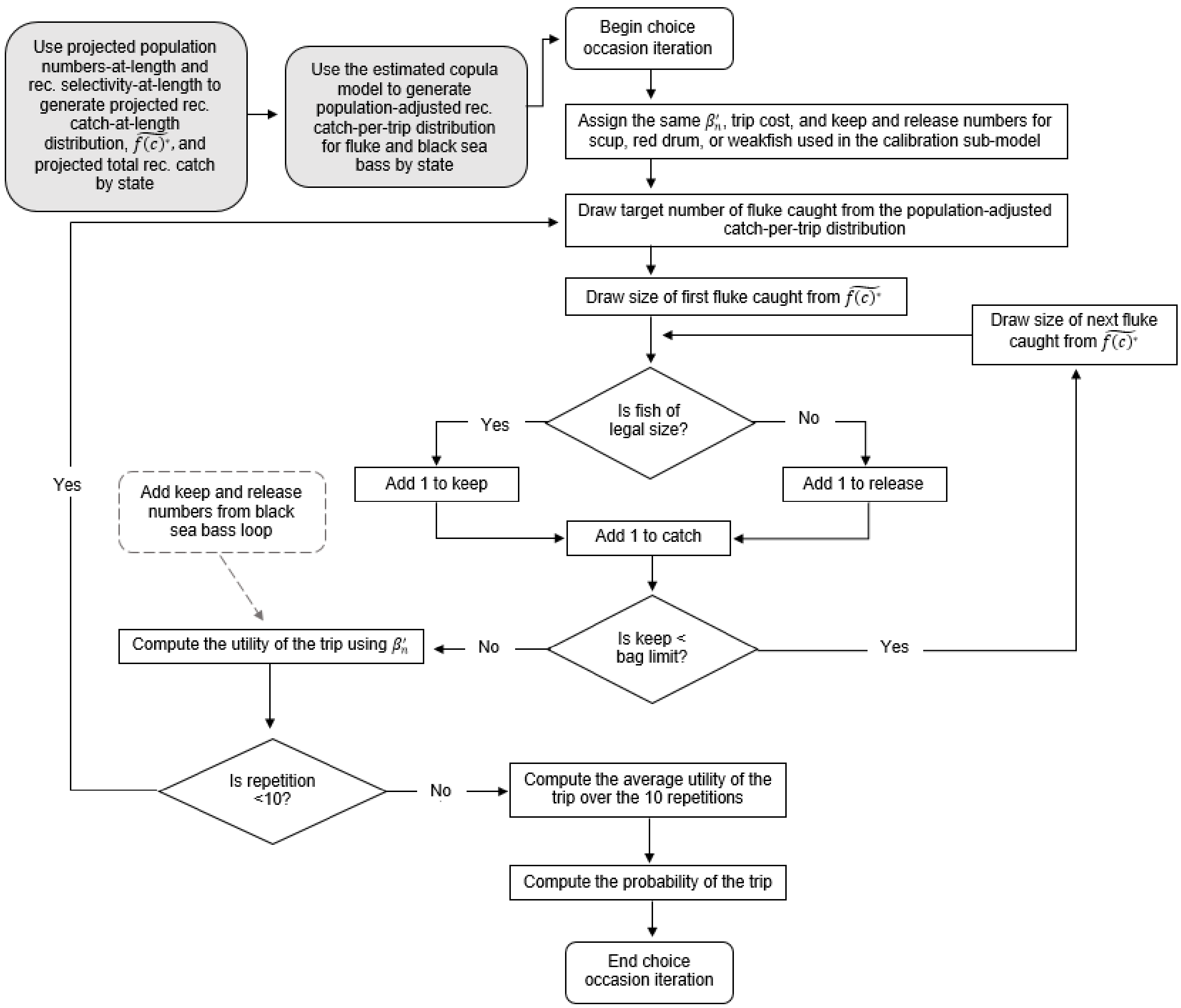

Figure A2. Projection sub-model algorithm. Only the loop for summer flounder is shown in detail.

From:	Mary Sabo
To:	Muffley, Brandon
Subject:	FW: Form Submission - June 2022 Public Comment Form
Date:	Tuesday, May 24, 2022 9:54:33 AM

Summer flounder MSE comment

From: Squarespace <form-submission@squarespace.info>
Sent: Saturday, May 21, 2022 11:09 AM
To: Mary Sabo <msabo@mafmc.org>
Subject: Form Submission - June 2022 Public Comment Form

Name: Karen ChinMancini

Email: kceagles@verizon.net

Topic: Summer Flounder Management Strategy Evaluation

Comments: I want to be able to catch more flounder, but the Commercial guys/gals have them already. Can we work on size and limit numbers for the Reactional fisherman/fisherwomen? Call me to discuss at 732-264-2571 home or 973-619-5357 cell. I am not available on June 7, 2022 but am available June 8,9/2022!

Sent via form submission from *Mid-Atlantic Fishery Management Council*

Name: Karen ChinMancini

Email: kceagles@verizon.net

Topic: Summer Flounder Management Strategy Evaluation

Comments: I want to be able to catch more flounder, but the Commercial guys/gals have them already. Can we work on size and limit numbers for the Reactional fisherman/fisherwomen? Call me to discuss at 732-264-2571 home or 973-619-5357 cell. I am not available on June 7, 2022 but am available June 8,9/2022!

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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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 27, 2022

To: Council and ASMFC Policy Board

From: Julia Beaty, Council staff

Subject: Recreational Harvest Control Rule Framework/Addenda Final Action Briefing Materials

The Mid-Atlantic Fishery Management Council will meet with the Atlantic States Marine Fisheries Commission's Interstate Fishery Management Program Policy Board on June 7, 2022 to consider taking final action on the Recreational Harvest Control Rule Framework/Addenda.

The following briefing materials are provided behind this tab (materials are listed in reverse chronological order).

1) Memo on Council staff recommendations for final action
2) Final Scientific and Statistical Committee Report on Implications of Recreational Harvest Control Rules on ABC Specification
3) Summary of comments received during Draft Addenda comment period
4) Framework/Addenda Options Reference Guide
5) Recreational Harvest Control Rule Draft Addenda for Public Comment
6) Harvest Control Rule Infographics
7) Letters from GARFO and states on 2022 recreational measures for summer flounder, scup, and black sea bass

The following briefing materials will be posted to the meeting page once they are finalized.

8) Summary of May 26, 2022 Fishery Management Action Team/Plan Development Team meeting
9) Summary of May 25, 2022 Advisory Panel meeting

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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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 27, 2022

To: Chris Moore, Executive Director

From: Julia Beaty, staff

Subject: Council staff recommendations for final action on the Recreational Harvest Control Rule Framework/Addenda

Background

The Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission's (Commission's) Interstate Fishery Management Program Policy Board (Policy Board) will consider taking final action on the Recreational Harvest Control Rule Framework/Addenda on June 7, 2022. This action considers changes to the process for setting recreational bag, size, and season limits (i.e., recreational measures) for summer flounder, scup, black sea bass, and bluefish. The goal of this action is to establish a process to set recreational measures that prevent overfishing, are reflective of stock status, appropriately account for uncertainty in the recreational data, consider angler preferences, and provide an appropriate level of stability and predictability in management changes from year to year.

Current Process and Legal Requirements

The annual specifications process for all four species includes overfishing limits (OFLs) recommended by the Council's Scientific and Statistical Committee (SSC). The OFLs for these species are derived directly from peer reviewed and accepted stock assessments. The SSC recommends acceptable biological catch (ABC) limits reduced from the OFLs to account for scientific uncertainty. Under the Council's risk policy, when biomass is at least 150% of the target level (as is currently the case for scup and black sea bass), the buffer between the OFL and the ABC is only 1.4% - 2.7% (depending on the OFL coefficient of variation, which is an expression of uncertainty). Therefore, ABC overages carry a high risk of OFL overages and overfishing when biomass is high. The buffer at lower stock sizes varies based on stock size, becoming more precautionary as biomass decreases. In this way, as noted by the SSC, the current process already incorporates an important theme of the Harvest Control Rule Framework/ Addenda: Catch limits are already more precautionary at lower stock sizes and less precautionary at higher stock sizes.

Commercial and recreational annual catch limits (ACLs) are derived from the ABC by applying the allocation percentages defined in the Fishery Management Plan (FMP). Annual catch targets (ACTs) are set less than or equal to the ACLs to account for management uncertainty. Expected dead discards are subtracted from the ACT to derive the recreational harvest limit (RHL). Recreational bag, size, and season limits are then set to allow harvest to meet but not exceed the RHL. If expected dead discards are accurately predicted, measures which prevent RHL overages should also prevent ACL overages. The options in the Harvest Control Rule Framework/ Addenda consider only how to set recreational measures. None of the options would change the process for deriving OFLs, ABCs, ACLs, ACTs, and RHLs.

The Council is required by law to set management measures that are expected to prevent overfishing. Therefore, the Council cannot recommend measures that are expected to result in recreational ACL overages unless it is also determined that the commercial sector will not achieve their full ACL. None of the options in this framework/addenda are meant to impact the ability of the commercial sector to achieve their full ACL. As such, recreational management measures must aim to prevent recreational ACL overages in order to proactively prevent overfishing and comply with the Magnuson-Stevens Fishery Conservation and Management Act.

Council Staff Recommendation for Final Action

Council staff recommend an alternative that is within the range of options in the framework/addenda. The staff recommendation is to: 1) set recreational measures for two years at a time, 2) use improved statistical methods for predicting the impacts of measures on harvest and discards, and 3) incorporate considerations related to variability and uncertainty in the recreational data. Under the staff recommendation, the only required modifications to the FMPs would be to allow recreational measures to be set for two years at a time. Council staff do not support modifying the FMP to require use of specific statistical methods when setting measures as this can limit the flexibility to adapt to changing circumstances and improved methods. As described in more detail below, improvements to these methods can and are being made without changes to the FMP.

Council staff do strongly support the use of statistical models such as the Recreational Economic Demand Model and the Recreational Fleet Dynamics Model (both of which are currently in development) to inform the setting of recreational measures. These models will allow for more statistically robust predictions of future harvest and discards under different combinations of measures and different stock sizes. In addition, they will incorporate data other than Marine Recreational Information Program (MRIP) data, such as angler preferences and availability of the stocks to anglers. In addition, Council staff support prioritizing completion of the previously initiated Technical Guidance Document to describe best practices related to identifying and modifying outlier MRIP estimates, using confidence intervals, and guidelines for maintaining status quo measures.

The timing of a two-year recreational measures cycle should align with the timing of updated management track stock assessments. In the interim year, measures would be reviewed and modified only if new data suggest a major change in the expected impacts of those measures on the stock or the fishery. This could provide greater stability in measures compared to the current process (which has the potential for annual changes) as the intent would be to change measures when updated stock assessment information is available and not overly react to one additional year of MRIP data in the interim year. The next two-year cycle would start with the 2023 management track assessments for all four species for setting measures for 2024-2025. In 2025, updated management track assessments would be used to set measures for 2026-2027.

Why Other Framework/Addenda Options Are Not Recommended

Council staff do not recommend implementation of the Percent Change, Fishery Score, Biological Reference Point, or Biomass Based Matrix Options (i.e., Options B-E in Section 3.1 of the Draft Addenda) as they reduce the flexibility mangers currently have to set measures to prevent overfishing. In addition, the process for setting measures under Options C-E (the binned approaches) would be much more complex than the Council staff recommendation. For example, for a species managed with three regions with identical measures in each state in a region, Option C would require 16 sets of measures, Option D would require 52 sets of measures, and Option E would require 24 sets of measures. The staff recommendation would require four sets of measures (one for each region and one for federal waters). Also, many details are lacking regarding the process for setting measures under these options. These details would need to be determined through specifications if one of these options is selected in June for implementation.

As previously stated, measures recommended by the Council must prevent recreational ACL overages in order to prevent overfishing and comply with the law. This can require frequent changes in measures as the ACL and RHL can vary annually. As previously stated, Options B-E will not change the process for setting ACLs and they will not change the requirement to prevent ACL overages. Therefore, Options B-E could require frequent changes in measures unless managers are willing to set more restrictive measures to allow for stability while preventing ACL and RHL overages.

Recent Improvements to the Current Process

The Monitoring Committee, Technical Committee, Council, and species Management Boards have made several improvements to the process for setting recreational measures in recent years, including the examples listed below. These changes have been incorporated into the current process and will continue to be used under the Council staff recommendation.

- The Northeast Regional Coordination Council adopted a new stock assessment process which began in 2020. This new process includes biennial management track stock assessments for summer flounder, scup, black sea bass, and bluefish. This provides managers with more frequent updates to stock status information than in previous years.
- The Council modified their risk policy such that a higher risk of overfishing (and therefore higher catch and landings limits) is now allowed under all biomass levels. For example, the ABC for stocks above 150% of their target level may now have a maximum 49% probability of overfishing. Previously, the ABCs were limited to a maximum 40% probability of overfishing. This change impacted the ABCs for 2021 and beyond.
- The Monitoring and Technical Committees have moved towards greater use of multi-year averages and coastwide projections of harvest estimates when predicting future harvest. Previously, for summer flounder, scup, and black sea bass, these predictions largely relied on projected harvest at the state level for the current year only.
- When setting measures for 2017, 2018, and 2022, the Technical Committee used statistical methods to identify and adjust outlier harvest estimates for black sea bass.
- The Monitoring Committee modified the methodology for calculating expected dead discards for black sea bass to derive the sector specific landings limits from the catch limits. This change was first implemented with the 2021 specifications and was intended to better predict discards than the previous method.
- In some recent years, the Monitoring Committee has used considerations related to percent standard error and confidence intervals to justify leaving measures unchanged when small RHL overages or underages were otherwise expected.

Future Management Actions Which May Further Improve the Process

Two additional ongoing efforts through the Recreational Reform Initiative may result in further changes or improvements to the process for setting recreational measures in coming years.

In October 2020, the Council and Policy Board agreed to develop a Technical Guidance Document to address the following topics: 1) Identifying and smoothing MRIP outlier estimates, 2) Use of preliminary current year MRIP data, and 3) Guidelines for maintaining status quo measures. Progress made through the Harvest Control Rule Framework/Addenda and through the Monitoring and Technical Committee's efforts to improve the measures setting process in recent years (as described above) will inform development of this Technical Guidance Document. It may be possible to develop an initial draft of this document by December 2022.

In October 2020, the Council and Policy Board also initiated an amendment to consider the following two topics: 1) Options for managing for-hire recreational fisheries separately from other recreational fishing modes (referred to as sector separation), and 2) Options related to recreational catch accounting (e.g., private angler reporting, enhanced vessel trip report requirements, tournament reporting, and tags for harvested fish). Further progress has not been made due to other priorities; however, it may be possible for the Council and Policy Board to consider approval of a scoping document for this amendment in December 2022.

If the Council and Policy Board wish to further develop certain topics considered through the Harvest Control Rule Framework/Addenda (as suggested by some public comments, SSC input, and recommendations from some advisors), Council staff recommend doing so through a separate future action. This will allow for modifications beyond the range of options currently considered in the framework/addenda. For example, future management actions could consider the potential FMP changes listed below. This is not intended to be an exhaustive list.

- Improvements to the Council and Board approach to setting state and federal measures.
- Improvements to the conservation equivalency process for waiving federal waters measures.
- Modifying the accountability measures for both the recreational and commercial sectors to include consideration of fishing mortality compared to the fishing mortality threshold (F_{MSY}) when determining if management action is needed in response to ACL overages (as considered under sub-options 3.1.C-2, 3.1.E-2, and 3.4.B in the framework/addenda).Defining threshold levels of stock status indicators (e.g., biomass compared to the target level, fishing mortality, recruitment, biomass trend) as triggers for changes in measures (e.g., as considered under the Percent Change, Fishery Score, Biological Reference Point, and Biomass Based Matrix Options, but with modifications to address concerns related to the complexity, feasibility, and legality of those options).
- Changes to the timing of management measure recommendations to allow changes in measures to be implemented earlier in the year.

Conclusion

As described above, the Council staff recommendation for final action on the Recreational Harvest Control Rule Framework/Addenda builds off previous and ongoing improvements to the measures setting process and provides mangers the flexibility to set measures to prevent overfishing while adapting to new information and allowing for continued improvements in the process. This recommendation will not solve all challenges with recreational fisheries management; however, the Council and Board have committed to consideration of further improvements and changes to the system in upcoming years.

Implications of Recreational Harvest Control Rules on ABC Specification

Submitted by
Mid-Atlantic Fishery Management Council, Scientific and Statistical Committee
SSC HCR Sub-Committee: T. Miller (chair), L. Anderson, C. Jones, P. Rago, B. Rothschild, A. Sharov

May 19, 2022

In response to the Council Motion

Introduction

The Mid-Atlantic Fishery Management Council (MAFMC) and the Atlantic States Marine Fisheries Commission (ASMFC) jointly manage several important fish species in the Mid-Atlantic region. A combination of biological reference points that specify maximum sustainable catch levels, and harvest control rules that specify the actual catch quota based on the current stock biomass is used to manage these species. Within the Council process, the MAFMC Statistical and Scientific Committee (SSC) is mandated to consider sources of scientific uncertainty to specify an acceptable biological catch (ABC) by applying the Council's risk policy. The Council's risk policy approach is a harvest control rule because it results in a catch, the ABC, specified as an amount in weight that varies according to stock biomass. Subsequently, Council and Commission staff, supported by Management Committees, develop catch quotas reflecting predetermined allocation decisions for the commercial (annual catch target, ACT) and recreational sectors (recreational harvest limit, RHL). In all cases, the combined ACT, RHL and dead discards must be equal to or less than the ABC.

In fulfilling their joint responsibility, the MAFMC and the ASMFC recently considered a number of proposed approaches to managing four key recreationally important species: Black Sea Bass, Bluefish, Scup, and Summer Flounder. The approaches proposed in the Addendum / Framework seek to prevent overfishing, be reflective of stock status, appropriately account for uncertainty in the recreational data, take into consideration angler preferences, and provide an appropriate level of stability and predictability in changes from year to year. The proposed Addendum / Framework presents five options (including one of no action or *status quo*) for how recreational harvest levels could be specified. In discussing the proposed approaches, a joint resolution was passed that sought input from the SSC to help Council and Commission members understand how the proposed approaches would affect catch levels before a final vote was taken. Specifically, the Council and Commission adopted the following motion:

> *"Request that the SSC provide a qualitative evaluation, in time for final action at the June 2022 Council/Policy Board meeting, regarding the potential effect of each of the five primary alternatives in the Harvest Control Rule Addendum/Framework on the SSC's assessment and application of risk and uncertainty in determining ABCs. The intent is to provide the Council and Policy Board with information to consider the tradeoffs among*

the different alternatives with respect to the relative risk of overfishing, increasing uncertainty, fishery stability, and the likelihood of reaching/remaining at BMSY for each approach at different biomass levels (e.g., for 1⁄2 BMSY < B < BMSY, the relative risk among alternatives is (highest to lowest) E > C > B > A>D)."

In response to this motion, the SSC created an *ad hoc* sub-committee comprising Drs. Lee Anderson, Cynthia Jones, Thomas Miller (chair), Paul Rago, Brian Rothschild, and Alexei Sharov. To fulfill the Council / Commission request, the sub-committee held three webinars (3/25, 4/13, 4/29). The webinars were public meetings. At each meeting, the sub-committee invited questions and comments from Council and Commission members and other stakeholders. The sub-committee extends its gratitude to Brandon Muffley and Julia Beatty (MAFMC staff) who supported the sub-committee by organizing meetings, providing relevant data, and answering queries from members of the sub-committee.

The sub-committee prepared this report through shared authorship and editing. The sub-committee's report was presented to the entire MAFMC SSC at their May 10th, 2022 meeting. Responses from the entire SSC were incorporated into the final report, and as such, this report represents the consensus view of the SSC.

The report is structured to address four key questions:

1. What is the impact of the proposed Addendum / Framework on the SSC's assessment and application of risk and uncertainty in determining ABCs?
2. Does the proposed Addendum / Framework represent a Harvest Control Rule?
3. What are some of the implications of the proposed Addendum / Framework?
4. What are the benefits and challenges of each proposed action within the proposed Addendum / Framework?

We answer each question in subsequent sections of this report.

(1) What is the impact of the proposed Addendum / Framework on the SSC's assessment and application of risk and uncertainty in determining ABCs?

The SSC operates under the Magnuson Stevens Fishery Conservation and Management Reauthorization Act (2007, as amended). A central goal of the MSA is to prevent overfishing. Achieving this goal requires concerted effort among all participants in fisheries management. Currently, responsibility for the management of that risk is partitioned among several groups. Stock assessment scientists estimate the overfishing limit. The Council establishes a risk policy that establishes probabilities of overfishing that are acceptable as a function of stock status. The SSC considers the nature and magnitude of scientific uncertainty and then combines this estimate and the Council's risk policy to set the ABC. Finally, management boards consider the nature and pattern of management uncertainty and set annual catch limits, which may be equal to or lower than the ABC. Each element of this management system has a role to play in ensuring fisheries operate with an acceptable risk of overfishing. Meeting goals for risk of overfishing is not the responsibility of any single group, but rather relies on the coordinated actions of all participants.

The SSC is legislatively mandated to provide the Council an ABC. An accepted stock assessment exists for each of the four species covered by the proposed Addendum / Framework that provides an estimate of the catch associated with the overfishing limit (OFL). The SSC uses a structured process that identifies key sources and magnitudes of scientific uncertainty and the Council's risk policy, termed as the p* approach, to determine the ABC. The MAFMC SSC's structured process involves consideration of scientific uncertainty in nine categories (Table 1).

Table 1. Categories of scientific uncertainty used by the SSC in developing ABCs. The principal considerations are provided for each decision criteria, but the list of considerations is not comprehensive.

Decision criteria	Considerations
Data quality	Accuracy and precision of catch Availability of age/length data External data for key parameters (e.g., M)
Model appropriateness and identification	Comparison with alternative models Match with life history
Retrospective analysis	Model misspecification, often due to undetected temporal trend
Comparison with empirical measures	External measure of population scale
Ecosystem factors	Stationarity of model parameters
Trends in recruitment	Evaluation of stanzas and trends
Prediction error	Validation of predictions with subsequent estimates
Assessment accuracy	Function of historical exploitation patterns
Simulation / MSE	Measures of robustness of assessment

The proposed Addendum / Framework is triggered by determination of the ABC, and as such, the actual ACTs and RHLs are determined only after the ABC has been specified. Consequently, the proposed Addendum / Framework does not affect the structured process the SSC uses to specify the ABC. ***Under the current SSC ABC process, neither the no action option, nor any of the alternative approaches proposed in the Addendum / Framework directly affect the SSC's perception of scientific uncertainty and hence cannot directly affect the ABC the SSC develops.*** However, the SSC notes that if implementation of any of the alternatives described in the Addendum / Framework subsequently degrades or improves the quality of assessment data, these impacts would be addressed in future specifications through assessment of the accuracy and precision of the catch data and potentially through assessment of prediction error.

(2) Does the proposed Addendum / Framework represent a Harvest Control Rule?

Harvest control rules are quantitative relationships that specify how management endpoints, such as catch, should vary with stock biomass to achieve management objectives. One advantage of such control rules is that their performance can be evaluation through management strategy evaluation. As an example, the Council's risk policy is a harvest control rule because it combines the estimate of the catch at the overfishing level and the acceptable probability of overfishing to provide a quantitative expression for how catch should vary with stock biomass. The performance of the Council's risk policy has been validated in simulation testing. In contrast, the alternatives described in the Addendum / Framework for the recreational fishery do not specify harvest or other management endpoints. Instead, the alternatives provide a suite of decision triggers that will be used to determine whether the current regulations that determine recreational harvest, principally specifications of season length, size limits, and bag limits, should be maintained, liberalized, or reduced. The options contained in the Addendum / Framework constitute a decision framework for establishing whether action is needed, but as yet they do not specify action. *Neither the no action option, nor any of the alternatives described in the Addendum / Framework represent harvest control rules. The alternatives define the direction of adjustments to catch based on recent landings and population status, but fall short of specifying how season length, size limits, and bag limits should be altered, and thus cannot be considered harvest control rules. The proposed alternatives described in the Addendum / Framework are triggers for action only. Specification of how regulations on season length, size limits, and bag limits or other management endpoints would change is missing. Until such details are provided, the performance of the proposed alternatives cannot be determined.*

The sub-committee felt that the proposed alternatives failed to address explicitly the complexity of the problem of specifying a vector of how regulations around season, size, and bag limits would change. The expected resultant harvest depends upon the relative contributions of the different specifications as well as a host of biological and socioeconomic parameters. The current ABC process that uses the Council's risk policy involves control of a single variable, the ABC. However, there are at least three specifications that have to be set simultaneously for the proposed alternatives to be implemented. The sub-committee notes that this increases substantially the complexity and the difficulty of the challenge which the sub-committee believes should be explicitly stated so Council and Commission members have a solid grip on the decision they are being asked to make.

Marine recreational fisheries present significant management challenges because the relationships between regulatory decisions regarding season length, size limits, and bag limits and the realized catch are not simple. Figure 1 presents plots of the relationships between catch limits and landings for the commercial and recreational sectors for the four species included in the Addendum / Framework. As indicated by the solid blue lines in Figure 1, there are significant relationships between catch limits and landings in the commercial sector for three of the four species. In contrast, only one of the four relationships between catch limit and landings is significant in the recreational sector. The dashed line in each panel is the 1:1 line expected if landings were exactly equal to the catch limit. By comparing data to this expected line, only the fisheries for Summer Flounder appear to be managed to be near their target catches in both sectors. Inspection of the four panels suggests greater variation around the 1:1 line for the recreational sector in three of the four species. Indeed these data could be taken as motivating a need for improved harvest controls in the recreational sector, or a broader acceptance that recreational fisheries cannot achieve the same level of control as that achieved through in-season catch monitoring in the commercial sector. These patterns suggest that even if policies are well designed conceptually, compliance with the policy may lead to substantial differences between specified and realized harvests. This potential is not discussed in the Addendum / Framework.

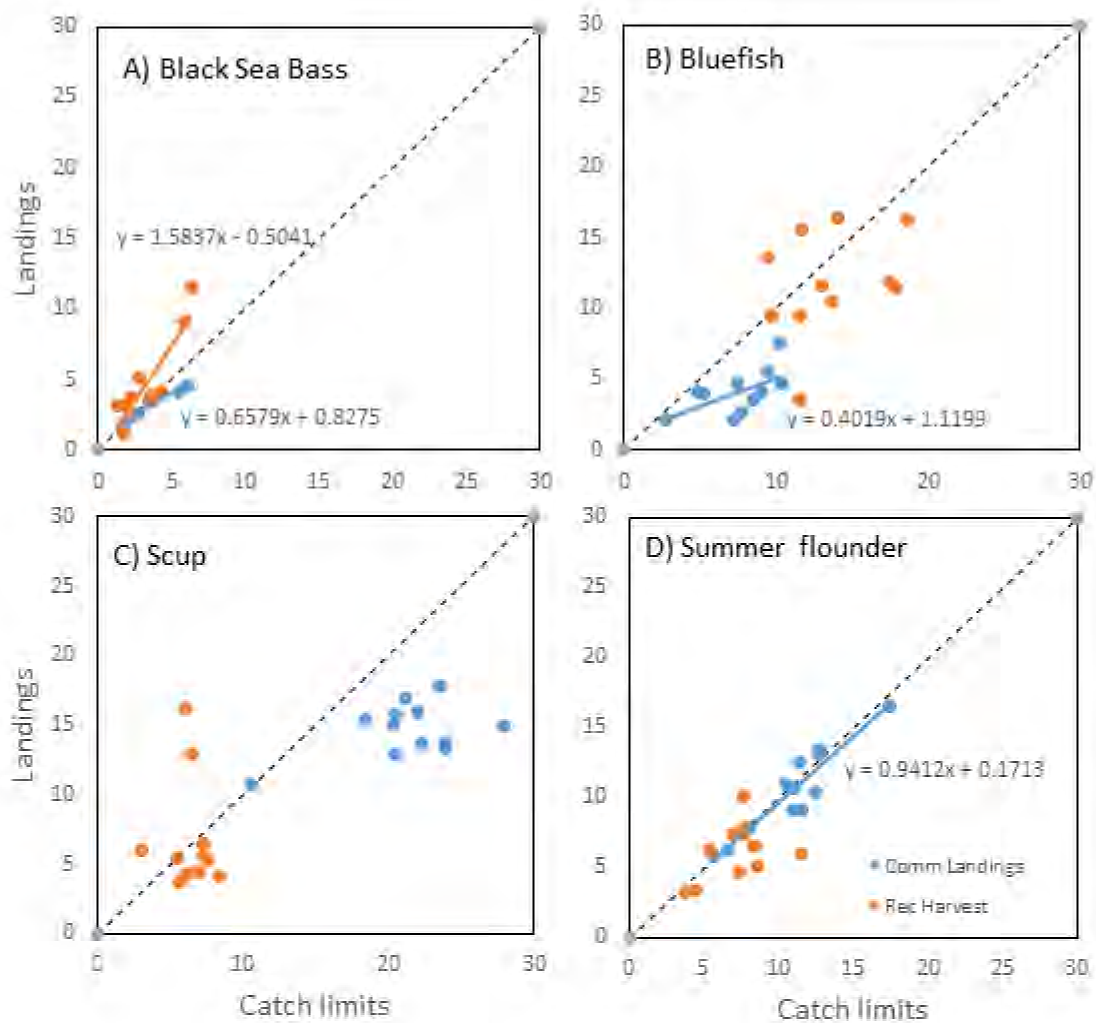


Figure 1. Comparisons of catch limit and subsequent landings for the commercial (blue) and recreational sectors (orange) for A) Black Sea Bass, B) Bluefish, C) Scup and D) Summer Flounder. All figures are plotted on the same scale. Regression lines are plotted for significant (P < 0.05) linear relationships

between catch limit and subsequent landings by sector. Regression relationships are given for significant regressions. The expected 1:1 line is shown as a dashed line in each figure.

There is a significant impact of angler behavior on the relationships shown in Figure 1. Angler behavior can be affected by many factors, causing deviations from expected relationships in both directions. High fuel prices can cause angler participation to decline, leading to lower than expected catches. Reports of good catches in traditional and social media can produce positive feedback that can lead to higher than expected catches. As a result, we understand why the workgroup who produced the alternatives described in the Addendum / Framework consciously chose not to produce recreational harvest control rules - and rather focused on directional rules that indicated how catches should change relative to a number of easily measurable stock characteristics. However, Council and Commission members should recognize that the proposed Addendum / Framework does not solve the problem of marine recreational fisheries management in the Mid-Atlantic, despite the apparent quantitative and sophisticated alternatives brought forward. The need for an approach to understanding how angler behavior and motivation affects angler avidity and ultimately catch remains. This is a significant social and natural science challenge.

(3) What are some of the implications of the proposed Addendum / Framework?

The proposed alternatives in the Addendum / Framework use a number of biological, stock and fisheries characteristics of the target species to define a process aimed at catch adjustment. Five alternatives are presented (Table 2)

Table 2. Summary of the alternatives proposed in the Addendum / Framework.

Alternative	Approach
Status Quo	Compares MRIP to RHL, and recommends change in regulations based on expert judgment.
% Change	Maintains a MRIP vs RHL comparison. Bands or bins of % change defined based on magnitude of difference between MRIP and RHL as well as B/B_{MSY} ratio. 15 different categories of action suggested.
Fishery Score	Applies multi-criteria decision making to fishery management. Action is based on the weighted average of multiple criteria, with weights based on "importance". Result is a continuous "aggregated" response variable, which is then binned into four categories of action.
Biological Reference Points	Use B/B_{MSY} and F/F_{MSY} to define bands or bins based on multiples of the reference point. Incorporates secondary measures, such as trends in recruitment or biomass to refine action. Current proposal has 34 different categories of action.
Biomass-based Matrix	Combines information on trends in biomass and stock status (B/B_{MSY}) to define 7 different categories of action.

We identify the following generic concerns with the proposed alternatives that also are inherent to the *status quo* approach.

1) Repeated use of fishery / stock status at multiple points in the decision process increases variability of catches.

   A central goal of the proposed Addendum / Framework is to reduce reliance on MRIP as the sole index of whether regulations need to be altered. In achieving this goal the Addendum / Framework seeks to use readily available information such as B/B_{MSY} and F/F_{MSY}. Estimated biomass relative to its reference point is used within the Council risk policy and in setting ABCs. The SSC notes that duplicated use of these indices will likely increase variability in fishery performance rather than dampen variability. As an example, if B/B_{MSY} <1, the Council's risk policy will lead to more precaution in setting the risk of overfishing. Under the Addendum / Framework, the B/B_{MSY} value will likely lead to additional precaution in recreational catch limits. This leads to precaution on top of precaution based on the value of a single index. A similar situation arises if B/B_{MSY}>1 which would lead to an increased level of risk in ABC determination based on the Council's risk policy and an increased level in risk associated with catch in the recreational fishery. This situation leads to a positive feedback in risk.

   The SSC encourages the workgroup developing the Addendum / Framework to find ways in which such types of feedback do not become a structural element of decision making.

2) Indirect effects on ABCs

   Recently, the Council has requested the SSC to provide multiyear, often three-year, specifications of ABCs. In most cases, the SSC assumes that the ABC will be fully caught in the first year to estimate stock biomass in the second year. This stock biomass is used in the Council's risk policy to calculate the ABC for the second year. The SSC then assumes that the year-2 ABC will be fully caught to estimate stock biomass in year-3, applying once again the Council's risk policy to estimate the year-3 ABC. In most cases, the SSC has not had to consider circumstances in which the ABC is exceeded.

   However, overages in recreational Black Sea Bass catches have been significant. To account for this the SSC has provided projections in which it assumes the ABC will be exceeded, thereby further reducing stock biomass, leading to a reduction in subsequent ABCs. Any policy that leads to harvests that are substantially above the quota will likely lead to a similar approach from the SSC of reducing ABCs in multi-year projections.

   There are structural issues in several of the alternatives related to time lags in the availability and uncertainty in the level of recreational catches, and related binning of responses, that may lead to increased uncertainty in whether ABCs may be exceeded, which could lead to the SSC setting lower ABCs than it otherwise would in multi-year specifications.

We note that biennial stock assessments are expected for each of the four species involved in the proposed Addendum / Framework that would be expected to ameliorate this challenge, as 3-year ABC will likely be superseded by new assessment-derived ABCs

3) The Council risk policy assumes a continuous relationship between stock status and fishery responses, whereas many of the alternatives in the proposed Addendum / Framework presume a discrete, binned approach that may not be compatible with the risk policy.

   Fisheries management is an example of process control, and there is an extensive body of literature that considers the response characteristics of both sensors (inputs - in fisheries, the inputs are catches, recruitments and stock biomasses) and process changes (outputs - in fisheries, the outputs are catch limits). For example, a room thermostat is a simple example of process control. Appropriate matching of the sensitivity of the sensors (accuracy of the thermostat), the size of the signal that triggers a response, and the latency in the response (size of the room, capacity of the HVAC system) are all factors that determine the degree to which the process is well controlled. For HVAC systems, thermostats, HVAC capacity both have to be specified appropriately to operate efficiently and effectively to obtain a comfortable room.

   The sub-committee explored how a fishery operates as a process control, considering variability in recruitment (inputs), and control rules of the fishery management process on the performance of the fishery (Appendix A - Rago, MS). Preliminary conclusions from this simulation are that the impacts of binning and random recruitment lead to a marked increase in the likelihood that OFLs would be exceeded. Moreover, populations were not rebuilt as frequently as occurred with population-specific optimal fishing mortality rates. Perhaps more importantly, a greater fraction of populations that were previously above B_{MSY} fell below ½ B_{MSY} when controlled with a binned HCR.

   The subcommittee does not conclude from these simulations that binned approaches should be abandoned; rather we wish Council and Commission members to be aware of the uncertainty that may be introduced by the mismatch between the harvest control rule (Council risk policy) and the binned approach.

4) Impact of time lags in estimates of recreational catch on management decisions

   MRIP estimates are most precise at the annual level for a whole stock. Real-time estimates of recreational catch can be problematic for many species (NASEM 2017, 2021) because of the reduced precision of small-area estimation.

5) Angler behavior.

   As noted previously, accurately predicting how angler behavior will change under a set of regulations is a general challenge in marine recreational fishery management. The relationships between recreational catches and specific regulatory tools (i.e., season, size, and bag limits) are highly uncertain. This challenge is exacerbated by trying to determine such relationships when regulations change frequently, potentially leading to lower compliance. The extent to which anglers accept, believe in, and follow regulations is a complication. The committee discussed whether the complexity of some of the proposed alternatives might lead to reduced compliance because of the challenge of communicating some of the specific binned options that result in multiple contingent outcomes.

6) Limited control in one sector leads to "borrowing" of quota from other sectors, and given the role of historical data in determining allocation, this may lead to unintended management-driven shifts in allocation.

The joint Council / Commission management process includes policy decisions about the allocation of catch among the principal sectors involved in the fishery. Allocation decisions are always the most controversial aspect of fishery management because they involve statements of economic and social value, about which simple dollar values are an insufficient foundation for decision-making.

The sub-committee discussed the impacts of the performance of marine recreational fishery management on the allocation. Ideally, levels of under- and overharvesting should be small and approximately equal in both sectors (e.g., see Figure 1D). Under this scenario, realized catches will lead to patterns of allocation that are close to those adopted in policy. In contrast, if constraining one sector is more challenging, and leads to larger deviations from the specified catch targets, the patterns of allocation may be substantially different to those specified in the policy (e.g., see Figure 1A). This can lead to effective "borrowing" of quota from the more controlled sector, and thus to increased levels of contention in the fishery management process. The sub-committee recommends this aspect be evaluated in considering the adoption of the proposed Addendum / Framework.

(4) What are the benefits and challenges of each proposed action within the proposed Addendum / Framework?

The sub-committee provides its consensus summary of the benefits and challenges associated with each of the five options in Table 3

Alternative	Benefits	Challenges
Status Quo	• Immediate corrective action to avoid exceeding RHL and overall overfishing of the stock. • Continuous response	• Expectation of recreational catch in the upcoming year being equal to the one observed in one or two most recent years or their average is not supported by the experience. • Angler groups and recreational anglers have expressed frustration with the current methods of setting

		harvest quotas.
% Change	• Uses data readily available already. Broad categories of B/B_{MSY}. • Easily understandable by stakeholders/anglers. • This and other new options are expected to provide more stability by employing a buffer concept, where an action is triggered only if the recent catch exceeds threshold values defined by specific alternatives.	• May suggest finer control of recreational catches than has been achieved historically • Duplicating use of B/B_{MSY} at this level may lead to increased variability of catches. • Allows liberalization of rec.catch in some circumstances when $B/B_{MSY} < 1$ • If stock size is increasing and effort in year t+1 is the same as in year t, then the expected harvest will increase in year t+1. When you boost effort by 10, 20 or 40% you are likely to overshoot the RHL because you are increasing E(t+1) while B(t+1) is also increasing. • Competition with commercial fleets underscores this challenge. Increasing E(t+1) inappropriately (e.g., + 40%) without a commensurate decrease in quota allocation to the commercial sector will result in increased probability of overfishing. • Potential to induce instability - constantly under or over-shooting targets. The degree to which this occurs is related to the magnitude of the restrictions or liberalizations
Fishery Score	• Combines multiple sources of information - both data and performance. • Fishery score approach is an example of a simple additive weighting multi-attribute decision-making. Selection of weights (expert opinion, optimal, eigenvalue weights, fuzzy) is important and is unspecified.	• We are unaware of examples of where a scoring system has been shown to control a population trajectory. • Mapping multiple factors to one scalar may preclude necessary actions or forgo catch. • Not clear if information is available to inform weights. Identifying *a priori* relative importance of

		various factors and appropriate selection of weights is difficult. Empirical adjustment based on multiple years of observations will be required for tuning, ● Strong correlation that is expected in B/B_{MSY} and F/F_{MSY} may lead to strong influence of this single measure. Such collinearity breaches the assumption of preferential independence. ● We are unclear whether all values of Fishery Score are likely/possible when this appears not to be the case from consideration of the input value distributions (e.g., distribution of B/B_{MSY} that is under management control).
Biological Reference Points	● Information readily available (B/B_{MSY} & F/F_{MSY}) as primary determinants.	● High number of categories might suggest a level of precision in data and management systems that appears unlikely. ● Within each bin of stock size and overfishing condition, regulations will be adjusted based on trends in biomass and recruitment. Apart from knowledge about year classes, how will such trends be evaluated? How many years needed to identify a trend? ● Does the averaging approach capture strong year classes? ● The stock assessment process used to derive the ABC already includes actions suggested in this Option. Biomass status determination separates the top 3 rows of Table 3 from the bottom row. F status determination separates the two columns. The top 3 rows in Table

		3 are defined by the Council's Risk Policy. The projection process, imperfect as it is, accounts for the expected effects of historical recruitment and variation in future recruitment to develop an expected biomass trajectory. ● This option compares recent harvests performance to determine whether regulation should be liberalized or restricted. The decision variable should instead be a comparison of recent F due to recreational harvest with target F. This is particularly important in situations where a subsequent stock assessment revealed that biomass was underestimated. Under these conditions, the poor performance was in part due to an increase in abundance rather than an increase in F. Regulations are designed to control fishing mortality; decisions to adjust regulations should therefore rely on comparison between target and realized Fs.
Biomass-based Matrix	● Uses existing data (B trend and B/B_{MSY})	● Not clear how this leads to stability ● Does not explicitly consider overfishing as a basis for action. Does this violate MSA?

Conclusions and Recommendations

We conclude that the proposed Addendum / Framework options are unlikely, in the short term, to affect the determination of the degree of uncertainty used in the current SSC process of ABC specification. The current process for specifying ABC is based on a structured decision making process that results in a preselected level of variability (CV) applied to the most recent estimates of OFL and stock biomass through the Council's risk policy (an HCR). The ABC specification process is not directly influenced by the level of the subsequent catches in any sector.

The sub-committee also notes that the performance of the proposed alternatives in the Addendum / Framework will likely be limited in scope temporarily if biennial stock assessments continue to be available for the four target species. At this frequency of stock assessment, we expect adjustments of OFLs through the stock assessment process, and subsequent adjustments in ABCs through the SSC process, will likely limit the impacts of poor performance by any proposed specification process.

At the same time, the sub-committee notes that the actual efficacy of the proposed alternatives in the Addendum / Framework is unknown. This uncertainty comes from two sources. First, the actual measures that will be taken in response to any of the triggers identified in the Addendum / Framework are not specified. Additional detail is required to turn the options put forward in the Addendum / Framework into control rules - there need to be links to specific management end points, beyond the focus on directionality that characterize the options currently. Until such specificity is provided, quantitative evaluation of the performance of the options is not possible. Second, performance of the discontinuous nature of the options proposed in the Addendum / Framework has not been proven effective in other fisheries nor formally evaluated, to the knowledge of the sub-committee. Preliminary modeling conducted by the sub-committee to evaluate the impacts of the binning of population states, reliance on various metrics of stock condition and recent catch history, and implications of recruitment variability could result in an increased risk of overfishing and becoming overfished. This suggests that the appearance of precision in the process that leads to regulatory specifications does not necessarily translate into precision in catch performance and compliance. The sub-committee expresses the concern that some of the overly complex, contingent decision-making processes included in the proposed alternatives do not reflect the actual level of control likely achieved in marine recreational fishery management.

Finally, the sub-committee cautions that stability of regulations is not the same as stability of catch. If regulations are properly set to achieve a target F, then catches and CPUE will be expected to fluctuate with stock biomass. This is an inherent feature of exploited populations. It is entirely possible to set a constant catch policy. However, harvest limits under such a constant catch policy would likely have to be substantially lower than the ABC (and its attendant RHL) to account for interannual variability in population processes and angler avidity.

Appendix A

Potential Effects of HCR Methods on Overfished Status

Paul Rago

April 10, 2022

The Harvest Control Rule Amendment consists of five options for setting recreational harvest controls. Four of these methods rely on quantitative scoring to assign population status into multiple categories. Example categories include overfished vs not overfished, overfishing occurring vs overfishing not occurring, and so forth. Cut points of the categories are used to create up to 8 different bins of population status. Within each bin, a homogeneous set of recreational effort measures (e.g., bag limit, size limit, season length) is assigned to control fishing mortality. In theory, the measures would exert a constant fishing mortality on the population while it was in a given population state (i.e., bin). When the population changes state, another set of HCRs would be applied. For example, if the population went from not overfished to overfished, allowable effort would be reduced to help restore the population to the “not overfished” bin.

The HCR policies could have important implications for controlling the population and the variability of catch. The simulation study herein examines those possible effects for a population with a constant average recruitment, independent of stock size. This is the assumption used in nearly all of the stock assessments in the Northeast. The hypothesis implies a steepness of 1.0. The basis of this pattern has been the inability to define a parametric stock recruitment relationship in most assessments.

Model

Let B_t represent the stock biomass at time t, Z represent the total mortality on the stock (Z= fishing mortality F + natural mortality M) and R_t equal the recruitment to the stock biomass at time t.

The basic dynamics are thus governed by

$$\boldsymbol{B}_{t+1} = B_t e^{-Z} + R_t \qquad (1)$$

Recursive application of Eq. 1 yields

$$\boldsymbol{B}_{t+1} = B_t e^{-Z} + R_t$$

$$\boldsymbol{B}_{t+2} = B_{t+1} e^{-Z} + R_{t+1}$$

$$\boldsymbol{B}_{t+3} = B_{t+2} e^{-Z} + R_{t+2}$$

...

$$\boldsymbol{B}_{t+T} = B_{T-1} e^{-Z} + R_{T-1} \qquad (2)$$

The limit of this process as T approaches infinity converges to

$$B_\infty = \frac{R}{1-e^{-Z}} \qquad (3)$$

In the absence of fishing, the maximum population size is defined as

$$B_{MAX} = \frac{R}{1-e^{-M}} \qquad (4)$$

If we apply the usual convention that B_{MSY}=1/2 B_{max}, a little algebra will show that F_{MSY} is defined as

$$F_{MSY} = -ln(2e^{-M} - 1) - M \qquad (5)$$

Applying the catch equation give MSY as

$$MSY = \frac{F_{MSY}}{F_{MSY}+M}\left(1 - e^{-(F_{MSY}+M}\right)B_{MSY} \qquad (6)$$

The behavior of a population governed by Eq. 1 is similar to a population governed by a logistic equation, although the density dependence is not explicit. Note also that the above definition of MSY is determined by the <u>assumption</u> that B_{MSY} is ½ B_{MAX}[1].

Harvest control rules, in general terms, are designed to achieve some objective, subject to constraints. If a population is overfished, control rules should allow the population to increase to B_{MSY} over some defined time period T. If a population is well above B_{MAX}, the objective is to allow as much fishing as possible subject to a constraint that F_t<F_{MSY}. In all other cases, a common objective is to move the population toward B_{MSY}. For the sake of this analysis, I assumed that the objective of the HCR was to achieve B_{MS} in some time period T subject to the constraint that Ft<F_{MSY}.

Under these conditions the optimal fishing mortality is defined as the fishing mortality rate necessary to move the population from its current state to B_{MSY} in a time horizon T. This can be written as two-point boundary value problem to find the solution to Eq 2 where B_{t+T}=B_{MSY}. Thus

$$\boldsymbol{B}_{t+1} = B_t e^{-F_{opt}-M} + R_t$$

$$\boldsymbol{B}_{t+2} = B_{t+1} e^{-F_{opt}-M} + R_{t+1}$$

$$\boldsymbol{B}_{t+3} = B_{t+2} e^{-F_{opt}-M} + R_{t+2}$$

...

[1] In a population truly governed by Eq. 1, the maximum sustainable yield would be to harvest the entire recruitment at each time period. No sense letting the biomass degrade in the B_t pool!

$$B_{MSY} = B_{t+T} = B_{T-1}e^{-F_{opt}-M} + R_{T-1} \qquad (7)$$

The optimal fishing mortality can be found numerically by setting finding Fopt such that B_{MSY}-B_{t+T}=0. Two special conditions apply. First, it may not be possible to achieve B_{MS} even when F=0. Second, Council policy and National Standards do not allow F to exceed F_{MSY}. Hence F_{opt} has a maximum value of F_{MSY}. Under condition 1 the F_{opt} is infeasible; under condition 2, the population will exceed B_{MSY} at the end of the horizon t+T. An important aspect of Eq. 7 is that the future dynamics are not affected by the current level of F. F_{opt} is a function of B_t, B_{t+T}, R and M only.

See Table 1 for a list of all model parameters.

Table 1. Summary of model parameters and derived quantities used in simulations.

Parameter	***Variable***	***Value***
Natural Mortality	M	0.2
Initial Biomass	B_0	300
Recruitment	R_t	100
Planning Horizon (years)	T	5
Range of Recruitment	R_{min}, R_{max}	50, 150
Derived Quantities		
Maximum Biomass	B_{MAX}	551.6
Biomass at MSY	B_{MSY}	275.8
Fishing Mortality for MSY	F_{MSY}	0.2503
Maximum Sustainable Yield	MSY	55.6
HCR Bins		
Biomass: Very High	>1.5 B_{MSY}	413.7
Biomass: High	[B_{MSY},1.5 B_{MSY})	[275.8, 413.7)
Biomass: Low	[0.5 B_{MSY}, B_{MSY})	[137.9, 275.8)
Biomass: Too Low	<0.5 B_{MSY}	<137.9

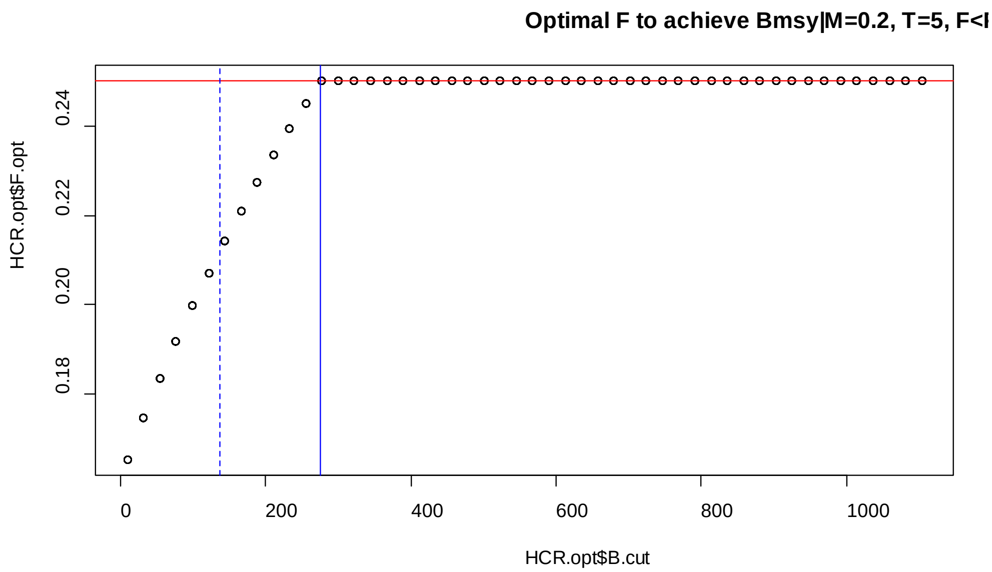


Figure 1. Optimal F to achieve B_{MSY} given initial biomass level Bt. See Eq. 7. Red line is F_{MSY}. Solid blue vertical line is B_{MSY}, dashed vertical line is ½ B_{MSY}.

As shown in Fig. 1 the optimal policy does not depend on whether fishing mortality is, or is not occurring at time t. However, the magnitude of change in F for a given population state (B_t, F_t) does depend on Ft (i.e., F_t-F_{opt}). To illustrate this further, consider the B_t, F_t phase plane used for Option D.

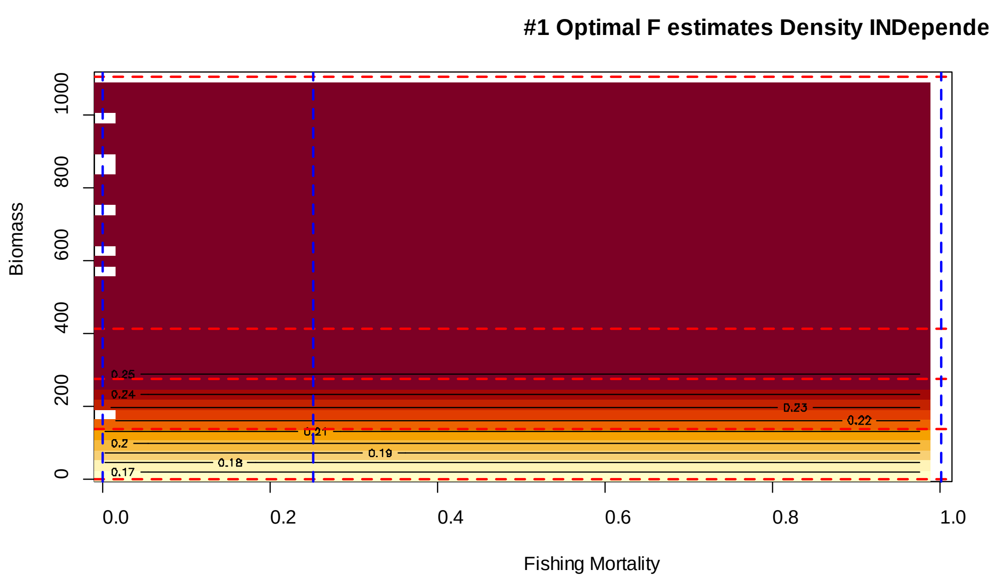


Figure 2. Optimal F response surface vs biomass and fishing mortality.

Effects of Binning

Equation 7 defines an optimal fishing mortality rate for every value of Bt. However, the HCR is based on the use of a common F strategy within bins of population states. These states include intervals of biomass, fishing mortality, biomass rates of change, a linear scoring approach, and expected differences between recent catch and RHL. One way of dealing with this binning is to use a measure of central tendency for all possible observations within the HCR category. For example, one could compute the average Fopt for all possible values of B_t in the interval $[B_{MSY}, B_{MAX}]$ or in the interval $[0.5\ B_{MSY}, B_{MSY}]$ etc. This process is illustrated in Fig. 3.

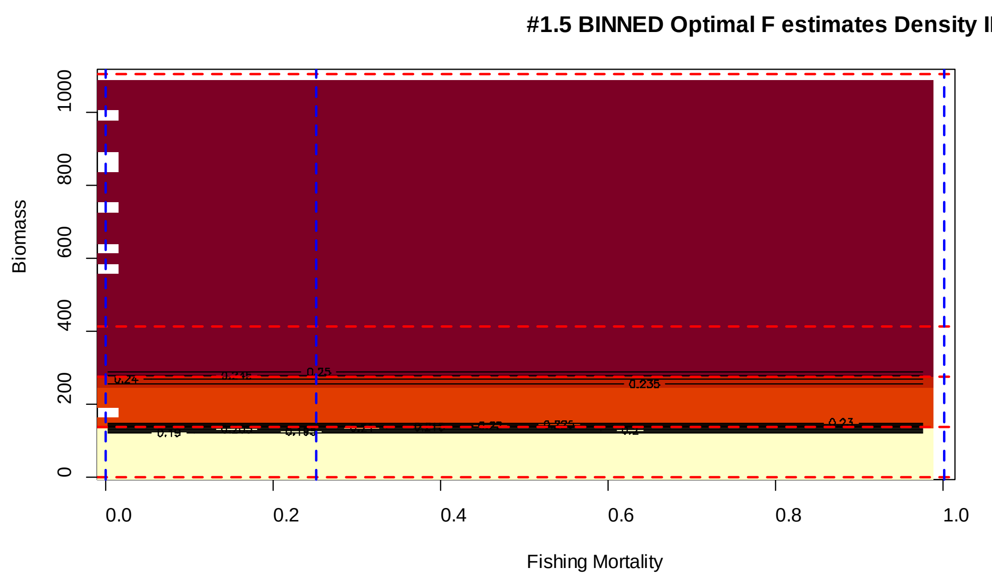


Figure 3. Binned optimal F values representing the average Fopt within each population state defined by the horizontal and vertical cut points. Lighter colors represent lower average fishing mortality rates.

Figure 3 illustrates that under a given population state, a common F would be applied. The use of averages of F_{opt} for each bin implies slightly different cumulative catches over the period T. Figure 4 shows the cumulative catches with unique F_{opt} values. Figure 5 shows the same response given average F_{opt} values within bins.

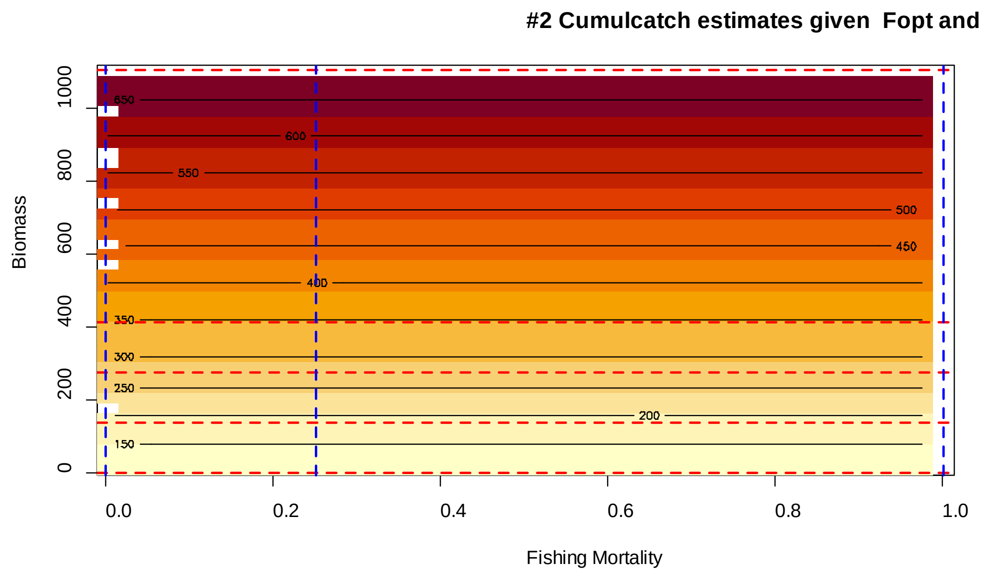


Figure 4. Response surface for cumulative catches over a T=5 yr period give F_{opt} for each level of initial biomass B_t and initial Fishing mortality F_t. See Fig. 2. Note that cumulative catch is unaffected by F_t.

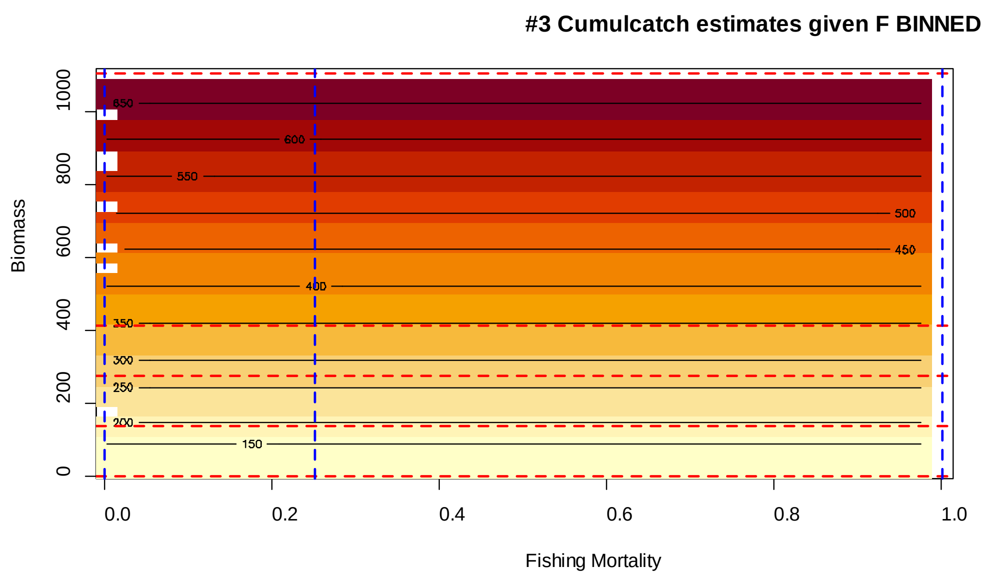
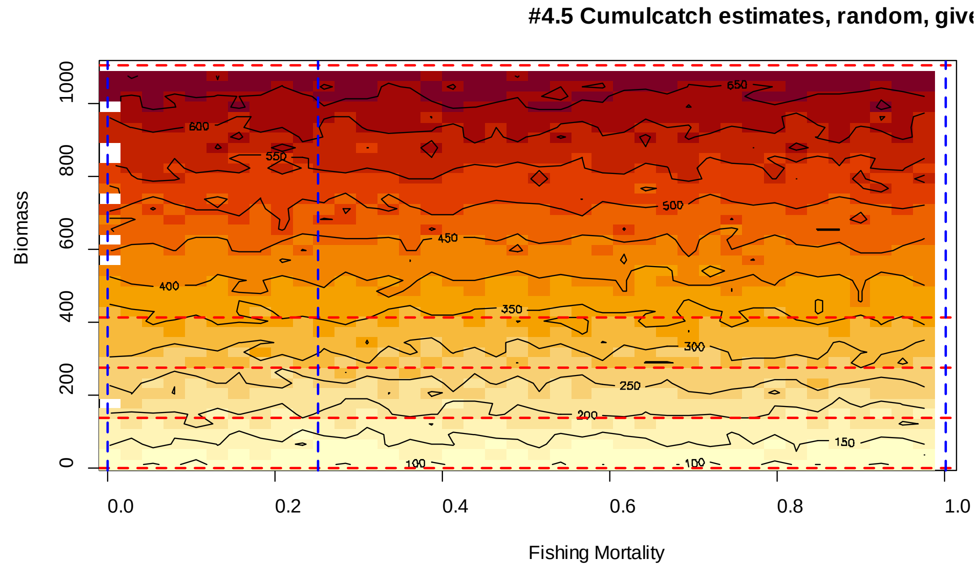


Figure 5. Response surface for cumulative catches over a T=5 yr period given BINNED F_t for category. See levels in Fig. 3. Note that cumulative catch is unaffected by F_t.

Effects of Random Recruitment and Binning

Results thus far have considered a deterministic model only. Random recruitment, combined with binned HCR might be expected to increase the variability of the catches. Recruitment was modeled as a uniform random number between R.min and R.max. See Table 1 for list of all model parameters.

First, consider the implications of random recruitment on cumulative catch (Fig. 6 top).



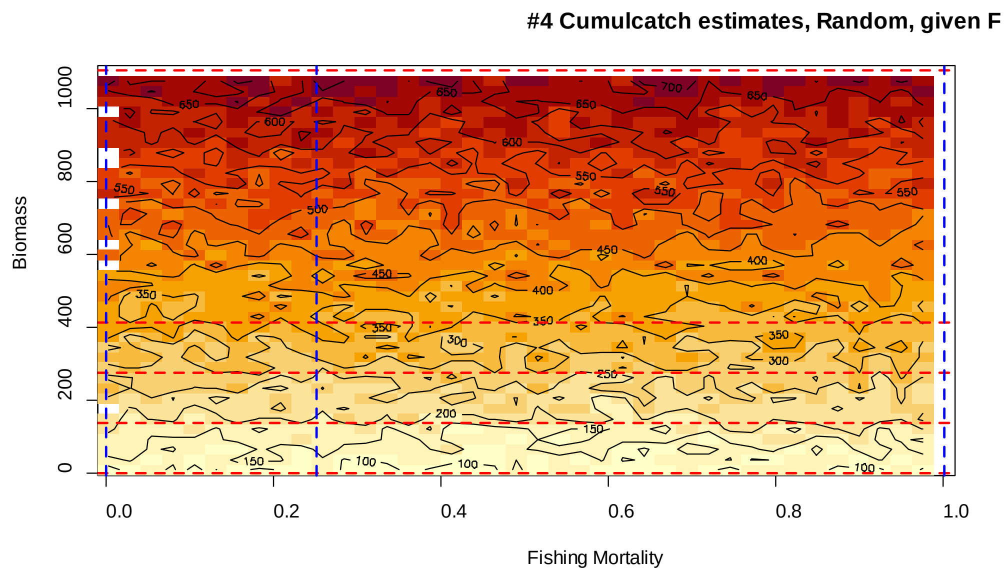
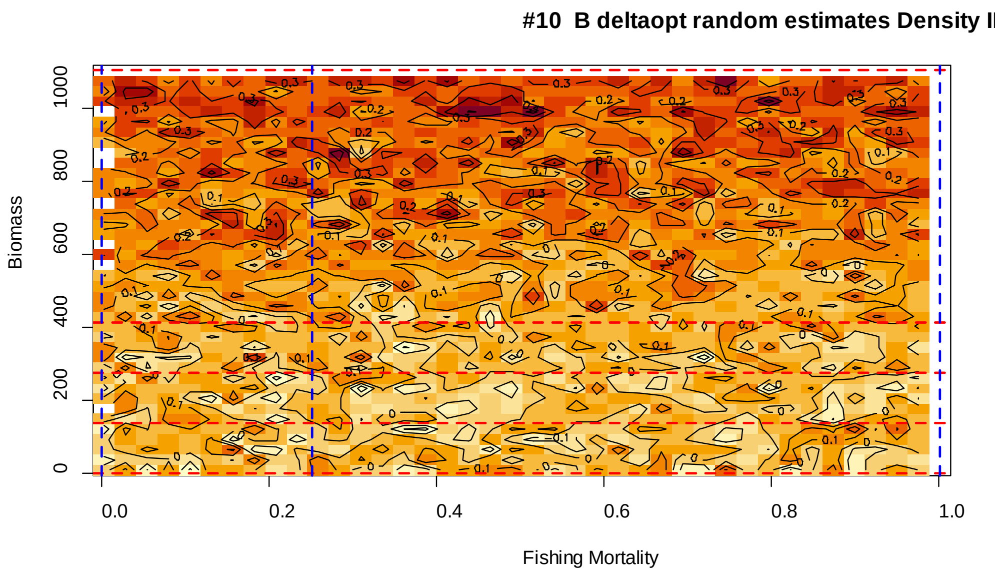


Figure 6. Cumulative catch as a function of initial density with random recruitment only and optimal F based on initial density (top). Cumulative catch with random recruitment AND binned F control (Bottom).

The mean and variance of cumulative catch did not change appreciably under the random Recruitment vs random recruitment with binned controls.

The efficacy of control measures can also be examined with respect to their ability to achieve target biomass levels. In this case the target was defined as being 90% or more of the B_{MSY}. In other words, successes were defined as outcomes where B_t>0.9 B_{MSY}.



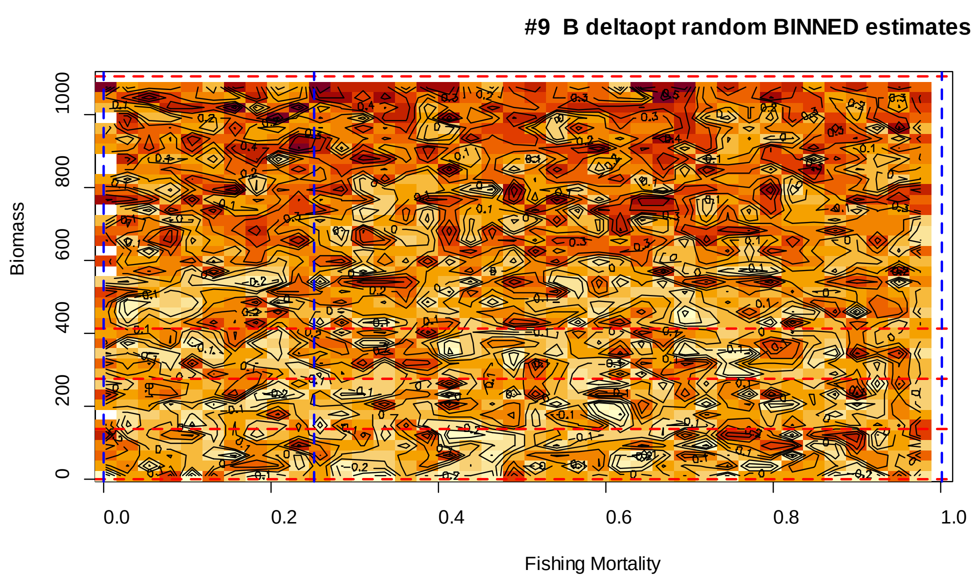


Figure 7. Difference in terminal biomass B_{t+T} and B_{MSY} as a function of initial density with random recruitment only and optimal F based on initial density (top). Cumulative catch with random recruitment AND binned F control (Bottom).

Are Binned Measures Sufficient?

One measure of the efficacy of binned controls is whether or not the measures achieve the desired target of achieving B_{MSY} over the planning horizon T. This property was tested by comparing the initial state of the population with the final state of the population after 5 years. Ideally, the derived F_{opt} should be sufficient to achieve B_{MSY} irrespective of the binning or magnitude of random recruitment. For the deterministic case, Fopt was sufficient to return the population to a not overfished state.

The rows below represent the initial state of the biomass, the columns represent the final state of the population after 5 years of applying F_{opt} for every biomass value or an average F_{opt} depending on the initial bin.

```
> tapply(HCR.opt$F.opt,list(HCR.opt$B.status, HCR.opt$B.poststatus.det),length )
           Not Overfished
Overfished            300
Low                   300
High                  350
Very High            1550
```

```
> tapply(HCR.opt$F.opt,list(HCR.opt$B.status, HCR.opt$B.poststatus.det.bin),length )
           Not Overfished
Overfished            300
Low                   300
High                  350
Very High            1550
```

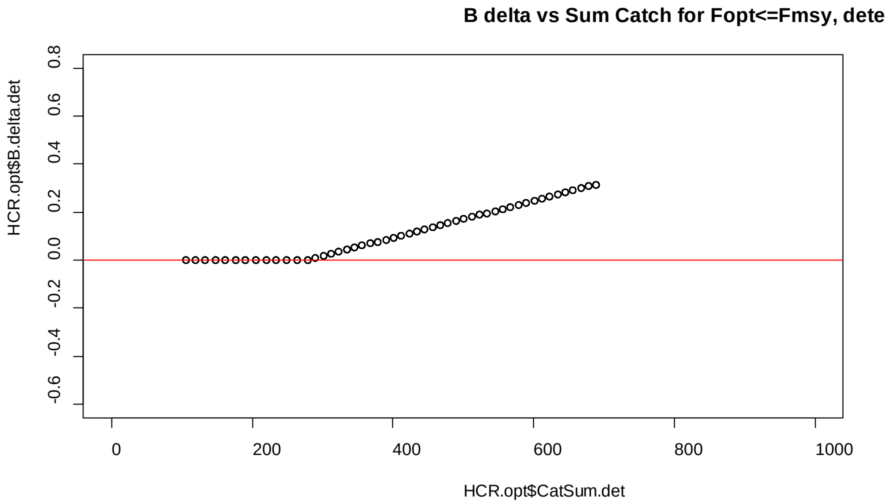
The effects of random variation in recruitment on the ability to recover the population degraded as shown in the table below. Note that populations that were initially overfished remained overfished in 69 of 300 cases (23% failure rate). A similarly high rate of failure occurred for populations that were low, but not overfished. Perhaps more disturbing, populations that were high had a 21% failure rate. Only 3.6% of the very high abundance populations became overfished.

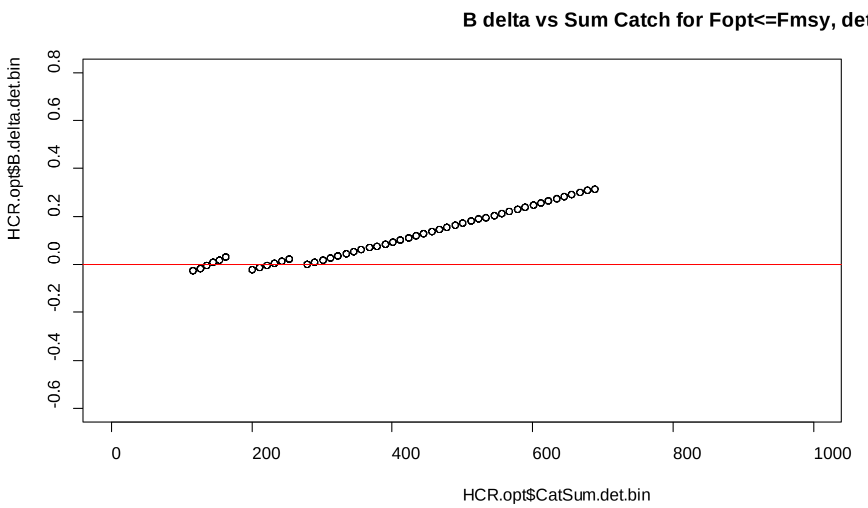
```
> tapply(HCR.opt$F.opt,list(HCR.opt$B.status, HCR.opt$B.poststatus.ran),length )
           Not Overfished Overfished
Overfished            231         69
Low                   231         69
High                  287         63
Very High            1494         56
```

The joint effects of random variation and binned controls are shown below. The success rate for achieving a not overfish population declined to 61.7% vs 77% when binning did not occur. The failure rate for stocks that were not initially overfished increased significantly with binned controls. For example, 19.1% of the populations initially at very high levels fell into an overfished condition. The ratio of failures when binned to unbinned controls is 296/56=5.3x. The odds ratio for this comparison is 6.3 =(1494*296)/(1254*56). The odds ratio for populations initially in a high population state is 2.5=(287*125)/(225*63).

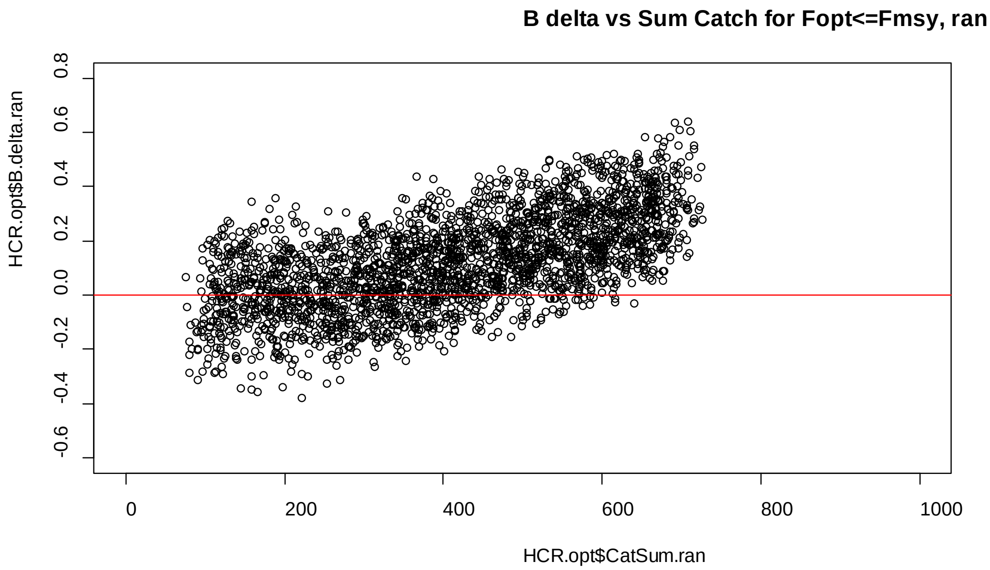
```
> tapply(HCR.opt$F.opt,list(HCR.opt$B.status, HCR.opt$B.poststatus.ran.bin),length )
           Not Overfished Overfished
Overfished            185        115
Low                   186        114
High                  225        125
Very High            1254        296
```

The following graphs illustrate the effects random Recruitment and binning on variation in B_{delta} are shown below. Note that the effect of binning is to result in negative population trends when biomass is low within the bin.

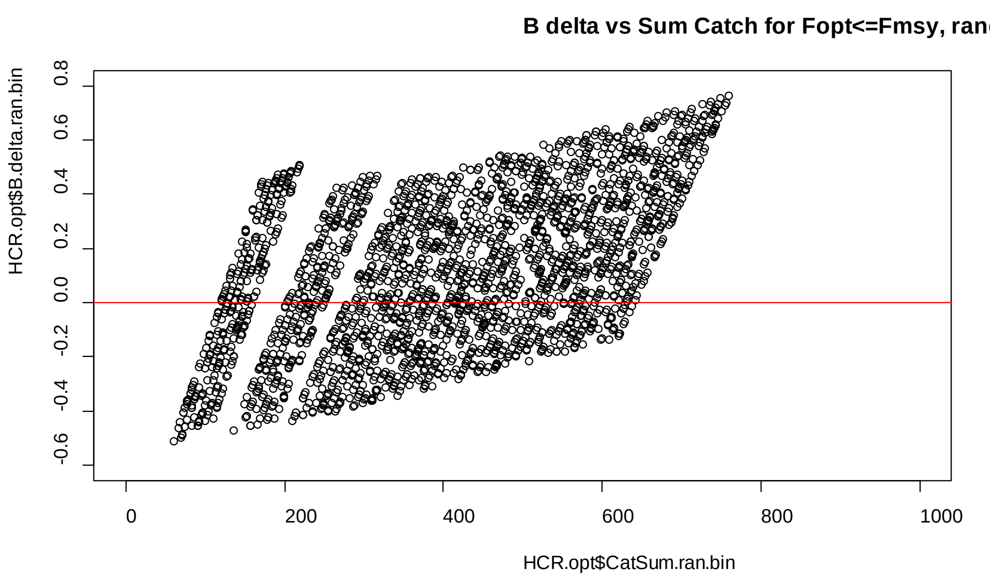

B delta vs Sum Catch for Fopt<=Fmsy, dete
HCR.opt$B.delta.det
-0.6
-0.4
-0.2
0.0
0.2
0.4
0.6
0.8
0
200
400
600
800
1000
HCR.opt$CatSum.det


B delta vs Sum Catch for Fopt<=Fmsy, det
HCR.opt$B.delta.det.bin
-0.6
-0.4
-0.2
0.0
0.2
0.4
0.6
0.8
0
200
400
600
800
1000
HCR.opt$CatSum.det.bin

When random variation is added to recruitment, the patterns become more interesting.



Note that the general "lazy J" pattern evident it the deterministic patter is preserved but the number and magnitude of population declines increases, especially when B is less than B_{MSY}. Superposition of binning on top of random variation (shown below) dramatically alters the resulting pattern with more "structure" induced by the bins and more failures.



Preliminary Conclusions

A simple population model was used to characterize the magnitude of uncertainty induced by binning of control rules. When combined with random variation, there was a marked increase in the failure rate of controls. Populations were not rebuilt as frequently as occurred with population specific optimal fishing

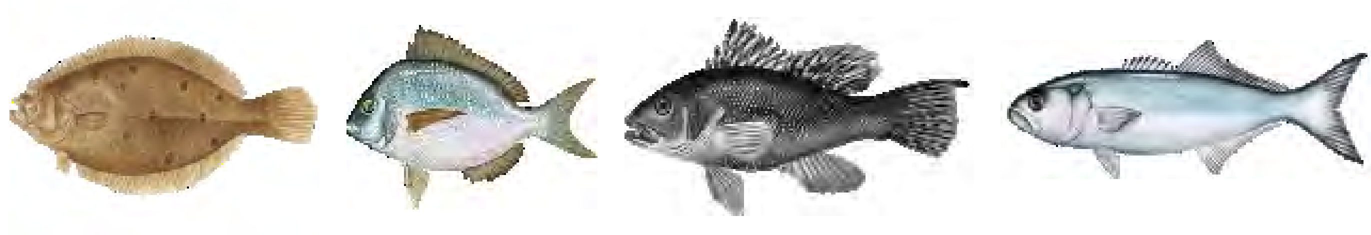
mortality rates. Perhaps more importantly, a greater fraction of populations that were previously above B_{MSY} fell below ½ B_{MSY} when controlled with a binned HCR.
The model used herein, although highly simplified, has properties similar to models used for stock assessments in the Mid Atlantic regions. The HCR implementation is highly simplified and ignores the potential changes in population state that might occur when a population is driven by random recruitment. Specifically, one could adjust the fishing mortality to different population states within the 5-yr projection period. However, it should be noted that neither of the scenarios with random recruitment made such adjustments.

The simulations are indicative but not definitive. I did not evaluate Options B, C or E and the simulation of Option D does not include the additional considerations of whether B or R are increasing or decreasing. Option D includes 13 possible controls rather than the 8 used in this exercise. The simulations may be sufficient to justify the general hypothesis that binning of controls could be problematic if the bins are too wide and the duration between updated of controls is too long.

RECREATIONAL HARVEST CONTROL RULE ADDENDA/FRAMEWORK

PUBLIC COMMENT SUMMARY DOCUMENT

May 2022



Prepared by the Atlantic States Marine Fisheries Commission

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

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1 INTRODUCTION AND COMMENT SUMMARY

1.1 OVERVIEW

This document summarizes public comments on the Recreational Harvest Control Rule Addenda and Framework. Through this action, the Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission (Commission) are considering potential modifications to the Fishery Management Plan (FMP) by considering changes to the process for setting recreational bag, size, and season limits (i.e., recreational measures) for summer flounder, scup, black sea bass, and bluefish. Key goals include providing greater stability and predictability in the recreational fishery management measures from year to year. Additional information can be found by accessing the draft addenda:
http://www.asmfc.org/uploads/file/623a4c14HCR_DraftAddenda_PublicComment_March2022.pdf

Eight virtual public hearings were held between March 16 and April 13, 2022, targeted toward certain states or regional groupings of states (Table 1). Hearings were attended by 164 people in total (excluding Council and Commission staff). Not all attendees provided comments.

Written comments were accepted from March 2, 2022 through April 22, 2022. In total 458 individuals or organizations either provided written comments (44) or sent in a form letter (414) on this action. Some of these commenters overlapped with those providing comments at hearings.

In total, 522 unique individuals and organizations provided comments during hearings verbally, through the live polling feature or in writing. Attempts were made so that individuals who provided multiple comments (e.g., in person and written, multiple in person, or multiple written comments) were only counted once towards the tallies included later in this document. In some instances, individuals provided in-person comments on behalf of an organization and those organizations also submitted written comments. In those instances, the individual and the organization comments were counted as one comment. The tables below differentiated comments received from individuals, organizations, and via form letter to help provide a clear picture of the comments received.

All public hearing comments are summarized in Section 2 of this document and all written comments are included in Section 3.

Table 2 provides a summary of demographic information for those who provided comment on this action. In summary, 88.9% of the 522 individuals and organizations who provided comments were primarily affiliated with the recreational fishery, 0.6% with the commercial fishery, 0.6% with an environmental non-governmental organization, and the remaining 10% of commenters either had multiple affiliations, were classified as other, or did not identify their affiliation. About 80% of the comments associated with the recreational fishery came from the form letter.

Table 1: Draft Addenda public hearing schedule.

Date and Time	Regional Grouping
Wednesday, March 16, 6-8 pm	Virginia
Monday, March 21, 6-8 pm	Maine and New Hampshire
Thursday, March 24, 6-8 pm	Rhode Island
Monday, March 28, 1, 6-8 pm	New Jersey and Delaware
Thursday, March 31, 6-8 pm	Maryland and PRFC
Tuesday, April 5, 6-8 pm	Connecticut
Monday, April 11, 6-8 pm	New York
Wednesday, April 13, 6-8 pm	Massachusetts

Table 2: Number of individuals and organizations who provided in-person and/or written comments by primary affiliation.

Affiliation	Individuals	Organizations	Percent of Total
Private Angler	429	14	84.9%
For-hire (Party/Charter Boat)	11	4	2.9%
Recreational Fishing Industry	3	3	1.1%
Commercial	3	0	0.6%
Environmental Non-governmental Organization	0	3	0.6%
Multiple	1	1	0.4%
Other	1	2	0.6%
Did Not Identify	47	0	9.0%
Total	495	27	522

1.2 Comment Summary

Public comments are summarized in the text and tables below grouped by topic: harvest control rule (HCR) approach, target metric for setting measures, conservation equivalency, accountability measure comparisons, general concerns and recommendations on HCR, preferences on HCR metrics, and general comments. Only those topics addressed by more than two individuals or organizations, or those directly related to specific alternatives are included in the summaries below. However, all comments are included in sections 2 and 3 of this document.

The five main HCR approaches received the most attention from commenters compared to all other topics. The percent change approach (option B) received the most support with a total of 460 individuals and organizations in favor of this management option. The fishery score (option C), biological reference point (option D), and biomass based matrix (option E) approaches received similar levels of support at around 16-23 individuals and organizations supporting each of these options. Option A, the no action approach, was by far the least popular option with only 7 individuals in support. Furthermore, 435 commenters stated that they were opposed to no action on this issue. While no comments were submitted in support of either of the sub-options for the percent change approach, one organization commented in opposition to sub-option B-2B.

Comments were also provided on the management issues in sections 3.2, 3.3, and 3.4 of the Draft Addenda. The options in section 3.2 consider which target metric would be used when setting measures appropriate for the set of stock conditions that define each bin under options C-E in section 3.1. Public opinion was evenly split between using a target level of dead catch (i.e., annual catch limit) or a target level of fishing mortality when setting measures for each of the bins, with seven organizations supporting the annual catch limit target and six organizations supporting the fishing mortality target approach. The options in section 3.3 consider how the Commission's conservation equivalency policy would apply to the management options listed under section 3.1. A total of 40 individuals and organizations who commented on this issue were in support of no action (option A), in other words continuing to allow states to submit conservation equivalency proposals. A total of 28 commenters supported regional conservation equivalency (option B) and five commenters supported disallowing conservation equivalency (option C). The options in section 3.4 consider a change to one component of the reactive accountability measures (AM) under options A, B, C-1, and E-1 in section 3.1. Specifically, they address situations when a reactive AM has been triggered and biomass is above the threshold but below the target level. No one supported no action (option A) and seven commenters supported using fishing mortality compared to a fishing mortality threshold.

Members of the public also provided a wide variety of general concerns and recommendations on the harvest control rule. The majority of the comments could be condensed into reoccurring themes. Four organizations supported postponing action on the Harvest Control Rule Addenda/Framework to allow for more development of all management options and thorough analysis of the impacts of the options. Four commenters supported phasing in implementation of the harvest control rule and implementing the management program for just black sea bass as a pilot. Six commenters expressed serious concerns that implementation of any of the harvest control rule options B-E could lead to increased risk of overfishing. A total of 443 individuals and organizations supported the opportunity to reconsider options C, D and E once the models are complete and analyses have been completed to demonstrate the performance of each approach. Six organizations shared that they were not able to provide comprehensive comments on the proposed action because either they thought the management approaches hadn't yet been fully developed or they preferred to wait until the Mid-Atlantic Fishery Management Council's Scientific and Statistical Committee released their review of the Draft Addendum/Framework. Six commenters spoke of the need to bring stability to recreational management and predictability in setting recreational regulations.

Many individuals and organizations also provided their preferences on which metrics should be used to inform a recreational harvest control rule. A total of 430 commenters supported using additional data besides recreational harvest estimates from the Marine Recreational Information Program (MRIP) when setting recreational bag, size and season limits. Support for utilizing each of the five metrics, sorted from least to most, included 16 in support of MRIP harvest compared to the recreational harvest limit, 36 in support of stock biomass, 38 in support of fishing mortality, 39 in support of recruitment, and 40 in support of biomass trend.

There were many general comments provided at hearings and in written form. While the comments were mostly unique and specific to different issues, some comments could be categorized into reoccurring themes. A total of 15 individuals and organizations shared strong concerns with MRIP data saying they thought MRIP data are either unbelievable, unreliable, or unfit for management. Two organizations commented that the recreational fisheries should be managed for optimum yield, as opposed to maximum sustainable yield. Three individuals commented that the minimum sizes should be reduced for one or more species affected by this action with the goal of reducing discards or protecting the larger fecund females.

Table 3: Summary totals of comments received on the draft addenda. Totals should not be summed between rows as this would result in double counting of individuals and organizations who commented in multiple categories.

Management Issue		Number of Form Letters/Individuals/Organizations			
Section 3.1 – Harvest Control Rule (HCR) Approach		**Form Letter[1]**	**Individuals**	**Organizations**	**Grand Total**
A	No Action	0	7	0	7
B	Percent Change Approach	414	31	15	460
C	Fishery Score Approach	0	12	4	16
D	Biological Reference Point Approach	0	13	4	17
E	Biomass Based Matrix Approach	0	18	5	23
Opposed to no action on this issue		414	13	8	435
Opposed to sub-option B-2B		0	0	1	1
Section 3.2 - Target Metric for Setting Measures		**Form Letter**	**Individuals**	**Organizations**	**Grand Total**
A	Recreational Harvest Limit	0	0	0	0
B	Annual Catch Limit	0	0	7	7
C	Fishing Mortality	0	0	6	6
Section 3.3 - Conservation Equivalency Policy		**Form Letter**	**Individuals**	**Organizations**	**Grand Total**
A	No Action	0	28	12	40
B	Regional CE allowed	0	23	5	28
C	CE is disallowed	0	3	2	5
Section 3.4 - Accountability Measures Comparisons		**Form Letter**	**Individuals**	**Organizations**	**Grand Total**
A	No Action - Catch compared to ABC	0	0	0	0
B	Fishing mortality compared to an F threshold	0	0	7	7

[1] Form letters (more than 3 of the same comment) include comments stating support for an organization's comments; however, if the commenter provided additional comments/rationale for management beyond the organization's comments, then it was considered an individual comment.

Management Issue	Number of Form Letters/Individuals/Organizations			
General Concerns and Recommendations on HCR	**Form Letter**	**Individual**	**Organization**	**Grand Total**
Supported postponed action	0	0	4	4
Supported phasing in implementation and piloting HCR for black sea bass	0	1	3	4
Serious concerns that HCR could lead to overfishing	0	1	5	6
Supports reevaluation of options C, D and E once measures and models are finalized	414	14	15	443
Unable to comment because HCR options haven't been fully developed and/or require review by SSC	0	0	6	6
Supports stability and predictability in setting recreational regulations	0	5	1	6
Preferences on HCR Metrics	**Form Letter**	**Individual**	**Organization**	**Grand Total**
Supports using additional data besides MRIP harvest estimates to set bag/size/season limits	414	11	5	430
MRIP harvest compared to the RHL is an important metric	0	14	2	16
Recruitment is an important metric	0	31	8	39
Stock biomass is an important metric	0	30	6	36
Biomass trend is an important metric	0	33	7	40
Fishing mortality is an important metric	0	33	5	38
General Comments	**Form Letter**	**Individual**	**Organization**	**Grand Total**
Strong concerns with MRIP data; unbelievable/unreliable	0	6	9	15
Recreational fishery should be managed for optimum yield	0	0	2	2
Minimum size should be reduced to reduce discards and/or protect females	0	3	0	3

2 PUBLIC HEARING SUMMARIES

A summary of each public hearing is provided below. Comments are summarized by hearing and each individual's comments are paraphrased. An interactive polling feature was also used for these hearings, and the results from the polls are included within the tallies of all comments received on this action, which can be referenced in table 3.

2.1 VIRGINIA

Wednesday, March 16, 2022, 6:00 p.m.

Attendees: (29 excluding Council/Commission staff): David Agee, Alex Aspinwall, Steve Atkinson, James Boltz, William Bradley, Skip Courtney, Nico Craig, John DePersenaire, Greg DiDomenico, Michelle Duval, Alexa Galvin, Pat Geer, Lewis Gillingham, Emily Keiley, Brooke Lowman, Shanna Madsen, John Mohan, Susanna Musick, William Pappas, Alexander Perez, Will Poston, Bob Pride, Jill Ramsey, Tyler Rowe, Somers Smott, Wes Townsend, Rick Vaughan, Wally Veal, Mike Waine.

Summary: The meeting started with an introduction and briefing from the hearing officer Pat Geer (VA). Following the presentation, several attendees asked clarifying questions. Five members of the public offered public comment on the HCR alternative sets. The majority of comments were focused on the concerns over the use of MRIP data to set regulations, and the desire for better accountability and regulations going forward. Several commenters want the states to retain the ability to use the Commission's conservation equivalency process. Questions from the public mainly focused on how measures are currently being set and how the different HCR options would approach the task of setting measures for the recreational sector. Additional questions focused on accountability measures and the role of conservation equivalency. Hearing officer Shanna Madson (VA) closed the meeting out.

Comments

- **Tyler Rowe (Charter Captain - Virginia)**: The use of MRIP is a big concern for the charter industry when it comes to future regulations. The data collected is often skewed and unreliable. The managers and MRIP staff are not seeing what is really happening out on the water. Overall, the charter industry would like to see better regulations and accountability moving forward.
- **James Boltz (Charter Captain - Virginia)**: I think that when you require a change in measures, it should be up to each state to determine what the new measures are. We want the states to have greater flexibility in setting their own measures. Here in Virginia, we were willing to shorten the summer black sea bass fishing season in order to allow for a February fishery.
- **Steve Atkinson (VA Saltwater Sportfishing Association - Virginia)**: We appreciate the opportunity to provide input and make comments. If we get no clear resolution on this harvest control rule approach by 2023, then the right thing to do is ignore the MRIP numbers. I believe that it was mentioned that the black sea bass stock is twice the biomass target level and a healthy stock. Why would we want to use MRIP data, which we know is suspect, to determine management actions for black sea bass? I am sure I speak for others when I say I want a better approach.

- **Bob Pride (Recreational Angler and Tackle Shop Owner - Virginia)**: The current timeline of completing regulations as late as March for the current fishing year is a problem for tackle shops, and we would like the process to be done earlier.
- **William Pappas (Charter Captain - Virginia)**: The last minute closure of black sea bass hurt a lot of people, and the use of MRIP data is not appropriate. Who sets the RHL? If you're using the best information, then you would want to make sure you continually add information and update the information. The system is broken, and we need new approaches to set measures. It also isn't appropriate that Virginia has to battle with another state to make things better in Virginia when regional conservation equivalency is used.

2.2 Maine and New Hampshire

Monday, March 21, 2022, 6:00 p.m.

Attendees (9 excluding Council/Commission staff): Clarisse Brown, Michelle Duval, Peter Fallon, Emily Keiley, Adam Nowalsky, Cheri Patterson, Will Poston, Wes Townsend, Megan Ware

Summary: The meeting started with an introduction and briefing from the hearing officer Cheri Patterson (NH). This hearing experienced low turnout and as a result there were only two individuals who provided had questions on the management issues. More time was needed by attendees to understand the content and provide feedback. Questions were asked about the data inputs for the various options, and what the Scientific and Statistical Committee's role in the process will look like going forward. Hearing officer Megan Ware (ME) provided closing remarks.

Comments

No comment offered.

2.3 Rhode Island

Thursday, March 24, 2022, 6:00 p.m.

Attendees: (15 excluding Council/Commission staff): Chris Batsavage, Rick Bellavance, Dave Daly, Michelle Duval, Dan Farnham, Steve Haasz, Rich Hittinger, Raymond Kane, John Lake, Michael Lombardi, Jason McNamee, Will Poston, Peter Randall, Eric Reid, Wes Townsend.

Summary: The meeting started with an introduction and briefing from the hearing officer Jason McNamee. Following the presentation, several attendees asked clarifying questions. Three members of the public offered comments on the HCR option sets.

All comments supported change from the status quo recreational measure setting process, but commenters were unsure of which option to fully support. Concerns were raised over not knowing what measures would be under the different alternatives. One member from the public asked for clarification about how the target metric of recreational dead catch compared to recreational fishing mortality would be used. The same individual asked for an update on the progress of the models and when they could be used. Other questions included concerns about the influence of MRIP in this process through the modeling efforts, and a recommendation to clarify how accountability measures will work in future presentations. The hearing officer then closed the meeting out.

Comments

- **Rich Hittinger (RI Saltwater Anglers Association – Rhode Island)**: We will be submitting written comments at a later date, but one thing I wanted to say is that we strongly recommend some sort of change. We do not agree with option A, no action. What we see happening is that while a stock is healthy, we are still required to take a significant cut in measures, while fluke, which everyone sees as declining, is getting a liberalization in measures. We had many people asking what was happening with black sea bass and fluke at the fishing show we were at last weekend. It makes no sense at all to the people who are fishing, and that’s why recreational management needs to be changed so it considers biomass. Currently, we will probably be interested in supporting option D, but we really need to look into more details of the options.
- **Rick Bellavance (RI Party and Charter Boat Association – Rhode Island)**: I agree with Rich’s comments in that the way we manage these fisheries isn’t working. But I am uncertain about how the alternatives crafted in this document are going to change things or make things better. Using black sea bass as an example, biomass is at a good level and so under one of the HCR options would be listed as the best level. But if the current measures are considered the most liberal that would be horrible. I don’t know what comment to provide without having any idea about how the measures are going to change. Is it possible to throw away current measures and start with new ones? How does this mesh with catch estimates? It’s not clear in the document how that will work out, so it’s hard to offer good input. I do think I’ll like another option other than A, but I am not sure what to support right now.

- **Peter Randall (Mate on C-Devil II Sportfishing – Rhode Island):** This was a great presentation and I agree heavily with Rick. It's hard to visualize what the future will look like without seeing what measures would be. It would weigh heavily on our decisions.

2.4 New Jersey and Delaware

Monday, March 28, 2022, 6:00 p.m.

Attendees: (63 excluding Council/Commission staff): Mary Benson, Dan Bias, Jeffrey Brust, George Burns, Nick Cicero, Michael Celestino, Joe Cimino, John Clark, Peter Clarke, Heather Corbett, Greg Cudnik, Dave Daly, Richard Danner, Robert Davis, John DePersenaire, Robert Degirarde, Alfred DiMartino, Michelle Duval, Andrew Fedkiw, Thomas Fote, Thomas Gordon, Paul Haertel, Brenden Harrison, Victor Hartley, Jim Hutchinson, Jeff Kaelin, Raymond Kane, Emily Keiley, Jim Lutz, John M, Michael Zaleski, Roy Miller, Brian Moroz, Steven Morris, Paul Mulholland, Adam Nowalsky, Will Poston, Joseph Procopio, James Rausch, Steven Reynolds, Brian Ribarro, Bob Rush, Bill Shillingford, Marc Sherry, Philip Simon, Thomas Smith, David Stormer, Mark Taylor, Jason Thomas, Wayne Thomas, Scott Thomas, Bob Topham, Bryson Torgovitsky, Wes Townsend, Arnold Ulrich, Ken Warchal, John Ward, Joseph White, Charles Williams, Ted Wood, Edward Yates, Harvey Yenkinson, Gerard Zagorski.

Summary: The meeting started with an introduction and briefing from hearing officers Joe Cimino (NJ) and John Clark (DE). Following the presentation, several attendees asked clarifying questions. Nine members of the public offered public comment on the HCR alternative sets.

The majority of comments supported option B due to concerns over the uncertainty and level of development of options C, D, and E. Overall, commenters did not want to see option A, status quo, continue. One commenter supported options C or D. Several comments addressed the concern of unpredictably in these fisheries and the continued struggle, if not inability, to make business plans.

A member from the public wanted to know if the predetermined measures will be available to the public before final action, to which staff responded that this would be unlikely unless final action was delayed. Other members wanted to know what would happen if the models and the option selected doesn't work and staff said that the PDT/FMAT has been discussing contingency plans for a bridged approach using traditional analytical methods to implementing pre-defined measures for the HCR options with bins. Other questions included the role of VTR data in the HCR process, how often biomass trends will be evaluated, and what the timeline for action is moving forward. The hearing officer, Joe Cimino (NJ), then closed the meeting out.

Comments:

- **Philip Simon (Village Harbor Fishing Club – New Jersey)**: I think that this is a problem that needs to be solved. One of the problems is that when you have a healthy stock, like black sea bass, and assuming you have constant fishing effort, the end result is that people catch them and we continue to go over the RHL. Then we have to put in a decrease and it's a constant cycle. I don't see this being solved by option A or B, and I would pick C or D. They have a better chance of dealing with the black sea bass situation. I'm not sure about option E. Page 37 of the draft document demonstrates that option B calls for a reduction if it were implemented today. If you're happy with that, then go for option B.

- **John DePersenaire (Recreational Fishing Alliance – New Jersey)**: I wanted to say that we are really supportive of the Council/Commission addressing this and bringing about a change to the recreational specifications setting. We are all frustrated by the situations that continue to occur in the black sea bass fishery. I wish the options were developed more at this point. It's hard for the public to determine which option works the best. I wish we could plug 2022 data in to see what the options would look like. It's hard for us to support anything but B. Relying on default measures which are not yet developed and won't be ready for final action makes me hesitant to support all of the other options.
- **Nick Cicero (Folsom Corp – New Jersey)**: I would like to see our industry, the charter industry, be able to plan ahead. This also includes tackle shops, dealers, and the for-hire sector. We would like to have a greater lead time in planning our businesses out.
- **Bob Rush (United Boatmen of NJ – New Jersey)**: I agree with Nick and John; MRIP has not been proven accurate. From a business perspective, we cannot keep operating this way. There is a lot of uncertainty around these new approaches. The lesser of the evils is option B.
- **Gerard Zagorski (New Jersey)**: I echo Bob and John's comments. I think C, D, and E are viable, but due to uncertainty around them I am hesitant. A isn't an option, so I think option B. I would like to see if we could run some models or data to see how the other options would work out before final action.
- **Paul Hartel (Jersey Coast Anglers Association – New Jersey)**: I agree with the others that due to the uncertainty, I support option B.
- **Victor Hartley (Keyport Princess – New Jersey)**: I agree with Bob and Jim and support option B. Options C, D, and E are too underdeveloped.
- **Thomas Gordon (New Jersey)**: I agree, and I want option B since C, D, and E are underdeveloped. I am also interested in efforts to improve survey data.
- **Harvey Yenkinson (MAFMC Advisory Panel Member – New Jersey)**: I am concerned with the complexity of options that NOAA comes up with. We don't use common sense when making these decisions, and there is a lot of inaccurate information. In my opinion, the more we add these metrics into the pot then the more we go the wrong way. I am afraid that if we use a complex option that we are going to use a formula that is no longer sensible.

2.5 Maryland and Potomac River Fisheries Commission

Thursday, March 31, 2022, 6:00 p.m.

Attendees: (25 excluding Council/Commission staff): Steven Anderson, C. Dollar, Steve Doctor, Michelle Duval, Lynn Fegley, Martin Gary, Lewis Gillingham, Sonny Gwin, Monty Hawkins, Harry Hornick, Emily Keiley, Scott Lenox, Michael Luisi, Kevin McMenamin, Randy Million, Mohamed Nabulsi, Adam Nowalsky, Denise Oden, Bert Olmstead, Eric Packard, Will Poston, Eric Reid, Lenny Rudow, Buddy Seigel, Angel Willey.

Summary: The meeting started with an introduction and briefing from the hearing officer Michael Luisi (MD). Following the presentation, several attendees asked clarifying questions. Two members of the public offered public comments.

Most comments offered did not support any one option, but instead expressed concerns over MRIP and how the RHL is set. One commenter supported option E due to no input for MRIP.

Questions from the public centered around clarification of how the RHL is calculated and the Commission CE options presented. The hearing officer, Michael Luisi (MD), then closed the meeting out.

Comments

- **Lenny Rudow (Fish Talk Magazine & Recreational Angler - Maryland)**: Option E eliminates the MRIP from consideration from the equation. I choose the options that do not include consideration of MRIP numbers because, when they're broken down, they're ridiculous. It's like they're built on a house of cards.
- **Kevin McMenamin (Annapolis Anglers Club, President - Maryland)**: Having the RHL set on yield is more of a commercial approach, and it is a misnomer. My recreational anglers would like to see the RHL set more on abundance.
- **Buddy Seigal (Atlantic Coast Sportfishing Association, Ocean Pines Anglers - Maryland)**: The question comes down to the general public not understanding the concept of what is being approached, how it's being approached. What they see at the local level is something very small, and trying to extrapolate that out doesn't make sense.

2.6 CONNECTICUT

Tuesday, April 5, 2022, 6:00 p.m.

Attendees: (19 excluding Council/Commission staff): Mark Alexander, Bruce Calvin, Raymond Castano, Justin Davis, Greg Dubrule, Michelle Duval, Matthew Gates, Raymond Kane, TJ Karbowski, Emily Keiley, Louis Marrella, Richard McCarthy, Jerry Morgan, Michael Pirri, Michael Plaia, Will Poston, R. Stec, Mike Waine, Eric Zlokovitz.

Summary: The meeting started with an introduction and briefing from the hearing officer Justin Davis. Following the presentation, several attendees asked clarifying questions. Four members of the public offered public comments.

Most comments offered did not support any one option, but instead expressed concerns over MRIP and the lack of use of VTR data. One commenter supported option C.

Several questions from the public were received. They included clarification about the use of VTRs in the HCR process, how the CE process will work regarding the federal process, how the models will work, and how the projections will be used from the stock assessment. One member asked for the history of this action, and how we got to where we are today. Then the hearing officer Justin Davis provided closing remarks.

Comments

- **Michael Pirri (Flying Connie - Connecticut)**: If I had to pick now, I would support option C because it outperforms the other options in my opinion.
- **Greg DuBrule (Owner/Operator party boat Black Hawk - Connecticut)**: I've been in the business for over 50 years. There are not a lot of people in this industry that come onto these things because they're disgusted by it. What other data besides MRIP do you use to come up with this? We have no confidence in MRIP, and that's why people don't want to participate. We've got professionals here that are out on the water. We fill out VTR reports, and then we find out they aren't even used. You'll get better information from locals out on the river than from MRIP staff. I want to protect these species, but the way you go about this stuff is so flawed it's unbelievable. As far as what option, it doesn't make a difference to me.
- **TJ Karbowski (Rock & Roll Charters - Connecticut)**: I don't trust MRIP, I don't trust their motives, so I am trying to figure out their involvement with this action.
- **Mike Waine (American Sportfishing Association)**: We were originally supportive of this, so I'll try to provide clarity on why this action is being taken. We proposed the idea to scale access to the resource based more on the status of the resource, considering its health rather than being reactive to catch estimates from MRIP. I just want to clarify that these approaches aim to look at information besides MRIP catch data.

2.7 NEW YORK

Monday, April 11, 2022, 6:00 p.m.

Attendees: (28 excluding Council/Commission staff): Adam Nowalsky, Antoinette Clemetson, Jim Gilmore, Carl LoBue, Chris Batsavage, Chris Spies, Dan Farnham, Emerson Hasbrouck, Emily Keiley, James O'Connor, John DePersenaire, John Maniscalco, Joseph Beneventine, Ken Wojtak, Louis Morace, Matt Broderick, Maureen Davidson, Meghan Lapp, Melissa Dearborn, Michelle Duval, Mike Waine, Molly Masterton, Neil Delanoy, Nelson Breen, Paul Kim, Renato Vojka, Rick Vaughan, Tom Schlichter

Summary:

The meeting started with an introduction and briefing from the hearing officer Maureen Davidson (NY). Following the presentation, several attendees asked clarifying questions. Three members of the public offered public comment on the HCR alternative sets. Two of these three members of the public preferred option B, while the third discussed her overall concerns with all of the alternatives, mostly related to how these options comply with the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

Questions from the public focused on how conservation equivalency would work with some of the options and whether changing percent reductions or suboptions from what is currently in the draft addendum would be allowed, if there was a desire to do so. The hearing officer Maureen Davidson closed the meeting out.

Comments

- **Neil Delanoy (Executive Director of the Captree Boatman's Association / Charter Captain – New York)**: Option B is probably the best way to go for now; there is too much uncertainty with the other options. Maybe someday we'll get there for the other options. I need to review the sub-options further, I will respond to them in a written comment.
- **John DePersenaire (Recreational Fishing Alliance - New Jersey):** We're in support of option B, because we feel it's the most developed option at this point, and the only real option we have the ability to understand what it's going to do prior to taking final action. We just don't feel comfortable supporting C, D, or E still knowing there's a lot of work to do with the modeling approach and figuring out what those pre-set measures will be. A lot of commercial fishermen were supportive of recreational reform, especially back during the allocation discussions, but no commercial fishermen have shown any support for this. We will also be submitting written comment.
- **Molly Masterton (Natural Resource Defense Council – New York)**: NRDC is still thinking about how we can meet the stated goals of this effort and select between alternatives while still remaining within the framework of ACLs and accountability measures that Magnuson-Stevens has set up to prevent overfishing. We're pleased that these issues are receiving a full review by the SSC, to ensure they comply with MSA mandates and meet the scientific rigor that's key to managing these fisheries. Some of these alternatives would set measures over two-year cycles, which immediately raises questions in regards to ACLs and AMs. Under Magnuson, when an ACL is exceeded at the end of a fishing year, the Council is required to implement AMs to make

sure catch is brought under the ACL as soon as possible, so we need to think more about how these would work on the water. Also, we need to consider if any of these untested approaches increase management uncertainty. If there's a chance of increased management uncertainty, we could consider uncertainty buffers that I believe aren't currently implemented for these fisheries. We will also be submitting written comments through the NGO community.

2.8 Massachusetts

Wednesday, April 14, 2022, 6:00 p.m.

Attendees: (18 excluding Council/Commission staff): Adam Nowalsky, Al Williams, Bob DeCosta, Daniel Mckiernan, Derek Perry, Emily Keiley, Ivy Fredrickson, John DePersenaire, Melissa Dearborn, Michael Pierdinock, Michelle Duval, Nichola Meserve, Raymond Kane, Rich Wood, Richard Nealley, Scott Steinback, Tiffany Hodkinson, Will Poston

Summary: The meeting started with an introduction and briefing from the hearing officer Nicola Meserve (MA). Following the presentation, several attendees asked clarifying questions. Three members of the public offered public comment on the HCR alternative sets, with all three preferring option B. Questions comprised the majority of public participation in this hearing.

Questions were primarily focused on obtaining further clarification on option B and its sub-options, and obtaining more information on the North Atlantic Recreational Fishing Survey that recently went out to the public. Other questions centered around how MRIP data is involved with the options and accountability measures, whether the sector allocations and consequently the RHL will still need to be adhered to if the recreational sector continues to grow, and what the predetermined measures were in options C, D, and E. The hearing officer Nichola Meserve closed the meeting out.

Comments

- **Raymond Kane (Cape Cod Fishermen's Alliance – Massachusetts)**: Massachusetts is caught behind the 8-ball. We don't get wave 6 results until the middle of February, and then the Commission/states need to turn around things quickly for May. The Mid-Atlantic Fishery Management Council needs to address this issue.
- **Michael Pierdinock (Stellwagen Bank Charter Boat Association, President - Massachusetts)**: As an association, we had meetings and discussed this to help our membership to understand the concepts. We commend the efforts to get to this point and have it assembled to address our ongoing frustration with MRIP. We see it as an opportunity for the HCR to address these problems. We're for the concept of C, D, and E, but since we don't know the outcomes of the models we can't support them. We suggest implementing option B for two years then run models for C, D, and E and see what the outcome is. Then have those results go out for public comment. At least B uses MRIP estimates with the status of the stock to come up with decisions. For conservation equivalency, even internally within Massachusetts we have issues deciding conservation equivalency. We prefer state-level conservational equivalency.
- **John DePersenaire (Recreational Fishing Alliance – New Jersey):** The RFA is on the same page as Mike, we support option B. We see the applicability of C, D, and E for certain species and may be viable, but we are uncomfortable supporting an option without knowing what the

measures will be. We have this understanding that we can come back and revisit options once they're more fleshed out. We also support state-level conservation equivalency, as we see problems with regional.

- **Melissa Dearborn (Regal Marine Products, Inc., Owner; New York Fishing Tackle Trade Association, Vice President – New York):** We support option B, but will submit official written comments. I am also concerned about other individual's comments that a few percentage points of reduction or liberalization don't make a huge difference to the recreational sector. My perspective in running a business is that every day of a fishing season matters, and one percentage point can make the difference for a longer season.

3 Written Comments

<u>American Sportfishing Association Form Letter:</u>

Dear Mr. Leaning,

As an avid angler who values catching summer flounder, scup, black sea bass and bluefish, I support using additional information besides recreational harvest data to establish bag, size and seasons that better reflect the status of the resource.

Therefore, I do not support status quo and urge managers to implement alternatives that use more than just recreational harvest data for determining measures.

However, choosing a specific alternative is difficult without knowing the outcomes of options C, D & E in terms of measures.

Option B is better than status quo and I support getting the opportunity to re-evaluate the other options (C, D and E) once measures or harvest levels for those alternatives are known.

Thank you for the opportunity to comment on this important issue.

From: Scott Jeffrey [mailto:eastendbt@gmail.com]

Sent: Friday, April 22, 2022 4:23 PM

To: Comments <comments@asmfc.org>

Subject: [External] Harvest Control Rule Comment

After reviewing the options provided it would seem best to me that option "D" would serve the recreational anglers best.

Having thirteen measures or reference points would serve best allowing the restrictions or regulations to be adjusted over time in smaller increments. Thirteen preset benchmarks also eliminates the guesswork by the authorities and allows the anglers to have a little more confidence in the system. The smaller increment changes would have less of an effect on the local economies but would allow for the fisheries to recover as planned.

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Thank you,

Scott Jeffrey

East End Bait & Tackle

170 East Montauk Hwy

Hampton Bays, NY 11946

Ph: 631-728-1744

scott@eastendbaitandtackle.com

www.eastendbaitandtackle.com

From: kevin@annapolisanglersclub.com [mailto:kevin@annapolisanglersclub.com]

Sent: Friday, April 22, 2022 4:12 PM

To: Comments <comments@asmfc.org>

Subject: [External] Harvest Control Rule

Hello ASMFC and MAFMC Commissioners.

As President of the Annapolis Anglers Club, I represent over 650 Recreational Anglers who are alarmed and concerned with the current Regulatory Process. The current process which heavily relies on MRIP estimates is highly mistrusted and widely criticized. I have distilled the many opinions I have heard in the past three years to one High Level Theme. Recreational Anglers are asking for Summer Flounder, Scup, Black Sea Bass and Bluefish to be managed for Sustained Abundance and not for Maximum Yield.

We do not support Option A (Status Quo) or Option B (almost Status Quo).

This approach has resulted in the Angler Angst noted above. We do support Options C, D and E. It is very difficult to evaluate these three specifically, but the most positive common theme is that they rely much less on just the MRIP Estimates. From the feedback that I have received, here is how I would grade the three remaining options.

#1 Option C

#2 Option E

#3 Option D

Completion of the modeling and impact estimates of these options are critical in order for all stakeholders to decide on which of these options to support. We hope that Fisheries Managers make the most conservative decisions to implement Maximum Sustainable Abundance of those Fisheries.

Thanks in advance for the opportunity to share these comments and for taking on the task of creating the next Framework for managing these Fisheries.

Kevin McMenamin

President – Annapolis Anglers Club

745 Rolling View Drive Annapolis MD 21409 kevin@annapolisanglersclub.com

(410) 340-5030 Mobile

From: Capt D [mailto:captdes@gmail.com]

Sent: Thursday, April 21, 2022 8:31 PM

To: Comments <comments@asmfc.org>

Subject: [External] Harvest control Rule

To whom it may concern,

In regards to the proposed Harvest Control Rule, I currently support alternative B as an interim step until measures for the bins described in C/D/E is fully described. B does rely on stock status for highly abundant stocks to prevent more restrictive measures based on MRIP.

Respectfully submitted,

Captain Desmond OSullivan

Owner, Celtic Quest Fishing Fleet.

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Captain Desmond O'Sullivan

From: flukeman@aol.com <flukeman@aol.com>

Sent: Tuesday, April 19, 2022 3:28 PM

To: Beaty, Julia <jbeaty@mafmc.org>

Subject: Fwd: Recreational Harvest Control Rule resources and public hearings

Julia,

It would be more visual and easier to understand, if you could apply, each year, the decisions as they are in Chart 3 of the guide to the past history, especially summer flounder. If I remember correctly, we started with 10 fish at 11 inches. Also please indicate the liberalization that could have occurred in that past timeframe.

Visually the chart is very negative. A recreational fisherman will see little hope (green) for the future. Yellow for caution, brown for worse than cautionary, and red for your done.

I still do not see where we are going to address the issues of discard mortality and harvesting of breeding females disproportionally to the population.

I have a problem with management resources not focusing on solving the problems but addressing minutiae. MANAGEMENT SHOULD REVIEW THEIR RESOURCES CONSUMED AND APPLY THE PARETO PRINCIPLE AND FOCUS ON CRITICAL FEW. ALOT OF PROBLEMS ARE SOLVED BY CREATING A LARGER PIE, FOR ALL TO SHARE.

Celebrating 25 years of negative progress.

Carl Benson

From: Capt. TJ Karbowski [mailto:tedkarbowski@yahoo.com]

Sent: Thursday, April 21, 2022 7:42 AM

To: Comments <comments@asmfc.org>

Cc: Justin Davis <justin.davis@ct.gov>

Subject: [External] Comments: Harvest Control Rule

The Harvest Control Rule will be a welcome relief to all who make their living on the water and rely on realistic and common sense regulations. MRIP (specifically “new” MRIP) has turned the lives of for-hire business owners upside down during our “off seasons”. We have been afraid to invest into our own businesses due to fear of not knowing if we would even have a business to return to just 6 short months away.

In short, since the start “new MRIP” our off-seasons have turned into living soap operas filled with drama, public meetings, zoom meetings, countless phone calls and emails, all the while causing extreme financial sacrifices to both our businesses and families. It is inconceivable to just walk away from a thriving business you have spent your entire life building knowing it is just a broken Government math problem that will make or break your entire career.

MRIP uses “weighting” and “bell curves”, both by their own admission are subjective, made up numbers that are as much as 90% off of the number they started from. Scup and sea bass stocks are at least double of target levels, yet due to ridiculous harvest numbers produced by MRIP we are under constant threat of being forced out of business.

I plead you to move forward with the Harvest Control Rule immediately.

Thank you,

Capt. TJ Karbowski

Rock & Roll Charters

Clinton, CT

203.314.3765

https://rockandrollcharters.com/

From: Burl Self [mailto:b_e_self@yahoo.com]

Sent: Wednesday, April 20, 2022 4:43 PM

To: Comments <comments@asmfc.org>

Subject: [External] harvest control rules

prioritize sports fishery on all species over commercial fishing.

Thanks

Best

Burl Self

Va Beach Va 703 201 9191

From: Eric Burnley [mailto:eburnle@aol.com]

Sent: Tuesday, April 19, 2022 4:09 PM

To: Comments <comments@asmfc.org>

Cc: JOHN CLARK <john.clark@delaware.gov>; Roy Miller <fishmaster70@comcast.net>

Subject: [External] Harvest Control Rule

My thoughts on the suggested harvest control rule for recreational fishing. Eric Burnley

Option A; This would not help the stock or the fisherman. We need to examine the various indicators and make an educated decision.

Option B; Estimated harvest is like betting on a horse race.

Option C; This also contains estimated harvest along with three reasonably solid data numbers.

Option D; Here we have the simplest equation. Stock size verses spawning stock biomass.

Option E: Stock size and trend in stock size. This option depends less on recreational harvest and I personally like that.

Right now we de[end too much on MRIP numbers and they are bad data. Any option that depends less on them has got to be better than what we have now.

Eric Burnley

From: Brendan O'Neil [mailto:boneil202@gmail.com]

Sent: Monday, April 18, 2022 8:54 PM

To: Comments <comments@asmfc.org>

Subject: [External] Harvest Control Rule

To who it may concern:

As a concerned angler who values catching summer flounder, scup, black sea bass and bluefish, I support using additional information besides recreational harvest data to establish bag, size and seasons that better reflect the status of the resource. Therefore, I do not support status quo and urge managers to implement alternatives that use more than just recreational harvest data for determining measures. However, choosing a specific alternative is difficult without knowing the outcomes of options C, D & E in terms of measures. Option B is better than status quo and I support getting the opportunity to re-evaluate the other options (C, D and E) once measures or harvest levels for those alternatives are known.

Thank you for the opportunity to comment on this important issue.

Regards,

Brendan O'Neil

Alexandria, VA

From: Ron Klasmeyer [mailto:ronklasmeyer3@gmail.com]

Sent: Monday, April 18, 2022 10:51 AM

To: Comments <comments@asmfc.org>

Subject: [External] Harvest Control Rule

Mr. Dustin Colson Leaning,

For public comment:

It appears these rules will once again target recreational fishing which does not, according to the science, appear to be the problem. The data from Woods Hole which is referenced in the proposed rule shows that the commercial landings are almost double the recreational landings. The discards alone for commercial fishing is almost a quarter of all the recreational landings. If you were to follow the science, the rules would be targeted at the commercial fishing industry. While I understand the need to bring the regional recreational fishing more into alignment, get away from what may appear as arbitrary creel limits and size limits, the science does not point to recreational fishing as impacting the black bass or summer flounder populations.

Respectfully,

Ron Klasmeyer

Leonardtown, Maryland

From: william martin [mailto:williamhmartin341@gmail.com]

Sent: Friday, April 15, 2022 5:34 PM

To: Comments <comments@asmfc.org>

Subject: [External] Harvest Control Rule

I strongly favor the updated harvest control rule favored by CCA

William H. Martin, Ph.D.

Towson MD

From: Chuck Wyatt [mailto:cwyatt650@aol.com]

Sent: Thursday, April 14, 2022 5:21 PM

To: Comments <comments@asmfc.org>

Subject: [External] Harvest Control Rule

As a concerned angler, I support Option B at this time. I do not support status quo and urge managers to implement alternatives that use more than just recreational harvest data for determining measures. However, choosing a specific alternative is difficult without knowing the outcomes of options C, D & E in terms of measures. Option B is better than status quo and I support getting the opportunity to re-evaluate the other options (C, D and E) once measures or harvest levels for those alternatives are known. Thank you for the opportunity to comment on this important issue.

From: Neil [mailto:neil@lauraleecaptree.com]

Sent: Tuesday, April 12, 2022 9:27 AM

To: Comments <comments@asmfc.org>

Cc: Paul Risi <pjr587@aol.com>; captaindevito@gmail.com; ndelanoy@aol.com

Subject: [External] Harvest control rule

My name is Neil Delanoy, I am commenting on behalf of the Captree Boatmen's Association, New York State's largest for-hire fleet. We take over 300,000 anglers out every year, fishing the waters of Great South Bay and the Atlantic Ocean. I STRONGLY SUPPORT OPTION B at this time. I feel it considers the three most important factors, MRIP, RHL and stock status in formulating management measures.

Respectfully Submitted,

Neil Delanoy

Executive Director

Captree Boatmen's Association

From: Ken & Barbara [mailto:brooklyngirl10@optonline.net]

Sent: Sunday, April 10, 2022 4:32 PM

To: Comments <comments@asmfc.org>

Subject: [External] Harvest Control Rule

To whom it may concern,

I would like to express my support for option B. Including stock assessments with harvest data makes sense and could smooth out some of the annual irregularities in the harvest data, especially when the stock is in overall good shape. I am hopeful that there could then be more consistency in regulations from year to year to help in planning and advertising for our business.

Thank you,

Capt. Ken Holmes

Vessel Brooklyn Girl, Orient Pt, NY

From: Patrick Gillen [mailto:patrickg@optonline.net]

Sent: Sunday, April 10, 2022 10:53 AM

To: Comments <comments@asmfc.org>

Subject: [External] Harvest Control Rule

I currently support alternative B as an interim step until measures for the bins described in C/D/E is fully described. B does rely on stock status for highly abundant stocks to prevent more restrictive measures based on MRIP.

Sincerely,

Patrick Gillen

Party/Charter boat Capt. Gillen from Captree, NY

From: Arthur James [mailto:amjretired@gmail.com]

Sent: Friday, April 8, 2022 11:13 AM

To: Comments <comments@asmfc.org>

Subject: [External] Harvest Control Rule

I fish for fluke in the bays off eastern Nassau County. My vote is for a slot limit of 17 or 18" to 24" with a bag limit of three. No one needs to bring home more than three fluke. No one. I disagree with some findings that fluke are back in big numbers. (I have been fishing the bays and inlets since the mid 1970s.

Arthur James

26 Joludow Drive Massapequa Park, NY 11762 516 650-9916

From: Don Pirro [mailto:dpirro1@gmail.com]

Sent: Thursday, April 7, 2022 2:12 PM

To: Comments <comments@asmfc.org>

Subject: [External] Harvest Control Rule

Dear Dustin and ASMFC,

Thank you for your efforts to improve the management of the precious resource of summer flounder, sea bass, bluefish, and scup. I am a long time avid angler who lives in Virginia and regularly fishes for these species from Virginia up through Massachusets. I am a member of Coastal Conservation Association in VA and religiously practice conservation. I am also a scientist and consider myself to be an informed and involved member of society when it comes to fisheries management having also participated in the Marine Resource Education Program sponsored by the Gulf of Maine Research Institute. Here are my desired options to the Harvest Control Rule for these species:

As a concerned angler who values catching summer flounder, scup, black sea bass and bluefish, I support using additional information besides recreational harvest data to establish bag size and seasons that better reflect the status of the resource. Therefore, I do not support the status quo and urge managers to implement alternatives that use more than just recreational harvest data for determining measures. The intent of including other factors (as identified in Options C, D, E) like fishing mortality, biomass level and recruitment provide a more holistic evaluation of the status of the fishery so that regulations can better align with stock condition instead of just being reactive to the uncertainty and variability of MRIP which many have lost faith in. However, choosing a specific alternative based on additional science and data points is impossible without knowing the outcomes of options C, D & E in terms of measures and seeing examples to fully understand the impact. At this time I can only support Option B (which is better than status quo) but I do support having the opportunity to re-evaluate the other options (C, D and E) at some future time once measures or harvest levels for those alternatives are known.

Thank you for the opportunity to comment on this important issue that impacts so many.

Yours Truly,

Don Pirro

Centreville, VA

From: Chris Dollar [mailto:cdollarchesapeake@gmail.com]

Sent: Thursday, April 7, 2022 10:50 AM

To: Comments <comments@asmfc.org>

Cc: CAPT. CHRIS DOLLAR <cdollarchesapeake@gmail.com>

Subject: [External] Harvest Control Rule

Good morning,

I am a professional fishing outfitter, small business owner, and ardent marine fisheries conservationist. For the past 27 years I have made my livelihood from the Chesapeake's marine and other natural resources. Having experienced the "yo-yoing" of fishery stocks and management decisions, I firmly believe it is imperative that we move with deliberate pace toward a new 21st century paradigm with regard to fisheries management. To me that means that the ASMFC, MAFMC, state and federal resource agencies must take decisive action to reverse species' decline and manage game fish and forage primarily for abundance rather than maximum harvest.

With regard to the draft Recreational Harvest Control Rule framework/addenda being proposed for summer flounder, scup, black sea bass and bluefish, I support using additional information besides recreational harvest data to establish bag, size, and seasons that better reflect the status of the resource. That also means I am opposed to the status quo. I urge managers to implement alternatives that use more than just recreational harvest data for determining measures.

That said, picking a specific alternative is difficult without knowing the outcomes of options C, D and E in terms of measures.

Option B is better than status quo and I support getting the opportunity to re-evaluate the other options (C, D and E) once measures or harvest levels for those alternatives are known.

Thank you for the opportunity to comment on this important issue.

Capt. Chris D. Dollar

"Stay Healthy…Go Fishing!"

Outdoor Communications & Fishing Outfitter

(410) 991-8468

Tacklecove.com

From: Bland [mailto:blandmail@comcast.net]

Sent: Monday, April 4, 2022 2:52 AM

To: Comments <comments@asmfc.org>

Cc: Joe Cimino <joseph.cimino@dep.nj.gov>; TOM FOTE <tfote@jcaa.org>; HEATHER CORBETT <heather.corbett@dep.nj.gov>; Peter J. Clarke <peter.clarke@dep.nj.gov>; Peter Hughes <phughes@atlanticcapes.com>; captadam@karenannii.com

Subject: [External] Harvest Control Rule

I am a NJ recreational fisherman who values catching summer flounder, scup, black sea bass and bluefish, I support using additional information besides recreational harvest data to establish bag, size and seasons that better reflect the status of the resource.

Therefore, I do not support status quo and urge managers to implement alternatives that use more than just recreational harvest data for determining measures.

However, choosing a specific alternative is difficult without knowing the outcomes of options C, D and E in terms of measures.

Option B is better than status quo and I support getting the opportunity to re-evaluate the other options (C, D and E) once measures or harvest levels for those alternatives are known.

Thank you for the opportunity to comment on this important issue.

Craig A. McIlrath

38 Mill Park Lane

Marlton, NJ 08053

blandmail@comcast.net

856-905-1711

From: teedle dowe [mailto:myfeb28@yahoo.com]

Sent: Sunday, April 3, 2022 3:37 PM

To: Comments <comments@asmfc.org>

Subject: [External] harvest control rule

Sea bass, not sure where your data on sea bass comes from. But I believe trying to control mother nature in anyway is not good. Years ago a moratorium was placed on stripe bass and around the same time weakfish numbers fell beyond belief ! While no one could catch the stripers , they where feasting on

the weakies my belief.

Back to the sea bass , they eat most everything that swims, crab, squid, porgies, sea bass and lots of other bait fish. What will be left for flounder ,tautog and other fish to eat, very little. My point, trying to control this eating machine will hurt others in many many ways.

My concern and regards,

Ted

From: brimoroz [mailto:brimoroz@protonmail.com]

Sent: Monday, March 28, 2022 7:50 PM

To: Comments <comments@asmfc.org>

Subject: [External] Harvest Control Rule

Hi,

I had a comment regarding the fisheries models under development that I felt wasn't appropriate for the webinar given then audience. There needs to be a bit more effort to help the public in these hearings understand the basics of how these models work (weighting, controlling uncertainties, flexibility, pros/cons e.g., future projections and/or sensitivity analysis etc...) Presenting solutions that depend on sophisticated models is useless without explaining the pros and cons of a model to folks who have little to no understanding of models or modeling. Many of them will poo-poo the idea of using a model-based approach because they don't understand it. I got the impression that folks in the audience think they can just plug in some numbers to these models/algorithms and then make their choice on whether they support the approach based on if they like the outcome or not--that is not how a model is used.

Thank you for your time,

Brian

From: Wayne.Thomas [mailto:Wayne.Thomas@kiewit.com]

Sent: Monday, March 28, 2022 7:46 PM

To: Comments <comments@asmfc.org>

Cc: Wayne.Thomas <Wayne.Thomas@kiewit.com>

Subject: [External] Harvest Control Rule

Dustin,

My comment or question would be as to the sensitivities in the models for adjustments to the legal harvest size limits… and would reducing the size of the harvest limit reduce catch and release mortality, save the bigger breeder fish, and actually help increase the fish populations.

I.e,: What happens is the average father-son team go out fishing in the morning and catch a number of fish.. say summer flounder/fluke… that are just below the legal keeper length… they continue to fish for their keeper and continue to catch and release fish.. which some die upon release. Wouldn't the fish populations be better off if that 16.25" first flounder was their keeper; they are happy anglers and stopped returning "shorts" back into the waters only to have them die. The same thing happens with the 28" striped bass harvest limit and their catch-release mortality rates..

Again, the positive residual effect would be more of the larger fish which are better breeders would remain and also help support the population.

I know it seems counter-intuitive to lower the harvest size limits but in reality it's a positive move. Less fish (not only by number but also by weight/pound) would be brought to shore and those remaining would be the bigger/better breeders.

Thanks for tonight's presentation and consideration… and your efforts in this important topic.

Wayne

Wayne D. Thomas, PE

Vice President, Strathmere Nj Fishing & Environmental Association

1-201-832-3351

From: Eric Packard [mailto:ericp669@gmail.com]

Sent: Friday, March 25, 2022 6:50 AM

To: Comments <comments@asmfc.org>

Subject: [External] Harvest Control Rule

As an avid angler who values catching summer flounder, scup, black sea bass and bluefish, I support using additional information besides recreational harvest data to establish bag, size and seasons that better reflect the status of the resource.

Therefore, I do not support status quo and urge managers to implement alternatives that use more than just recreational harvest data for determining measures.

However, choosing a specific alternative is difficult without knowing the outcomes of options C, D and E in terms of measures.

Option B is better than status quo and I support getting the opportunity to re-evaluate the other options (C, D and E) once measures or harvest levels for those alternatives are known.

Thank you for the opportunity to comment on this important issue.

Eric Packard

Artist (I fish sometimes, too)

From: Michael Shepherd [mailto:sheponfishing@yahoo.com]

Sent: Wednesday, March 16, 2022 4:52 PM

To: Comments <comments@asmfc.org>

Subject: [External] Harvest control rule

I am a recreational fisher in South Jersey and I appreciate the opportunity to emphasize the need to change the thinking concerning summer flounder regulations. I join the critics who have shown that current regulations requiring the harvest of the breeding females is a major factor in the decline of summer flounder.

We need be allowed slot fish inside the 17-18 minimums.

Mike Shepherd

609-350-0388

April 22, 2022

Dustin Colson Leaning
FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland Street
Suite 200
Arlington, VA 22201

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

Dear Mr. Colson Leaning and Ms. Beaty:

Thank you for the opportunity to comment on the Harvest Control Rule (HCR) Framework/Addenda, a joint action that is a part of the Mid-Atlantic Fishery Management Council's (Council) and the Atlantic States Marine Fisheries Commission's (Commission) Recreational Reform Initiative. The American Saltwater Guides Association (ASGA) represents conservation-minded fishing guides, charter boat captains, small fishing-related businesses, and anglers, many of whom participate in fisheries impacted by this action. We have followed the development of this initiative for more than a year, recognizing the challenges presented by the current approach to managing recreational fisheries for several species jointly managed by the Council and Commission. While we commend the Council and Commission for their progress to date and do have feedback on specific aspects of the draft document, we continue to be concerned with the complexity of the alternatives provided for public feedback, an issue further exacerbated by the lack of Council Scientific and Statistical Committee (SSC) review prior to the solicitation of public comments.

While we appreciate the urgency of the task at hand, we are cautious of hastily implementing an untested management approach for four species without all of the necessary information and resources to avoid another challenging specifications cycle—all the while potentially increasing the risks of overfishing. Additionally, the larger process surrounding this effort continues to cause concern. The Commission is soliciting public comment while key aspects of this highly complex document remain undeveloped—including the "critical"[1] Recreational Economic Model and the Recreational Fleet Dynamics Model[2]—and while the SSC is in the process of developing a report on the risks and uncertainties associated with the HCR approaches.[3] Asking the public to comment on these options without an understanding of the relative risks and benefits of each HCR approach—or the potential concrete measures that could result—limits the ability to provide constructive comment. Moreover, this process could potentially (further) undermine public faith in the fishery management process should a preferred alternative lead to an unanticipated and undesirable on-the-water regulatory outcome.

Until the SSC releases its report, we are not in a position to comment on a preferred alternative for Section 3.1 of the Framework/Addenda, Management Options to Set Recreational Management Measures. We do plan on submitting a more detailed public comment in the subsequent SSC HCR Report public comment period, which will be guided by our desire for the long-term sustainability of these stocks while also acknowledging the challenging reality that the black sea bass and scup stock biomasses are at 200 percent of the target, yet sizeable reductions continue to be required and implemented.[4] We hope this effort can find the correct balance for managing these healthy stocks within the confines of the Magnuson-Stevens Act (i.e., holding sectors accountable to science-based limits).

For Section 3.2, Target Measure for Setting Measures, ASGA recommends Option B, Annual Catch Limit. Setting measures to achieve a level of total dead catch (harvest and discards) would be an improvement for management and inject additional considerations into the measure-setting process. For example, accounting for discards would possibly encourage managers to make more explicit optimum yield considerations within a fishery. Option B does, however, contain a concerning sentence that we believe deserves additional clarification: "For this reason, the target level of catch for each bin may not always be equivalent to the recreational ACL under the no action alternative as a range of ACLs could fall under the same bin."[5] We understand that by design three of these HCR approaches will have predetermined measures for a range of stock conditions; therefore, each bin will be expected to produce a range of catch. However, additional information and specific guidelines are necessary regarding the intention to adhere to the Recreational ACL and set a range of catch for each bin that will not lead to overfishing.

---

[1] Mid-Atlantic Fishery Management Council. Overview of work, major accomplishments, and timeline recommendations. October 1, 2021.
https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/616712674e13667ceb57b591/1634145031712/
[2] Mid-Atlantic Fishery Management Council. Recreational Harvest Control Rule Framework/Addenda. January 26, 2022.
https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/61f44ea1cbe85135c3b669cc/1643400867886/Tab04_Rec-HCR-FW_2022-02.pdf
[3] Mid-Atlantic Fishery Management Council. February Meeting Motions. February 8-9, 2022.
https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/620569fcbaa00808ea528741/1644521980583/2022-02_MAFMC-Motions.pdf
[4] Atlantic States Marine Fisheries Commission. Draft Addendum XXXIV To The Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan and Addendum II to the Bluefish Fishery Management Plan for Public Comment. February 2022.
http://www.asmfc.org/files/PublicInput/HCR_DraftAddenda_PublicComment_March2022.pdf
[5] Ibid.

For Section 3.3, Conservation Equivalency (CE), we support Option B, Regional Conservation Equivalency. On the one hand, given that the HCR is an untested approach to managing recreational fisheries, we have significant concerns about applying CE at all given the additional uncertainty that it could bring to bear on management outcomes. On the other hand, we are cognizant of how diverse these fisheries are across their geographic ranges and understand that regulations for one region may not be effective or appropriate in another. Therefore, we support the regional use of conservation equivalency. One potential benefit for employing a regional approach for CE would be reduced staff workload. This possible extra bandwidth will be important to devoting all the necessary resources towards potentially implementing one of these HCR approaches.

We look forward to providing additional comments following our review of the SSC's findings, and appreciate your consideration of our views at this time.

Sincerely,

Will Poston
Policy Associate
American Saltwater Guides Association
will@saltwaterguidesassociation.org
(202) 577-8990

Willy Goldsmith, Ph.D.
Executive Director
American Saltwater Guides Association
willy@saltwaterguidesassociation.org
(617) 763-3340

New York Fishing Tackle Trade Association
P.O. Box 3210
Patchogue, NY 11772
nyftta@gmail.com

April 22, 2022

Dustin Colson Leaning, FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland Street, Suite 200A-N
Arlington, VA 22201
RE: Public Comments for Harvest Control Rule

The New York Fishing Tackle Trade Association (NYFTTA) represents both the retail and wholesale bait and tackle dealers in the New York Marine district. The livelihood of our members, our industry, depends upon healthy stocks of many species of fish. Our mission is not just to promote the sport of fishing, but also to do our part in conserving resources for the future. Conserving resources for the future is not just managing the fishery from a conservation or regulatory approach, but also accounting for the socioeconomic impact of such regulations and maintaining fair and equitable access.

For decades the recreational fishing community has abided by recreational measures that are put in place with the goal of restraining harvest within sustainable levels. Often times, these measures were restrictive, imposing economic hardship on the recreational industry. Yet, as a sustainable fishery is the ultimate goal for the future of the fishery and the recreational community, we did our part. Hardships have paid off and we have seen fisheries rebuild; fisheries no longer being overfished. In fact, some fisheries have been successful to the point that even under measures meant to control harvest, these fisheries are so abundant, that harvest goes over. And when these instances occur, even though we know recreational measures are not reflective of stock size, managers hands are tied with a plan that does not incorporate factors beyond harvest.

The options laid out in this draft addendum take a first step at incorporating other data with the RHL when setting recreational measures. These options have models that are still being developed and we have yet to see what they will look like. While we are in favor of incorporating other factors, such as the bio mass, not seeing the impact of the final models, makes it difficult to support a future course. That being said, NYFTTA reluctantly supports **Option B for the Percent Change Option**. This Option is a step in the direction of developing managing measures that more completely encompass the harvest of recreational fishing with the health of the stock. In the end, we need sustainable fisheries, and moving in this direction will allow the stakeholders to benefit when fisheries are healthy, as well as take more comprehensive action when fisheries are on the downturn.

However, supporting Option B is only supporting a concept. The devil is in the details of how this will be achieved, which is where the sub-options come into play. We **DO NOT support Sub Option B-2B**. This option has set percentages for both liberalization and reduction. This option poses the real possibility that a fishery could be at 99% of its target, but if "future 2-YR avg. RHL is less than the lower bound of the harvest estimate CI" <u>a 40% reduction</u> would be implemented. In this scenario, a mere 1% more in biomass would bring this reduction down to 20%. There is a huge difference in the economic impact a 20-point spread reduction would have to the recreational community and industry. In one of the recent public hearings, I overhead someone say that in the BSB fishery this year, the ".7%" of the 20.7% BSB fishery was trivial. I can understand that looking in from the outside, it could be perceived that that a couple of points is inconsequential, but this is far from true! To the industry, to the shop who as a seasonal business, and already has less than a half a year to make their livelihood, every day matters! Whether it is 1, 5, 10 or 15% more, it can make an enormous economic impact and help to find that balance where both the FISHERY and the INDUSTRY can sustain. Sub-option B2-B has dangerous implications for the recreational industry. At this time, until these models are fully developed, we could only **lend support to Option B-1A**. Even in this sub-option we have concern, as it misses the mark when the biomass exceeds 150%. There should be a differential in the liberalization equation with an added benefit over that 150% mark. For the same reasons we disagree with a “set” percent in sub-option B-1B, we have reservations of the “set” percent of sub-option B-2A. We believe there needs to remain flexibility with smaller increments in the percentages of liberalizations/reductions.

While we support that we can do a better job setting recreational harvest measures by utilizing “innovative management tools” and additional factors beyond harvest, this is unchartered territory. We believe this should be a 2-year interim approach. The Harvest Control rule should sunset in two-years with the ability to revisit through public input if it was a success and whether it should continue, revert back to the current models or be replaced entirely with a new model.

In addition to being a representative of the NYFTTA, I also own Regal Marine Products, a wholesale bait and tackle distributor. Our customers, bait and tackle shops, range from NJ through Rhode Island. I am very in tune with the recreational industry and the economic impact that regulations have on not only each state, but the region as a whole. There is no doubt that changes in recreational measures have a direct economic correlation on the industry. When we look at recreational measures, they are there to support the recreational fishing community, to give access to the hundreds of thousands of fishermen who enjoy the sport of fishing. Please make no mistake that at the heart of that community lies an industry that supports them. We ask that you think about that balance, as the choices you make today, not only determine the sustainability of the fisheries, but us as an industry as well.

Respectfully Submitted by,

Melissa Dearborn
Dearborn

Melissa Dearborn
Vice President, NYFTTA
melissa@regalbait.com

Respectfully Submitted by,

Melissa

Melissa Dearborn
Owner, Regal Marine Products, Inc
melissa@regalbait.com

1075 Tooker Avenue
West Babylon, NY 11704
April 20, 2022

Duston Colson Leaning, Fishery Management Plan Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland Street, Suite 200 A-N
Arlington, VA 22201

RE: Harvest Control Rule

Dear Mr. Leaning:

With respect to *Draft Addendum XXXIV to the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan and Addendum II to the Bluefish Fishery Management Plan* (the "Draft Addenda"), I support Option A, *status quo*.

My support for the no-action option does not necessarily reflect on the intrinsic merits of the various Harvest Control Rule approaches, but is instead based on the lack of information, critical to the Harvest Control Rule debate and to the implementation of any control rule that may be adopted, provided to members of the Interstate Fishery Management Program Policy Board (the "Policy Board"), the Summer Flounder, Scup, and Black Sea Bass Management Board (the "Management Board"), the Mid-Atlantic Fishery Management Council (the "Council"), and to stakeholders and members of the general public.

While the Draft Addenda go into great detail outlining how the various control rule options would calculate management measures, and provide some detail on how such options might impact anglers, they leave out the most important information of all: How each control rule option might affect the long-term management and long-term health of the relevant fish stocks.

Without such information, it is impossible to provide intelligent comment.

In a properly managed fishery, the primary goals of fishery managers, and so of fishery management measures, are to prevent overfishing and maintain spawning stock biomass at, or rebuild spawning stock biomass to, B_{msy}. The Draft Addenda provide no guidance on the likelihood of measures developed pursuant to any of the Harvest Control Rule options successfully meeting such goals, nor do they rank the options in terms of management effectiveness or relative risk to the managed resource. Those are egregious omissions.

Below, I address the concerns which led me to select Option A in more detail.

I
The need for the Harvest Control Rule has not been clearly established.

The Draft Addenda state that "The goal of the Draft Addenda and the Council's framework is to establish a process for setting recreational bag, size, and season limits for summer flounder, scup, black sea bass, and bluefish such that measures aim to prevent overfishing, are reflective of stock status, appropriately account for uncertainty in the recreational data, take into consideration angler preferences, and provide an appropriate level of stability and predictability in changes from year to year." Most of those goals can and are being achieved under the current management program.

Even such contentious issues as uncertainty in the recreational data can be addressed within the current management system, as demonstrated by the use of "Thompson Tau outlier analysis"[1] to address uncertainty in recreational black sea bass data when establishing 2022 management measures. Admittedly, such Thompson Tau analysis does not directly address the issues of management stability and predictability, although such issues are closely tied to the uncertainty in recreational data, so additional management tools are arguably needed.

However, it is not clear that the Harvest Control Rule is needed to address the uncertainty and stability issues.

The uncertainty inherent in the annual estimates of recreational catch, landings, and effort falls within the general category of "management uncertainty," as does angler behavior in response to management measures, weather conditions, other available fish stocks, and similar factors. Such management uncertainty certainly exists in each of the summer flounder, scup, black sea bass, and bluefish fisheries, yet the monitoring committees responsible for recommending annual management measures have consistently refused to acknowledge it, and instead set the management uncertainty value at zero, the one value that everyone knows is wrong.

By recognizing the existence of management uncertainty, and setting a recreational harvest target at an appropriate level below the recreational harvest limit, the Management Board and Council could create a buffer that would allow for management uncertainty, lead to more stable and predictable management measures, and significantly reduce incidents of "chasing the RHL," while remaining within the current management structure.

The Draft Addenda note that "many recreational stakeholders expressed frustration that the black sea bass measures did not seem reflective of stock status as they have generally been more restrictive in recent years compared to when the stock was under a rebuilding plan, despite the stock currently being more than twice the target level and highly available to anglers." There is no question that some stakeholders, particularly those connected to the recreational fishing industry, have expressed such

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[1] See Presentation to Atlantic States Marine Fisheries Commission Summer Flounder, Scup, and Black Sea Bass Management Board, ASMFC Winter Meeting, available at http://www.asmfc.org/files/Meetings/2022WinterMeeting/SFSBSB_BoardPresentations_Jan22.pdf

feelings. However, it then becomes necessary to ask whether a transient condition[2] in a single fish stock justifies overthrowing the current management system in favor of an untested Harvest Control Rule that will be used to manage all four recreational fisheries.

Nothing in the Draft Addenda suggest that such justification exists.

II
The Harvest Control Rule is being moved forward with undue haste.

The Harvest Control Rule discussion that took place at the Council's February 8, 2022 meeting made it clear that two statistical models deemed "critical for thorough analysis of the options," and which will "greatly improve the process for setting management measures under any of the options,"[3] will not be available until some time in 2023 (the exception is a single statistical model relating to the recreational summer flounder fishery, which is expected to be ready for use later in 2022).

Yet when questions arose at the February 8 meeting about the wisdom of moving forward without such supposedly "critical" models, Savannah Lewis, who then led the ASMFC's Plan Development Team, responded that "The word is 'critical," not 'required,'" a comment that should raise concerns, particularly when it was followed up with an admission that such models were indeed "critical," but that moving ahead was justified by "what happened over the last three months," a clear reference to the controversy over more restrictive black sea bass regulations. The fact that a state fishery manager sitting on the Policy Board later noted that "Nobody wants to go through the process [of setting black sea bass regulations] again this year," further raises concerns that a desire to avoid further controversy is outweighing the need to establish a proper, well-considered foundation for the Harvest Control Rule and for 2023 regulations.

Until Michelle Duval, a Council member from Pennsylvania, successfully put a motion on the table asking that the Council's Scientific and Statistical Committee analyze all of the Harvest Control Rule options under various scenarios, and determine their relative risk with respect to managing fish stocks at different levels of abundance, both the Policy Board and Council were preparing to vote on a Harvest

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[2] The most recent benchmark stock assessment, along with subsequent stock assessment updates, identified an exceptionally strong black sea bass year class produced in 2011 (recruited at age 1 in 2012), and a second smaller, but still unusually strong, year class in 2015 (recruited at age 1 in 2016), which made a significant contribution to the current black sea bass abundance. However, recruitment has since returned to more typical levels (with the exception of the smallest-in-the-time series 2017 year class), and spawning stock biomass, while still twice the target level, has been in decline. That sets the stage for one of two likely alternatives: Either the SSB will continue to decline toward (and hopefully not below) the target level in the face of average recruitment, or additional strong year classes will be produced that maintain SSB at or close to current levels, in which case biologists performing the stock assessment are likely to increase their estimates of black sea bass productivity and revise B_{msy} upward. In either case, the likelihood of SSB remaining at or near 200 percent of B_{msy} in the long term is probably low.

[3] Memorandum from Joint PDT/FMAT for Recreational Reform to Mid-Atlantic Fishery Council and ASMFC Policy Board, dated October 1, 2021, pp. 1-2, available at https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/616712674e13667ceb57b591/1634145031712/2021-10-21_Combined-Briefing-Materials.pdf

Control Rule in June 2022, without having even that basic information, which is, of course, also not available to stakeholders commenting on the Draft Addenda.

It is poor policy to move ahead with a new and untested management approach before all of the information and statistical models needed to properly evaluate and implement such approach are available.

III
Will the Harvest Control Rule increase uncertainty in the management process?

The Draft Addenda cited "uncertainty in the recreational fishery data" as one justification for adopting the Harvest Control Rule. What the Draft Addenda do not make clear is whether at least some of the Harvest Control Rule options would increase uncertainty in the management process.

The current management approach requires relatively few parameters. Managers be able to estimate both F_{msy} and the current spawning stock biomass to calculate the Overfishing Limit (which the Council's Scientific and Statical Committee will then reduce, to account for scientific uncertainty, to produce the Acceptable Biological Catch), and an estimate of the previous year's catch and landings, which is subject to some level of management uncertainty. The uncertainty associated with each parameter can negatively affect the effectiveness of the resulting management measures.

However, some of the Harvest Control Rule options rely on additional data. Option C, the "Fishery Score Approach," would incorporate an estimate of current biomass, an estimate of B_{msy}, an estimate of the current fishing mortality rate, an estimate of F_{msy}, an estimate of recruitment, as well as an estimate of recreational landings. The point estimate used for each of those parameters is surrounded by a confidence interval. So the important question to ask is whether, by basing management measures on so many different parameters, each of which is subject to some level of uncertainty, the Harvest Control Rule could introduce a significantly higher level of uncertainty, and thus of risk, into the management process.

The Draft Addenda do not answer that question, nor do they answer such question with respect to Option D, the "Biological Reference Point Approach," which is based on estimates of the current fishing mortality rate, F_{msy}, current biomass, B_{msy}, recruitment, recruitment trends, and recreational landings levels, or Option E, the "Biomass Based Matrix Approach," which requires estimates of current biomass, Bmsy, and biomass trends.

Without understanding how a Harvest Control Rule option increases uncertainty, and so possibly increases risk, in the management process, the suitability of such options cannot be properly evaluated.

IV

Does the Harvest Control Rule meet the minimum legal standards for fishery management measures?

The Magnuson-Stevens Fishery Conservation and Management Act[4] ("Magnuson-Stevens") establishes clear requirements for fishery management measures, many of which have been interpreted by the federal courts. While Magnuson-Stevens does not apply to the Atlantic States Marine Fisheries Commission ("ASMFC"), and the ASMFC's management actions are not subject to review pursuant to the federal Administrative Procedures Act,[5] such considerations are relevant to measures adopted by the Council and National Marine Fisheries Service ("NMFS").

It is not clear from the Draft Addenda, nor from private conversations that I have held with Council and NMFS staff, whether all of the Harvest Control Rule options would meet such legal standards. Two legal standards cause particular concern.

Magnuson-Stevens includes ten National Standards for Fishery Conservation and Management.[6] National Standard 1 states that "Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry."

That requirement has been interpreted by the federal courts to mean that any management measure must have at least a 50 percent probability of preventing overfishing to be legally acceptable. The court in *Natural Resources Defense Council v. Daley*,[7] a matter arising out of legally inadequate summer flounder management measures adopted by the Council, found that "at the very least, this means that 'to assure' the achievement of the target F, to 'prevent overfishing' and to 'be consistent with' the fishery management plan, the [total allowable landings] must have had at least a 50% chance of attaining [the target fishing mortality rate]."

Neither the Draft Addenda nor any comment that I have yet heard on the part of the Council or NMFS has provided clear assurance that management measures produced by each of the Harvest Control Rule options would meet that minimum legal standard.

Magnuson-Stevens also requires that regional fishery management councils "develop annual catch limits for each of its managed fisheries that may not exceed the fishing level recommendations of its scientific and statistical committee or the peer review process established [elsewhere in the statute]."[8]

While the Draft Addenda discuss how accountability measures might be applied to the various Harvest Control Rule options should recreational landings exceed such catch limits, nowhere do they state how management measures will be developed to prevent such catch limit to be exceeded in the first place. That causes particular concern with respect to Options C, D, and E, where management measures are

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[4] 16 U.S.C. 1801 *et seq*

[5] *New York v. Atlantic States Marine Fisheries Commission*, 609 F.3rd 524, (2nd Circuit, 2010)

[6] 16 U.S.C. 1851

[7] 209 F.3rd 747 (DC Circuit, 2000)

[8] 16 U.S.C. 1852(h)(6)

largely or completely divorced from the previous year's annual catch limit. It is difficult to believe that a court would be receptive to an argument that, while Magnuson-Stevens requires an annual catch limit to be established, it does not require a regional fishery management council to consider that catch limit when crafting management measures for the upcoming season.

The lack of assurances that management measures produced pursuant to any or all Harvest Control Rule options will both have a 50 percent probability of preventing overfishing and are likely to constrain recreational landings to the annual catch limit give rise to concerns that the Harvest Control Rule does not meet the minimum legal requirements established by Magnuson-Stevens.

V

The Policy Board, Management Board, and Council should phase in implementation of the Harvest Control Rule, testing it first on black sea bass.

While current management practices may not be perfect, they managed to rebuild the summer flounder, scup, and black sea bass stocks, which were once badly overfished. In the case of black sea bass and scup, spawning stock biomass was not merely rebuilt to the target levels, but to levels far above such targets. As noted in the first section of these comments, the few shortcomings of the current management approach can be remedied with relatively modest measures, without the need to radically change the management process.

That being the case, changes to the current management process should be done cautiously. It is difficult to understand why the Policy Board, Management Board, and Council are intent on radically altering the management paradigm for all four species at the same time, instead of engaging in a pilot program involving a single species, to determine whether the Harvest Control Rule works in practice, and not merely in theory.

That is particularly true because, even should the Harvest Control Rule fail to adequately constrain fishing mortality and maintain spawning stock biomass, there will likely be significant resistance, both from the angling industry and from Council and Policy Board members who have invested substantial effort and personal prestige in such Harvest Control Rule, to restoring the current approach to recreational fishery management.

Given that discontent over black sea bass management has provided much of the impetus for development of a Harvest Control Rule, it would make sense to limit initial implementation of the Harvest Control Rule, if implementation is to occur, to only that species. Spawning stock biomass is high enough that even if the management measures developed pursuant to any control rule fail to constrain recreational landings to sustainable levels, the black sea bass stock is likely to remain well above the biomass target until managers can address the issue.

If the Harvest Control Rule does not have an adverse impact on the black sea bass stock, its use could then be extended to summer flounder, scup and, once the stock is rebuilt, bluefish. But if the Harvest Control Rule fails to adequately constrain the recreational black sea bass harvest, managers will know that more work must be done before it can be used to manage the scup and, more importantly, the summer flounder and bluefish stocks, which unlike black sea bass and scup, are already below their biomass targets.

<u>VI</u>
<u>Summary</u>

The Harvest Control Rule represents the most significant change to the management of bluefish and mid-Atlantic demersal species since the passage of the Sustainable Fisheries Act in 1996 and the 2000 court decision in *Natural Resources Defense Council v. Daley*. As such, it should not be adopted in haste, and certainly not until all of the information and statistical models needed to support the new management approach are in place.

Today, neither the models nor the information are available.

The Draft Addenda were released prematurely, out of an understandable desire to put the Harvest Control Rule in place for the 2023 season, whether it was fully ready or not. Such Draft Addenda thus lacked the information needed to make intelligent and informed choices with respect to the Harvest Control Rule options.

I support Option A, *status quo*, solely because, based on the information available, that is the only option that will clearly do no harm to the long-term health of mid-Atlantic fish stocks.

The haste with which the Draft Addenda were prepared and presented does no justice to the management process, the affected fish stocks, nor the Harvest Control Rule itself, which may well be the most appropriate approach to managing recreational fisheries in the mid-Atlantic. However, such appropriateness can't be determined given the information that is currently available.

I thus respectfully request that the implementation process be delayed until such information is available, at which time the Policy Board and Council can again seek comment, this time from a fully informed public, and determine whether the Harvest Control Rule is the right management tool for the species in question.

Thank you for considering my thoughts on this matter.

Sincerely,

Charles A. Witek, III

NEW JERSEY COUNCIL OF DIVERS AND CLUBS
526 S. Riverside Drive
Neptune, NJ 07753
www.scubanj.org

4/20/22

HARVEST CONTROL RULE FOR RECREATIONAL MANAGEMENT

DRAFT ADDENDUM XXXIV TO THE SUMMER FLOUNDER, SCUP AND BLACK SEA BASS MANAGEMENT PLAN & THE BLUEFISH MANAGEMENT PLAN FOR PUBLIC COMMENT

The NJ Council of Divers and Clubs is presently an organization of 14 sport diver clubs in New Jersey and nearby states. The following is testimony regarding the proposed recreational harvest control rules

The NJ Council of Divers and Clubs supports Option A No Action (Current Recreational Measures Setting Process). With the recreational fishery, many thousand of recreational fishermen are involved and the exact take cannot be determined because recreational fishermen do not report their catch to a central processing agency. <u>I have never supported automatically doing something based on any formulae that does not allow fishery managers to consider the overall impact on the recreational fishery.</u>

The NJ Council of Divers and Clubs believes that trying to define an exact procedure through Option B Percent Change Approach, Option C Fishery Score Approach, Option D Biological Reference Point Approach, and Option E Biomass Based Matrix Approach is not realistic because in most cases you will not have really good data on the recreational catch. The least harmful of the approaches is option B, except that 150% of the target stock seems very high and unrealistic to me.

The NJ Council of Divers and Clubs would support Conservation Equivalency Options to give states more flexibility for alternative measures.

Respectfully

jf2983182@msn.com

Jack Fullmer

Legislative Committee

The NJ Council of Diving Clubs recently reorganized and changed its name to the NJ Council of Divers and Clubs to try to attract more membership from dive shops, dive boats as well as individual divers.

RHODE ISLAND
SALTWATER
ANGLERS
Association
P.O. Box 299, Tiverton, Rhode Island 02878 401-826-2121 www.RISAA.org

April 22, 2021

Dustin Colson Leaning

Re: Harvest Control Rule

Dustin and Commission Members:

The Rhode Island Saltwater Anglers Association (RISAA) represents over 7500 saltwater anglers and 28 affiliate clubs in Rhode Island, Connecticut and Massachusetts. We have been following the discussions and developments related to "Recreational Reform" with much interest.

We have always based our positions on science based measures and continue to believe science must dictate management. RISAA also feels equally as strong that when the management tools clearly are failing then additional tools are needed to allow managers the ability to respond appropriately to changing fish stock status levels. In that line we have come to believe that the current recreational management tools need some form of improvement and therefore we are in favor of a change as proposed under the Harvest Control Rule. We are not in favor of Option A, Status Quo because we believe that it is important that managers have the ability to use important factors such as population status when establishing recreational management measures. We believe that Option B is a step in the right direction and would therefore be significantly better than Status Quo. Some of the other options may provide even better recreational management however since they were not presented in sufficient detail we are not sure what effect they may have on recreational management issues.

At the present time we would like to state for the record that we are opposed to Option A and would support Option B with further analysis of the other options.

Thank you,

Greg Vespe
Executive Director
Rhode Island Saltwater Anglers Association

39 Industrial Park Road, Unit C
Plymouth, MA 02360
www.stellwagenbank.org

April 20, 2022

Dustin Colson Leaning, FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland Street
Suite 200
Arlington, Virginia 22201

RE: Harvest Control Rule

Dear Mr. Colson Leaning:

On behalf of the Stellwagen Bank Charter Boat Association (SBCBA) whose membership includes the for hire fleet, recreational anglers and commercial fisherman that fish the state and federal waters off the coast of Massachusetts, we offer the following comments to the Harvest Control Rule ("HCR"):

The SBCBA is pleased to see the proposed HCR alternatives that attempt to address the ongoing uncertainties and variability associated with MRIP data resulting in poor stock status as well as seasons and bag limits inconsistent with our observations on the water. The HCR alternatives attempt to provide other metrics less reliant on MRIP data to make fishery management decisions.

Section 3.1. Management Options to Set the Recreational Management Measures.

The SBCBA support Option B, the Percent Change Approach, as an interim approach until Options C, D and E can be developed further and scenario tested. Option B is the only option that has been tested by looking at what the management response would have been if Option B was implemented in previous years versus a fishery management action that occurred under the "no action alternative".

Once tested, Options C, D and E can be detailed to the recreational fishing community in order for the public to understand the differences in setting recreational measures across the alternatives that provides the public the opportunity to evaluate the trade-offs of each approach. Therefore, the SBCBA supports the opportunity to reconsider Options C, D and E once

39 Industrial Park Road, Unit C
Plymouth, MA 02360
www.stellwagenbank.org

the outcomes are known and scenario testing has been completed to demonstrate the performance of these alternatives.

Section 3.3. Conservation Equivalency Options
The SBCBA supports Option A that does not require conservation equivalency but allows use of such if necessary providing flexibility that may alleviate challenges associated with implementing a new HCR approach. The use of a conservation equivalency process provides an approach that works across a broad geographic range of fish availability and angler preferences.

Section 3.4 Accountability Measures Comparisons
The SBCBA support Option B which would utilize fishing mortality relative to the fishing mortality threshold in response to the application of accountability measures. The document states that the most recent fishing mortality estimate considers more recent information than the information used to set a previous year's ACL. Therefore, Option B clearly represents the use of best available science which is consistent with the Magnusson Stevens Act, National Standard 2.

If you have any questions or comments please email or give us a call.

Very truly yours,

Capt. Mike Pierdinock
Capt. Mike Pierdinock
SBCBA, President
sbcbamp@gmail.com

Capt. Timothy Brady
Capt. Timothy Brady
SBCBA, Vice President
tbrady@maritime.edu

Capt. Rick Golden
Capt Rick Golden
SBCBA, Secretary
1620anglers@gmail.com

Cc: Michael Pentony, GARFO
Russell Dunn, NMFS
Dan McKiernan, MassDMF
Ron Amidon, MassF&G

Jersey Coast Anglers Association
Working for Marine Recreational Anglers
1594 Lakewood Road, Unit 13, Toms River, NJ 08755
TEL.: 732-506-6565 - FAX: 732-506-6975

4/21/22

ASMFC/MAFMC

The Jersey Coast Anglers Association represents approximately 75 fishing clubs throughout our state. We strongly support making a change in the way our summer flounder, scup, black sea bass and bluefish are managed. We believe that very few, if any, of our fisheries managers believe that the MRIP numbers are accurate and should be the only data used in determining quotas, seasons, bag limits and size limits. Until this point, their hands have been tied but now there is an opportunity for change that we hope will result in better fisheries management and fairer regulations for our recreational fishermen

Of the options available to consider, we strongly oppose option A which is status quo. We believe any of the other options would be better than that. Options C, D, and E are not fully developed so we can not support them at this time. Therefore, we urge you to implement Option B at this time and consider the other options once they are fully developed.

Respectfully submitted,

Mark Taylor, JCAA President

MARINE TRADES
ASSOCIATION OF NEW JERSEY

April 18, 2022

Dustin Colson Leaning
FMP Coordinator
1050 N. Highland St.
Suite 200 A-N
Arlington, Virginia, 22201

Dear Mr. Leaning,

The following comments are being submitted on behalf of the Marine Trades Association of New Jersey (MTA/NJ) regarding the Harvest Control Rule for Bluefish, Summer Flounder, Scup and Black Sea Bass. The MTA/NJ is in support of Option B in section 3.1 of the Recreational Harvest Control Rule Draft Addenda/Framework.

The MTA/NJ, established in 1972, is a non-profit trade organization comprised of over 300 marine-related businesses dedicated to advancing, promoting, and protecting the marine industry and waterways in the State of New Jersey. We represent hundreds of recreational businesses both large and small located in every county of the state.

It is largely agreed that the present recreational fishery management system used by the ASMFC and MAFMC has failed. Form over substance has dictated recreational management by the ASMFC and MAFMC for years to the detriment of the fishing community. Common sense and reality (such as stock status) are less significant than formulaic and non-adaptive management. Add to that an MRIP program that is distrusted by most of the recreational (and commercial) fishing community, and a reality-based component is needed. Option B offers an opportunity to inject the reality of stock status into the system to help level the uneven management road on which our recreational community, particularly our businesses, have suffered. Option A assures the same type of failure we have seen for years. The other options are too uncertain. Please consider adopting Option B.

Thank you for your consideration. If you have any questions, feel free to contact me at 732-292-1051 or mdanko@mtanj.org.

Sincerely,

Melissa Danko

Melissa Danko
Executive Director
Marine Trades Association of New Jersey

April 15, 2022

Dustin Colson Leaning, FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland Street
Suite 200
Arlington, VA 22201

Dear Mr. Colson Leaning,

Thank you for the opportunity to provide input on the Harvest Control Rule Draft Addenda/Framework for summer flounder, scup, black sea bass and bluefish. Our organizations represent the recreational fishing and boating industry and our nation's anglers, and we appreciate the continued efforts by the Atlantic States Marine Fisheries Commission (ASMFC) and the Mid Atlantic Fishery Management Council (MAFMC) to find solutions that are better suited for managing the recreational fishery.

The harvest control rule (HCR) alternatives aim to address numerous challenges currently facing recreational fishery management, including uncertainty in the MRIP data, the need to change measures (sometimes annually) based on those data, and recreational measures (bag, size and season) not reflecting stock status. Most recently, the 2022 fisheries specification process exemplified these challenges and demonstrates the need for alternative approaches to setting bag, size and season. As a result, we offer the following input on the HCR alternatives. While we believe several of the management alternatives presented hold tremendous potential for more efficiently managing both the recreational sector and our fisheries resources, we urge the ASMFC Policy Board and MAFMC to seriously consider which alternatives would be ready for implementation beginning in 2023.

Section 3.1 Management Options to Set the Recreational Management Measures.
We support Option B, the Percent Change Approach, as an interim approach until options C, D and E can be developed further to include the setting of measures within the bin(s) and backtesting.

Option B is currently the only option that has been backtested by looking at what the management responses would have been if option B was implemented in previous years versus management actions that occurred under the no action alternative. This performance testing is critical to understanding the rest of the HCR options, but the modeling approaches are not developed enough to complete that analysis. Additionally, we have consistently maintained the importance of putting alternatives C, D and E in terms that the recreational fishing community understands to illustrate the differences in setting the recreational measures across the alternatives and provide the opportunity to evaluate the trade-offs of each approach. However, to date, that has not been accomplished for options C, D and E.

Nonetheless, we strongly support the opportunity to reconsider options C, D and E once the outcomes are known and analyses have been completed to demonstrate the performance of each approach.

Section 3.2 Target Metric for Setting Measures
The document states that the options in section 3.2 do not apply because we selected Option B in section 3.1, however we thought it would be prudent to provide input on section 3.2

Primary: We support Option C, Fishing Mortality Target (F).
Secondary: We support Option B, Annual Catch Limit (ACL).

Selecting fishing mortality or ACL as the target for setting recreational measures incentivizes fishery managers to directly manage discards. Currently, when management measures are adjusted to achieve the RHL, the impacts on discards are poorly understood because of limited data on discarded fish. Setting measures on F or the ACL incentivizes fishery managers to collect length frequency data on discarded fish through both improvements to the MRIP sampling design and state volunteer angler surveys. The discard length frequency data is then used to better understand how changes to the management measures impact the number of discards.

Section 3.3 Conservation Equivalency Options
We support Option A that allows the continued use of conservation equivalency. Option A provides flexibility that may alleviate challenges associated with implementing a new HCR approach. The conservation equivalency process exists because it is too challenging to establish one set of bag, size and season limits that work across a broad geographic range of fish availability and angler preferences. Option A does not require conservation equivalency but allows it if needed.

Section 3.4 Accountability Measures Comparisons
We support Option B which would utilize fishing mortality relative to the fishing mortality threshold in response to the application of accountability measures. The document states that the most recent fishing mortality estimate considers more recent information than the information used to set a previous year's ACL. Therefore, option B clearly represents the use of best available science which is timelier and more consistent with National Standard 2.[1]

Thank you for considering our input. We appreciate the ASMFC Policy Board and Council for their continued support of the recreational management reform initiative and the Fishery Management Action Team for their work on the harvest control rule addenda/framework.

Sincerely,

Michael Waine
Atlantic Fisheries Policy Director
American Sportfishing Association

Jeff Angers
President
Center for Sportfishing Policy

Ted Venker
Conservation Director
Coastal Conservation Association

Chris Horton
Senior Director of Fisheries Policy
Congressional Sportsmen's Foundation

Lorna O'Hara
Interim Executive Director
Recreational Fishing Alliance

Clay Crabtree
Federal Government Relations Director
National Marine Manufacturers Association

[1] https://www.fisheries.noaa.gov/national/laws-and-policies/national-standard-2-related-resources

Conservation Law Foundation ● Natural Resources Defense Council ● Ocean Conservancy

April 22, 2022

Dustin Colson Leaning
FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland Street, Suite 200
Arlington, VA 22201

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

Re: Recreational Harvest Control Rule Framework/Addenda

Dear Mr. Colson Leaning and Ms. Beaty:

On behalf of the organizations below, we provide these comments on the Mid-Atlantic Fishery Management Council's (Council) and Atlantic States Marine Fisheries Commission's (Commission) Recreational Harvest Control Rule (HCR) Framework/Addenda for the summer flounder, scup, black sea bass, and bluefish recreational fisheries.[1] Our organizations support strong implementation of the core conservation requirements of the Magnuson-Stevens Fishery Conservation and Management Act, including requirements to prevent overfishing with annual catch limits and accountability measures.

Recognizing the unique management challenges presented by these recreationally important species, and the importance of continued discussions on how to improve recreational data collection, stock assessments, and the annual process for setting recreational management measures (e.g., season lengths, bag and size limits) we appreciate that the HCR Framework/Addenda is in some respects attempting to address these challenges and improve management outcomes. However, we have serious concerns that some of the management options presented could increase the risk of overfishing. There remains significant ambiguity regarding how the options would be implemented within the framework of ACLs and annual accountability as required by federal law.

Given that the HCR approach is a significant departure from current management for these important species, we think it appropriate to proceed with caution, rather than being driven by a goal of implementing changes in time for the 2023 fishing season. We strongly recommend that the Council and Commission pause further consideration of the Draft HCR Framework/Addenda pending the completion and full consideration of the Council's Scientific and Statistical Committee's (SSC) review of the potential effects of the five alternatives, and pending completion of the statistical models that will predict recreational harvest based on selected input controls, which at present are not anticipated to be available for use for most species until Fall 2022 or later. Prior to any action being taken, the Council and Commission must also be able to clarify how the option(s) comply with the controlling Magnuson-Stevens Act framework.

[1] Atlantic States Marine Fisheries Commission, Draft Addendum XXXIV to the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan and Addendum II to the Bluefish Fishery Management Plan for Public Comment, Harvest Control Rule for Recreational Management ("Harvest Control Rule Draft Framework/Addenda") (February 2022).

Furthermore, we are concerned that such a significant change to management is being pursued via a framework action by the Council, rather than through a full fishery management plan (FMP) amendment. As the Council notes, framework actions or adjustments can be made for "minor changes and modifications to existing measures,"[2] while "issues that require significant departures from previously contemplated measures or that are otherwise introducing new concepts may require an amendment of an FMP instead of a framework adjustment."[3] Given the scope of the changes proposed and the novelty of the underlying concepts, we recommend the Council use the more inclusive and thorough FMP amendment process to consider the changes proposed.

We provide initial thoughts on the HCR management options below, however, it is challenging without more information to fully assess the options against our primary concern of constraining recreational catch to annual catch limits and preventing overfishing. We anticipate that the further development of statistical models, as well as the review by SSC, will provide additional clarity regarding our concerns. We hope further public comment will be considered at that time and prior to any final action.

Controlling Magnuson-Stevens Act Requirements

Since its 2007 reauthorization, the Magnuson-Stevens Act (MSA) has required science-based annual catch limits (ACLs) as a means of ending and preventing overfishing.[4] Each Council is required to "develop annual catch limits for each of its managed fisheries" that may not exceed recommendations of its scientific and statistical committee or the established peer review process.[5] For each fishery management plan, the Council must "establish a mechanism for specifying annual catch limits in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability."[6] These conservation requirements are controlling over other considerations in federally managed fisheries, and management measures must have, at minimum, a 50% probability of preventing overfishing.[7] Further, in the case of an overfished stock, the MSA's rebuilding requirements dictate that a rebuilding allowable biological catch (ABC) and ACL must be set at a level that ends overfishing immediately[8] and reflect "the annual catch that is consistent with the schedule of fishing mortality rates . . . in the rebuilding plan."[9]

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[2] Mid-Atlantic Fishery Management Council, "Council Actions" at https://www.mafmc.org/council-actions
[3] Mid-Atlantic Fishery Management Council, Framework Actions Summary (May 2014), available at: https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/589e07cfdb29d65cd8f551bc/1486751696154/Frameworks.pdf
[4] *See* Senate Report 109-229 (April 4, 2006) at 21 (explaining the need for enhanced science-based management and accountability to curb continued overfishing under the Sustainable Fisheries Act of 1996 framework: "This provision is intended to provide a transparent accounting mechanism to help ensure that each fishery is in compliance with the overfishing and rebuilding requirements of the [MSA].").
[5] Magnuson-Stevens Fishery Management and Conservation Act (MSA) § 302(h)(6), 16 U.S.C. § 1852(h)(6)
[6] MSA § 303(a)(15); 16 U.S.C. § 1853(a)(15)
[7] *Natural Resources Defense Council v. Daley,* 209 F.3d 747, 753 (D.C. Cir. 2000) ([U]nder the Fishery Act, the Service must give priority to conservation measures" and "[i]t is only when two different plans achieve similar conservation measures that the Service takes into consideration adverse economic consequences."); National Standard 1 Guidelines, 50 C.F.R. § 600.310 (f)(2)(i).
[8] 16 U.S.C. § 1854(e)(3)(A).
[9] 50 CF.R. § 600.310(f)(3)(ii).

Effective implementation of accountability measures (AMs) on an annual basis is a critical counterpart to ACLs in preventing overfishing. Under the National Standard 1 Guidelines, the Council must determine as soon as possible after the fishing year if an ACL is exceeded. If an ACL is exceeded, the Council is required to implement AMs "as soon as possible," such as overage adjustments (i.e., paybacks) or other corrective measures to ensure catch is brought down below the ACL.[10] In the case of multi-year measures, plans "must include a mechanism for specifying ACLs for *each year* with appropriate AMs to prevent overfishing [emphasis added]."[11]

We note that recent amendments made to the MSA by the Modern Fish Act of 2018 clarified that Councils have authority to use certain fishery management measures, such as harvest control rules and fishing mortality targets, for recreational fisheries. The text of Section 102 and a statutory rule of construction within the Modern Fish Act made clear that such measures are only to be implemented "in addition to" annual catch limits, accountability measures, and the rebuilding requirements of the MSA.[12]

Proposed Harvest Control Rule Options

Should the Council and Commission decide to pursue any of the HCR options for the black sea bass, summer flounder, scup, and/or bluefish fisheries, we strongly recommend only pursuing HCR option(s) that can help improve and strengthen application of ACLs and AMs to the relevant fisheries. Options should be considered only if they can clearly show how the MSA's primary requirement to prevent overfishing will be achieved. As currently drafted, none of the Options B-E appear to have this as a goal or likely outcome, as they would decrease emphasis on whether recreational landings are kept at or below the recreational harvest limit (RHL) on an annual basis, which means they may be more at risk of exceeding the recreational ACL and risking stock status.[13] Prior to proceeding with such a drastic change to management, the Council and NMFS must ensure that the ACL and AM requirements of the law will be carried out. While the Framework/Addenda does recognize that the Council is bound by the

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[10] *Id.* at § 600.310(g)(3).
[11] *Id.* at § 600.310(f)(4)(i), providing further that "[a] multiyear plan must provide that, if an ACL is exceeded for a year, then AMs are implemented for the next year consistent with paragraph (g)(3) of this section."
[12] The Modernizing Recreational Fisheries Act or "Modern Fish Act," Public Law 115-405 (2018), sec. 201, codified as 16 U.S.C. § 1852(h)(8). Section 103 of the Modern Fish Act also provided a rule of construction as follows: "Nothing in this Act shall be construed as modifying the requirements of sections 301(a), 302(h)(6), 303(a)(15), or 304(e) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1851(a), 1852(h)(6), 1853(a)(15), and 1854(e)), or the equal application of such requirements and other standards and requirements under the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.) to commercial, charter, and recreational fisheries, including each component of mixed-use fisheries."
[13] In addition to the NS1 guidelines, which describe the need for annual accountability to ACLs, recent analysis by the Gulf Fishery Management Council regarding accountability in potential carryover provisions may also be instructive. The Council's SSC considered simulations of carryovers and determined that pound-for-pound paybacks on an annual basis are key to ensuring the health of fish stocks: "Generally, so long as unharvested quota is carried over and overharvested fish are paid back pound for pound in the following fishing year, there are unlikely to be long-term negative effects on a species' rebuilding plan. However, if carryover is permitted for a species which also experiences quota overages, and those overages are not paid back, the spawning stock biomass (SSB) will deplete, regardless of whether the stock is in a rebuilding plan." Gulf Fishery Management Council, Carryover Provisions and Framework Modifications (Draft Generic Amendment) at 8-9 (June 2019), https://gulfcouncil.org/wp-content/uploads/E-6a-Draft-Generic-Amendment-for-Quota-Carryover-and-Framework-Modification.pdf.

requirements of the MSA, including requirements for ACLs, accountability measures, and prevention of overfishing,[14] as currently written, the Framework/Addenda document fails to show how the options presented will comply with this statutory mandate.

Under status quo management (Option A), each of the species being considered have both a commercial and a recreational ACL, and managers achieve the recreational ACL through the use of an RHL, which is set equal to the ACL minus estimated discard mortality. Accountability measures are already implemented in a way to take advantage of existing flexibility within the National Standard 1 Guidelines.[15] Option A is the only option that has a clearly stated goal of constraining harvest annually to the RHL and ACL, both science-based tools that are key to preventing overfishing in the long-term. Despite that goal, both the black sea bass and scup recreational fisheries exceeded their RHL in 2021, and more recently, the Atlantic states were unable to agree upon measures that would meet the scup RHL for the 2022 fishing season, leading NOAA Fisheries to propose a federal recreational closure.[16] This indicates that there is room for improvement in status quo management of these fisheries, particularly regarding how managers are monitoring and predicting recreational catch and accounting for uncertainty. We note that some of the advancements being considered in this Framework/Addenda, such as the use of the Recreational Fleet Dynamics Model and/or the Recreational Economic Demand Model, could potentially also be used to supplement status quo management.

Options B-E, by contrast, each indicate a preference for setting management measures in two-year cycles to align with new assessment information, and evening out accountability measures over two years. While this may in some cases provide more predictability for the recreational fishing community, it does not allow managers to respond to increased fishing effort or concerning biomass trends in as nimble as a fashion as annual measures. Some of the Options, particularly the Percent Change approach (Option B), also seem to further divorce management measures from ACLs with the use of predetermined catch reductions/increases. Under Option B, necessary harvest reductions for a predicted overharvest that falls beneath the confidence interval (e.g., 20% if stock biomass is between the target level and 150% of the target, or no reduction if stock biomass is greater than 150% of the target) may not correlate to or properly respond to the RHL, and thus may be more likely to result in overfishing.[17]

For Options B-E to be properly assessed and compared, we believe more clarification is needed to ensure that recreational landings would be constrained to an RHL and ACL to prevent overfishing on an annual basis as required by the MSA. Our comments on the options are thus preliminary in nature. Of Options B-E, the Biological Reference Point Approach (Option D) may hold the most promise for improvements to status quo management, as it puts forth a wide variety of possible management responses depending on different combinations of spawning stock biomass and fishing mortality, with liberalizations or

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[14] Draft HCR Framework/Addenda document, supra note 1, at 12.
[15]See, e.g., MAFMC Summary of Accountability Measures for Summer Flounder, Scup, and Black Sea Bass (December 2020), available at https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/5fc7f80aa37e3325c14d37a8/1606940682870/AMs+description_SF_scup+BSB_Dec2020.pdf
[16] NOAA Fisheries, Recreational Management Measures for the Summer Flounder, Scup, and Black Sea Bass Fisheries; Fishing Year 2022, 87 Fed Reg. 22863 (May 18, 2022).
[17] Harvest Control Rule Draft Framework/Addenda at 19.

restrictions also considering recruitment and biomass trends.[18] This approach may allow for the most built-in precautionary management to prevent overfishing, and allow for managers to respond more nimbly to changes in stock status and fishing effort. Option D also includes mandatory reactive AMs to respond to declining stock status, which the other options do not. However, as with the other new options, we believe a great deal more clarification is needed.

Implementing ACLs and Accountability Measures for Options B-E

We are particularly concerned by the Draft HCR Framework/Addenda's discussion on pages 32-33 of alternative "target metrics" for setting recreational measures. As discussed above, the current RHL-ACL framework is a critical component of preventing overfishing as required by the MSA. And, at least as explained in the Draft document, setting recreational measures based on a "Recreational Fishing Mortality Target," absent an RHL and ACL, would not comply with the ACL requirement.[19]

Additionally, it is important to consider that the consistent application of accountability measures is the linchpin of a functioning catch limit system. It is a primarily technical exercise to "set" a total allowable catch, but the implementation and use of AMs makes the difference between a "hard TAC," where fisheries are held accountable to meeting the science-based ACL, and a "soft TAC," where there is less accountability and overages of the TAC need not be paid back in the same way (i.e., TACs are viewed as a target rather than a limit). As the recreational sector continues to grow, it will be increasingly important to ensure that it is managed sustainably and with a focus on improving the accuracy and timeliness of data collection. Not only would reduced accountability for the recreational sector increase the risk of overfishing and stock depletion, but it will create a disparity with the commercial sector in the case of these mixed sector fisheries, likely leading to what are effectively de facto reallocations in some cases.

Lastly, the Draft HCR Framework/Addenda is an important opportunity to consider how management uncertainty can be better accounted for in setting catch levels. The potential relaxation of RHLs through these options, coupled with high management uncertainty, could lead to increasingly volatile seasons if those limits are exceeded and accountability measures are required to prevent overfishing. The National Standard 1 Guidelines require the use of buffers to account for management uncertainty.[20] Whether the Council and Commission opt to pursue any of the new management options or no action, it is critical to consider relative management uncertainty.

Additional Process Considerations

If the Council and Commission pursue one of the HCR options currently proposed, we strongly suggest phasing in implementation of new measures and beginning with one fishery on a trial basis. The HCR approach represents a significant departure from how recreational fisheries for these four species have been managed to date, and the status of the stocks and recent management trends indicate that a precautionary approach is warranted. All four of the stocks being considered have once been overfished and subsequently rebuilt, while bluefish is still under its second rebuilding plan, and summer flounder is

[18] Harvest Control Rule Draft Framework/Addenda at 25-28.
[19] MSA §§ 302(h)(6), § 303(a)(15); 16 U.S.C. §§ 1852(h)(6), 1853(a)(15)
[20] 50 C.F.R. § 600.310(f)(1)(v), (4)(i).

below its biomass target.[21] The black sea bass fishery, which is at double its target biomass level, may be the most appropriate fishery on which to trial new models and management approaches within the MSA framework.

This action could be highly significant for the health of the managed fish populations, the livelihoods of fishermen and anglers who depend on them, and for other regions following along. We re-emphasize that it is important to pause further consideration of this action until the SSC has completed its full review of the questions before it, the SSC and Commission/Council have further time to review the statistical models, and there is subsequent opportunity for public engagement through an iterative Council process. The Council should also prioritize improvements the Marine Recreational Information Program (MRIP) and other surveys, including consideration of the of the data collection, analysis, and integration recommendations set forth in the 2021 report by the National Academy of Sciences (NAS) to facilitate better annual and in-season management.[22]

* * * *

Thank you for the opportunity to comment on these important issues. Please do not hesitate to contact us if you have any questions.

Sincerely,

Molly A Masterton

Molly Masterton
Director, U.S. Fisheries and Staff Attorney
Natural Resources Defense Council

Erica Fuller
Senior Attorney
Conservation Law Foundation

Ivy Fredrickson
Senior Staff Attorney
Ocean Conservancy

[21] Harvest Control Rule Draft Framework/Addenda at 8-10.
[22] National Academies of Sciences, Engineering, and Medicine 2021. Data and Management Strategies for Recreational Fisheries with Annual Catch Limits. Washington, DC: The National Academies Press. https://doi.org/10.17226/26185.

Virginia Saltwater Sportfishing Association, Inc (VSSA)
3419 Virginia Beach Blvd #5029
Virginia Beach, VA 23452
joinvssa.org

April 21, 2022

Dustin Colson Leaning
FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 N. Highland Street,
Suite 200 A-N
Arlington VA. 22201

RE: Harvest Control Rule

Dear Mr. Leaning

The Virginia Saltwater Sportfishing Association was founded in 2015 and currently represents over 600 anglers and six fishing clubs in the Commonwealth of Virginia. VSSA submits the following comments on the Guide to the Recreational Harvest Control Rule Draft Framework/Addenda.

Of the five (5) options offered for setting the recreational bag, size, and season limits we can only recommend only Option B at this time. VSSA strongly believes the harvest control rule options should consider more than just recreational harvest data from the questionable MRIP data when determining the recreational bag, size and seasons. Additionally, we believe more comprehensive data such as fishing mortality, recruitment, and in particular the biomass level mentioned in options C, D, & E are needed, but not until the actual outcomes and harvest levels, or the measures, for these alternatives can be quantified.

In summary, VSSA does not support status quo and we urge managers to implement alternatives that use more than just the recreational harvest data for determining measures. Additionally, we cannot choose a specific alternative until we know the outcomes of measures for options C, D & E. Option B is better than status quo and look forward to re-evaluating Options C, D and E, once the measures and harvest levels for those alternatives are known.

Thank you for the opportunity to comment and considering our position on this important issue."

Respectfully,

John J. Bello
Chair – Government Relations Committee

Cc Patrick Geer - VMRC

April 22, 2022

Dustin Colson Leaning, FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland Street, Suite 200
Arlington, VA 22201

Re: Harvest Control Rule

Dear Mr. Colson Leaning,

On behalf of *Wild Oceans*, an organization founded by anglers in 1973, I am pleased to provide comments on the Harvest Control Rule for Recreational Management Addenda/Framework, which would modify the Mid-Atlantic Fishery Management Council (MAFMC) and Atlantic States Marine Fisheries Commission (ASMFC) management plans for summer flounder, black sea bass, scup and bluefish.

Our organization firmly believes that the conservation of fishery resources must be first and foremost in order to secure a vibrant future for fishing. Health of the resource must be prioritized over fisheries access in management plans. Therefore, we are disappointed that the draft document was sent out for public comment before statistical models necessary for informing the options are ready for use[1] and before the completion of a scientific evaluation of overfishing risk associated with the various options. **Absent this information, we cannot support moving ahead with the Addenda/Framework at this time.**

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires the federal councils to prevent overfishing. Specifically, National Standard 1 Guidelines call on the regional management councils to "establish an ABC [acceptable biological catch] control rule that accounts for scientific uncertainty in the OFL [overfishing limit] and for the Council's risk policy, and that is based on a comprehensive analysis that shows how the control rule prevents overfishing. The Council's risk policy could be based on an acceptable probability (at least 50 percent) that catch equal to the stock's ABC will not result in overfishing."[2] ABCs recommended by the Council's Scientific and Statistical Committee (SSC) must prevent overfishing and must consider scientific uncertainty consistent with the Council's risk policy.[3]

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[1] Holzer, J., Jiao, Y. and Jones, C. September 20, 2021. *Mid-Atlantic Fishery Management Council Sub-Group of the Scientific and Statistical Committee. Peer Review Report of Recreational Fishery Models*. https://www.mafmc.org/s/05_Rec-Model-Peer-Review-Reports.pdf

[2] 50 CFR § 600.310 (f)(2)

[3] Memorandum from the Joint PDT/FMAT for Recreational Reform to the Mid-Atlantic Fishery Council and ASMFC Policy Board. *Overview of work, major accomplishments, and timeline recommendations*. October 1, 2021. https://www.mafmc.org/s/03_FMAT-PDT-Memo-RecReform.pdf

P.O. BOX 272122 • Tampa, FL 33688
WWW.WILDOCEANS.ORG

Annual Catch Limits (ACLs) cannot exceed the ABC and must work in coordination with Accountability Measures (AMs) to prevent overfishing.[4]

To understand how each of the harvest control rule options perform under the MAFMC risk policy, the Council and ASMFC Policy Board passed a motion at their February joint meeting to:

> Request that the SSC provide a qualitative evaluation, in time for final action at the June 2022 Council/Policy Board meeting, regarding the potential effect of each of the five primary alternatives in the Harvest Control Rule Addendum/Framework on the SSC's assessment and application of risk and uncertainty in determining ABCs. The intent is to provide the Council and Policy Board with information to consider the tradeoffs among the different alternatives with respect to the relative risk of overfishing, increasing uncertainty, fishery stability, and the likelihood of reaching/remaining at B_{MSY} for each approach at different biomass levels.[5]

Regrettably, this evaluation is not scheduled to be complete and available for public review until after the public comment period for this action closes.

Recreational fisheries are fundamentally different from commercial fisheries and warrant different approaches to the way they are monitored and managed. *Wild Oceans* supports the goal of the Addenda/Framework "to establish a process for setting recreational bag, size, and season limits for summer flounder, scup, black sea bass, and bluefish such that measures aim to prevent overfishing, are reflective of stock status, appropriately account for uncertainty in the recreational data, take into consideration angler preferences, and provide an appropriate level of stability and predictability in changes from year to year." However, meeting this goal should not come at the expense of holding the recreational sector to a lesser standard than commercial fisheries when it comes to conservation of the resource. A scientifically-robust evaluation of harvest control rule options should ensure stakeholders this is not the case.

Without the final report from the Mid-Atlantic Fishery Management Council's Scientific and Statistical Committee and in the absence of statistical models deemed "critical for thorough analysis of the options," we cannot select a preferred option at this time. We urge both the ASMFC and the MAFMC to postpone final action until these tools become available and the public is granted adequate time to evaluate the Harvest Control Rule options with these resources in hand.

Thank you for your consideration.

Sincerely,

Pam Lyons Gromen
Executive Director

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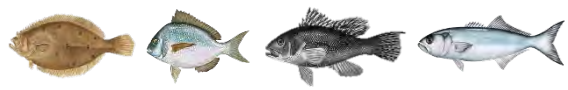
[4] MSA § 303(a)(15)
[5] MAFMC. February 2022 Meeting Motions. https://www.mafmc.org/s/2022-02_MAFMC-Motions.pdf

Recreational Harvest Control Rule Addenda/Framework

Options Reference Guide



Introduction

The Atlantic States Marine Fisheries Commission (Commission) and the Mid-Atlantic Fishery Management Council (Council) are considering changes to the process for setting recreational bag, size, and season limits (i.e., recreational measures) for summer flounder, scup, black sea bass, and bluefish. Key goals include providing greater stability and predictability in the recreational fishery management measures from year to year. The Commission is considering these changes through draft addenda, and the Council is considering an identical set of options through a framework action. Collectively, these management actions are referred to as the *Recreational Harvest Control Rule Draft Addenda/Framework*. Both groups will meet jointly to consider public comments before taking final action.

This reference guide provides an overview of the options under consideration in the Draft Addenda/Framework. This guide is intended to be used with the Draft Document for Public Comment, which provides more detail on the options.

How to Provide Comments

Comments may be submitted at any of eight virtual public hearings held between **March 16** and **April 13, 2022**, or via written comment through **April 22, 2022**. Please visit http://www.asmfc.org/about-us/public-input for a hearing schedule and instructions for submitting comments.

Management Options to Set Recreational Management Measures

Section 3.1 of the Draft Addenda proposes five possible approaches for setting recreational measures. As described below and summarized in Table 5, key differences between the options include the information considered when setting measures and the circumstances under which measures would change. These differences have implications for how often measures would change, how responsive they are to changing conditions, and the primary conditions of concern (e.g., stock size, level of recreational harvest, or other factors). Please refer to the Draft Addenda for more details on each option.

None of the options would implement any specific bag, size, or season limits. Rather, they would define the process for establishing measures using different approaches and different types of information. Specific measures would be established and modified through separate future actions through the Commission and Council's specifications process.

As you review these options, we encourage you to think about the following questions:

- In your opinion, which option represents the best process for setting recreational management measures and why?
- What types of information are most important in guiding the selection of management measures (e.g., stock size, recent harvest levels, whether or not overfishing is occurring)?
- What circumstances should trigger changes in management measures (e.g., a change in stock size, an expected harvest limit overage or underage)?

Option A. No Action (Current Recreational Measures Setting Process)

Draft Addenda Section 3.1.A

Under this option, no change would be made to the current requirements for setting recreational bag, size, and season limits. Under the current requirements, measures aim to prevent recreational harvest from exceeding the annual recreational harvest limit (RHL). Generally, measures are determined based on a comparison of recent harvest estimates to the upcoming RHL. If recent harvest is higher than the RHL, then more restrictive measures are generally put in place. If harvest is lower than the RHL, measures are generally relaxed. This process does not vary based on stock status (how healthy the stock is) and generally does not account for expected differences in availability or other factors in the upcoming year compared to previous years. Under this option, measures are not pre-defined and can change as often as every year - especially if large RHL overages or underages are expected under status quo measures.

Option B. Percent Change Approach

Draft Addenda Section 3.1.B

This option uses the following two factors to determine if and how measures should change:

(1) **Expected harvest compared to future recreational harvest limits** (RHLs) – based on a comparison of recent harvest estimates to upcoming RHLs

(2) **Stock size** (B/B_{MSY}) – a measure of how current stock size (B) compares to the target level (B_{MSY})

Table 1 below illustrates how information about expected harvest and stock size would be used to determine if management measures should be restricted, liberalized, or remain unchanged. Depending on the sub-options chosen, changes in measures would aim to achieve specific percentage changes in harvest. Under this option, changes would be considered every other year when new scientific information about the stock is available. Compared to the other options under consideration, this option is most similar to the current process as it relies heavily on comparisons of expected harvest to the RHL. This option differs from the current process in that the percent change in harvest varies depending on the size of the stock.

Table 1. Process for determining the appropriate percent change in harvest when developing management measures under the percent change approach.

Row	Estimated harvest compared to future limits	Stock Size (B/B_{MSY})	Target Change in Harvest	
A	Harvest expected to be below the upcoming recreational harvest limits	Very high (at least 150% of the target stock size)	Sub-Option B-1A: Liberalization amount based on difference between expected harvest and RHL	Sub-Option B-1B: Large liberalization: 40%
		High (between the target and 150% of the target stock size)	Sub-Option B-1A: Liberalization amount based on difference between expected harvest and RHL	Sub-Option B-1B: Medium liberalization: 20%
		Low (below the target stock size)	Sub-Option B-2A: Small liberalization: 10%	Sub-Option B-2B: No liberalization or reduction
B	Harvest expected to be close to the upcoming recreational harvest limits	Very high (at least 150% of the target stock size)	Small liberalization: 10%	
		High (between the target and 150% of the target stock size)	No liberalization or reduction	
		Low (below the target stock size)	Small reduction: 10%	
C	Harvest expected to be higher than the upcoming recreational harvest limits	Very high (at least 150% of the target stock size)	Sub-Option B-2A: Small reduction: 10%	Sub-Option B-2B: No liberalization or reduction
		High (between the target and 150% of the target stock size)	Sub-Option B-1A: Reduction amount based on difference between expected harvest and RHL	Sub-Option B-1B: Medium reduction:20%
		Low (below the target stock size)	Sub-Option B-1A: Reduction amount based on difference between expected harvest and RHL	Sub-Option B-1B: Large reduction: 40%

Option C. Fishery Score Approach

Draft Addenda Section 3.1.C

This option combines multiple data inputs into one "fishery score" which would be used to guide the selection of management measures. The fishery score incorporates four data inputs:

(1) **Stock size** (B/B_{MSY}) – current stock size (B) compared to the target level (B_{MSY})
(2) **Recruitment** – the amount of new fish entering the population each year
(3) **Fishing mortality** (F/F_{MSY}) – the rate at which fish are removed by the fisheries (F) compared to the threshold level that defines overfishing (F_{MSY})
(4) **Expected harvest compared to future recreational harvest limits** (RHLs) – a measure of how effective the previous measures were at controlling harvest

Based on the resulting score, the stock would be placed into one of four "bins" with corresponding management measures, as illustrated in Table 2 below. Each bin would be associated with a range of stock status and fishery performance conditions, with Bin 1 representing the best conditions and the most liberal measures and Bin 4 representing the worst conditions and most restrictive measures. Each bin would have pre-defined measures. The measures for each bin would aim to achieve a target level of recreational harvest, dead catch (harvest and fish presumed to die when released), or fishing mortality that is appropriate for the stock conditions associated with that bin.

The intent is to consider changes in measures when new stock assessment information is available – typically every other year. Measures would only change when the stock moves to a different bin based on the data inputs listed above. Compared to all other options, measures may change less frequently under this approach because measures would remain in place over a greater range of conditions. However, compared to the other options, the changes would likely be greater in magnitude.

Table 2. Fishery score bins, associated stock status and fishery performance outlook, and relative differences in measures.

Bin	Fishery Score	Stock Status and Fishery Performance Outlook	Measures
1	4-5	Good	Most Liberal
2	3-3.99	Moderate	Liberal
3	2-2.99	Poor	Restrictive
4	1-1.99	Very Poor	Most Restrictive

Option D. Biological Reference Point Approach

Draft Addenda Section 3.1.D

This option uses two primary factors to guide the selection of management measures:

(1) **Stock size** (B/B_{MSY}) – current stock size (B) compared to the target level (B_{MSY})
(2) **Fishing mortality** (F/F_{MSY}) – a measure of whether overfishing is occurring

As illustrated in Table 3 below, the stock would be assigned to one of seven bins based on these two factors. Each bin would have a set of default measures which would be implemented the first time the stock is placed in that bin. Subsequent stock assessment updates may require movement to a different bin. If, in a subsequent year, a stock assessment indicates no major change in stock condition, then other factors (stock size, recruitment, and trends in harvest levels) would be considered to determine if measures should be modified to the secondary measures within the same bin (i.e., slightly more restrictive or slightly more liberal than the default measures).

The primary and secondary measures in each bin would be pre-defined. The measures for each bin would aim to achieve a target level of recreational harvest, dead catch (harvest and fish presumed to die when released), or fishing mortality that is appropriate for the stock conditions associated with that bin.

This approach allows for stability of measures if stock status is unchanged and smaller changes in measures if warranted based on stock size, recruitment, and/or expected harvest. Compared to the fishery score and biomass-based matrix approaches, this option may result in more frequent changes in measures, but the changes may be smaller in magnitude.

Table 3. Summary of the Biological Reference Point Option illustrating bins of measures associated with different combinations of stock conditions. Green indicates the most liberal measures and red the most restrictive. B stands for stock biomass compared to the target level and R stands for recruitment.

Stock Biomass Compared to Target Level	**Overfishing is Not Occurring** Fish are being harvested sustainably	**Overfishing is Occurring** Too many fish are being removed through fishing
Very High At least 150% of the target stock size	R↑ / R↓ B↑: liberal / liberal B↓: default / default **1**	R↑ / R↓ Recent harvest limits **have not** been exceeded — B↑: default / restrictive; B↓: restrictive / restrictive Recent harvest limits **have** been exceeded — B↑ B↓: restrictive and re-evaluate measures **4**
High Above the target, but below 150% target stock size	R↑ / R↓ B↑: liberal / liberal B↓: default / default **2**	R↑ / R↓ Recent harvest limits **have not** been exceeded — B↑: default / restrictive; B↓: restrictive / restrictive Recent harvest limits **have** been exceeded — B↑ B↓: restrictive and re-evaluate measures **5**
Low Below the target stock size, but more than 50% of the target stock size	R↑ / R↓ B↑: default / restrictive B↓: restrictive / restrictive **3**	R↑ / R↓ Recent harvest limits **have not** been exceeded — B↑: default / restrictive; B↓: restrictive / restrictive Recent harvest limits **have** been exceeded — B↑ B↓: restrictive and re-evaluate measures **6**
Overfished (Too Low) Less than 50% of the target stock size	**MOST RESTRICTIVE/REBUILDING PLAN** **7**	

Option E. Biomass Based Matrix Approach

Draft Addenda Section 3.1.E

This option would set recreational measures based on two factors:

(1) **Stock size** (B/ B_{MSY}) – current stock size (B) compared to the target level (B_{MSY})
(2) **Trend in stock size** – a measure of whether the stock size is increasing, decreasing, or stable

Based on these two factors, the stock would be placed into one of six "bins" with corresponding management measures, as illustrated in Table 4 below. Bin 1 represents the best conditions and the most liberal measures, while Bin 6 represents the worst conditions and the most restrictive measures. The measures for each bin would be pre-defined and would aim to achieve a target level of recreational harvest, dead catch, or fishing mortality that is appropriate for the stock conditions associated with that bin.

Under this option the placement of a stock in a bin is guided only by stock size and stock size trend. This approach considers fewer types of information compared to the fishery score and biological reference point approaches. This option is the least reliant on estimates of recreational harvest compared to all other options.

Table 4. Recreational management measure matrix under the Biomass Based Matrix approach.

Stock Size (i.e., biomass compared to target level)	**Trend in stock size**		
	Increasing	**Stable**	**Decreasing**
Very High: At least 150% of target stock size	Bin 1		
High: Above the target, but below 150% target stock size	Bin 1	Bin 2	
Low: Below the target stock size, but more than 50% of the target stock size	Bin 3	Bin 4	
Overfished (Too Low): Less than 50% of the target stock size	Bin 5	Bin 6	

Table 5: Summary of information considered when setting recreational measures and expected number of sets of pre-determined measures under options A - E in Section 3.1 of the Draft Addenda.

Option in Section 3.1	**Information used to set measures**					**Expected number of pre-set measures**
	Expected harvest	**Stock size**	**Fishing mortality**	**Recruitment**	**Stock size trend**	
A: No action	Primary					Measures are not pre-set
B: Percent change	Primary	Primary				Measures are not pre-set
C: Fishery score	Primary	Primary	Primary	Primary		4
D: Biological reference point	Only when overfishing is occurring	Primary	Primary	Secondary	Secondary	13
E: Biomass based matrix		Primary			Primary	6

Additional Options Under Consideration

Target Metric for Setting Measures

The Fishery Score Approach, Biological Reference Point Approach, and Biomass Based Matrix Approach all use bins with pre-defined measures. If one of these approaches is selected, an option from Section 3.2 must be selected to specify whether the measures in each bin will aim to achieve a target level of recreational harvest (Option 3.3.A), recreational dead catch (harvest plus discarded fish that are presumed to die, Option 3.3.B), or fishing mortality (a measure of the rate of removal from the stock, Option 3.3.C).

Conservation Equivalency Options

Section 3.3 includes options to define the degree of flexibility states have in proposing alternative measures through the Commission's conservation equivalency process. Option 3.3.A allows individual states to propose alternative measures if they can demonstrate that they are expected to have the same impact on the stock as the measures which would otherwise be implemented. Option 3.3.B allows states to work together as regions to propose alternative measures which are expected to have the same impact on the stock as the measures which would otherwise be implemented. Option 3.3.C does not allow states or regions to propose alternative measures.

Key Terms

Biomass (B): The size of a stock of fish measured in weight.

Biomass target (B_{MSY}): The stock size associated with maximum sustainable yield (MSY), as defined by a stock assessment. When a stock's biomass is at or above its biomass target, the stock is able to replace more fish than are being removed through fishing and other sources of mortality.

Fishing mortality (F): The rate of fishery removals of fish from a stock, typically estimated through a stock assessment.

Fishing mortality threshold (F_{MSY}): The maximum rate of fishing mortality (the proportion of fish that are removed by fishing) that will, over the long term, result in maximum sustainable yield. When fishing mortality exceeds F_{MSY}, overfishing is occurring.

Fishing mortality target: A target level of fishing mortality used to set recreational management measures. Summer flounder, scup, black sea bass, and bluefish currently do not have recreational fishing mortality targets and instead are managed with recreational catch and harvest limits. Currently, stock-wide fishing mortality thresholds (F_{MSY}) are established for each stock and apply to all sources of fishing mortality combined, including the commercial and recreational fisheries.

Recreational Harvest Limit (RHL): The total allowable annual recreational fishery harvest, set based on information from the stock assessment, considerations about scientific and management uncertainty, allocations between the commercial and recreational sectors, and assumptions about dead discards.

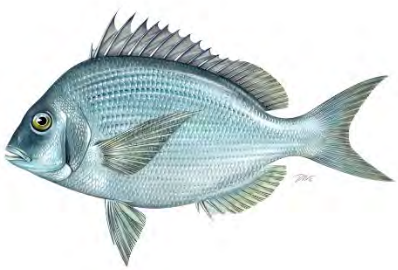
Recruitment: The number of fish born within a given time period that survive to a certain stage (e.g., age 1).

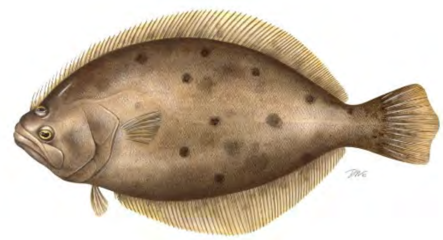
Atlantic States Marine Fisheries Commission

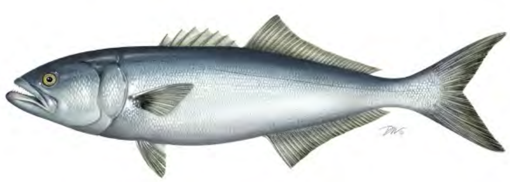
DRAFT ADDENDUM XXXIV TO THE SUMMER FLOUNDER, SCUP, AND BLACK SEA BASS FISHERY MANAGEMENT PLAN AND ADDENDUM II TO THE BLUEFISH FISHERY MANAGEMENT PLAN FOR PUBLIC COMMENT

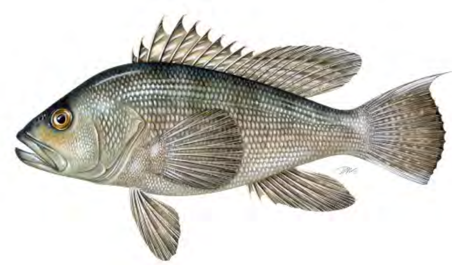
Harvest Control Rule for Recreational Management

This action is being developed with the Mid-Atlantic Fishery Management Council.









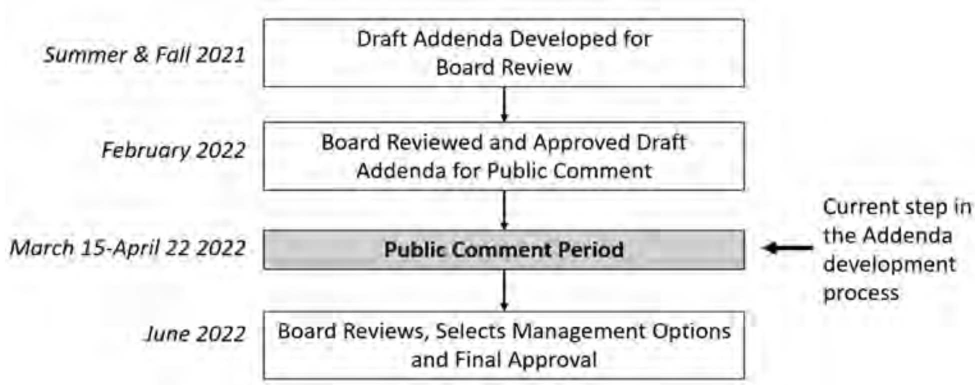
Approved for Public Comment February 2022
Updated March 2022 (Appendix 3)
Updated May 2022 (Section 3.1)

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Draft Document for Public Comment

Public Comment Process and Proposed Timeline

In October 2020, the Atlantic States Marine Fisheries Commission's (Commission) Interstate Fisheries Management Policy Board (Policy Board) and the Mid-Atlantic Fishery Management Council (Council) initiated draft addenda (for the Commission) and framework action (for the Council) to address management of the summer flounder, scup, black sea bass, and bluefish recreational fisheries. This document (Draft Addendum XXXIV to the Summer Flounder, Scup and Black Sea Bass FMP and Draft Addendum II to the Bluefish FMP, herein referred to as Draft Addenda) and the Council's framework consider modifications to the process for setting recreational bag, size, and season limits (i.e., "recreational measures") for all four species. The Draft Addenda and the Council's framework action consider an identical set of options and the Commission's Interstate Fisheries Management Policy Board (Policy Board) and Council will select the same management options for implementation. This document presents background on recreational management for these species and a range of options to set recreational measures for public consideration and comment. The addenda process and expected timeline are below.



After public comment, the Draft Addenda was revised to correct for some missing information and typos. In Section 3.1, the text for sub-options B-2A and B-2B was updated to match Table 1. Table 1 accurately reflected the intent of this option and change was only needed to the text. The text for both sub-options previously only described what would occur if the upcoming 2-year average RHL is below the lower bound of the CI around the harvest estimate and biomass is greater than 150% of the target level, and did not indicate that they also apply if the upcoming 2-year average RHL is greater than the upper bound of the CI around the harvest estimate and biomass is below the target.

Modifications were also made to the accountability measure sub-options under the fishery score and biological reference point approaches. For sub-options C-1 and E-1, additional text was added to note that the current process for bluefish includes a single-year comparison of dead catch to the ACL, as opposed to the three-year average comparison for the other three species. In addition, it was noted that the bluefish accountability measures also include considerations related to transfers between the commercial and recreational sectors. For sub-options C-2 and E-2, additional text was added to clarify that the intent is to re-evaluate measures only when overfishing is occurring and the recreational dead catch to ACL comparison shows an overage. This change was needed to clarify that recreational accountability measures are not triggered under this sub-option when overfishing is occurring but the recreational sector has not exceeded their ACLs.

Lastly, in the biological reference point approach, when providing examples of the biomass level measures would be based on for each bin, Bin 5 was changed to default measures based on biomass that is 75% of the target level, instead of 100% as it read previously. This change was made to differentiate Bin 5 from Bin 4.

Public comment may be submitted via public hearings or through written comment and will be accepted until April 22 at 11:59 p.m. If you have any questions or would like to submit a comment, please use the contact information below. **All comments will be made available to both the Commission and Council for consideration; duplicate comments do not need to be submitted to both bodies.**

Tips for Providing Public Comment

We value your input. To be most effective, please include specific details as to why you support or oppose a particular proposed management option. Specifically, please address the following:

- Which proposed options do you support, and which options do you oppose?
- Why do you support or oppose the option(s)?
- Is there any additional information you think should be considered?

For the options in Section 3.1, we encourage you to think about the following questions:

- In your opinion, which option represents the best process for setting recreational management measures and why?
- What types of information are most important in guiding the selection of management measures (e.g., stock size, recent harvest levels, whether or not overfishing is occurring)?
- What circumstances should trigger changes in management measures (e.g., a change in stock size, an expected harvest limit overage or underage)?

Submit Comments to:

Mail: Dustin Colson Leaning, FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland Street, Suite 200 A-N
Arlington, VA 22201

Email: comments@asmfc.org
(Subject: Harvest Control Rule)
FAX: 703.842.0741

Table of Contents

1.0 Introduction

Summer flounder, scup, black sea bass, and bluefish fisheries are managed cooperatively by the Commission in state waters (0-3 miles) and by the Council and NOAA Fisheries in federal waters (3-200 miles). The management unit for summer flounder in U.S. waters is the western Atlantic Ocean from the southern border of North Carolina northward to the U.S.-Canadian border. The management unit for scup and black sea bass in U.S. waters is the western Atlantic Ocean from Cape Hatteras, North Carolina north to the Canadian border. Bluefish are managed in U.S. waters along the entire eastern seaboard, from Maine to Florida.

The Council and Commission jointly agree to recreational annual catch limits (ACLs) and recreational harvest limits (RHLs) for all four species, which apply throughout the management units. They also jointly agree to the overall approach to setting recreational bag, size, and season limits (i.e., recreational measures). Recreational measures in state waters are determined through the Commission process as outlined in Addendum XXXII for summer flounder and black sea bass, Addendum XI for scup, and Amendment 1 for bluefish.

In October 2020, the Commission's Policy Board and the Mid-Atlantic Fishery Management Council approved the following motion:

> *Move to initiate a joint framework/addendum to address the following topics for summer flounder, scup, black sea bass, and bluefish, as discussed today:*
>
> - *Better incorporate MRIP uncertainty into management*
> - *Develop guidelines for maintaining status quo measures*
> - *Develop a process for setting multi-year measures*
> - *Consider changes to the timing of federal waters measures recommendations*
> - *Harvest control rule*
>
> *and to also initiate an amendment to address recreational sector separation and recreational catch accounting such that scoping for the amendment would be conducted during the development of the framework/addendum.*

During their February 2021 meeting, the Council and Policy Board prioritized development of the harvest control rule referenced in the motion above prior to further development of the other topics. This Draft Addenda and the complementary Council framework address only the harvest control rule; however, as described in more detail in later sections of this document, considerations related to uncertainty in the Marine Recreational Information Program (MRIP) data, guidelines for status quo measures, and multi-year measures are incorporated into many of the options.

The goal of the Draft Addenda and the Council's framework is to establish a process for setting recreational bag, size, and season limits for summer flounder, scup, black sea bass, and bluefish such that measures aim to prevent overfishing, are reflective of stock status, appropriately account for uncertainty in the recreational data, take into consideration angler preferences, and provide an appropriate level of stability and predictability in changes from year to year.

2.0 Overview

2.1 Statement of Problem

As described in more detail in section 2.2, the Commission and Council face a number of challenges setting recreational management measures for summer flounder, scup, black sea bass, and bluefish, including concerns related to uncertainty and variability in the recreational fishery data, the need to change measures (sometimes annually) based on those data, as well as the perception that measures are not reflective of current stock status. In addition, management measures have not always had their intended effect on overall harvest.

The purpose of this document is to consider a management approach called a harvest control rule to establish a process for setting recreational bag, size, and season limits for summer flounder, scup, black sea bass, and bluefish that aims to prevent overfishing, is reflective of stock status, appropriately accounts for uncertainty in the recreational data, takes into consideration angler preferences, and provides an appropriate level of stability and predictability in changes from year to year. The management options aim to rely less on expected fishery performance and instead uses a more holistic approach with greater emphasis on stock status indicators and trends.

Addendum XXXII established an interim management approach for summer flounder and black sea bass that addressed several key management objectives and served as a foundation for broad-based, long-term management reform. The Policy Board and Council are addressing ongoing management challenges and objectives via comprehensive, long-term management reforms over the next several years starting with this document. Those actions will draw upon improved recreational fishery data,[1] updated stock assessments, and innovative management tools.

2.2 Background

For all four species, recreational ACLs are set jointly by the species management board and the Council. ACLs account for landings and dead discards. An RHL for each species is set equal to the ACL minus expected dead discards. Recreational measures (i.e., bag, size, and season limits)

[1] MRIP is an evolving program with ongoing improvements to its methods. Several recent advancements including the transition from a telephone survey to a mail survey to estimate fishing effort have resulted in revisions to the recreational catch and harvest estimates.

are set with the goal of preventing RHL overages. In preventing RHL overages, these measures also aim to prevent ACL overages and overfishing.

The ACLs and RHLs are revised when new stock assessment information becomes available. They are based on stock assessment projections, considerations related to scientific uncertainty, and commercial/recreational allocations. The RHLs incorporate assumptions about dead discards and can be further reduced to account for management uncertainty.

The methods used to determine which measures will prevent RHL overages are not specified in the FMPs and may be modified based on annual recommendations from the Council's Monitoring Committees and the Commission's Technical Committees. MRIP harvest data from one or more recent years are typically used to predict the impacts of changes in bag, size, or season limits on harvest when setting recreational measures. This process typically relies on the assumption that if the recreational measures remain unchanged, next year's harvest will be similar to harvest in the current year or a recent multi-year average. If unchanged measures are expected to result in harvest notably above or below the RHL, then the measures are adjusted to achieve a desired percent liberalization or reduction in harvest based on an analysis of trends shown in recent years' MRIP data.

To allow for consideration of preliminary, current year MRIP data, the Commission's species management board and Council typically determine the overall approach for the upcoming year's recreational measures (e.g., status quo or an overall percentage liberalization or reduction) in December of the current year. They also agree to the federal waters measures in December with the approach for developing state waters measures typically approved by the board in February of the following year.

Of these four species, those that tend to harvest close to or more than their RHL (primarily summer flounder and black sea bass) have required frequent changes to the recreational bag, size, and season limits to prevent future RHL overages. In some cases, the required changes in measures appear to have responded to variability and uncertainty in the MRIP data rather than a clear conservation need. This challenge has been referred to as "chasing the RHL." In addition, many recreational stakeholders expressed frustration that the black sea bass measures did not seem reflective of stock status as they have generally been more restrictive in recent years compared to when the stock was under a rebuilding plan, despite the stock currently being more than double the target level and highly available to anglers.

The bluefish stock was declared overfished in 2019, triggering the development of a rebuilding plan and a need for more restrictive management measures than had previously been in place. The Draft Addenda includes special considerations for stocks in a rebuilding plan. The options in this document are not meant to replace the bluefish rebuilding measures. Any measures implemented for bluefish must comply with the rebuilding plan.

2.3 Status of the Stocks

2.3.1 Summer Flounder

The most recent summer flounder management track stock assessment was completed in June 2021, using data through 2019 (NEFSC 2021a). The Council and Commission FMP for summer flounder defines the management unit as all summer flounder from the southern border of North Carolina to the United States-Canada border. The assessment approach is a complex statistical catch-at-age model incorporating a broad array of fishery and survey data. Results from the 2021 assessment indicate that the summer flounder stock was not overfished, but was 14% below the biomass target, and overfishing was not occurring, in 2019 (Figure 1). Fishing mortality was 20% below the threshold level defining overfishing. More detail on the assessment can be found here.

The 2021 management track stock assessment provided the basis for setting fishery specifications for 2022–2023.

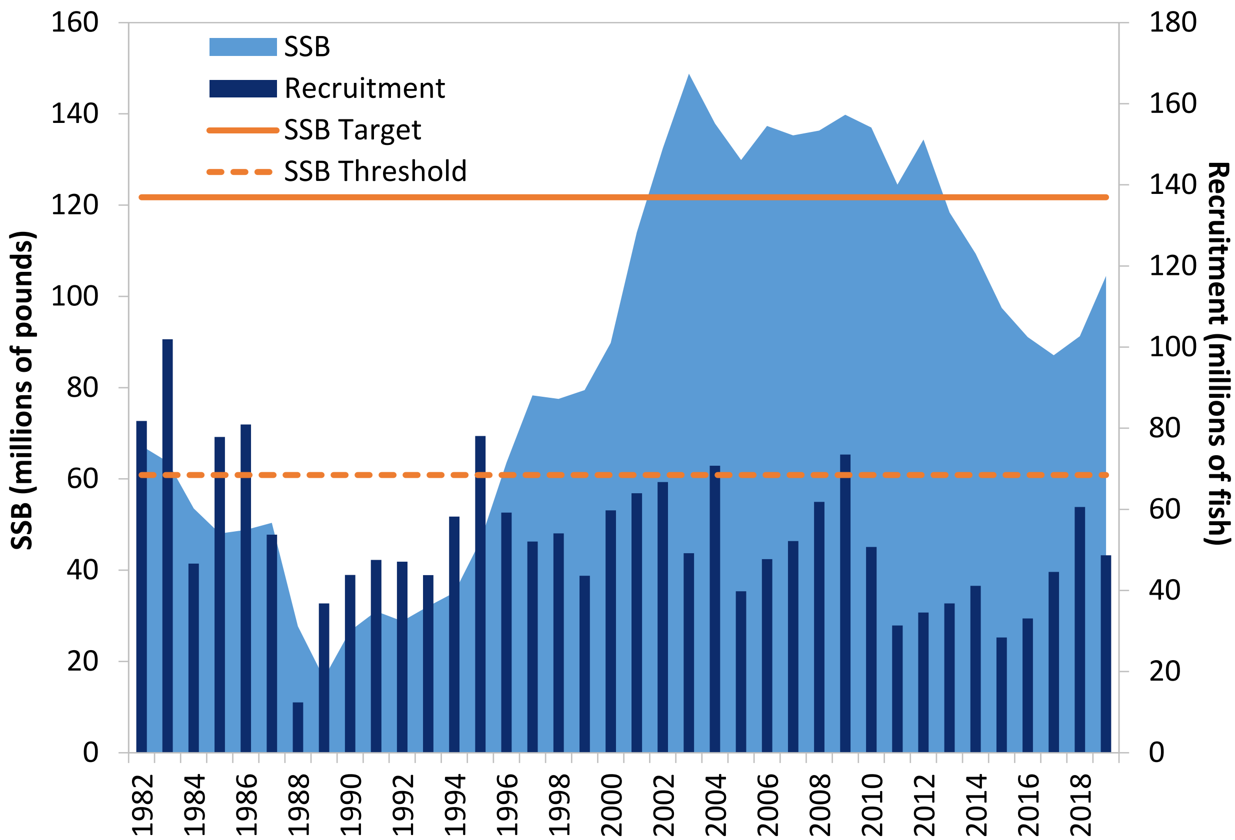


Figure 1. Summer flounder spawning stock biomass and recruitment. Source: 2021 Operational Assessment Prepublication Report, Northeast Fisheries Science Center.

2.3.2 Scup

The most recent scup management track stock assessment was completed in June 2021, using data through 2019 (NEFSC 2021b). The Council and Commission FMP for scup defines the management unit as all scup from Cape Hatteras, North Carolina to the United States-Canada border. The assessment approach is a complex statistical catch-at-age model incorporating a broad array of fishery and survey data. Results from the 2021 assessment indicate that the scup stock was not overfished and was about two times the biomass target, and overfishing was not occurring, in 2019 (**Figure 2**). Fishing mortality was 32% below the threshold level defining overfishing. More detail on the assessment can be found here.

The 2021 management track stock assessment provided the basis for setting fishery specifications for 2022–2023.

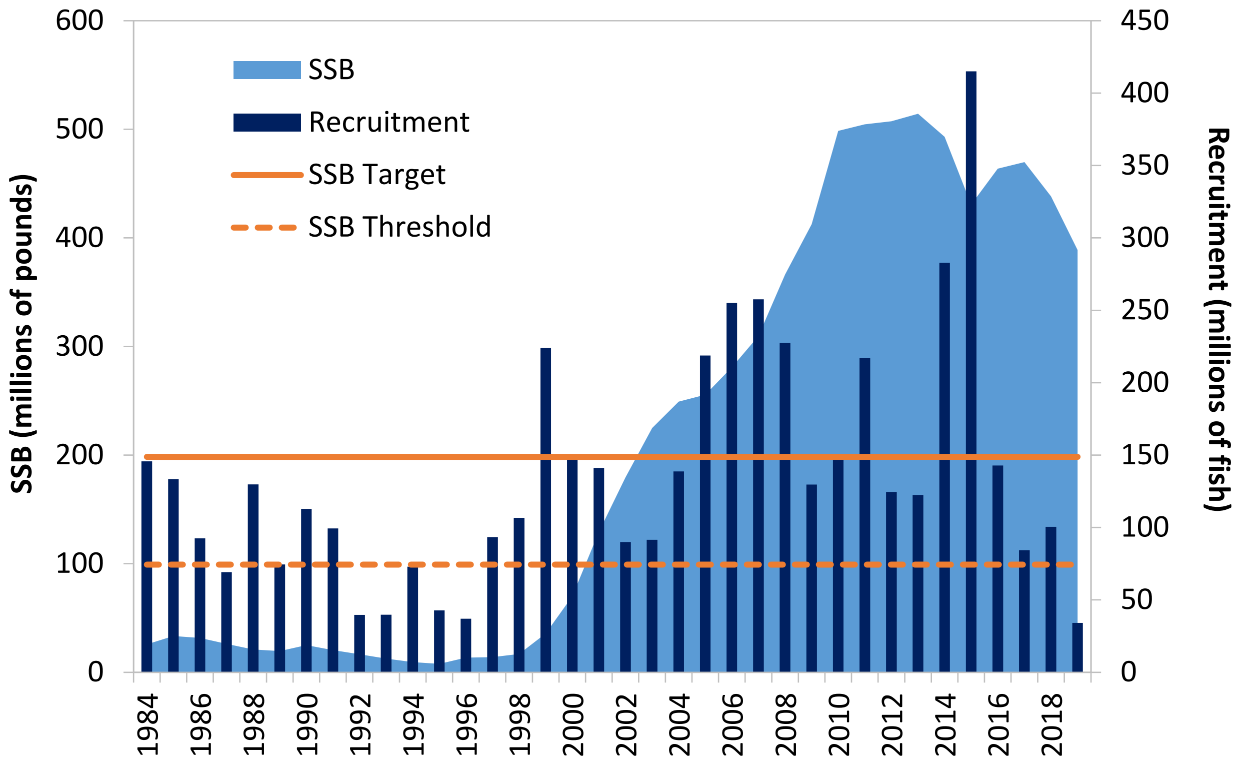


Figure 2. Scup spawning stock biomass and recruitment. Source: 2021 Operational Assessment Prepublication Report, Northeast Fisheries Science Center.

2.3.3 Black Sea Bass

The most recent black sea bass stock assessment update was completed in July 2021, using data through 2019 (NEFSC 2021c). The Council and Commission FMP for black sea bass defines the management unit as all black sea bass from Cape Hatteras, North Carolina to the United States-Canada border. The assessment modeled black sea bass as two separate sub-units (North and South) divided approximately at Hudson Canyon, from which results were combined for the entire stock's status determination. The assessment used a combined-sex, age-structured assessment model. Results from the 2021 assessment indicate that the black sea bass stock was not overfished and was about 2.2 times the target level, nor was overfishing occurring in 2019 (Figure 3). Fishing mortality was 15% below the threshold level defining overfishing. The assessment required an adjustment to account for the significant retrospective pattern. This adjustment was only applied to the terminal year of the assessment and the adjusted values are used for management. Of the four species considered in this action, only black sea bass required a retrospective adjustment in the assessment. More detail can be found here.

The 2021 management track stock assessment provided the basis for setting fishery specifications for 2022–2023.

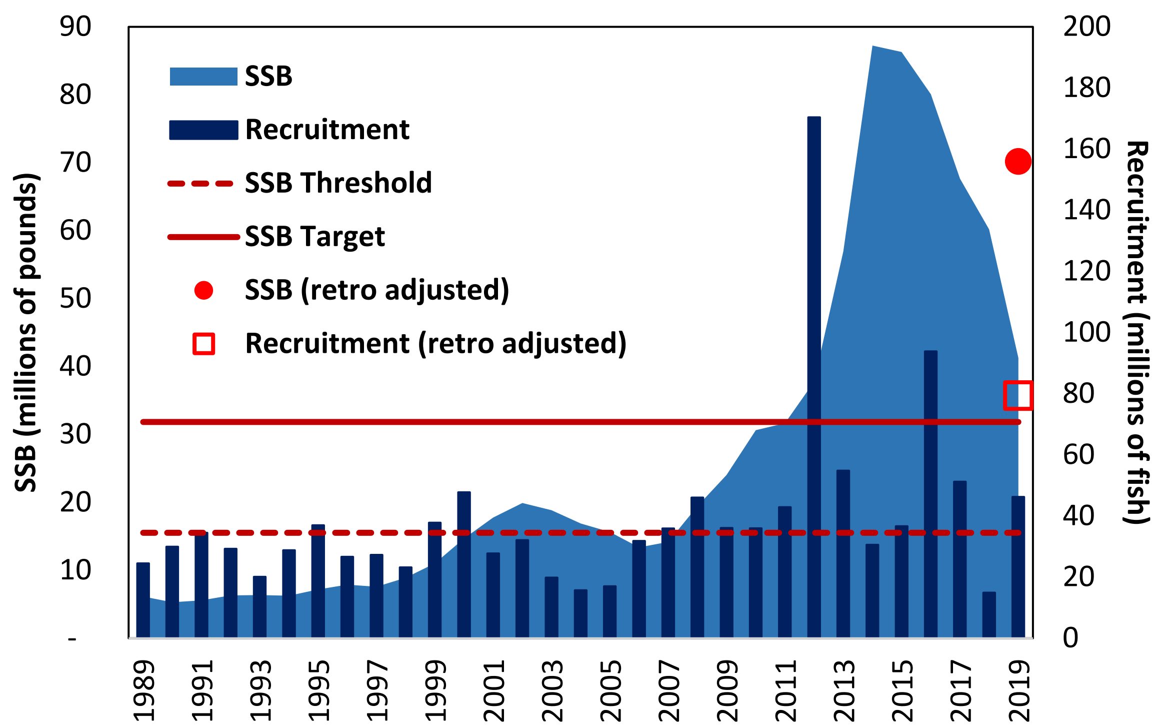


Figure 3. Black sea bass spawning stock biomass and recruitment with retrospective adjusted values. Source: 2021 Operational Assessment Prepublication Report, Northeast Fisheries Science Center.

2.3.4 Bluefish

The most recent bluefish management track stock assessment was completed in June 2021, using data through 2019 (NEFSC 2021d). The Council and Commission FMP for bluefish defines the management unit as all bluefish in United States waters of the western Atlantic Ocean. The assessment approach is a complex statistical catch-at-age model incorporating a broad array of fishery and survey data. Results from the 2021 assessment indicate that the bluefish stock was overfished and was 5% below the overfished threshold, but overfishing was not occurring in 2019 (Figure 4). Fishing mortality was 5% below the threshold level defining overfishing. More detail on the assessment can be found here.

The 2021 management track stock assessment along with the preferred rebuilding plan selected jointly by the Board and Council at their June 2021 meeting provided the basis for setting fishery specifications for 2022–2023.

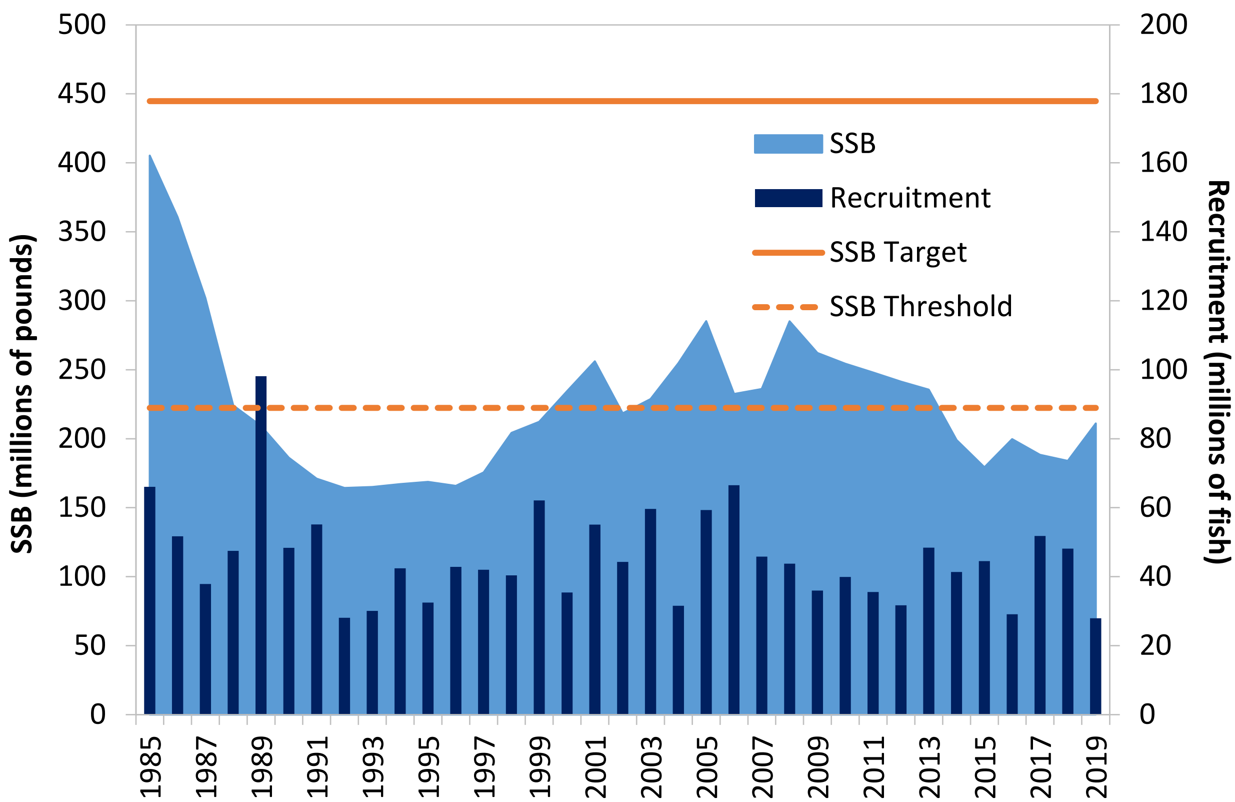


Figure 4. Bluefish spawning stock biomass and recruitment. Source: 2021 Operational Assessment Prepublication Report, Northeast Fisheries Science Center.

2.4 Status of the Fishery

2.4.1 Summer Flounder

Recreational harvest peaked in 1983 at 36.74 million pounds, and declined to a time series low of 5.66 million pounds in 1989. A more recent review of recreational fishery performance from 2011 to present reveals an average of 12.59 million pounds with a high of 19.41 million pounds in 2013 and a low of 7.60 million pounds in 2018. Recreational harvest in 2020 was 10.06 million pounds, a 29% increase from the prior year's harvest of 7.80 million pounds. The total recreational catch (harvest plus live and dead releases) of summer flounder in 2020 was 33.32 million fish, slightly lower than the time series average of 34.46 million fish. The assumed discard mortality rate in the recreational fishery is 10%. In 2020, an estimated 80% of the harvest (in numbers of fish) originated from private/rental boats, while shore-based anglers and party/charter boats accounted for an average of 18% and 2% of the harvest, respectively. In addition, 61% of summer flounder harvested by recreational fishermen (in numbers of fish) were caught in state waters and about 39% in federal waters.

2.4.2 Scup

Most recreational scup catches are taken in states of Massachusetts through New York. From 2011 to 2020, recreational harvest has ranged from 8.27 million pounds in 2012 to 14.12 million pounds in 2019. In 2020, recreational harvest was 12.91 million pounds. The total catch (harvest plus releases) of scup in 2020 were 27.27 million fish, slightly higher than the ten year average of 27.07 million fish. The assumed discard mortality rate in the recreational fishery is 15%. In 2020, an estimated 62% of the harvest (in numbers of fish) originated from private/rental boats, while shore-based anglers and party/charter boats accounted for an average of 28% and 10% of the harvest, respectively. In addition, 90% of scup harvested by recreational fishermen (in numbers of fish) were caught in state waters and about 10% in federal waters.

2.4.3 Black Sea Bass

After a drastic peak in 1986 at 11.19 million pounds, recreational harvest averaged 5.02 million pounds annually from 1987 to 1997. Recreational harvest limits were put in place in 1998 and harvest generally increased from 1.92 million pounds in 1998 to 9.06 million pounds in 2015. In 2016 and 2017 harvest jumped up to 12.05 and 11.48 million pounds, respectively; however the 2016 and 2017 estimates are regarded as implausibly high outliers by the Technical Committee. In 2020, recreational harvest was estimated at 9.12 million pounds with recreational live discards from Maine to Virginia estimated to be 29.79 million fish. Assuming 15% hook and release mortality, estimated recreational dead discards are 4.47 million fish, equal to 51% of the total recreational removals (harvest plus dead discards).

2.4.4 Bluefish

From 2011-2020, recreational catch (harvest plus fish caught and released) of bluefish in U.S. waters of the Atlantic coast averaged 44.46 million fish annually. In 2020, recreational catch was estimated at 30.68 million fish. In 2020, recreational anglers harvested an estimated 9.34

million fish weighing 13.58 million pounds (6,160 metric tons). Harvest during 2018-2020 was exceptionally low compared to the ten year average of 25.69 million lbs. The 2020 average weight of landed fish is 1.45 pounds, which is also lower than the ten year average of 1.65 pounds. This lower average weight is due to the regional distribution of state landings in 2020. The majority of the recreational harvest (pounds) came from Florida (42%), North Carolina (16%), New Jersey (13%), and New York (11%). Fish from southern states (NC-FL) made up 59% of the landings and are typically smaller on average than fish caught in northern states (ME-VA). In 2020, recreational dead releases (15% of released alive fish) were estimated at 3.20 million fish.

3.0 Proposed Management Program

The Policy Board and Council are considering changes to the process of setting recreational management measures for summer flounder, scup, black sea bass, and bluefish. These management changes are considered through the management programs of the Commission and the Council. The Council is bound by the requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), including requirements for ACLs, accountability measures, and prevention of overfishing. NOAA Fisheries, which has final approval authority for Council management documents, will not approve measures that are inconsistent with the MSA. NOAA Fisheries provides guidance throughout development of Council actions to ensure that the preferred options selected for implementation are consistent with the MSA and other applicable laws.

As proposed, the same options would be selected for all four species. It is not intended that one harvest control rule option would be used for some species and a different option for others. However, depending on considerations, such as ongoing development of statistical models to predict recreational harvest, the Policy Board and Council may consider approving different implementation dates by species for any change to the FMPs. All harvest control rule approaches involve various combinations of input metrics (data inputs), flexibilities, and accountability measures with the goal of standardizing management measure setting and providing stability to these recreational fisheries. A table for comparison across all options can be found in Appendix 1.

Stocks under an approved rebuilding plan are subject to the measures of that rebuilding plan, which may differ from the measures under the options below. None of the options in this document are meant to replace rebuilding plan measures. In some instances, measures implemented through the options below may be used as temporary measures until a rebuilding plan is implemented, which can take up to two years after the stock is declared overfished.

3.1 Management Options to Set Recreational Management Measures

Option A. No Action (Current Recreational Measures Setting Process)

Section 2.2 describes the process used in recent years to set recreational measures. The details of this process are not defined in the FMPs and can be modified without an addendum or other change to the FMPs. The following sections summarize the language currently in the Commission's FMPs regarding recreational measures for each species. Under the no action option, these sections of the FMPs could remain unchanged.[2]

1. Summer Flounder

As outlined in section 3.1 of Addendum XXXII, management measures are set annually through a specification process. The process involves the following steps:

- At the joint meeting with the Council typically in December, the Board and Council will decide whether to specify coastwide measures to achieve the coastwide RHL or conservation equivalent management measures using guidelines agreed upon by both management authorities. If the latter, the Board will then be responsible for establishing recreational measures to constrain harvest to the RHL.
- The Technical Committee (TC) will continue to evaluate harvest estimates as they are released, and project how suites of possession limits, size limits and seasons might impact recreational landings in each region. In recommending adjustments to measures (reductions, liberalizations or no change), the TC will examine several factors and suggest a set of regional regulations, which when combined, would not exceed the RHL. These factors could include but are not limited to stock status, resource availability (based on survey and assessment data), and fishery performance (harvest, discards, effort, estimate uncertainty, inter-annual variability), as well as the standards and guiding principles set forth below. The Board will use information provided by the TC to approve a methodology for the states to use in developing regional proposals, typically at the Commission's Winter Meeting.
- The states will collaborate to develop regional proposals for the current year's recreational measures that include possession limits, size limits and season length pursuant to the Board-approved methodology. These proposals will be reviewed by the TC to ensure the data and analysis are technically sound.

[2] Under the no action option, predicted harvest under any combination of measures could continue to rely on the methods described above, or alternative methods could be used if deemed appropriate. For example, the Council and Commission are supporting the development of statistical models for predicting harvest based on management measures and other factors. These models could be used under the no action option.

- The Board will review state proposals, TC recommendations, and establish final measures at a Summer Flounder, Scup, and Black Sea Bass Board meeting following the release of wave 6 MRIP estimates from the previous year.
- Once the Board has approved the measures and the states have promulgated them, the Commission will send a letter to the Regional Administrator certifying the Board approved measures, in combination, will achieve but not exceed the RHL.

The Board also uses a set of standards and guiding principles to structure the development of measures during specification setting (Addendum XXXII Section 3.1.1).

2. Scup

Addendum XI provides the ability for the Board and Council to establish management measures annually through a specification process. The process involves the following steps:

- At the joint meeting with the Council typically in December, the Board and Council will determine whether to maintain status quo measures or a liberalization or reduction in measures are needed to achieve the coastwide RHL.
- States will then proceed to develop proposals, typically the states MA-NY, but other states could have adjustments, for the upcoming year's recreational measures that include possession limits, size limits and season length. These proposals will be reviewed by the TC to ensure the data and analysis are technically sound.
- The Board will review state proposals, TC recommendations, and establish final measures at the Commission's winter meeting.

3. Black Sea Bass

As outlined in section 3.2 of Addendum XXXII, management measures are set annually through a specification process. The process involves the following steps:

- At the joint meeting with the Council typically in December, the Board and Council will decide whether to adopt coastwide measures or if the states will implement measures to constrain harvest to the RHL. If the latter, the Board will then be responsible for establishing recreational measures to be implemented in state waters to constrain harvest to the RHL.

- The TC will continue to evaluate harvest estimates as they are released, and project how suites of possession limits, size limits and seasons might impact recreational landings in each region. In recommending adjustments to measures (reductions, liberalizations or no change), the TC will examine several factors and suggest a set of regulations for regions, which when combined, would not exceed the RHL. These factors can include but are not limited to stock status, resource availability (based on survey and assessment data), and fishery performance (harvest, discards, effort, estimate uncertainty, inter-annual variability), as well as the standards and guiding principles set forth below. The Board will use information provided by the TC to approve a methodology for the states to use in developing regional proposals, typically at the Commission's Winter Meeting.

- The states will collaborate to develop regional proposals for the current year's recreational measures that include possession limits, size limits and season length pursuant to the Board-approved methodology. These proposals will be reviewed by the TC to ensure the data and analysis are technically sound

- The Board will review state proposals, TC recommendations, and establish final measures at a Summer Flounder, Scup, and Black Sea Bass Board meeting following the release of wave 6 MRIP estimates from the previous year.

- Once the Board has approved the measures and the states have promulgated them, the Commission will send a letter to the Regional Administrator certifying the Board approved measures in combination will achieve but not exceed the RHL.

The Board also uses a set of standards and guiding principles to structure the development of measures during specification setting (Addendum XXXII Section 3.2.1).

4. Bluefish

As outlined in section 5.1.4.1.3 of Amendment 1, management measures are set annually through a specifications process. The process typically involves the following steps:

- At the joint meeting with the Council typically in December, the Board will determine whether to maintain status quo coastwide measures or a liberalization or reduction in measures are needed to achieve the coastwide RHL.

- In order to achieve the annual RHL, recreational fisheries will be constrained by a coastwide regime of coastwide size limits, bag limits, and seasons. Once a basic regime for these limits is established, typically at the joint meeting with the Council in December, states will be given the opportunity to vary these measures in accordance with the Commission's Conservation Equivalency process[3].

- A state may submit a proposal for a change to its regulatory program to the Commission. Such changes shall be submitted to the ASMFC staff, which will distribute the proposal to the Management Board, the Plan Review Team, the Technical Committee, the Stock Assessment Subcommittee, and the Advisory Panel.
- States must submit proposals at least two weeks prior to a planned meeting of the Technical Committee.
- The ASMFC staff is responsible for gathering the comments of the Technical Committee, the Stock Assessment Subcommittee, and the Advisory Panel and presenting these comments to the Management Board at the Commission's winter meeting.
- The Management Board will decide whether to approve the state proposal for an option management program if it determines that it is consistent with the harvest target and the goals and objectives of the FMP.

5. Current Accountability Measures for Summer Flounder, Scup, Black Sea Bass, and Bluefish

The MSA requires Council FMPs to contain provisions for ACLs and "measures to ensure accountability." The National Standards Guidelines state that accountability measures (AMs) "are management controls to prevent ACLs, including sector-ACLs, from being exceeded, and to correct or mitigate overages of the ACL if they occur. AMs should address and minimize both the frequency and magnitude of overages and correct the problems that caused the overage in as short a time as possible." (50 CFR 600.310 (g)).

The current recreational AMs for these species were implemented through an omnibus amendment in 2013 (Amendment 19 to the Summer Flounder, Scup, and Black Sea Bass FMP and Amendment 4 to the Bluefish FMP). The AMs are included in the Council's FMP. They are not included in the Commission's FMP; however, any changes to the AMs considered through this action will be considered by both the Council and Commission.

Proactive AMs include adjustments to the management measures for the upcoming fishing year (as described in previous sections), if necessary, to prevent the RHL and ACL from being exceeded. Measures to prevent the RHL from being

[3] http://www.asmfc.org/files/pub/ConservationEquivalencyGuidance_2016.pdf

exceeded are ultimately intended to also prevent ACL overages, which in turn prevents overfishing.

Given the timing of MRIP data availability, the regulations do not allow for in-season closure of the recreational fishery if the RHL or ACL is expected to be exceeded. Therefore, measures must be set in a manner that is reasonably expected to constrain harvest to the RHL.

Reactive recreational AMs include a set of possible responses to exceeding the recreational ACL, depending on stock status and which limits are exceeded. Paybacks of ACL overages may be required in a subsequent fishing year, depending on stock status and the scale of the overage, as described below. ACL overages in the summer flounder, scup, and black sea bass recreational fisheries are evaluated by comparing the most recent 3-year average recreational ACL against the most recent 3-year average of recreational catch (i.e., landings and dead discards). If average catch exceeds the average ACL, then the appropriate AM is determined based on the following criteria:

1. If the stock is overfished ($B < ½ B_{MSY}$), under a rebuilding plan, or the stock status is unknown:

The exact amount, in pounds, by which the most recent year's recreational ACL has been exceeded will be deducted in the following fishing year, or as soon as possible once catch data are available.

2. If biomass is above the threshold, but below the target ($½ B_{MSY} < B < B_{MSY}$), and the stock is not under a rebuilding plan:

a. If only the recreational ACL has been exceeded, then adjustments to the recreational management measures (bag, size, and seasonal limits) would be made in the following year, or as soon as possible once catch data are available. These adjustments would take into account the performance of the measures and conditions that precipitated the overage.
b. If the ABC is exceeded in addition to the recreational ACL, then a single year deduction will be made as a payback, scaled based on stock biomass. The calculation for the payback amount is: *(overage amount) ** $(B_{MSY}-B)/½\, B_{MSY}$.

3. If biomass is above the target ($B > B_{MSY}$):

Adjustments to the recreational management measures (bag, size, and seasonal limits) will be made for the following year, or as soon as possible once catch data are available. These adjustments would take into account the performance of the measures and conditions that precipitated the overage.

Reactive recreational AMs for the bluefish recreational fishery are very similar to the process described above with a few key differences. First, ACL overages are evaluated on a 1-year basis as opposed to a 3-year average. Second, if a transfer between the commercial and recreational sectors caused the transferring sector to register an ACL overage, then instead of applying an overage payback to the transferring sector, a transfer in a subsequent year would be reduced by the amount of the ACL overage.

Option B. Percent Change Approach

This option differs from the no action option in that it includes additional consideration of biomass compared to the target level (B/B_{MSY}) when determining if the recreational management measures should be liberalized, restricted, or remain unchanged. The amount of change varies based on the magnitude of the difference between a confidence interval (CI)[4] around an estimate of expected harvest and the average RHL for the upcoming two years, as well as considerations related to biomass compared to the target level (B/B_{MSY}).

Specifically, the first step in determining the overall percent change in harvest would be to compare the average RHL for the upcoming two years to the CI[5] of the most recent two years of MRIP estimates, or to a CI around an alternative predictor of harvest based on a robust statistical methodology approved by the Technical and Monitoring Committees. The MRIP estimates (or approved alternative estimates) are intended as a proxy for expected harvest in the upcoming years under status quo measures, similar to the current process. Depending on whether the average RHL is above the upper bound of the CI, within the CI, or below the lower bound of the CI around the estimate of expected harvest, the management responses are narrowed down to those illustrated in rows A, B, and C in Table 1, respectively.

The second step narrows down the suite of management responses further by taking into consideration the B/B_{MSY} ratio. The third column in Table 1 displays the resulting percent change in measures required for the upcoming two years. A range of sub-options is under consideration for the resulting percent change when the RHL is above or below the bounds of the CI, as described below. Regardless of the sub-options chosen, when the RHL is within the CI, no change in measures would be made if the B/B_{MSY} ratio is between 1 and 1.5 (i.e., the stock is between the target biomass level and 150% of the target level). A 10% liberalization in harvest would be allowed when the B/B_{MSY} ratio exceeds 1.5 (i.e., the stock is greater than 150% of the target biomass level). A 10% reduction in harvest would be required when the B/B_{MSY} ratio is less than 1 (i.e., biomass is below the target level).

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[4] A confidence interval provides an upper and lower bound around a point estimate to indicate the range of possible values given the uncertainties around the estimate. For example, a CI of 5% for an estimate of 100 would mean that the value could fall anywhere between 105 and 95. In this option, the CI represents a range of potential harvest estimates that can be reasonably expected to encompass the true harvest value.

[5] Specifically, an 80% joint distribution CI has been suggested as this method takes into consideration the percent standard error (PSE) of each individual years' MRIP estimate and the variability of the estimates between years.

It is important to note that this option considers changes from a starting set of measures. If the current measures have resulted in notable differences between harvest and the RHL in recent years, then they may not be an appropriate starting point under this option and an alternative starting point may be required.

Table 1. Process for determining the appropriate percent change in harvest when developing management measures under the percent change approach.

Row	Future RHL vs Harvest Estimate[6]	B/B_{MSY}[7]	Change in Harvest	
A	Future 2-year avg. RHL greater than upper bound of harvest estimate CI	> 1.5	Sub-Option B-1A: Liberalization percent equivalent to difference between harvest estimate and 2-year avg. RHL	Sub-Option B-1B: 40% Liberalization
		1 – 1.5	Sub-Option B-1A: Liberalization percent equivalent to difference between harvest estimate and 2-year avg. RHL	Sub-Option B-1B: 20% Liberalization
		< 1	Sub-Option B-2A: 10% Liberalization	Sub-Option B-2B: 0%
B	Future 2-YR avg. RHL within CI of harvest estimate	> 1.5	10% Liberalization	
		1-1.5	0%	
		< 1	10% Reduction	
C	Future 2-YR avg. RHL less than lower bound of harvest estimate CI	> 1.5	Sub-Option B-2A: 10% Reduction	Sub-Option B-2B: 0%
		1-1.5	Sub-Option B-1A: Reduction percent equivalent to difference between harvest estimate and 2-year avg. RHL	Sub-Option B-1B: 20% Reduction
		< 1	Sub-Option B-1A: Reduction percent equivalent to difference between harvest estimate and 2-year avg. RHL	Sub-Option B-1B: 40% Reduction

Under this option, the Council and Board would consider adjusting the recreational management measures in sync with the setting of catch and landings limits in response to updated stock assessment information. It is anticipated that updated stock assessments will be available every other year. In interim years, the Council and Board would review the catch and landings limits compared to the measures. They may revise the measures in interim years if new data such as a research track stock assessment or other technical

[6] The two year average MRIP estimate with associated CI is intended as a predictor of future harvest under status quo measures. This may be replaced with statistical model based approaches for predicting harvest.

[7] The proposed B/B_{MSY} inflection points are based on the Council's Risk Policy. Future changes to the Council risk policy may warrant reconsideration of this proposed process.

reports suggest that the measures are not performing as expected or if a change is needed for other reasons. The intent would be to only change the measures in interim years if new information suggests strong concerns with the current measures.

Sub-Options for Percent Change When the RHL is Outside the Bounds of the Expected Harvest Estimate CI – *This section was updated May 2022, as shown in tracked changes below*

If the Policy Board and Council adopt the percent change approach, they must also select either sub-option B-1A or B-1B. In addition, they must also select either sub-option B-2A or B-2B.

Sub-Option B-1A: Percent Change Capped at Difference Between 2 Year Average RHL and Harvest Estimate

If selected, this sub-option would be used in the following two situations: 1) the average two-year RHL is above the upper bound of the harvest estimate CI (Row A in Table 1) and biomass is at or above the target (B/B_{MSY} is at least 1), or 2) the average two-year RHL is below the lower bound of the harvest estimate CI (Row C in Table 1) and biomass is at or below 150% of the target (B/B_{MSY} is less than or equal to 1.5). Other situations either do not have sub-options (RHL is within the CI; Row B in Table 1) or are covered by sub-options B-2A and B-2B, below.

Under this sub-option, the percent liberalization or reduction in harvest would be defined as the percent difference between the two-year average RHL and a point value harvest estimate. The point value harvest estimate would be either a two-year average of recent MRIP harvest estimates or an alternative estimate based on a robust statistical methodology approved by the Monitoring/Technical Committees. The intent behind this sub-option is to scale liberalizations or reductions proportionately when there are large differences between the harvest estimate and the RHL. For example, if there is a 15% difference between the two-year average RHL and the point value harvest estimate, then the reduction would be 15%. The outcome of this sub-option could be very similar to the no action option (section 3.1.A).

Sub-Option B-1B: 20% or 40% Change (Depending on B/B_{MSY})

Under this sub-option, management measures would aim to achieve the following percentage liberalizations or reductions in overall harvest, as illustrated in Table 1:

- **40% liberalization** when the average two-year RHL is above the upper bound of the harvest estimate CI (Row A in Table 1) and biomass is more than 150% of the target level (B/B_{MSY} greater than 1.5).
- **20% liberalization** when the average two-year RHL is above the upper bound of the harvest estimate CI (Row A in Table 1) and biomass is above the target level but less than 150% of the target level (B/B_{MSY} of 1 – 1.5).
- **20% reduction** when the average two-year RHL is below the lower bound of the harvest estimate CI (Row C in Table 1) and biomass is above the target level but

less than 150% of the target level (B/B_{MSY} of 1 – 1.5).

- **40% reduction** when the average two-year RHL is below the lower bound of the harvest estimate CI (Row C in Table 1) and biomass is below the target level (B/B_{MSY} less than 1).

Other situations either do not have sub-options (RHL is within the CI) or are covered by sub-options B-2A and B-2B, below.

The intent of this sub-option is to provide predictable changes in harvest based on the percentage amount applied historically in management.

Sub-Option B-2A: 10% Reduction or Liberalization

Under this sub-option, management measures would aim to achieve a 10% reduction or liberalization in harvest, regardless of the scale of the expected underage or overage, as illustrated in Table 1.

- **10% liberalization**~~**Under this sub-option,**~~ when the upcoming 2-year average RHL is greater than the upper bound of the CI around the harvest estimate (i.e., an RHL underage is expected) and biomass is below the target.
- **10% reduction** when the upcoming 2-year average RHL is below the lower bound of the CI around the harvest estimate (i.e., an RHL overage is expected) and biomass is greater than 150% of the target level.

The rationale behind a 10% liberalization is that a liberalization can be allowed, despite biomass being below the target, because an RHL underage is expected with status quo measures. ~~, measures would be modified such that expected harvest is reduced by 10%, regardless of the scale of the expected overage.~~ The rationale behind ~~this alternative~~a 10% reduction -is that a reduction is needed to ensure that continued overages do not contribute to overfishing as required by the MSA; however, the assumption is that the reduction need not be greater than 10% per cycle given that biomass is very high compared to the target level. An analysis of potential impacts on stock status under this, as with all other options in this document, has not been performed.

Sub-Option B-2B: No Change in Measures

Under this sub-option, no change in the measures would be made, regardless of the scale of the expected underage or overage, when ~~the~~ either of the following situations occur:

- The upcoming 2-year average RHL is greater than the upper bound of the CI around the harvest estimate (i.e., an RHL underage is expected) and biomass is below the target.
- The upcoming 2--year average RHL is below the lower bound of the CI around the harvest estimate (i.e., ~~meaning~~ an RHL overage is expected under status quo

measures) and biomass is greater than 150% of the target level.~~, no change in the measures would be made, regardless of the scale of the expected overage~~

~~.~~The assumption behind this alternative is ~~that~~ 1) liberalizations cannot be allowed because biomass is below the target level or 2) reductions are not needed because biomass is very high compared to the target level. However, it should be noted that harvest overages can contribute to overfishing, even at high biomass levels, and, as previously stated, in order to comply with the MSA, any adopted options must prevent overfishing. An analysis of potential impacts on stock status under this, as will all other options in this document, has not been performed.

Accountability Measures under the Percent Change Approach

Background information on AMs is provided in section 3.1 under Option A on page 16. Under the Percent Change Approach, measures would be more restrictive when stock status is poor and more liberal when stock status is good. In addition, when RHL overages are expected (based on the CI comparison described above), measures would be proactively reduced by a predetermined percent when the stock is less than 150% of the target level. Reductions would also be taken if the stock is below the target even when the RHL is within the CI, helping to rebuild the stock back to the target. These aspects of this option could all be considered proactive AMs.

This option requires minimal changes from the current reactive AMs described on page 16. The current reactive AMs would be modified such that when paybacks are required, the payback could be spread evenly across two years to help facilitate the use of constant measures across two years. When a payback is applied, the percent change would be determined based on the reduced ACL.

Consideration could also be given to options A and B listed in section 3.4. These options consider modifications to the metrics considered when biomass is above the threshold but below the target and a scaled payback of a past overage may be needed.

Option C. Fishery Score Approach

The fishery score is a formulaic method that combines multiple metrics into one value which is used to determine the appropriate management measures. Based on the score, the stock would be placed into one of four bins with corresponding management measures. The fishery score would be based on four metrics: biomass (B) relative to the target (B_{MSY}), recruitment (R), fishing mortality (F), and fishery performance, as described in more detail below and in Appendix 3. Each metric has a weight assigned to it, determined by the Technical/Monitoring Committees such that metrics with a stronger relationship to harvest would have more weight in the fishery score while still accounting for metrics that impact harvest but may not drive harvest. Additional metrics may be added and weighting schemes adjusted as more data become, based on the recommendations of the Monitoring/ Technical Committees.

The fishery score would be calculated using the following formula:

$$B/B_{MSY}(W_B) + F/F_{MSY}(W_F) + R\ (W_R) + \text{Fishery performance}\ (W_{FP}) = \text{Fishery Score}$$

Where W refers to the weight of each factor. The fishery score value corresponds to a predetermined bin. The fishery score would range from 1 to 5 and the bins are defined as displayed in Table 2.

Weights would have a minimum of 0.1 and maximum of 0.5 to prevent any one metric from being weighed too heavily in relation to the others. The intent is to allow the Monitoring/Technical Committees to recommend changes to the weights through the specifications process based on their expert judgement and empirical methods when possible. Changes should be limited to provide stability in comparisons over time.

Table 2. Fishery score bins and the associated level of concern, stock status, and measures that are associated with each bin.

Bin	Fishery Score	Stock Status and Fishery Performance Outlook	Measures
1	4-5	Good	Most Liberal
2	3-3.99	Moderate	Liberal
3	2-2.99	Poor	Restrictive
4	1-1.99	Very Poor	Most Restrictive

A declining fishery score over time could indicate negative trends in stock status and an examination of the individual fishery score metrics can provide insight into why the overall score is declining. This can also serve as an early warning of the need to use more restrictive measures in the future if the trend continues.

Measures associated with each of the four bins would aim to achieve a target level of harvest, catch, or fishing mortality, depending on the option selected from section 3.2. The target would be a point value, but the measures in each bin would be anticipated to produce a range of possible harvest, catch or fishing mortality, given uncertainty and variability in the data. Considerations related to confidence intervals and other statistical metrics and models could be used to determine the appropriate measures for each bin.

Although the fishery score would be calculated based on multiple factors, the management measures associated with each bin could be defined based on four categories of biomass. For example, the most liberal bin (Bin 1, fishery score of 4-5) could have measures based on a target level of harvest, catch, or fishing mortality (depending on the option selected from section 3.2) which is appropriate for biomass that is double the target level. The next most liberal bin (Bin 2, fishery score of 3-3.99) could have measures that are appropriate for biomass at 125% of the target. The next lowest bin (Bin 3, fishery score of 2-2.99) could have measures that are appropriate for biomass at 75% of the target level. The most restrictive bin (Bin 4, fishery score less than 2) could have measures that are appropriate for biomass at 25% of the target level (however; if the stock is under a rebuilding plan, the most restrictive fishery score measures may be temporary until replaced by rebuilding plan measures).

While the measures associated with each bin would be based on biomass compared to the target, placement of a year's measures within one of the four bins would be driven by multiple factors. For example, if the recruitment and fishery performance metrics have low scores, then the stock may be placed in a more restrictive bin with more restrictive measures than would occur based on biomass considerations alone. The opposite could occur if multiple metrics have high scores. In this way, the measures would be reflective of a combination of biomass relative to the target and assumed future conditions (e.g., high recruitment assumed to result in higher biomass in the future, allowing for more liberal measures).

Under this option, the Council and Board would consider adjusting the recreational management measures in sync with the setting of catch and landings limits in response to updated assessment information. It is anticipated that updated stock assessments will be available every other year. In interim years, the Council and Board would review the catch and landings limits and the measures. As part of this review, the fishery score could be re-calculated with updated fishery performance data; however, updated estimates for the other fishery score metrics would not be available. The Council and Board may revise the measures in interim years if new data, such as a research track assessment or other technical reports, suggest that the measures are not performing as expected or if a change is needed for other reasons. The intent would be to only change the measures in interim years if new information suggests strong concerns with the current measures.

Sub-Options for Accountability Measures under the Fishery Score Approach *– This section was updated May 2022, as shown in tracked changes below*

Background information on AMs is provided in section 3.1 on page 16. For both sub-options in this section, measures are set based on a variety of factors such that they are more restrictive when stock status is poor and more liberal when stock status is healthy. In addition, as described above, this method can provide an early warning of deteriorating stock conditions which can inform the setting of measures. The measures for all bins will be regularly reviewed to ensure that they remain appropriate and prevent overfishing. These aspects of this approach can be considered proactive AMs.

Sub-Option C-1: Reactive AMs Similar to Current AMs

As under this sub-option, ACL overages would be evaluated by comparing the most recent 3-year average recreational ACL against the most recent 3-year average of recreational dead catch (i.e., landings and dead discards) for summer flounder, scup, and black sea bass. For bluefish, this would be a single-year comparison. If ~~average catch exceeds the average~~this comparison shows an ACL overage, then the appropriate AM is determined based on the following criteria:

1. If the stock is overfished ($B < ½ B_{MSY}$), under a rebuilding plan, or the stock status is unknown:

    a. The stock is placed in the most restrictive bin. These may be temporary measures until replaced by measures required by a rebuilding plan, which can take up to two years to implement.

    b. If the stock was already in the most restrictive bin or the measures in the most restrictive bin are otherwise expected to continue to result in overages, then those measures must be modified as soon as possible following the determination of the overage such that they are reasonably expected to prevent future overages.

2. If biomass is above the threshold, but below the target ($½ B_{MSY} < B < B_{MSY}$), and the stock is not under a rebuilding plan:

    a. If only the recreational ACL has been exceeded, then the stock would remain in its current bin, but the measures associated with that bin and all other bins, will be re-evaluated with the goal of preventing future ACL overages.

    b. If the ABC or F_{MSY} (as determined through section 3.4) is exceeded in addition to the recreational ACL, and the stock has not already moved to a more restrictive bin due to a decrease in the fishery score, then the measures associated with the next more restrictive bin would be implemented. In addition, measures in all bins would be re-evaluated and revised as appropriate. If the stock moves to a more restrictive bin based on a decrease in the fishery score, then an additional AM is not needed as the negative impacts on stock status have already been accounted for in the movement to the more restrictive bin.

3. If biomass is above the target ($B > B_{MSY}$):

    The management measures associated with each bin will be adjusted, taking into account the performance of the measures and the conditions that precipitated the overage.

The bluefish regulations outline additional considerations for transfers in future years when a transfer between the commercial and recreational sectors was determined to have contributed to the ACL overage which triggered the AM.

Sub-Option C-2: Reactive AMs Based on Overfishing Status to Evaluate Measures

If overfishing is occurring (F is greater than F_{MSY}), and the recreational dead catch to recreational ACL comparison shows an overage, even if a change in bin was not triggered through re-calculation of the fishery score as described above, the management measures for all bins will be re-evaluated and modified as needed to appropriately constrain recreational catch and end overfishing.

Option D. Biological Reference Point Approach – *This section was updated May 2022, as shown in tracked changes below*

Under this option, the primary metrics of terminal year B/B_{MSY} and F/F_{MSY} from the most recent stock assessment would be used to guide selection of management measures. Management measures would be grouped into seven bins, as illustrated in **Error! Reference source not found.**. Each bin would have a set of default measures which would be implemented the first time the stock is placed in that bin.

To define the bins under this option, fishing mortality (F) would be considered in two states: overfishing (F greater than F_{MSY}) or not overfishing (F equal to or below F_{MSY}). B/B_{MSY} would be further divided to provide more responsive levels of access based on the following:

- Biomass is greater than or equal to 150% of the target.
- Biomass is greater than or equal to the target but less than 150% of the target.
- Biomass is less than the target, but greater than or equal to the threshold (the threshold is ½ the target).
- Biomass is less than the threshold (the stock is overfished).

Recruitment and trends in biomass are secondary metrics under this option which are used to fine tune default measures only when stock conditions (F/F_{MSY} and B/B_{MSY}) relative to the categories above have not changed between the prior and most recent assessments. In this case, biomass trend and a recruitment metric, describe in Appendix 3, can be used to further relax, restrict, or re-evaluate measures. As such, biomass trends and recruitment would impact the management measures, but to a lesser extent than F/F_{MSY} and B/B_{MSY}.

Changes to the measures would be considered based on the following process when updated stock assessment information is available (anticipated to be every other year). The first time a stock is in a new bin, the fishery would be subject to the default measures. If the bin remains unchanged after a subsequent stock assessment update, then recruitment and biomass trend would be considered to determine if measures remain unchanged or if limited liberalizations or reductions can be permitted. As described below, liberalizations within a bin are only allowed in Bins 1 and 2, which are associated with a healthy stock status. Restrictions and/or re-evaluation within a bin can be required based on secondary metrics for Bins 3-6. This allows for relative stability if stock status is unchanged, but also room for tuning of measures if warranted based on biomass trend and/or recruitment. It is intended that the changes within a bin would be based on predetermined guidelines. However, the Council and Board may revise the measures in interim years if new data, such as a research track assessment or other technical reports, suggest that the measures are not performing as expected or if a change is needed for other reasons. The intent would be to only change the measures in interim years if new information suggests strong concerns with the current measures.

Liberalizations within a bin are not permitted when biomass is below the target level or when F exceeds F_{MSY}. For example, if a stock in Bin 2 (F below F_{MSY} and biomass above B_{MSY}, but below 150% of B_{MSY}) remains in Bin 2 based on an updated stock assessment, then measures may be liberalized to preset measures if recruitment and/or biomass trends show positive signs (see Appendix 3). If either of those metrics shown negative signs, then measures would stay status quo. If the updated stock assessment information indicates biomass exceeds 150% of B_{MSY}, then the stock would move into Bin 1, triggering a new set of default measures more liberal than those from Bin 2. Alternatively, if biomass is below the target, then the stock would move to a more restrictive bin (Bins 3-6).

Stocks in Bin 3 are not subject to overfishing and are not overfished but are below their target biomass level. Stocks in Bins 4-6 are experiencing overfishing. The goal of the management measures in Bins 3-6 is to improve stock status by ending overfishing and/or increasing biomass. If the initial default measures do not accomplish this, but the primary metrics of F/F_{MSY} and B/B_{MSY} do not change, then secondary measures can inform how to better adjust regulations to reach the target through additional restrictions. This differs from stocks in Bins 1-2, where measures would not be adjusted in this circumstance. Additionally, when a stock is in Bins 4-6 (F exceeds F_{MSY}) and the current measures produce catch or harvest that exceed the ACL or RHL (e.g., based on a multi-year average), then the default measures should be re-evaluated.

Any overfished stock (biomass below ½ B/B_{MSY}) would automatically fall into Bin 7 until an approved rebuilding plan is implemented. Stocks under a rebuilding plan must comply with the requirements of the rebuilding plan, and the rebuilding plan measures may differ from the pre-defined measures in this option.

Measures for Bins 1-7 would aim to achieve a target level of harvest, catch, or fishing mortality, depending on the option selected from section 3.2. Although placement in Bins 1-7 would be based on a combination of biomass and fishing mortality, the recreational management measures associated with each bin could be defined based on six categories of biomass and the target level of harvest, catch, or fishing mortality deemed appropriate for that biomass level. The following biomass levels are provided as examples which may be further refined. These examples were constructed such that more risk is allowed when stock status is good compared to when stock status is poor.

- **Bin 1** (biomass greater than or equal to 150% of the target and F below F_{MSY}): default measures are based on biomass that is double the target level.
- **Bin 2** (biomass above the target level but less than 150% of the target and F below F_{MSY}): default measures based on biomass that is 140% of the target level.
- **Bin 3** (biomass between the target and threshold and F below F_{MSY}): default measures based on biomass that is 75% of the target level.
- **Bin 4** (biomass greater than or equal to 150% of the target and F above F_{MSY}): default measures based on a biomass that is at the target level.
- **Bin 5** (biomass above the target level but less than 150% of the target and F above F_{MSY}): default measures based on biomass that is ~~at~~ 75% of the target level.
- **Bin 6** (biomass between the target and threshold and F above F_{MSY}): default measures based on biomass that is 60% of the target level.
- **Bin 7** (biomass below the threshold): default measures based on biomass that is 25% of the target level, until replaced by rebuilding plan measures.

The measures in each bin would be anticipated to produce a range of possible harvest, catch, or fishing mortality, given uncertainty and variability in the data. Considerations related to confidence intervals and other statistical metrics and models could be used to define the measures associated with each bin. Measures within each bin would take into consideration small changes to allow for liberalizations or reduction to allow for the flexibility to fine tune measures based on both recruitment and biomass trends in addition to the current biomass and fishing mortality levels.

Table 3. Summary of the biological reference point option illustrating bins of measures associated with different combinations of stock conditions. B stands for biomass, F for fishing mortality rate and R for recruitment.

	F ≤ Fmsy	F > Fmsy
B >= 150% Btarget	R↑ R↓ B↑ liberal | liberal B↓ default | default **1**	R↑ R↓ MRIP ≤ RHL/ACL B↑ default | restrictive MRIP ≤ RHL/ACL B↓ restrictive | restrictive MRIP > RHL/ACL B↑ B↓ restrictive & re-evaluate measures **4**
Btarget ≤ B < 150% Btarget	R↑ R↓ B↑ liberal | liberal B↓ default | default **2**	R↑ R↓ MRIP ≤ RHL/ACL B↑ default | restrictive MRIP ≤ RHL/ACL B↓ restrictive | restrictive MRIP > RHL/ACL B↑ B↓ restrictive & re-evaluate measures **5**
Bthreshold ≤ B < Btarget	R↑ R↓ B↑ default | restrictive B↓ restrictive | restrictive **3**	R↑ R↓ MRIP ≤ RHL/ACL B↑ default | restrictive MRIP ≤ RHL/ACL B↓ restrictive | restrictive MRIP > RHL/ACL B↑ B↓ restrictive & re-evaluate measures **6**
B < Bthreshold	**MOST RESTRICTIVE/REBUILDING PLAN** **7**	

<u>Accountability Measures under the Biological Reference Point Approach</u>

Background information on AMs is provided in section 3.1 on page 16. Under the Biological Reference Point approach, measures are set based on a variety of factors such that they are more restrictive when stock status is poor and more liberal when stock status is healthy. Each bin has two sets of measures: a default set and either a more liberal or more restrictive set of measures. The measures for all bins will be regularly reviewed to ensure that they remain appropriate and prevent overfishing. These aspects of this approach can be considered proactive AMs.

The Biological Reference Point option is unique in that it includes reactive AMs built into the bins to respond to declining stock status (i.e., more restrictive measures implemented when biomass is below the target or F exceeds F_{MSY} and biomass trend and/or recruitment show negative signs or recreational overages have occurred; Bins 3-6). Therefore, no additional reactive AMs are needed under this approach.

Option E. Biomass Based Matrix Approach

This option would define six bins of recreational measures based on two factors: biomass compared to the target level (B/B_{MSY}) and the most recent trend in biomass. Bin 1 represents the optimal conditions, while Bin 6 represents the worst conditions.

Definitions:

- Abundant = Stock is at least 150% of the target level (B_{MSY})
- Healthy = Stock is above the target, but less than 150% of the target
- Below Target = Stock is below the target, but above the threshold (the threshold is half of the target and defines an overfished condition)
- Overfished = The stock is below the threshold
- Biomass trend would be defined as stable, increasing, or decreasing based on the methods described in Appendix 3.

When biomass exceeds 150% of the target level, regardless of the biomass trend, Bin 1 measures are selected. This is aimed at providing an opportunity to keep recreational management measures aligned with stock status, which in this case, is significantly above the target. When a stock is fished at F_{MSY} it is expected that stock size will decrease towards the biomass target unless above average recruitment events occur. Thus, it is not necessarily a negative sign if the stock at such high biomass levels experiences a declining trend.

Measures associated with each of the six bins would aim to achieve a target level of harvest, catch, or fishing mortality, depending on the option selected from section 3.2. The measures in each bin would be anticipated to produce a range of possible harvest, catch, or fishing mortality, given uncertainty and variability in the data. Considerations related to confidence intervals and other statistical metrics and models could be used to define the measures associated with each bin.

Although placement in Bins 1-6 would be based on a combination of B/B_{MSY} and biomass trend, the management measures associated with each bin could be defined based on six categories of biomass and the target level of harvest, catch, or fishing mortality deemed appropriate for that biomass level. The following biomass levels are provided as examples which may be further refined. These examples were constructed such that more risk is allowed when stock status is good compared to when stock status is poor.

- **Bin 1** (biomass greater than or equal to 150% of target level or biomass above target but less than 150% of target with increasing trend): measures are based on biomass that is 150% of the target level.
- **Bin 2** (biomass above the target level but less than 150% of the target with stable or decreasing trend): measures based on biomass that is at the target level.

- **Bin 3** (biomass between the target and threshold and increasing trend): measures based on biomass that is 75% of the target level.
- **Bin 4** (biomass between the target and threshold and stable or decreasing trend): measures based on biomass that is 60% of the target level.
- **Bin 5** (biomass below the threshold and increasing trend): measures based on biomass that is 40% of the target level.
- **Bin 6** (biomass below the threshold and stable or decreasing trend): measures based on biomass that is 20% of the target level.

Table 4. Recreational management measure matrix under the Biomass Based Matrix approach.

Biomass Level	**Biomass Trend**		
	Increasing	**Stable**	**Decreasing**
Abundant At least 150% of target	Bin 1		
Healthy Above target, but less than 150% of target	Bin 1	Bin 2	
Below Target but above threshold	Bin 3	Bin 4	
Overfished Below threshold	Bin 5	Bin 6	

Sub-Options for Accountability Measures Under the Biomass Based Matrix *– This section was updated in May 2022, as shown in tracked changes below*

Background information on AMs is provided in section 3.1 on page 16. For both sub-options below, measures are set based on a variety of factors such that they are more restrictive when stock status is poor and more liberal when stock status is healthy. The measures for all bins will be regularly reviewed to ensure that they remain appropriate and prevent overfishing. These aspects of this approach can be considered proactive AMs.

Sub-Option E-1: Reactive AMs Similar to Current AMs

As under this sub-option, ACL overages would be evaluated by comparing the most recent 3-year average recreational ACL against the most recent 3-year average of recreational dead catch (i.e., landings and dead discards) for summer flounder, scup, and black sea bass. For bluefish, this would be a single-year comparison. If ~~average catch exceeds the average~~this comparison shows an ACL overage, then the appropriate AM is determined based on the following criteria:

1. If the stock is overfished ($B < \frac{1}{2} B_{MSY}$), under a rebuilding plan, or the stock status is unknown:

    a. The most restrictive measures (Bin 6) would be implemented. These may be temporary measures until replaced by measures required by a rebuilding plan, which can take up to two years to implement.

    b. If the most restrictive measures were already in place or are otherwise expected to continue to result in overages, then those measures must be modified for the upcoming fishing year such that they are reasonably expected to prevent future overages.

2. If biomass is above the threshold, but below the target ($\frac{1}{2} B_{MSY} < B < B_{MSY}$), and the stock is not under a rebuilding plan:

    a. If only the recreational ACL has been exceeded, then the stock would remain in its current bin, but the measures associated with that bin and all other bins, will be re-evaluated with the goal of preventing future ACL overages.

    b. If the ABC or F_{MSY} (as determined through section 3.4) is exceeded in addition to the recreational ACL, and the stock has not already moved to a more restrictive bin due to a decrease in biomass, then measures associated with the next more restrictive bin would be implemented. In addition, measures in all bins would be re-evaluated and revised as appropriate. If the stock moves to a more restrictive bin based on a decrease in biomass, then an additional AM is not needed as the negative impacts on stock status have already been accounted for in the movement to the more restrictive bin.

3. If biomass is above the target ($B > B_{MSY}$):

    The management measures associated with all bins will be adjusted, taking into account the performance of the measures and the conditions that precipitated the overage.

The bluefish regulations outline additional considerations for transfers in future years when a transfer between the commercial and recreational sectors was determined to have contributed to the ACL overage which triggered the AM.

Sub-Option E-2: Reactive AMs with a Trigger Based on Overfishing Status to Evaluate Measures

Under this sub-option, if overfishing is occurring (F is greater than F_{MSY}), and the recreational dead catch to recreational ACL comparison shows an overage, even if a change between bins was not triggered through an updated comparison of the Biomass

Based Matrix metrics as described above, the management measures for all bins will be re-evaluated and modified as needed to appropriately constrain recreational catch and end overfishing.

3.2 Target Metric for Setting Measures

The options in this section define the target metric which would be used when setting measures appropriate for the set of stock conditions that define the bin under options C-E in section 3.1. The options in section 3.2 do not apply if either options A or B in section 3.1 are selected. While the PDT/FMAT has not come to a consensus on which method was preferable, they did agree that if option C is selected, a secondary option should also be selected if the primary option cannot be calculated for any reason.

Option A. Recreational Harvest Limit

Under this option, the measures associated with each bin in options C-E under section 3.1 would aim to achieve but not exceed a target level of harvest which is informed by the RHL. Options C-E in section 3.1 use a binned approach to setting recreational management measures, with each bin representing a range of stock conditions. For this reason, the target level of harvest for each bin may not always be equivalent to the RHL under the no action alternative as a range of RHLs could fall under the same bin.

The RHL is calculated by removing projected dead discards from the Recreational ACL. Both the RHL and ACL are based on stock assessment projections, considerations related to scientific uncertainty, and commercial/recreational allocations. The RHLs can also be adjusted to account for management uncertainty.

Option B. Annual Catch Limit

Under this option, the measures associated with each bin in options C-E under section 3.1 would aim to achieve but not exceed a target level of dead catch (i.e., harvest and dead discards) which is informed by the recreational ACL. Options C-E in section 3.1 use a binned approach to setting recreational management measures, with each bin representing a range of stock conditions. For this reason, the target level of catch for each bin may not always be equivalent to the recreational ACL under the no action alternative as a range of ACLs could fall under the same bin.

The ACL is based on stock assessment projections, considerations related to scientific uncertainty, and commercial/recreational allocations.

Option C. Recreational Fishing Mortality Target

Under this option, the measures associated with each bin in options C-E under section 3.1 would aim to achieve but not exceed a target level of fishing mortality (F) for the recreational fishery. It remains to be determined how a recreational fishing mortality target would be calculated. The stock assessments for each species calculate a fishing mortality reference point (F_{MSY}) for the commercial and recreational fisheries combined. Overfishing occurs at the stock level when fishing mortality exceeds this reference point. There are no fishing mortality reference points specific to the recreational fisheries. Furthermore, although the current stock assessment models for summer flounder, scup, and bluefish generate estimates of recreational fishing mortality, the current stock assessment model for black sea bass does not model the recreational fishery separately from the commercial fishery. Therefore, unless the model structure changes, it would not be possible to generate a fishing mortality estimate for black sea bass to compare against a recreational fishing mortality target. For these reasons, if this sub-option is selected as preferred by the Policy Board and Council, a secondarily preferred sub-option may also be selected for use in the event that a recreational fishery F target or F estimate cannot be generated.

3.3 Conservation Equivalency Options

The options in this section consider how the Commission's conservation equivalency policy would apply to the management options listed under section 3.1. The options in this section may only be considered if a harvest control rule management option other than Option A (No Action) in section 3.1 is selected.

Option A. No Action (States Retain Ability to Propose Conservation Equivalent Measures)

This option maintains the ability for states to submit proposals for alternative recreational management measures that are expected to achieve an equivalent level of recreational harvest, catch, or F (as determined by the sub-options in section 3.2). If a state submits a proposal outside of an implementation plan process, it must provide the proposal two months in advance of the next Board meeting to allow committees sufficient time to review the proposal and to allow states to respond to any requests for additional data or analyses. Further details describing the process and procedures can be found in the Commission's conservation equivalency policy noted above.

Option B. Regional Conservation Equivalency

This option allows for regions, as defined by the pre-determined species regions in Appendix 4, to submit proposals for alternative recreational management measures which are expected to achieve an equivalent level of recreational harvest, catch, or fishing mortality (depending on the option chosen from section 3.2) as the pre-defined measures of the bin. If a region is submitting a proposal, it must provide the proposal two months in advance of the next Board meeting to allow committees sufficient time to review the proposal and to allow the regions to respond to any requests for additional data or analyses.

Option C. Conservation Equivalency is Disallowed

Under this option, conservation equivalency under the Commission process will not be permitted for any of the four species on a state or regional level. This would reduce the flexibility afforded to states/regions compared to the previous two options, but would help achieve the goals of stability and predictability in measures. Several of the options proposed in this document have mechanisms in place to allow for the revision of management measures at different bins if they are not working as intended.

3.4 Accountability Measures Comparisons

The options in this section consider a change to one component of the reactive AMs under options A, B, C-1, and E-1 in section 3.1. Specifically, they address situations when a reactive AM has been triggered and biomass is above the threshold but below the target level. All other components of the AMs are summarized along with options A-E in section 3.1. These changes are only considered for the recreational AMs. No changes to the commercial AMs are considered through this action. Regardless of option chosen, AMs should be regularly revaluated following the provisions of the MSA.

Option A. Catch compared to the ABC

Under this sub-option, when a reactive AM has been triggered by a recreational ACL overage and the most recent biomass estimate is between the target and the threshold, catch relative to the ABC would also be considered. The response to the overage would be stricter if the ABC was also exceeded (e.g., a payback would be required or the stock would be placed in a more restrictive bin, depending on the option). If only the recreational ACL was exceeded, the response to the overage would be less strict (e.g., measures would be revised but a payback would not be required or the stock would remain in its current bin, depending on the option).

Option B. Fishing mortality compared to an F threshold

This sub-option maintains ACL evaluations within the AMs, but rather than considering if the ABC was also exceeded (see previous section), consideration would be given to if the fishing mortality threshold (F_{MSY}) was also exceeded. The intent behind this option is that it considers if total fishery removals negatively impacted the stock based on the most recent information. For example, catch in a past year may have exceeded the recreational ACL, but a subsequent stock assessment update may indicate that the stock did not suffer notable negative impacts if the fishing mortality threshold was not exceeded. The most recent fishing mortality estimate considers more recent information than the information used to set a previous year's ACL. To set the ACL and ABC, projections must be made that make assumptions about how the fishery may perform. This approach using a fishing mortality comparison would look at data that represents what transpired in the fishery or stock during the time being evaluated, according to the most recent stock assessment. If regularly updated estimates of total fishing mortality compared to the threshold are not available, then this comparison would default to the ABC comparison described above.

4.0 Compliance

TBD

5.0 Literature Cited

NEFSC. 2021a. Summer Flounder Management Track Assessment Report.

NEFSC. 2021b. Scup Management Track Assessment for 2021. Prepublication copies prepared for use by Fishery Management Council staff and SSC. Available at https://www.mafmc.org/ssc-meetings/2021/july21-23.

NEFSC. 2021c. Black Sea Bass Management Track Assessment for 2021. Prepublication copies prepared for use by Fishery Management Council staff and SSC. Available at https://www.mafmc.org/ssc-meetings/2021/july21-23.

NEFSC. 2021d. Atlantic Bluefish Management Track Assessment for 2021. Prepublication copies prepared for use by Fishery Management Council staff and SSC. Available at https://www.mafmc.org/ssc-meetings/2021/july21-23.

4.0 APPENDICES

Appendix 1. Comparison of Options and Current Stock Status

The following table summarizes metrics considered when setting recreational measures under each option in this Draft Addenda/Framework. Primary metrics determine in the appropriate bin (see section 3.1 for more details); secondary metrics are only used if, through the evaluation of the primary metrics, the stock stays in the current bin. Metrics considered through accountability measures may differ from those shown below. See section 3.1 for more details on the options.

Option	Metrics used to set measures					Measures are pre-determined	Expected number of sets pre-determined measures	Measures specified for 1 or 2 years
	Expected harvest*	Biomass compared to target level (B/B_{MSY})	Fishing mortality compared to threshold level (F/F_{MSY})	Recent recruitment	Biomass trend			
No action	Primary					No	N/A	1
Percent change	Primary	Primary				No	N/A	2
Fishery score	Primary**	Primary**	Primary**	Primary**		Yes	4	2
Biological reference point	Only when $F>F_{MSY}$	Primary	Primary	Secondary	Secondary	Yes	13	2
Biomass based matrix		Primary			Primary	Yes	6	2

*Expected harvest refers to expected harvest under status quo measures compared to the upcoming year(s)' RHL and could be based on past MRIP estimates, including consideration of confidence intervals for those estimates, or a model-based estimate of harvest, including considerations related to uncertainty in that estimate.

**As described in section 3.1-C, the fishery score metrics may not be weighted evenly. The Monitoring/Technical Committees will recommend the appropriate weight for each metric. These weights can be modified through the specifications process.

Appendix 2. Placement of Each Species in Each Option with Current Data

Option B: Percent Change Approach

As illustrated in the figure below, for summer flounder, the 2022-2023 RHL is within the CI of the 2019-2020 MRIP harvest estimates and the most recent B/B_{MSY} ratio is 0.85. Therefore, a 10% reduction would be needed under the Percent Change Approach.

For black sea bass and scup, the 2022-2023 RHL is below the CI of the 2019-2020 MRIP harvest estimates and the most recent B/B_{MSY} ratio exceeds 1.5. Therefore, depending on sub-option selected, either a 10% reduction would be needed or no change in measures would be made under the Percent Change Approach.

Row	Future RHL vs Harvest Estimate	$B/_{BMSY}$	Change in Harvest	
A	Future 2-year avg. RHL greater than upper bound of harvest estimate CI	> 1.5	Sub-Option B-1A: Liberalization percent equivalent to difference between harvest estimate and 2-year avg. RHL	Sub-Option B-1B: 40% Liberalization
		1 - 1.5	Sub-Option B-1A: Liberalization percent equivalent to difference between harvest estimate and 2-year avg. RHL	Sub-Option B-1B: 20% Liberalization
		< 1	Sub-Option B-2A: 10% Liberalization	Sub-Option B-2B: 0%
B	Future 2-YR avg. RHL within CI of harvest estimate	> 1.5	10% Liberalization	
		1-1.5	0%	
		< 1	 10% Reduction	
C	Future 2-YR avg. RHL less than lower bound of harvest estimate CI	> 1.5	Sub-Option B-2A: 10% Reduction  	Sub-Option B-2B: 0%  
		1-1.5	Sub-Option B-1A: Reduction percent equivalent to difference between harvest estimate and 2-year avg. RHL	Sub-Option B-1B: 20% Reduction
		< 1	Sub-Option B-1A: Reduction percent equivalent to difference between harvest estimate and 2-year avg. RHL	Sub-Option B-1B: 40% Reduction

Option C: Fishery Score Approach

The Monitoring/Technical Committees will recommend the appropriate weight for each metric within the fishery score approach. These weights can be modified through the specifications process. In this example the weighting for each metric was assigned as follows:

B/B_{MSY} = 40% F/F_{MSY} = 20%   Recruitment = 20%   Fishery Performance = 20%

Summer Flounder

Using the results of the 2021 management track assessment for summer flounder we calculated the current fishery score as follows, assuming the weighting described above:

- B/B_{MSY} = 47,397/55,217 = 0.85 (FS=3)
- F/F_{MSY} = 0.340/0.422 = 0.81 (FS=5)
- Recruitment Percentile: 81-100% (FS=5)
- Landings: 2019-2020 avg. RHL within CI (FS=3)

3(.4) +5(.2) + 5(.2) + 3(.2) = 3.8

Given a fishery score of 3.8, summer would be considered at medium risk with a moderate stock status and the corresponding management measures would be liberal.

Bin	Fishery Score	Stock Status and Fishery Performance Outlook	Measures
1	4-5	Good	Most Liberal
2	3-3.99	Moderate	Liberal
3	2-2.99	Poor	Restrictive
4	1-1.99	Very Poor	Most Restrictive

Scup

Using the results of the 2021 management track assessment for scup we calculated the current fishery score as follows, assuming the weighting described above:

- B/Bmsy=176,404/90,019 = 1.95 (FS=5)
- F/Fmsy = 0.136/0.200 = .68 (FS=5);
- Recruitment Percentile: <20% (FS= 1)
- Landings: 2019-2020 avg. RHL below lower bound of CI (FS=1)

$$5(.4) + 5(.2) + 1(.2) + 1(.2) = 3.4$$

Given a fishery score of 3.4, scup would be considered at medium risk with a moderate stock status and the corresponding management measures would be liberal.

Bin	Fishery Score	Stock Status and Fishery Performance Outlook	Measures
1	4-5	Good	Most Liberal
2	3-3.99	Moderate	Liberal
3	2-2.99	Poor	Restrictive
4	1-1.99	Very Poor	Most Restrictive

Black Sea Bass

Using the results of the 2021 management track assessment for black sea bass we calculated the current fishery score as follows, assuming the weighting described above:

- B/Bmsy= 30,774/14,441 = 2.1 (FS=5)
- F/Fmsy =.5 (FS=5)
- Recruitment Percentile: 61-80% (FS= 4)
- Landings: 2019-2020 avg. RHL below lower bound of CI (FS=1)

$$5(.4) + 5(.2) + 4(.2) + 1(.2) = 4$$

Given a fishery score of 4, black sea bass would be considered at low risk with a healthy stock status and the corresponding management measures would be the most liberal.

Bin	Fishery Score	Stock Status and Fishery Performance Outlook	Measures
1	4-5	Good	Most Liberal
2	3-3.99	Moderate	Liberal
3	2-2.99	Poor	Restrictive
4	1-1.99	Very Poor	Most Restrictive

<u>Bluefish</u>

Using the results of the 2021 management track assessment for bluefish we calculated the current fishery score as follows, assuming the weighting described above:

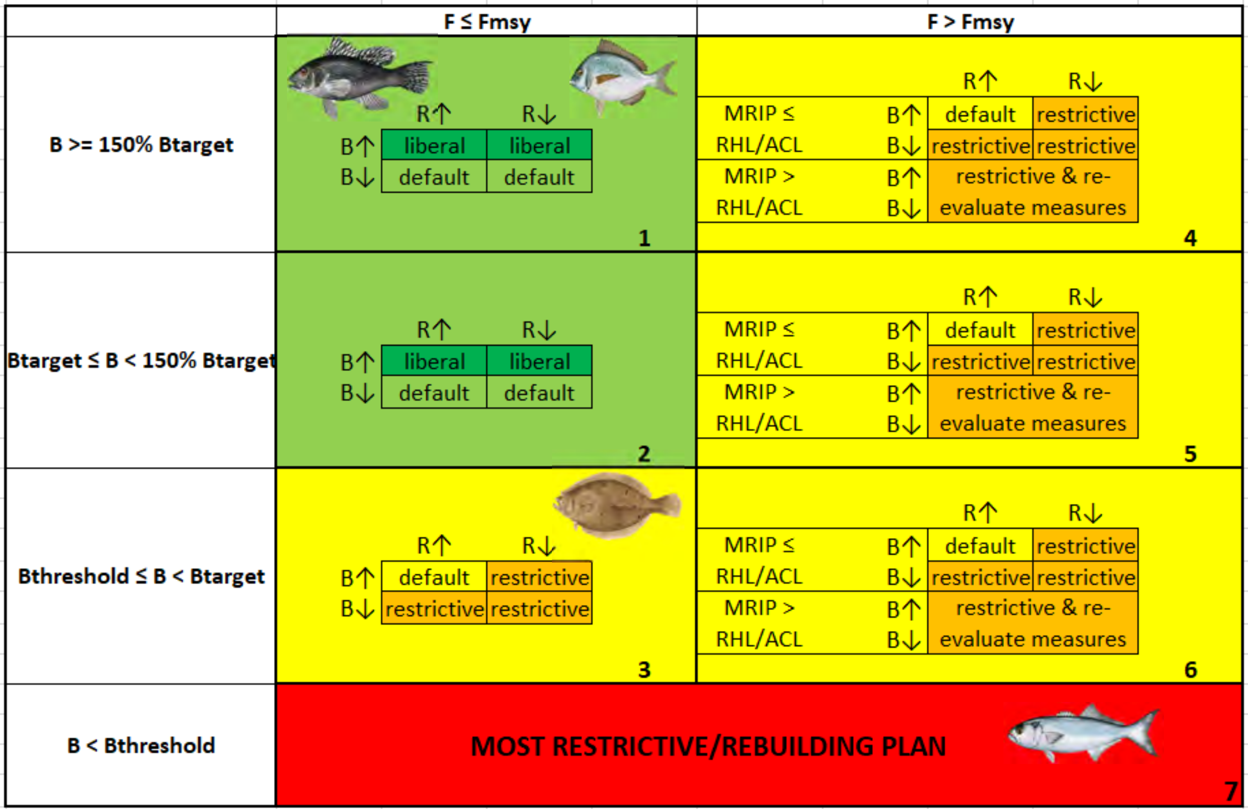
- B/Bmsy= 95,742 /201,729 = 0.47 (FS=1)
- F/Fmsy =.95 (FS=3)
- Recruitment Percentile: 41-60% (FS= 3)
- Landings: 2019-2020 avg. RHL below lower bound of CI (FS=1)

1(.4) +3(.2) + 3(.2) + 1(.2) = 1.8

Given a fishery score of 1.8, bluefish would be considered at the highest risk with a very poor stock status and the corresponding management measures would be the most restrictive.

Bin	Fishery Score	Stock Status and Fishery Performance Outlook	Measures
1	4-5	Good	Most Liberal
2	3-3.99	Moderate	Liberal
3	2-2.99	Poor	Restrictive
4	1-1.99	Very Poor	Most Restrictive

Option D: Biological Reference Point Approach



As illustrated in the figure above, under the Biological Reference Point option, each stock under consideration is shown in the respective bin based on the most recent stock assessment results (summarized under the fishery score alternative)

- Both scup and black sea bass would be in Bin 1, with the default measures. If the 2023 stock assessment update indicates that both recruitment and biomass have increasing trends with no change to biomass or fishing mortality, then measures would be liberalized.
- For summer flounder, the stock is placed in Bin 3. This bin indicates a low biomass without overfishing occurring, and measures would be the default measures of this bin. If in the 2023 stock assessment, biomass and fishing mortality show stable trends but either recruitment or biomass showed a decline, measures would be restricted. If biomass improves, then the stock will move from Bin 3 to Bin 2 – as long as overfishing isn't occurring.
- For bluefish, the stock is under a rebuilding plan and defaults to Bin 7. The stock will remain here until the Board/Council determine if can once again enter into the harvest control rule.

Option E: Biomass Based Matrix Approach

According to the most recent stock assessment information, both scup and black sea bass have biomass levels that are over 150% of the target with a decreasing biomass trend. This places them in Bin 1 under the Biomass Based Matrix Option. Summer flounder has a biomass below the target and an increasing biomass trend. Therefore, the stock is in Bin 3. Bluefish is in Bin 6 because it is in a rebuilding plan.

Stock Status	Biomass Trend		
	Increasing	**Stable**	**Decreasing**
Abundant At least 150% of target	Bin 1		
Healthy Above target, but less than 150% of target	Bin 1	Bin 2	
Below Target but above threshold	Bin 3 	Bin 4	
Overfished Below threshold	Bin 5	Bin 6 	

Appendix 3. Determining Metrics for Each Option

Please note that the methodology for determining metrics for each option could be revised pending further PDT/FMAT and Board/Council discussion. These changes would only affect the calculation of metrics under each option, and would not impact the management framework for using the harvest control rule approaches.

Confidence Intervals for MRIP Comparison

For options that incorporate comparison of harvest to recent MRIP estimates, the FMAT/PDT recommends using an 80% confidence interval (CI) around the most recent two years of MRIP harvest estimates. An 80% CI balances concerns related to certainty (higher CI %) and precaution when reductions might be needed or economic opportunity when liberalizations could be allowed (lower CI %). As described in section 3.1, the intent of this CI is to serve as a proxy for expected future harvest under status quo measures. This proxy could be replaced by an alternative estimate and associated CI generated from a robust statistical methodology approved by the Monitoring/Technical Committees.

Option C: Fishery Score Approach

Determining Metric Values for the Fishery Score

The following section provides an example of how the metrics could be used to generate a fishery score value ranging from 1 to 5.

$B/B_{MSY}(W_B)$

Biomass from the most recent stock assessment would be given a value of 1-5 based on the following criteria, which are loosely based on other aspects of the management program (e.g., the Council's risk policy).

- 5: Biomass is equal to or greater than 150% of the target
- 4: Biomass is less than 150% of the target, and equal to or greater than the target
- 3: Biomass is below the target, and equal to or greater than 75% of the target
- 2: Biomass is below 75% of the target, and equal to or above the threshold (which is ½ the target and defines an overfished state)
- 1: Biomass is below the threshold

$F/F_{MSY}(W_F)$

Fishing mortality could be scored based on whether the most recent fishing mortality estimate is at, above, or below the threshold level. Only three increments were selected for fishing mortality as other aspects of the management program consider only whether F is at, above, or below the target. This scoring methodology may be revised based on further analysis and additional stock assessment considerations.[8]

- 5: F/F_{MSY} is at least 5% less than 1
- 3: F/F_{MSY} within 5% of 1
- 1: F/F_{MSY} is at least 5% greater than 1

Recruitment(W_R)

To determine the recruitment metric, the most recent three year average estimate of recruitment will be compared to the 20th, 40th, 60th, 80th, and 100th percentiles of the time series of recruitment used in stock projections. This percentile categorization of the relative strength of an incoming year class was deemed more informative than measuring trends in recruitment, especially given the highly variable nature of recruitment from year to year. Assessing where recruitment fell in the percentile distribution was determined a more appropriate measure of recruitment's impact on future levels of biomass.

- 5: 3 year average R in the 81-100 percentile
- 4: 3 year average R in the 61-80 percentile
- 3: 3 year average R in the 41-60 percentile
- 2: 3 year average R in the 21-40 percentile
- 1: 3 year average R is in the 0-20 percentile

Fishery performance (W_{FP})

Fishery performance is evaluated by comparing the confidence interval (CI) defined based on the method described on page 44. The score is determined by where the average RHL appears in relation to the CI.[9] The following three categories are used for this metric:

[8] An alternative scoring method which may be further developed by the FMAT/PDT is to consider the probability that the terminal year fishing mortality estimate (F) from the most recent stock assessment exceeds the threshold level defining overfishing (F_{MSY}). The following four categories are provided as examples.

- 5: 0-24% probability that terminal year F exceeds F_{MSY}
- 4: 25-49% probability that terminal year F exceeds F_{MSY}
- 2: 50-74% probability that terminal year F exceeds F_{MSY}
- 1: 75-100% probability that terminal year F exceeds F_{MSY}

[9] When developing a CI from two years of MRIP data, the PDT/FMAT recommends the use of a joint distribution 80% confidence interval that takes into consideration the PSE of each individual years' MRIP estimate and the variability of the estimates between years. This recommendation is based on an analysis of several years of MRIP

- 5: 2-yr avg. RHL above upper bound of CI
- 3: 2-yr avg. RHL within CI
- 1: 2-yr avg. RHL below lower bound of CI

Option D and E: Biological Reference Point and Biomass Based Matrix

Evaluating B/Bmsy and F/Fmsy

Fishing Mortality (F)

- F ≤ Fmsy - *Fishing mortality is less than or equal to the target.*
- F > Fmsy - *Fishing mortality is greater than the target (overfishing is occurring)*

Biomass (B)

- 150% B_{MSY} target ≤ B - *Biomass is greater than or equal to 1.5x the target*
- B_{MSY} target ≤ B < 150%B_{MSY} target - *Biomass is greater than or equal to the target but less than 1.5x the target*
- B_{MSY} threshold ≤ B < B_{MSY} target - *Biomass is less than the target but greater than or equal to the threshold*
- B < B_{MSY} threshold – *Biomass is less than the threshold (Overfished), a management response (Rebuilding Plan) is required under the MSA. See Accountability Measures for more information.*

Evaluating Biomass Trends – This Section was revised March 2022

Evaluating biomass trends can be accomplished using a variety of statistical methods. The PDT/FMAT is working on a number of potential options.

One possible approach would use the average percent change in biomass (or spawning stock biomass) from the three most recent years in the assessment. The average percent change would then be compared to a pre-defined breakpoint. In the figure below we have tested three potential breakpoints 3, 4, and 5 percent. For a 3 percent breakpoint a biomass trend would be considered stable if the percent change was between -3 percent and 3 percent change; considered increasing if the percent change was greater than 3 percent; and, decreasing if the percent change was greater than -3 percent. The number of years in the average, and the breakpoint selected will influence the resulting trend. For the purposes of the biological reference point approach (option D), which only has two categories for biomass trend, the stable and increasing biomass trends would both be considered a positive biomass trend and the decreasing biomass trend would be considered a negative biomass trend.

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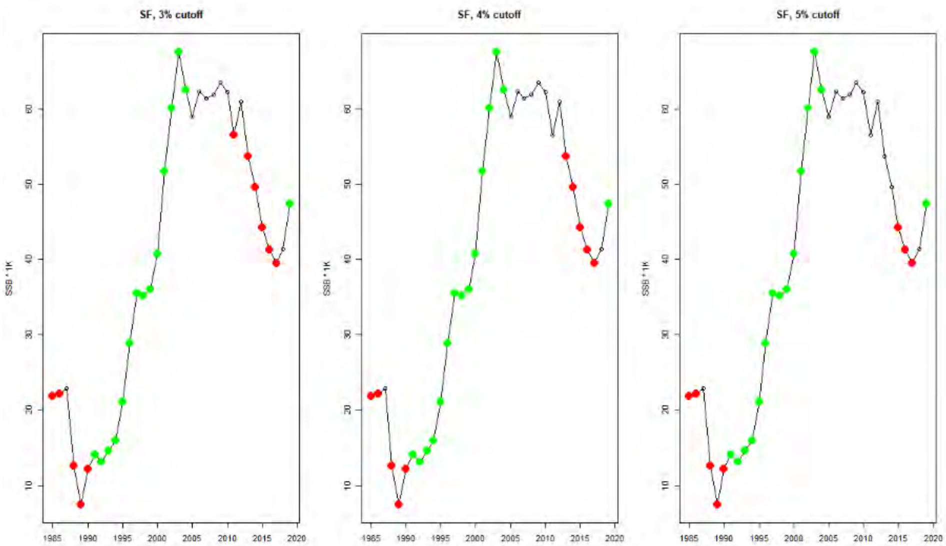
data for each species. The use of MRIP data in this context is intended as a proxy for expected future harvest under status quo measures. This may be replaced with statistical modelling approaches for predicting harvest, with associated CIs, if such approaches are available in the future.

Summer flounder Trend Sensitivity Analysis



An alternative approach to derive a biomass trend would combine survey indices into a biomass index that could be used to determine the trend. The approach was designed to combine multiple indices and generate a single value to use as a catch-multiplier to provide catch advice in plan-B assessment approaches. We could use a similar approach to combine information from multiple indices and get a single quantitative metric to judge biomass trends. The following steps would be followed: 1) Create an average biomass index from one or more surveys; 2) apply a LOESS smooth to average; 3) fit log linear model to the most recent three years of smoothed data; and 4) transform slope back to normal scale to get a value. This approach may also be considered a back-up approach if an analytical model with biomass estimates is unavailable.

Recruitment - This Section was revised March 2022

Recruitment will be evaluated based on the most recent three-year average recruitment estimate compared to the median of the time series of recruitment used in stock projections. "High" recruitment will be considered a three-year average that is equal to or greater than the median and "Low" recruitment will be considered a three-year average that is below the median.

Fishery Performance - This Section was revised March 2022

This secondary metric comes into play only when a stock remains in its current bin for a second specifications cycle and overfishing is occurring ($F > F_{MSY}$). This metric considers whether or not the current measures resulted in catch and/or harvest greater than the specified limit from the previous specifications cycle. Specifically, a two-year average of catch or harvest from the previous specifications cycle will be compared to the two-year average of the ACL or RHL. A CI around the catch and/or harvest estimates can be considered when evaluating if an overage occurred.

Appendix 4: Regions for Each Stock

Under Addendum XXXII, summer flounder and black sea bass were divided into the following regions:

Summer Flounder: Section 3.1.1

Measures will be developed using a six-region approach, where the regions are defined as: 1) Massachusetts, 2) Rhode Island, 3) Connecticut-New York, 4) New Jersey, 5) Delaware-Virginia, and 6) North Carolina.

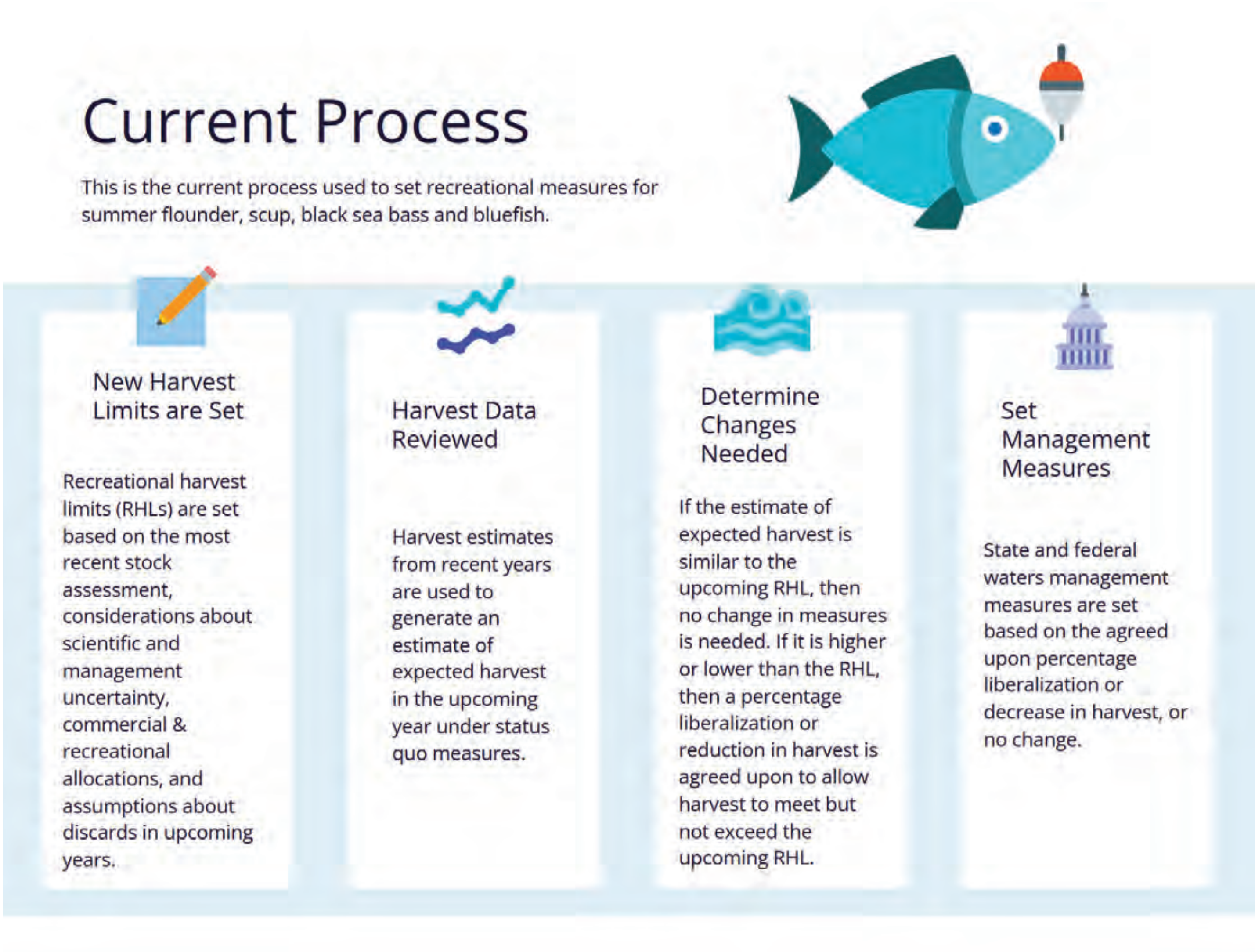
Black Sea Bass: Section 3.2.1

Measures will be developed using a three-region approach, where the regions are defined as Massachusetts through New York; New Jersey; and Delaware through North Carolina (north of Cape Hatteras).

Regions have not been established for management of the recreational scup and bluefish fisheries. The Board and Council can develop regions for these species during final action on this addenda or through a separate action.

Supplemental Infographics to the Draft Addenda/Framework on the Harvest Control Rule

This is a supplement to the [Quick Reference Guide]() for the Draft Addenda/Framework on the Harvest Control Rule. Please refer to the Quick Reference Guide (Section 3.1) when viewing these infographics. The Draft Addenda/Framework can be found at http://www.asmfc.org/files/PublicInput/HCR_DraftAddenda_PublicComment_March2022.pdf.



Percent Change Option

1 → RHL compared to MRIP estimate

Determine if the RHL for the upcoming management period is above, below, or within the confidence interval of the most recent MRIP time-series estimates.

2 → Compare biomass to target level

Compare the biomass estimate from the stock assessment to the biomass target level. Biomass categories are as follows:

- 150% above biomass target
- Between 100% and 150% biomass target
- Below biomass target

3 → Find percent change in measures

The RHL and biomass comparison determines the appropriate percent change in harvest needed (if any).

4 → Set Management Measures

Management measures are either liberalized, restricted, or maintained at status quo to acheive the percent change determined through step 3.

Fishery Score Option

STEP 1

Stock Assessment Results

An updated stock assessment is completed and approved for management use.

STEP 2

Calculate Fishery Score Factors

Fishing mortality, biomass, recruitment, and fishery performance metrics are drawn from the stock assessment and recent MRIP estimates.

STEP 3

Use Formula to Calculate Fishery Score

Fishery score factors are entered in the Fishery score formula to produce a value ranging from 1 to 5. On this scale, 1 is the lowest possible score and 5 is the highest possible score.

STEP 4

Determine Management Step Based on Fishery Score

Based on the calculated fishery score, the stock is placed into one of four bins. Each bin has a pre-determined set of management measures (see below)

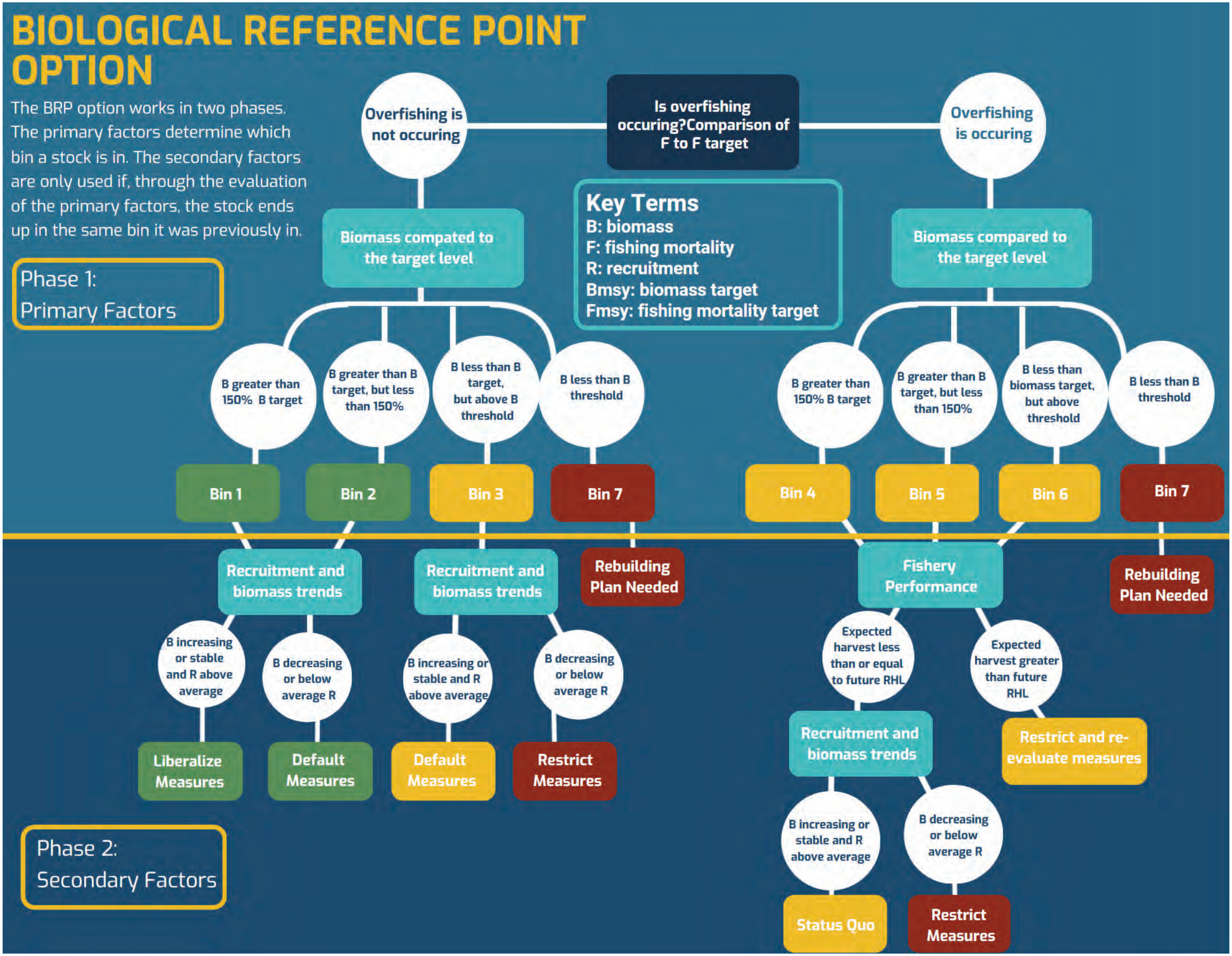
STEP 5

Determine Management Measures

Pre-determined management measures from the relevant bin are implemented.

Fishery Score bins and the associated stock status, fishery performance outlook, and measures that are associated with each bin.

Bin	Fishery Score	Stock Status and Fishery Performance Outlook	Measures
1	4-5	Good	Most Liberal
2	3-3.99	Moderate	Liberal
3	2-2.99	Poor	Restrictive
4	1-1.99	Very Poor	Most Restrictive


BIOLOGICAL REFERENCE POINT OPTION
The BRP option works in two phases. The primary factors determine which bin a stock is in. The secondary factors are only used if, through the evaluation of the primary factors, the stock ends up in the same bin it was previously in.
Phase 1: Primary Factors
Is overfishing occuring?Comparison of F to F target
Overfishing is not occuring
Overfishing is occuring
Key Terms
B: biomass
F: fishing mortality
R: recruitment
Bmsy: biomass target
Fmsy: fishing mortality target
Biomass compated to the target level
Biomass compared to the target level
B greater than 150% B target
B greater than B target, but less than 150%
B less than B target, but above B threshold
B less than B threshold
B greater than 150% B target
B greater than B target, but less than 150%
B less than biomass target, but above threshold
B less than B threshold
Bin 1
Bin 2
Bin 3
Bin 7
Bin 4
Bin 5
Bin 6
Bin 7
Recruitment and biomass trends
Recruitment and biomass trends
Rebuilding Plan Needed
Fishery Performance
Rebuilding Plan Needed
B increasing or stable and R above average
B decreasing or below average R
B increasing or stable and R above average
B decreasing or below average R
Expected harvest less than or equal to future RHL
Expected harvest greater than future RHL
Liberalize Measures
Default Measures
Default Measures
Restrict Measures
Recruitment and biomass trends
Restrict and re-evaluate measures
B increasing or stable and R above average
B decreasing or below average R
Status Quo
Restrict Measures
Phase 2: Secondary Factors

Biomass Based Matrix Approach

Stock Status is determined

Based on the relationship of biomass to the target level, biomass is categorized as either very high, healthy, below target, or overfished.

Biomass Trend Evaluated

A stock's biomass trend is considered increasing, stable, or decreasing.

Bin Determined

Based on biomass level and biomass trend, stock is placed in one of 6 bins: Bin 1 (optimal conditions) and Bin 6 (worst conditions).

Determine Management Measures

Pre-determined measures from the determined bin are implemented. If the bin is the same as in the prior years, measures remain status quo.

Recreational management measures matrix under the Biomass Based Matrix Approach

Stock Size (i.e., biomass compared to target level)	Trend in stock size		
	Increasing	**Stable**	**Decreasing**
Very High: At least 150% of target stock size	Bin 1		
High: Above the target, but below 150% target stock size	Bin 1	Bin 2	
Low: Below the target stock size, but more than 50% of the target stock size	Bin 3	Bin 4	
Overfished (Too Low): Less than 50% of the target stock size	Bin 5	Bin 6	

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930

April 15, 2022

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

Dear Mike,

On April 15, 2022, the proposed rule for the 2022 summer flounder, scup, and black sea bass recreational management measures filed. The development of this action was challenging and I appreciate the hard work of Council and Commission staff throughout the process.

Based on the recommendations of the Council and Board, the rule proposes to approve the use of conservation equivalency for summer flounder and black sea bass. State or regional measures can be liberalized to achieve a 16.5-percent harvest increase overall for summer flounder. For black sea bass, state or regional conservation equivalency measures must achieve a 20.7-percent harvest reduction.

For scup, in addition to the 1-inch minimum size increase proposed by the Council and Board, we are proposing a closure of the Federal recreational scup fishery. The action proposed by the Council and Board would not sufficiently reduce scup harvest as required by the Fishery Management Plan (FMP). Because the Council and Board failed to propose measures that meet the FMP requirements, we are required by the regulations at 50 CFR 648.122(b) to propose additional measures to ensure the scup recreational annual catch limit is not exceeded.

Throughout the development of the 2022 recreational measures, we have received requests to maintain status quo measures for scup and black sea bass. The regulations do not allow us to do that. These regulations implement the recreational management measure setting process developed by the Council in conjunction with the Board. We are required to act consistent with the regulations, all of which were deemed necessary and appropriate by the Council, that implement previously approved FMP actions. Absent Secretarial action, we cannot change the regulations until the Council and Board take additional action to modify the FMP's underlying requirements related to the setting of recreational management measures.

The allowance of status quo measures in 2020 and 2021 has been cited as rationale for continued status quo measures. Those years, during which we did allow for status quo measures, were unique circumstances, a planned temporary allowance of status quo measures in accordance with the MRIP transition, and an allowance of continued status quo in the face of a global pandemic that accounted for limited recreational catch data in 2020. In both of those circumstances, and leading up to this year's decision, I have been very clear that status quo was a temporary solution and that the Council and Board needed to take action to resolve issues with recreational fisheries moving forward. We have been clear and consistent in telling the Board and Council that, in the absence of action to change the way the recreational fishery is managed, we would need to implement measures consistent with the regulations in 2022.

The issues with recreational fisheries management are not new. In 2018, it became clear that the revised MRIP numbers, particularly for these species, would present significant challenges for the future of recreational management. In April 2018, the Council and Board received a presentation on the Draft Strategic Plan on Black Sea Bass Recreational Reform. In response, a Steering Committee was formed and a white paper was developed. However, it was not until October 2020 that the Council and the Commission's Policy Board agreed to initiate a joint framework/addendum and a joint amendment to address several recreational issues. Despite initiation of these actions in October, limited progress was made until the spring of 2021. We have consistently urged the Council and Board to prioritize Recreational Reform in the hope that we would have had a new system in place for 2022. We are disappointed that this did not happen. Now, the earliest we can expect final action is in June 2022. If the Council and Board do not take final action in June, I fear we will not have a new system in place for 2023 either.

I am urging the Council and Board to take final action on the Harvest Control Framework in June. The Council and Board have had nearly four years to address the challenges presented by the revised MRIP numbers; we cannot continue to allow this issue to go unresolved.

Sincerely,

Michael Pentony
Regional Administrator

cc: B. Beal; C. Moore; J. Beaty; K. Coutre; K. Dancy

May 6, 2022

The Honorable Gina Raimondo
Secretary of Commerce
U.S. Department of Commerce
1401 Constitution Avenue NW
Washington, DC 20230

Dear Secretary Raimondo:

We the undersigned, represent heads of the U.S. East Coast Natural Resources/Fishery management agencies (NH, MA, RI, CT, NY, NJ, DE, MD, PRFC, and VA) and are writing in opposition to new restrictions being imposed upon the recreational black sea bass and scup fisheries, as detailed in NOAA Fisheries proposed rule released on April 18, 2022.

We very much appreciate the flexibility and discretion that NOAA has shown in the last few years in response to changing catch estimates, slow-moving and complicated management, and the COVID-19 pandemic. Flexibility is needed in the proposed rule, and we question the imposition of these unnecessary fishery restrictions on healthy, abundant stocks when a comprehensive solution in the form of the Harvest Control Rule (HCR) Addendum is less than six months away.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) mandates that we prevent overfishing using the best scientific information available. The 2021 assessments conducted for black sea bass and scup found that in 2019 the stocks were approximately 200% of their biomass targets and that overfishing was not occurring for either species. These results are the best available science and show that joint management of these two stocks by the MAFMC and ASMFC is fulfilling the requirements of the MSA. The recreational fishery cuts proposed by NOAA under Part 648 of the Code of Federal Regulations, requiring accountability measures for both fisheries, are based upon significantly less data and much cruder consideration of estimate uncertainties than the most recent assessment results.

The last decade of fisheries management for these species has been difficult, complicated by explosive biomass growth, unprecedented availability to anglers, catch limits not informed by a successful stock assessment, and/or the transformation of Marine Recreational Information Program (MRIP) effort estimation. While the stocks grew to over twice the biomass target, black sea bass recreational regulations grew more restrictive yet failed to control landings and commercial scup fisheries have not fully utilized their quota. As NOAA, MAFMC, and ASMFC struggle to manage fisheries on extremely abundant stocks using new MRIP estimates, anglers and the businesses that depend upon them have suffered.

Recreational catch estimates have been problematic for decades. Recent significant changes in estimates of effort and catch have still not been fully assimilated into management. The HCR Addendum/Framework, which will come before the ASMFC and MAFMC for approval in June of this year with implementation in 2023, seeks to base management decisions upon assessment outputs and not MRIP estimates alone. The HCR process could provide a solution for 2022 management, but the federal implementation process prevents us from using it until 2023.

Given the abundance of both stocks and the solution on the horizon in the form of the HCR, there is ample reason for NOAA to continue to exercise management discretion and flexibility and not impose the restrictions in their proposed rule. This is an opportunity to move recreational fisheries management forward, without first taking unnecessary steps back. Prior to the pandemic in 2019, almost 2.8 million anglers from the north and mid-Atlantic states spent over 2 billion dollars on saltwater recreational fishing and took 3.2 million and 2.4 million trips targeting scup and black sea bass, respectively. These millions of anglers and the industries that surround them are vital to the coastal community economies emerging from the COVID pandemic. It is illogical to impose these reductions now when necessary change is so near. Therefore, we are requesting your intervention to maintain status quo measures for scup and black sea bass for 2022.

We thank you for your consideration and attention to this matter and we look forward to your prompt response.

Respectfully,

U.S. East Coast Natural Resources Commissioners/Directors

Basil Seggos, Commissioner
New York State Department of
Environmental Conservation

Shawn LaTourette, Commissioner
New Jersey Department of Environmental
Protection

Katie Scharf Dykes, Commissioner
Connecticut Department of
Environment & Energy

Ron Amidon, Commissioner
Massachusetts Department of
Fish and Game

Terrence Gray, Acting Director
Rhode Island Department of
Environmental Management

Scott Mason, Executive Director,
New Hampshire Fish and Game
Department

Michael Luisi, Acting Director
Fisheries and Boating Services
Maryland Department of
Natural Resources
Chairman - MAFMC

David Saveikis, Director
Delaware Division of Fish & Wildlife

Patrick Geer, Chief of Fisheries
Management
Virginia Marine Resources Commission

Marty Gary
Executive Director
Potomac River Fisheries Commission

cc. Rick Spinrad,
Janet Coit
Mike Pentony

May 9, 2022

Ms. Janet Coit
Assistant Administrator, NOAA Fisheries
1315 East-West Highway
Silver Spring, MD 20910
Via email: janet.coit@noaa.gov

Dear Ms. Coit,

Please consider these comments in response to the April 18, 2022 Proposed Rule on 2022 Recreational Management Measures for the Summer Flounder, Scup, and Black Sea Bass Fisheries; particularly the proposed closure of the recreational scup fishery in Federal waters.

Recreational scup and black sea bass management has been particularly challenging over the last decade as both stocks have grown to over twice their biomass targets while recreational catch and effort estimates have changed significantly. For scup, the changes made to the Marine Recreational Information Program (MRIP) effort estimation significantly changed our understanding of the magnitude of the recreational fishery by more than doubling catch, instantly creating a management crisis in an otherwise healthy stock. While assessments and some aspects of the specifications process have incorporated these new estimates, many other aspects of management remain challenging due to these changes. We believe the proposed closure of the recreational scup fishery in Federal waters is unnecessary for the short and long-term health of the stock, ineffective and inefficient for controlling recreational harvest and fishing mortality in a meaningful way, and extremely damaging to the public's regard for marine fisheries management by NOAA Fisheries, the Mid-Atlantic Fishery Management Council (MAFMC), and the Atlantic States Marine Fisheries Commission (ASMFC).

There are two separate fishery management plan changes moving through the interstate and Federal process that will improve our ability to manage for the sustainable use of the scup fishery. Sector allocations were updated in the Commercial/Recreational Allocation Amendment to reflect the increased recreational take resulting from the change in MRIP methodologies, which was approved by the MAFMC and ASMFC in December 2021. This Amendment will increase the recreational scup fishery catch-based allocation from 22% of the Acceptable Biological Catch (ABC) to 35%. The second management action underway is referred to as the Harvest Control Rule Framework/Addendum (HCR), which is an important component of the Recreational Reform Initiative. This action seeks to better manage recreational fisheries by appropriately accounting for data uncertainties and incorporating assessment-based metrics into the decision-making process instead of relying almost solely upon past harvest performance (MRIP) comparisons with future recreational harvest limits (RHLs). The HCR could potentially be approved at the joint MAFMC/ASMFC meeting in June of 2022. Unfortunately, neither the revised sector allocations nor the HCR will be in place for the 2022 recreational scup fishing season.

The 2021 Management Track Assessment (data through 2019) for scup determined that the stock was not overfished, that overfishing was not occurring, and that the stock biomass was 1.96 times the biomass target. Yet in its proposed rule, NOAA Fisheries notes that a 56% reduction of the recreational scup fishery is required because harvest projections, based upon MRIP estimates, exceed the 2022 RHL of 6.08 million pounds. This purported need to reduce recreational harvest to avoid overfishing fails to incorporate the consistent underutilization of quota by the commercial sector. The commercial fishery has repeatedly underutilized its allocation, leaving an average of 34% of the coastwide quota over the last 6 years. Preliminary landings from 2021 are 12.93 million pounds of a 20.50 million pounds quota. The 2022 commercial scup quota is 20.38 million pounds and 2022 harvest-to-date during the Winter 1 Quota Period has so far underperformed relative to this time last year. If 2022 commercial landings do manage to match the 2021 landings, that would result in a 7.4 million pound commercial quota underage that would nearly cover the projected recreational overage of 7.8 million pounds under status quo recreational regulations.

Notably, of course, status quo recreational regulations for 2022 are not on the table (with or without NOAA Fisheries' proposed rule). The MAFMC and the ASMFC's approved coastwide 1-inch minimum size increase is projected to reduce recreational harvest by 33%. Taking into account this recreational harvest reduction, recent patterns of commercial landings and projected discards (2018-2019 ratios landings:discards), total catch should remain below the ABC, preventing overfishing and fulfilling the requirements of the MSA without the unnecessary impacts to anglers and dependent small businesses that would be created by a Federal waters closure.

This was believed to be sufficient by the Technical Committee, the Monitoring Committee, the Council and the Commission, especially given pending changes to both sector allocations and general recreational management. If the Federal rule-making process was faster and the revised commercial/recreational allocations were in place for 2022, this year's RHL would have been considerably larger and the "required" reduction would have been much smaller. While the exact values are not currently known, there is an example in the Allocation Amendment of what the revised 35% recreational scup allocation could do for the 2023 RHL; it increases it from 5.41 million pounds to 9.06 million pounds. A similar increase of 67% applied to the 2022 specifications would have produced a 10.1 million pound RHL and depreciated the called-for reduction to roughly 27%. The proposed rule's calculation also does not recognize an analysis conducted by the ASMFC Technical Committee to identify and adjust outliers in the MRIP harvest data for scup, which we understand could further reduce the required reduction. As noted in the proposed rule, a similar analysis was conducted for the MRIP black sea bass harvest data, which dampened that species' recreational harvest reduction for 2022 from 28% to 20.7%.

It is true that the GARFO Regional Administrator stressed that the 1 inch minimum size adjustment would not be sufficient to address the RHL overage at the December 2021 Joint Meeting and on other occasions. However, the imposition of a Federal waters closure of the recreational scup fishery is not only unnecessary for the health of the stock but of highly questionable efficacy. According to the Proposed Rule, the closure would only account for an additional 6% harvest reduction, well short of its goal. The rule further acknowledges that the actual reduction will be less than 6% as anglers switch to targeting scup exclusively in state waters (where the majority of the fishery already occurs) and Federally permitted for-hire vessels drop their open access scup permits to do the same.

While the harvest reduction from a Federal waters closure is unlikely to be realized, the impact to anglers and for-hire operations will be an increase in inefficiency—more time, more fuel, more discards, and less profit (for small businesses). Scup are a very important component of bottom fishing in New England and the Mid-Atlantic, in particular given the relative scarcity of legal sized fluke and highly restrictive black sea bass limits. During many trips targeting mixed bottom fish, anglers would expect to catch scup, fluke and black sea bass as these species often utilize the same bottom. The proposed rule would require anglers pursuing other species in Federal waters to discard all scup caught while fishing greater than 3 miles from shore, only to have those same anglers later fish within 3 miles for scup, likely generating more discards of species targeted earlier in the trip. The result of this rule is more effort and discarded fish and associated mortalities for all three highly sought-after species in the fishery management plan and further eroding of the public's confidence and compliance with marine recreational fishing regulations.

The impact of the proposed closure would be felt disproportionately among various jurisdictions, depending upon how much of their fishery occurs in Federal waters. The proposed rule acknowledges some of the impacts of the Federal waters closure and requested additional or alternative measures in lieu of a closure. We are aware that an 11 inch minimum size implemented throughout most state and Federal waters is projected to achieve the 56% reduction that is expected to restrain harvest to the 2022 RHL. An 11 inch minimum size would have a relatively small impact on anglers fishing from well-equipped private vessels, for-hire vessels, and in most larger bodies of water. However, the size limit change would have significantly greater, unintended impacts on small vessels fishing in sheltered coastal waters and shore-based anglers where the availability of larger fish is reduced. This impact would be felt disproportionately by subsistence fishermen from vulnerable communities, and therefore is a clear environmental justice (EJ) issue. Several states have implemented special shore fishing programs for scup that allow a smaller minimum size, including the state of RI during your tenure as State Director. These programs were developed as EJ initiatives before that term was coined. The states determined that raising the minimum size beyond what was implemented for 2022 would significantly impact the efficacy of these programs. This was a larger factor in the management decisions made for 2022. Additionally, these same communities are a significant component of some of the Party and Charter industry trips that occur, with people from these communities saving up to book trips in the hope of filling a cooler with fresh scup, and in this manner would be directly impacted by the Federal fishery closure.

Reasons for the opposition of the States to NOAA Fisheries' stated aim to reduce recreational scup harvest by 56% and the specific closure of the recreational fishery in Federal waters has been described above. A Federal closure will fail to significantly restrain scup harvest while increasing discards and disrupting fishery operations across multiple states. Consequently, it is with some disbelief among managers that it was included in the proposed rule. The timing of that rule, published on 4/18/2022, is so late as to make it impossible for most states to respond with appropriate, well-conceived measures, formulated with public feedback, that balance the impacts of restrictions among all recreational scup fishery stakeholders. It is also questionable how effective such measures will be in constraining recreational harvest given that a significant portion of the fishery will have been prosecuted before either the final Federal rule or any such late State rulemakings could be implemented.

The approval of a 1 inch minimum size limit increase coastwide for the recreational scup fishery by fishery managers from the MAFMC and ASMFC was a measured response to recent recreational overages, was recommended by State technical expertise given the status of this fish population, was based on current scup quota usage patterns, and also accounts for the uncertainty in MRIP data and its use as a stand-alone tool for fishery management. Pending management actions will potentially address both sector quota allocations and recreational fisheries management but will not be implemented for the 2022 fishery. Recreational harvest reductions as a result of the size increase combined with underutilization of quota by the commercial fishery and recent fishery discard rates suggests that the ABC will not be exceeded. The closure of the recreational scup fishery in Federal waters is an unnecessary, ineffective, and disruptive measure that should be eliminated from the final rule. We hope you agree with this conclusion and help the states in seeking relief from the proposed Federal waters closure.

We thank you for your consideration and attention to this matter and we look forward to your prompt response.

Sincerely,

Daniel J. McKiernan
Director, Division of Marine Fisheries
Massachusetts Department of Fish and Game

James J. Gilmore, Jr.
Director, Division of Marine Resources
New York State Department of Environmental Conservation

Jason McNamee
Deputy Director, Bureau of Natural Resources
Rhode Island Department of Environmental Management

Joseph Cimino
Marine Fisheries Administrator
New Jersey Department of Environmental Protection, Fish and Wildlife Division

Justin Davis
Assistant Director, Fisheries Division
Connecticut Department of Energy and Environmental Protection

John H. Clark
Fisheries Section Administrator
Delaware Division of Fish and Wildlife

CC:
Michael Pentony
Chris Moore
Robert Beal
Toni Kerns

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 27, 2022

To: Chris Moore, Executive Director

From: Jason Didden, Staff

Subject: Atlantic Mackerel Rebuilding

The following materials are included for Council consideration on this subject:

1) Mackerel, Squid, and Butterfish (MSB) Committee Summary
2) MSB and River Herring and Shad (RH/S) Joint AP Input
3) Hearings' Summaries
4) Written Comments
5) Public Hearing Document
6) Supplemental Links:
    a. March 2023 SSC input on Mackerel Rebuilding: https://www.mafmc.org/s/SSC-DRAFT-REPORT-3-28-22_final.pdf
    b. 2021 Atlantic Mackerel Management Track Assessment Summary: https://www.mafmc.org/s/c_2021-Atlantic-Mackerel-MT-assessment-report-9jhh.pdf
    c. 2021 RH/S Update information: https://www.mafmc.org/briefing/october-2021 (under "Atlantic Mackerel Rebuilding")

Note that the included MSB Committee Summary details the decision points for this rebuilding action.

Staff supports the Committee rebuilding recommendations because they avoid combining too many optimistic choices that would decrease the chances of successful rebuilding.

The Scientific and Statistical Committee (SSC) recommended examining the uncertainty inherent in the projections that are used to determine that rebuilding should occur by 2032. In response, Science Center staff produced bar charts that display the distribution of biomass projections in 2032 for all 200,000 projection runs for Alternative 3 (P*: 52% chance of rebuilding) and Alternative 4 (F=0.12: 61% chance of rebuilding). These charts are displayed and discussed on the following pages, and were selected because they illustrate the uncertainty and were the focus of MSB Committee discussion.

Figure 1. Projected 2032 Biomass distribution based on P* at Fmsy, 150% CV (Alternative 3)

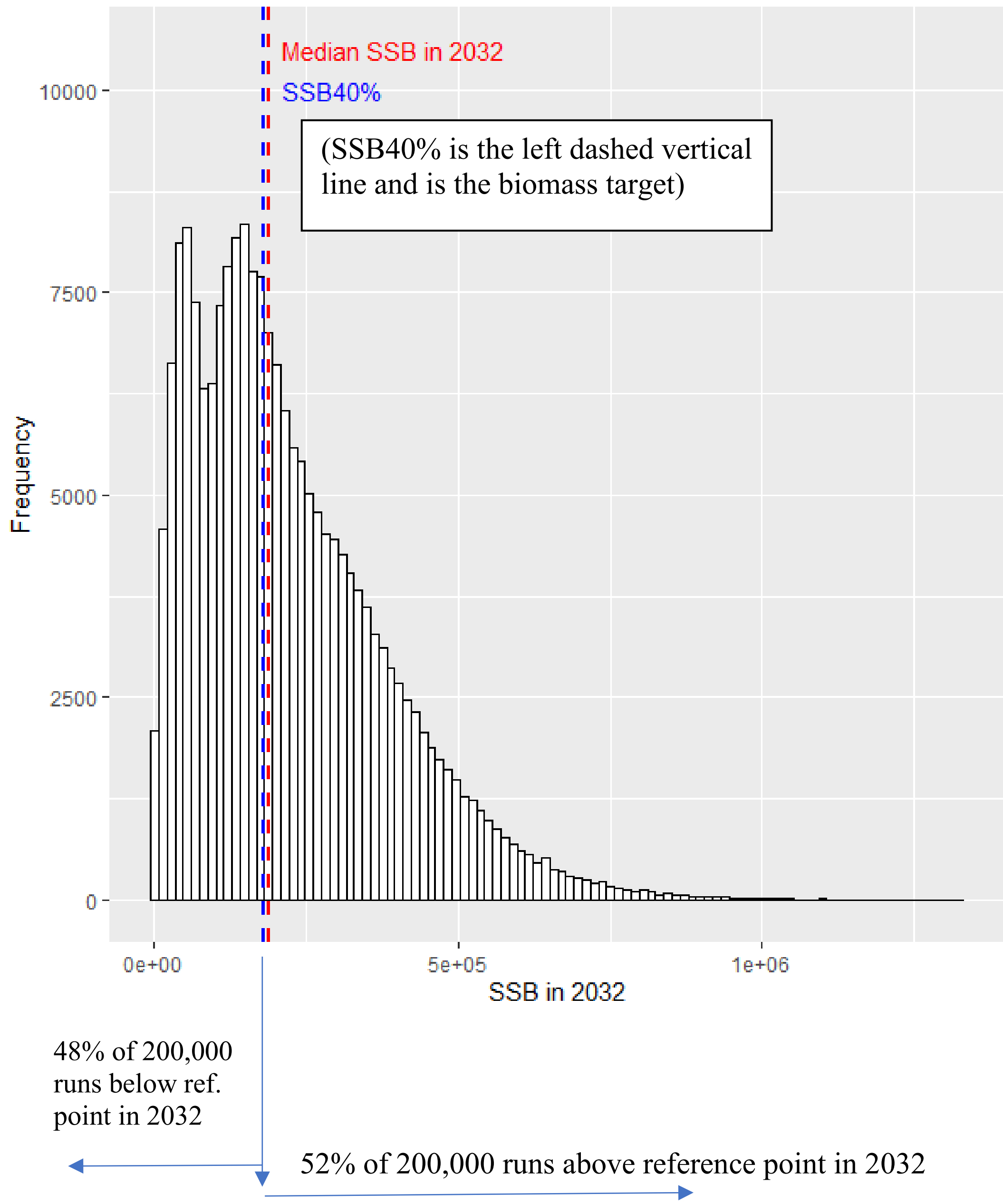
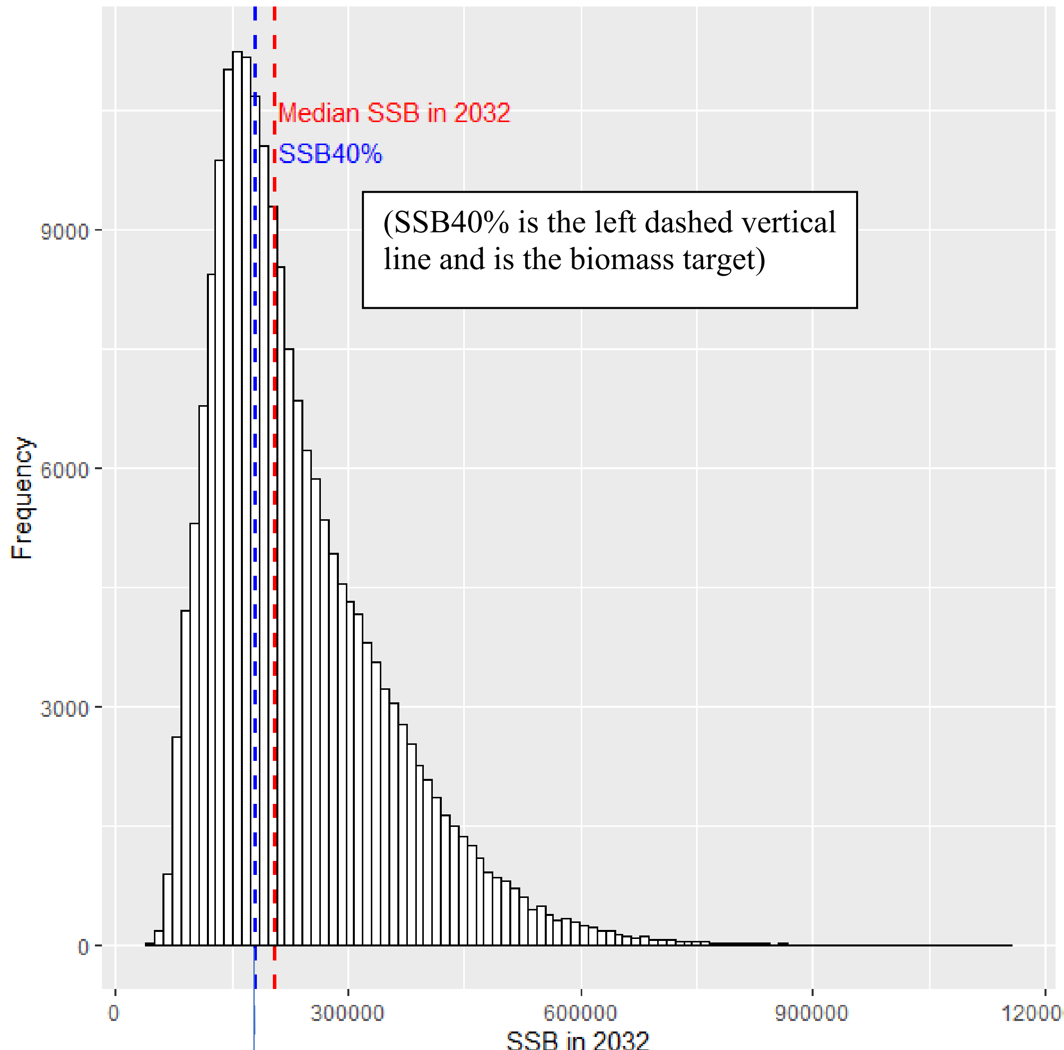


Figure 2. Projected 2032 Biomass distribution based on 61% rebuilding scenario (F=0.12) (Alternative 4)

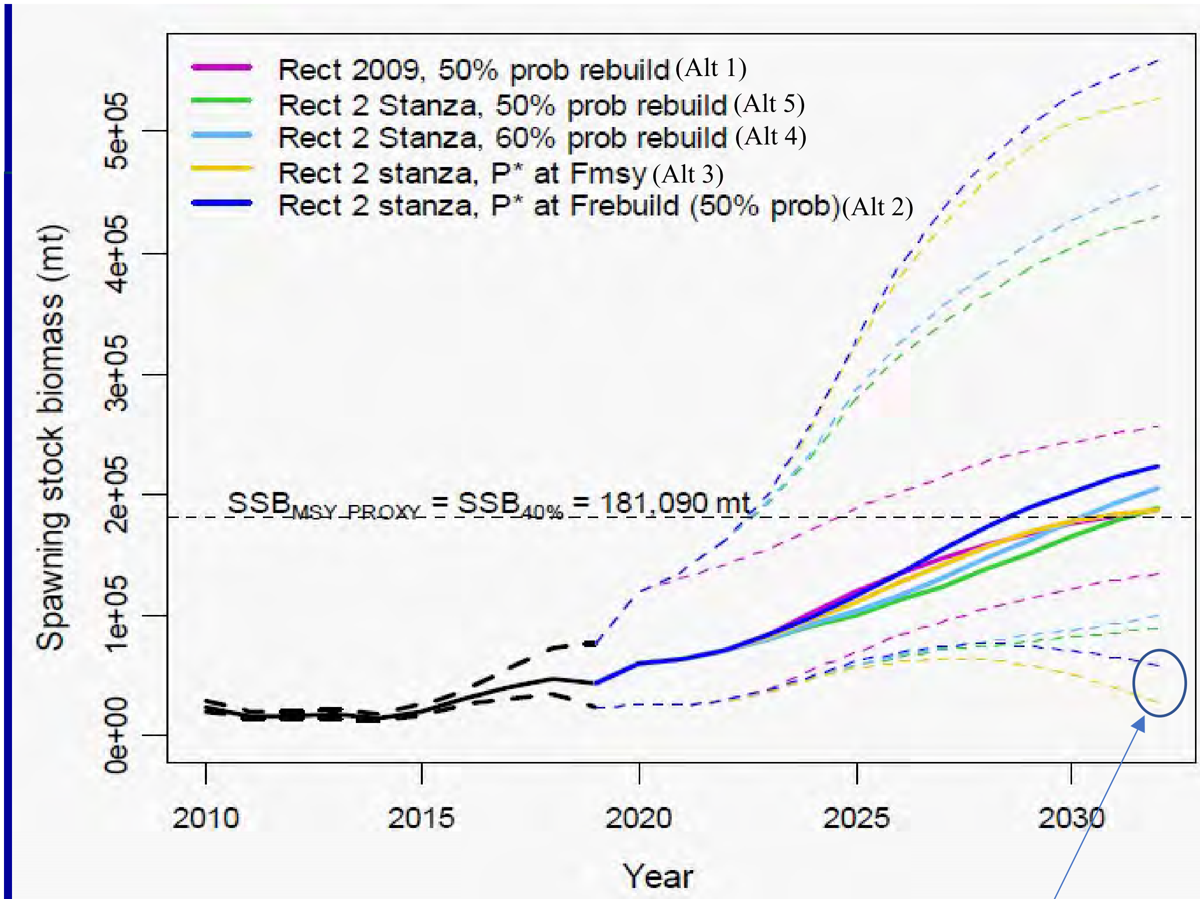


39% of 200,000 runs below ref. point in 2032

61% of 200,000 runs above reference point in 2032

Both Figures 1 and 2 indicate that like most fisheries projections that extend out so many years, there is substantial uncertainty at the end of the projection period. This leads to tens of thousands of runs (out of 200,000) ending at much higher or much lower biomasses than the median value, which is used as the "best science" point estimate. The true spread of uncertainty is likely even greater, because like every projection, not all uncertainties in the underlying data can be fully accounted for.

Figure 3. Median biomass trajectories for the five rebuilding approach alternatives with 90% confidence intervals. (best viewed in color)



The projection results of each alternative are what underlie the confidence intervals shown above. The dashed lines encompass 90% of all runs, so 10% of runs fall outside those bounds.

While it appears that the two P*-based options have a surprisingly high risk of ending at a particularly low biomass, this is because the **<u>median biomass</u>**-based <u>P* mortality rates</u> are used in all iterations, regardless of biomass for each particular iteration. This results in higher assigned catches and mortalities than would occur if P* was calculated in the future for any one run with low biomass. As such, the low-end bounds of these runs are an artifact of the projection program, and the rebuilding probability of P*-based options is likely higher than currently calculated. While not a capability of the current projection program, run-by-run and year-by-year recalculated P* iterations that individually consider biomass are worth exploring in the future to more realistically project the performance of P*-based rebuilding approaches.

Mackerel, Squid, and Butterfish Committee (MSB) Meeting Summary and Decision Sequence

May 16, 2022
Webinar

The Mid-Atlantic Fishery Management Council's (Council) MSB Committee met on May 16, 2022 at 9am. The purpose of this meeting was to develop recommendations regarding Atlantic mackerel (or just "mackerel" hereafter) rebuilding and associated specifications.

MSB Committee Attendees: Peter Hughes (Chair), Sara Winslow, Joe Cimino, Michelle Duval, Dan Farnham, Sonny Gwin, Adam Nowalsky, Emily Gilbert, Melanie Griffin, Kris Kuhn, and Eric Reid.

Other Attendees: Jason Didden, Carly Bari, Cheri Patterson, Jeff Kaelin, Greg DiDomenico, Peter Fallon, John Almeida, Aly Pitts, Alan Bianchi, Purcie Bennett-Nickerson, Gerry O' Neill, Megan Ware, Meghan Lapp, Katie Almeida, James Boyle, Kelly Whitmore, Mark Binsted, Melissa Smith, Zachary Greenberg, and Will Poston.

Jason Didden of Council staff reviewed the mackerel assessment, rebuilding approaches, and associated potential management measures. The meeting progressed through a decision sequence aligned to mackerel rebuilding as described in the public hearing document. Public comments from hearings and written comments were summarized and are provided in briefing materials. Staff notes that the National Environmental Policy Act (NEPA) document for this action may organize the alternatives slightly differently to facilitate NEPA compliance.

Decision Sequence (detailed below):

1. Canadian set aside
2. Rebuilding approach
3. Recreational measures
4. Recreational deduction
5. Discard set-aside
6. Closure approach
7. River herring and shad (RH/S) cap
8. Mackerel mesh requirements
9. Mackerel permit and regulation clarification

1. Canadian set-aside

Staff reviewed recent Canadian catch and the Canadian decision to close their 2022 commercial fishery, which includes a closure of their previously less-monitored and quasi-commercial "bait fishery." Canada did not modify their recreational measures, which include a 20-fish possession limit in any one day and a 26.8 cm[1] (10.55 inches) minimum size. Per the Fishery Management Plan (FMP), Canadian catch is deducted from the stock-wide acceptable biological catch (ABC) in each year. The Committee passed the following motion:

I move that the Committee recommend to the Council that 2,197 MT be set aside for Canada for 2023.

Rationale: Uncertainty exists, but [2,197 MT] appears likely to approximate 2023 Canadian landings considering the 2022 closure in Canada.

Griffin/Reid, passed by unanimous consent.

Staff notes that if Canada closes their fishery in 2023 like 2022, some of that set-aside will likely stay "in the water" given the timing of the respective U.S. and Canadian fisheries and management processes.

2. Rebuilding Approach

Staff reviewed the rebuilding trajectories for the 5 rebuilding alternatives. All rebuild within ten years given their underlying assumptions, with recruitment assumptions being among the most critical. Staff noted that for even the relatively more optimistic assumptions of slowly increasing recruitment, their average of about 134 million recruits for 2020-2024 is less than the estimated realized average of 155 million recruits for 2014-2019 (the 2009-2013 average was 93 million recruits, and the 2009-2019 average was 127 million). Staff also noted the 2014-2019 average catch was about 18,000 metric tons (MT), while the average catch in the projections for 2020-2022 is about 14,000 MT. That includes a likely over-prediction for 2022 catch by about double (12,000 MT vs more likely 6,000 MT), which should provide a slight boost to biomass versus projections, all else being equal.

Staff, at the request of M. Duval and in consultation with the Executive Director, coordinated an additional rebuilding projection that was generally between Alternatives 3 and 4 in the public hearing document. Catches of 6,316 MT in 2023 and 2024, followed by P* catches (8,142 MT in 2025 and then increasing), were still predicted to rebuild the stock by 2031 (like the original P*/Alternative 3). The hybrid alternative had a similar overall probability of rebuilding by 2032 (i.e. in 10 years). The hybrid approach was the subject of a failed *motion to substitute* during consideration of the following motion, which did pass:

I move the Committee recommend to the Council to select as preferred Alternative 4 – 61% Rebuilding Probability in 10 Years.

[1] 26.8 cm is the length at which 50% of Atlantic mackerel are considered mature in the Canadian assessment

Rationale: this approach balances the practicalities of landings and discards in U.S. fisheries with a high probability of rebuilding in recognition that Atlantic mackerel play an important role in the ocean food web. The SSC deemed it a suitable rebuilding approach. [2]

Griffin/Reid, motion passed 9/0/0

Staff follow up regarding rebuilding: Alternative 4 would set an ABC of 8,094 just in 2023. Only one year of specifications is being set because a management track assessment (MTA) is expected in 2023 using data through 2022 (3 years of additional data beyond the last MTA). No data subject to this new rebuilding action (2023 and beyond) will be incorporated into the 2023 MTA, so the 2023 MTA will not provide information on the performance of mackerel rebuilding 2.0, but will indicate whether we appear to generally be on track leading up to implementation of mackerel rebuilding 2.0. Given implementation timetables and that each MTA also produces updated reference points (including the rebuilding target), staff notes an interesting cycle will re-occur where revisions to rebuilding plans are repeatedly required without ever really being able to observe the effects of that rebuilding plan.

3. Recreational measures

Staff reviewed the recreational measures in the public hearing document and public input. Staff, at the request of P. Hughes and in consultation with the Executive Director, coordinated re-analysis of a 20-fish possession limit in addition to the 10-fish and 15-fish options in the public hearing document. (Since "no action" would mean an infinite possession limit, a 20-fish limit is still "in the range.")

The Committee passed the following motion:

I move that the Committee recommend the Council select as preferred a 20-fish per person Atlantic mackerel recreational possession limit for 2023 and could be adjusted in future specifications.

Rationale: Reduces recreational mortality to further support ongoing rebuilding. While smaller limits may achieve greater reductions on paper, they cause severe economic impacts that would ripple through tuna and other fisheries as a result of a drastic possession limit change from the current unlimited; they are not practicable from a compliance and enforcement side and the costs likely outweigh the benefits. A 20 fish limit benefits from buy-in of the regulated community and is a meaningful first step for 2023. Additionally, this limit likely will improve the reliability of MRIP catch estimates and is consistent with the Canadian limit.

Griffin/Reid, passed by unanimous consent.

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[2] Staff notes the SSC recommended the P* approach in March 2022, but in previous advice from July 2021 noted that rebuilding probabilities "greater than 0.5 are associated with shorter rebuilding time and greater catch stability."

4. Recreational deduction

Staff reviewed that like expected Canadian catch, expected recreational catch is deducted in the FMP as part of the process to calculate the commercial mackerel quota. The MSB Monitoring Committee previously suggested either to keep deducting the recent 5-year average regardless of any new recreational measures, or to assume that only half of the predicted “paper” reduction occurs given the uncertainty about recreational responses to possession limits. A 20-fish possession limit was associated with a 17% “paper” reduction. The 2017-2021 average recreational catch was 2,582 MT, and a 17% reduction from that would be 2,143 MT.

The Committee passed the following motion:

I move that the Committee recommend to the Council that a 2023 recreational deduction be made using the calculated expected deduction from the 20-fish possession limit.

The discussed rationale included potential arbitrariness in not accounting for the potential recreational measures, and that recreational responses could lead to lesser **or** greater reductions than projected. Discussion also questioned whether an overall management uncertainty buffer was included in the rebuilding options (no), whether one existed now (yes for commercial), or whether they could be included in the future (yes).

Griffin/Farnham

Motion passed by consent with one abstention.

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5/6. Discard set-aside and closure approach.

Staff reviewed that expected commercial discards are deducted per the FMP as part of the process to calculate the commercial mackerel quota. The public hearing document includes a 115 MT deduction based on recent average discard rates. Based on the other MSB Committee recommendations, the following specifications would be set for 2023:

ABC: 8,094 MT
-Minus 2,197 MT for Canada
US ABC: 5,897 MT
-Minus 2,143 MT for expected recreational catch (-17% from 5-year recent average)
-Minus 115 MT for expected commercial discards (3-year recent average rate)
U.S. Commercial Quota: 3,639 MT (also known as Domestic Annual Harvest or DAH):

In the public hearing document, the following approach to closing the fishery was included:

Averaging 2018-2021, the fishery landed 805 MT after April 1, and these were times when the directed limited access fishery was not active (range was 618 MT to 1,037 MT). As such, this time period should represent landings rates that could occur during a closure of the directed fishery. The proposed "first" closure approach is to buffer this performance by 10% and one month, so that before May 1 the directed fishery would close with 886 MT left in the quota, and from May 1 on, the directed fishery would close with half that, i.e. 443 MT left in the quota. NMFS would also have the discretion to not close the fishery in November and December if performance suggests that a quota overage is unlikely. While it is possible that an early closure in January could result in more than 886 MT in additional landings, and it is possible that a closure in late April could result in unused quota remaining, this proposed system likely strikes a reasonable balance between achieving OY and regulatory simplicity. At this threshold for the "first" closure, additional trip limits would be implemented: 40,000 pounds for Tier 1-3 directed permits and 5,000 pounds for incidental/open access permits. There would be a final closure with 100 MT left in the quota where all permits were subject to a 5,000 pound trip limit to minimize any potential overages. With these trip limits any possible overages should be minimal, and would be deducted from subsequent years if an overall ACL overage occurs. Based on the Committee recommendations, this approach would mean that before May 1 the directed fishery would close at 2,753 MT and after May 1 the directed fishery would close at 3,196 MT. At 3,539 MT of projected landings, all appropriately-permitted vessels would have a 5,000 pound trip limit.

The Committee passed the following motion:

I move that the Committee recommend that the Council utilize the proposed replacement 2023 discard set-aside and closure approach.

Duval/Gwin, passed by unanimous consent.

7. River herring and shad (RH/S) cap

Staff reviewed the current RH/S cap, recent cap performance, and related public comments. Staff, at the request of S. Winslow and in consultation with the Executive Director investigated whether a RH/S cap of 89 MT could be considered (89 MT was the median catch of RH/S by cap trips from 2005-2012). From a procedural perspective such a cap value could be considered since it would be within the range of caps discussed in the public hearing document. Staff noted that a RH/S cap of 82 MT in 2018 and 2019 led to closures of the mackerel fishery. Committee discussion revolved around two perspectives: 1) reduced incentive to avoid RH/S if the cap remains at 129 MT despite a substantially smaller mackerel quota than the quota originally associated with the 129 MT cap (a 17,371 MT mackerel DAH) versus 2) the challenges of monitoring a small cap given the limited observer coverage and how the cap begins the year using the previous year's RH/S interaction rate (new data is phased in for the first four observed trips). There was also discussion whether the discard estimation method should be revisited, and whether any progress had been made on moving toward a biologically-based cap. Staff *follow-up: Staff notes the discard estimation method has been peer-reviewed. Staff had several informal discussions with Science Center monitoring committee staff in 2021 that indicated there might be some approaches to combining indices to inform a cap, but such an investigation would be beyond the scope of Monitoring Committee work. There is a river herring assessment commencing that may provide additional opportunity for exploring such concepts.*

The Committee passed the following motion:

I move that the Committee recommend that the Council maintain the current 129 MT river herring and shad cap for 2023.

Farnham/Reid

Motion passed by unanimous consent.

8. Mesh requirements

Staff reviewed the 3" minimum mesh alternative, the limited information on potential effects, and public comment.

The Committee passed the following motion:

I move that the Committee recommend the Council select as preferred, No Action on commercial minimum mesh size.

Rationale: Not ripe for action given lack of information to inform costs and benefits of adopting. Limited to no public feedback on action speaks to possible lack of effective engagement on the proposal.

Motion passes by consent with 1 abstention.

9. Mackerel permit and regulation clarification

Staff reviewed the current regulatory issue, where it is not clear if possession of Atlantic mackerel in the EEZ triggers the need to have a permit and/or submit vessel trip reports. Staff summarized public input on the issue. The Committee discussed the need for greater clarity in communicating requirements, as well as potential clarifications that could be part of that communication.

The Committee passed the following motion:

I move that the Committee recommend the Council request additional outreach and compliance assistance by NOAA Fisheries regarding the appropriate permitting and catch reporting for commercial and for-hire vessels possessing mackerel. (Would apply only to commercial and for-hire vessels and would not include previously-purchased fish with a bill of sale)

Griffin/Gwin, passed by unanimous consent.

Joint Mackerel, Squid, Butterfish (MSB) and River Herring and Shad (RH/S)

Advisory Panels (APs): Meeting Summary

May 13, 2022

AP Attendees:

Katie Almeida - Brattleboro, MA
Greg DiDomenico - Cape May, NJ
Daniel Farnham, Jr. - Montauk, NY
Zachary Greenberg - Washington, DC
Emerson Hasbrouck - Riverhead, NY
Jeff Kaelin - Cape May, NJ
Peter Kaizer - Nantucket, MA
Meghan Lapp - North Kingstown, RI
Pam Lyons Gromen - Tampa, FL
Gerry O'Neill - Gloucester, MA
Fred Akers - Newtonville, NJ
Mark Binsted - Washington, DC
Allison Colden - Annapolis, MD
Mari-Beth DeLucia - Harrisburg , PA
Roger Rulifson - Banner Elk, NC
Jamie Winslow - Robersonville, NC

Other Attendees:

Jason Didden
Chris Batsavage
Carly Bari
Melanie Griffin
Melissa Smith
Alan Bianchi
James Boyle
Will Poston
Purcie Bennett-Nickerson
Eric Reid
Peter Hughes
Mike Waine
Jaclyn Higgins
D Mussina
Brooke Handley
Kelly Whitmore
Mike Pierinock
Emily Gilbert
Will Poston

AP Input: Canada 2023 Catch Deduction

Jeff Kaelin: The 2,197 MT deduction makes sense to save some catch for the U.S. given Canada closed their fishery. This matches the NE states' recommendation as well. Why can't we assume zero for Canada? We shouldn't manage our fishery based on what Canada is doing. We should focus on our rebuilding schedule. Having some catch occurring to provide data is also important.

Meghan Lapp: 2,197 MT is more appropriate given the 2021 Canadian fishery wasn't closed. Their assessment uses much of the same egg data and their egg survey dominates our data – results probably won't be too different across the assessments.

Pam Lyons Gromen: Of the two options the 2,197 MT seems more realistic and possibly still somewhat inflated. Seems unlikely Canada will change for 2023. Seems troubling that if Canada decides to leave more fish in the water, we can take them. It's a shared resource and we need to be good partners.

Zack Greenberg: I agree with Pam's comments.

Gerry O'Neil: Favor 2,197 MT for similar reasons as Jeff/Meghan above. In addition, what's the effect of us over-projecting 2022 catch? [Staff relayed expected to have a relatively small positive impact on 2023+ biomasses.]

Public:

Purcie Bennett-Nickerson: I support Pam's comment. Canada made the decision to stop fishing this year, there's no sign Canada is changing - if we are going to assume Canada is staying low, we should do the same – keep catch low. To follow the science, both countries need to stop fishing.

AP Input: Rebuilding Approaches

Gerry O'Neil: I favor Alternative 5 – I'm looking to just survive – it's not much fish but it's something. At least we'll have some fish to cover bycatch levels of fishing.

Jeff Kaelin: We support Alternative 5 as a bridge to get through this. I'm worried these fish are just not surviving to recruit into the fishery – I'd like to see other research into effects on recruitment other than fishing. If we set the quota a bit higher and the fish aren't there, we won't catch them anyway. Food or water temperature issues seem likely to be driving issues.

Dan Farnham: I support Alternative 5 so we have some quota to work on to maintain infrastructure – otherwise we'll come out of rebuilding with no fleet. If the fish are not there we won't catch them but if they are, we'll be able to catch some – don't want to put people out of business.

Greg DiDomenico: I support Alternative 5 for similar reasons as others – it's the only option given our long history in this fishery and our investment in this fishery.

Meghan Lapp: I support Alternative 5 and would like the Committee to know that with the SSC-recommended option, even if the lowest options for Canada and Recreational catch are assumed, we're left with zero for commercial landings.

Allison Colden: I support Alternative 3, the SSC recommendation, for the same reasons the SSC provided. With the condition of the stock, we need to meet higher rebuilding probabilities and get on a better trajectory, especially given the uncertainty of the projections.

Pam Lyons Gromen: You have our comments. Reiterate Alternative 3 support: we don't think Canada will have much quota in 2023, so Alternative 3 is practicable and consistent with Canda as a partner in a shared resource. We have a responsibility to rebuild with them. Ecologically, Alternative 3 leaves more fish in water for the ecosystem but also leads to higher catches and catch stability. Alternative 3 will be a more long-term successful strategy.

Zack: You have our comments. We support Alternative 1 – the most conservative approach that accounts for the best science and importance of the stock as forage while accounting for shared nature of the fishery.

Public:

Purcie Bennett-Nickerson: You have our comments supporting Alternative 1 – It has the highest probability of rebuilding the stock with less margin for error. MSA requires the Council to select catch within bounds of the SSC. Other options allow too much fishing as soon as any biomass occurs. [Council and NMFS Staff clarified that the SSC has endorsed all of the ABCs associated with the different rebuilding approaches.] Follow-up: The SSC's recommended path constitutes a fishing level recommendation that should not be exceeded. Using P* with low recruitment results in rebuilding longer than 10-year rebuilding. We need to allow this stock to rebuild to get to where this fishery was in the past – our current approach will never allow full rebuilding. Going the way we've been going will not get back to historical yield. You just need to stop fishing for now. There should be a conversation with the ASFMC as well to address state-waters catch.

AP Input: Possession Limits

Pam Lyons Gromen: It's important to get feedback from the States on enforcement issues with differential trip limits. We should get feedback from the states if commercial permits could cover for-hire issues with getting bait. At the end of the day also need to reduce from the recreational sector – we advocated in our letter for the 10-fish limit. Consider how to address public comments without sacrificing conservation.

Jeff Kaelin: 15 fish should be sufficient for personal use. The commercial permit should be investigated to cover other catch and adds a reporting benefit.

Meghan Lapp: A lot of this discussion gets to wider questions – under most scenarios recreational catch may be substantial in the near term. Are for-hire vessels selling their catch – that should require commercial permits anyway (and a dealer permit). These questions need to be investigated to get a handle on what's occurring and address equitable contributions toward rebuilding under National Standard 4. Is this really recreational fishing or commercial fishing – we need to figure that out.

Dan Farnham Jr: If went down the road of using a commercial permit to address for-hire, need to address how catch would be handled? How might monitoring be complicated?

Gerry O'Neil – I'm recommending the lowest possible option for the sake of commercial survival - recommending 10 fish.

Public:

Mike Waine: How are you accounting for recreational catch? If a bag limit is used for recreational fishery the full reduction estimated under that limit should be used. There's obvious integer bias and it's unclear how well the fishery is captured in the surveying. Regardless of the limit chosen, the fishery should be given full credit for the reduction.

Mike Pierdinock: We need an accommodation on possession that considers how the for-hire fishery operates.

AP Input: Commercial Discard Assumption and Closure Provisions

Jeff Kaelin: Discard deduction seem reasonable. Assumes 100% discard mortality.

The AP was digesting the closure approach but there were no objections to the described approach voiced on the call based on initial impressions.

AP Input: River Herring and Shad (RH/S) Cap

Jeff Kaelin: We should stay at a 129 MT cap and it has not been reduced in the last year or two as the quota has been reduced. The Council seems to have adopted the NE approach of not down-scaling the cap. An 89 MT cap, based on the median catch, makes the future of the fishery bleak and may unnecessarily hamstring the fishery. The Council needs to see the RH/S update information when making this decision. The new river herring assessment could also utilize the cap amounts.

Pam Lyons Gromen: We strongly oppose staying at 129 MT and moving toward the NE Council's approach. We endorse staying with the ratio approach to discourage bycatch. Holding 129 MT with the very low quotas is the wrong direction. The RH/S Committee Chair's 89 MT idea seems more reasonable and was still tied to a 10,000 MT quota/catch previously. If the scaled cap is truly impracticable, 89 MT seems as high as we could support. We continue to support moving to a biologically-based cap – we need to consider restoration of individual runs. Until then, we need to focus on measures that incentivize avoidance. Our rebuilding preference is for no commercial quota, but if there is some quota the cap should not stay at a static quota.

Gerry O'Neill: Favor 129 MT and we've had shutdowns before - would rather that not happen again.

Meghan Lapp: I support 129 MT. The cap is not based on science but a math game to create avoidance and it should stay that way along the lines of New England because it's just a math exercise and not tied to the size of the RH/S stocks. It's important to note that the cap is small to begin with, and lowering any further compounds data/monitoring issues with using only last year's data before you get any trips from the current year.

Allison Colden: I echo Pam's comments. Concerned about staying at 129 MT with such a low quota. RH/S are depleted – states are doing many things but those efforts won't matter depending on bycatch. A static cap disincentivizes avoidance so doesn't make sense – it increases the allowed interaction rate. Should continue to scale the cap with the quota. 89 MT might be a reasonable ceiling, but definitely not 129 MT remaining regardless of the quota – that would be bad policy.

Mari-Beth DeLucia – I Echo Pam and Allison's comments. I work more on the inland side, we haven't seen big run improvements. We need a biologically-based cap, or 89MT at most if a smaller scaled cap is not possible.

Greg DiDomenico: We support a 129 MT cap. There's been more than enough discouragement of bycatch in this fishery. There's no where else to go and have met the end of what we can possibly be burdened by.

Zachary Greenberg: We support continuing to scale the cap and echo other comments of concern: RH/S remain depleted to historic lows. The caps are the only protection in federal waters and scaling maintains the incentive to avoid.

Fred Akers: I would support the 89MT if scaling is unfeasible and echo Pam's and Zack's comments. I'd like to see the economic value of those fish (RH/S) given they are bought and sold.

AP Input: 3" Mesh Requirement

Jeff Kaelin: We've tried to use the mackerel brailers in the past but not even sure of what we used. We need more information about what's been used to make a decision – it just hasn't been looked at carefully enough – we need more investigation of what's been used in the past and would need more discussion with the fleet to move forward given the level of uncertainty.

Gerry O'Neill: I'm torn – there's interest in it, but also not clear about what's been used. We did not have success with it – our experience is that as the bag started to fill up you lost your selectivity from a brailer. Would need more discussion with fishery participants. Not in favor without more vetting.

AP Input: Regulation Clarification

Mike Pierdinock: The public needs clarification on permitting and reporting.

AP Input: RH/S Spatial Considerations

Greg DiDomenico: It would be useful to overlay wind lease areas on these maps. Need to get RH/S update information to consider.

Jeff Kaelin: More boxes in the ocean won't help. We need good reporting and provide that. We don't get good information about where RH/S catch comes from with small mesh bottom trawl and that could be useful. The mackerel and herring fishing has been the bad guy and closing areas doesn't make sense with the cap and existing reporting. Need to get RH/S update information to consider.

Pam Lyons Gromen: We support looking at other gears and having a joint cap for the herring and mackerel fisheries based on a biologically-based method. These areas seem persistent – could it be a way to focus conservation efforts? We've never achieved observer coverage levels we'd hoped – could the Council use these areas to focus observer coverage? With alosine genetics repository – could we use these areas to better understand where bycatch is coming from? It would be unfortunate to just not do anything with this information. We need to continue to prioritize data collection in general and for the cap. It's also important to note that the bycatch avoidance program is no longer in operation along with its shoreside monitoring. Also, the 12-mile buffer zones, which covered at least portions of three of these areas, are no longer in operation. Let's at least focus the limited resources we have.

Roger Rulifson: In 1980s I tagged river herring from commercial weirs in Minas Basin and Cobequid Bay, Bay of Fundy. I have very few tag returns but some. I also contacted states that had tag returns – South Carolina had tag returns that went up to Canada – data are very sparse for tag returns, but seems useful to get that kind of data out in the public realms. Relative to the maps reviewed today, it might be useful to include those in a manuscript along with old tagging data to consider if ocean currents have shifted or what other factors may be important.

General:

Gerry O'Neill: how does fishery disaster work? Melissa Smith (was involved in Maine herring disaster declaration): process starts with a state's Governor communicating with NOAA.

Mackerel Rebuilding 2.0 Hearings Summaries

April-May 2022 – 5 Hearings

Jason Didden of Council Staff attended all hearings. Peter Hughes, the Mackerel, Squid, and Butterfish (MSB) Committee Chair, also attended all of the in-person hearings.

#1: April 25, 2022 – New Bedford, MA

Attendees:

Katie Almeida
Dan McKiernan
Kelly Whitmore

Summary:

Staff provided an overview. No comments for the record were provided at this hearing.

(other meetings continue next page)

#2: April 26, 2022 – Plymouth, MA

Attendees:

Steve Wood
Raymond Kane
Melanie Griffin
Matt Ayer
Rich Antonino
Mike Pierdinock
John Bunar
Richard Barbieri
Greg Sears
Bob Lavallea
Kevin Simon
Tim Brady
Mark Petitt
Tracy Terrin
John Parkinson
Steve DiPillo
Brian Curry
Tom DePersia
Eric Morrow
Jeff DePersia
Taylor Sears

Summary:

Staff first provided an overview. Some staff clarifications are noted in the comment summary.

Comments:

Brian Curry (Stellwagen Captain and member MV Fishermen's Preservation Trust):
The egg survey is missing the inshore areas where fishermen see a lot of mackerel, all the way to the beach. If you don't measure in the right place, you could really be missing what's going on. Mackerel are showing up in more and more areas. If you don't improve the survey you'll just keep missing fish, and you need to improve reporting (and communicate the need for reporting) so it's not assumed there's no fish just because you're not getting information from people. You didn't collect the data that you are presenting… We're catching these fish and seeing it and you're saying "Don't believe your eyes." We would like to talk to the people doing the science – they need to step towards us. With how short the eggs are eggs, seems easy that you would just miss spawning in your survey. Couldn't the Canadian's fishing during spawning be reducing the eggs? It would be great to see the distribution of egg survey stations, and when the survey starts and stops.

Ray Kaine: Are we really seeing an Eastward shift that governance bodies are not addressing?

Greg Sears (Mass Bay Guides): We support managing these stocks to make sure we have a fishery for the next generation. We oppose the scientific conclusions and the potential economic impacts, which is why you should stay away from the recreational and charter/for-hire industry. The MSA's mission statement includes increasing long term economic and social benefits. 10-15 fish might cover live bait, but it's very hard to know what's happening with the meat/chum components. Related to science, we haven't been reporting – we didn't know we were supposed to. We need to report. But the science is flawed because we haven't reported even close to what we've had for mackerel catches – we didn't know about the reporting. Regarding low catches, you are not accounting that a lot of boats just no longer exist. You are going too fast – use the 2023 assessment and don't make harsh decisions now. We need to show the amount of recruitment occurring because we'll be locked into low numbers in the future. I don't know how you're going to enforce bait and chum rules. You're also going to hurt the commercial fishery because now a recreational guy won't be able to buy a flat of mackerel. Why are you attacking the highest social and economic impact businesses when it would cause the least impact to get the needed deductions from the commercial fishery? There will be wide array of repercussions by restricting the recreational/for-hire fishery to achieve overall reductions. Coming out of the pandemic and now this, there's already a lot fewer people here at this meeting than there would have been years ago. You're also going to take away an opportunity for folks to go out and learn about nature.

It seemed like from your presentation the thing driving all this is the catch data. [Staff clarified the different inputs used by the assessment]. I laugh when I hear the MRIP interviews – clients will tell them they caught halibut when they caught haddock – they just don't know the difference. So the data is BS. We can give the information. I didn't know before I had to report mackerel, now I am and trying to spread the word. The communities will tell you the best. Make sure people know they have to report and then make sure they do report. Stop the estimating, we know what we see and can report it.

Mike Pierdinock (President Stellwagen Charter Boat Association): I'm representing over 100 members, primarily for-hire captains also recreational anglers. With mackerel and other species, we've been seeing fish arrive sooner and leave later. With mackerel we used to have a spring run but now they stay here all season. Nearshore and offshore. The surveys cover the same areas at the same times, but with the changes in the timing and location of fish we've seen, you're not consistently capturing the biomass. We see tremendous amounts of with – small fish inshore and larger offshore. There's no lack of mackerel – to see cuts is inconsistent with our observations. And like other species, they seem to be moving NE. We worry that if the next assessment uses data from the same area and time of year, are you going to further restrict while we still see tremendous amounts of fish in our waters. We wish you'd reach out to us for data and look to us as allies and not the enemy. We fill out VTRs and could provide more information to help out with the stock assessments.

For a typical striped bass or tuna fisherman, 15-20 fish would accommodate most for live bait, but may have more fish in a pen they use throughout the week. Severe restrictions on mackerel would significantly impact these fisheries and associated indirect economic activity. The 100% discard mortality is not consistent with our observations – maybe 10%-15% if you handle them right. There needs to be accommodation for fish to be used as chum. Mackerel can also save the day fishing with kids and families if nothing else is biting. Zero possession would be devastating. 10-15 fish would not accommodate some not represented here that take bucket-fulls home to eat – they won't go out anymore. If you were accurately capturing the biomass the limit could be 50-60-100. We're looking at 15, wish it was 20. You have to be an attorney to understand all the various state/federal requirements – you need more public outreach. We promote eVTRs and safety requirements but you need to clarify what's required and do more outreach. It's not really clear what's required. Since none of us have confidence in MRIP, the harvest control rule approach could be applied to this as a solution, or maybe a management strategy evaluation, and we need to ground truth the MRIP data.

John Bunar (Tackle Shop Owner): When you put up data like there's 20% of catch coming from shore, or don't have survey locations publicly available, you lose the confidence of people who see the fish all the time. You need to tell us exactly where this shore catch is occurring. So you won't get compliance until people have confidence that you've ground-truthed the data – hardly any fish are caught from shore as a proportion. If the biomass location trends continue, maybe you should wash your hands of it and send it to the New England Council. You're not going to obtain these reductions when people see what they see. Have you been fishing in New England in the past 10-15 years to see what's happened to the mackerel stock in New England waters? It's amazing. The mackerel have destroyed the sand eel population on Stellwagen Bank – if a sand eel sticks its head out of the gravel it's annihilated. There's no whale bubble feeding or juvenile tuna on Stellwagen – the mackerel have changed that ecosystem incredibly. There's a line from Cox's ledge over to Chatham, outside of that line without mackerel there's still the ecosystem without mackerel with bubble feeding and tuna. I've seen big humpbacks learn to feed on mackerel the last few years with aggressive charging of bubble feeding. I'd never seen that before. Mackerel have changed the ecosystem. Whale watching boats will tell you that whales had fed for 100s of years with bubble feeding but they are not seeing that because of mackerel. We haven't seen bubble feeding since the mackerel wiped out the sand eels. There's science that needs to occur to understand what's going on with mackerel and what they are doing. You have to explain the science – people have told me this is crazy. Give us something to tell these people. As a charter captain we want these fish – it's great fishing. We're willing to help but what we see is amazing. An August 1 closure would be a death sentence. What would have to take place to slide management to the New England Council? You are pulling stings from a long ways away and considering where the stock is now…

Brian Sears/Multiple: 15 years ago we had no mackerel, we had to go elsewhere for bait. Now we could catch your proposed limits in minutes.

Jeff DePersia (Charter Captain): Is there a possibility of getting changes made for the 2023 assessment? For example different areas and times for the surveys? [Staff described the kinds of changes potentially evaluated in different assessments.] There's a huge biomass out there and you are seeing them too – I was out today on Stellwagen there were mackerel all over the place and they are here all throughout the fall now. MRIP comes to our marina for collecting charter effort – they are not over at the town pier.

Mark Petit (Charter Captain): Looking at the 2021 egg survey track, there's no data collection around us south of Gloucester. Looking at the track you actually did a good job of avoiding the mackerel. May to early June when we pull mackerel out this orange stuff comes out – we can tell you when we're seeing that and could help your survey.

Keith Baker: In Cape Cod Bay there is a ton of spawning in May. I'm out every day, I go from Cape Cod Bay to Buzzards Bay to south of the Vineyard to east of Chatham and I've seen more mackerel in the last 3-5 years than I've seen in the last 50 years at a range of sizes. Looking at your egg survey they don't do any testing where I am and I cover a lot of ground. We used to have mackerel a few weeks in the spring and another shot in the fall but now it's all season.

Tom DePersia (Charter Captain): Is surveying in the Mid-Atlantic dragging us down because we've never seen so many fish. Is this just a warming and distribution issue? We've seen the same issue with tuna and shifting stocks. Maybe there are just as many fish. We're not seeing fewer fish – we've never seen this many – to cut us down with what we have, something is wrong with this science. Maybe there should be different regulations north and south of Cape Cod, like with cod. We are overloaded with mackerel. We have zero confidence in MRIP. We need a better way of getting data and VTRs is the better way. Asking our customers what we caught and/or released, they don't know. The interviewer is just going to put big numbers down.

Missed name: Seems like you may just be missing the spawning – if your survey was better aligned with actual spawning everything could be different.

Tim Brady: The tool already exists for the for-hire fishery to tell you what we're catching every day – eVTRs. The disconnect continues to be that you're not using it for catch. The only trouble I have with mackerel is deciding what I'm going to target with it – if it's striped bass I want tinkers, if tuna then I have to look around for larger mackerel. Around Plymouth I've never seen as many mackerel and I've been fishing here for the last 58 years.

Eric Morrow (Charter Captain): You just said you agree that there's a lot of fish around here, and that fish have shifted NE. Why are we getting a cut because there are fish here but Mid-Atlantic catches have dropped off and are dragging us down? It seems like the surveys are missing the mark. With the narrow window between spawning and larvae you could easily be missing the spawning in your survey. All it takes is one little thing and exponentially it gets screwed up. Just like saying that 20% of recreational catch is off the beach. You've got four dudes on the end of the canal…that's not 20% of catch. And 100% mortality is impossible. For mackerel crushed in a trawl net sure, but there's no way we have 100% mortality.

#3: April 27, 2022 – Portsmouth, NH

Attendees:

Peter Whelan	Paul Hogg
Ritchie White	Dan Diodati
Chris Valaskatgis	Cheri Patterson

Summary:

Staff first provided an overview and addressed clarification questions.

Staff responses to clarification questions:

MRIP Interviewers do not ask for-hire captains about catch – they ask the anglers, and they ask about all catch, harvested or released.

The assessment counts all released fish as dead though that's not likely the case, but it's a very small component of total mortality regardless, so would not affect the assessment results. This could be an area for future research.

If reporting changes, those changes should be accounted for retroactively to properly assess the stock (so catch is apples to apples across years).

Comments (names missed for some comments that occurred mid-presentation):

MRIP interviewers are not asking about bait like mackerel – they should be more specific about what they are asking and what fish. At the end of the day, a lot of anglers are not going to bother participating.

You should consider pushing management measures back one year and stress that it's important to get better recreational estimates for mackerel. Consider an app to let anglers provide data and mandatory reporting for for-hire fisheries.

Having 20% of recreational mackerel catch coming from shore does not seem right.

Accommodations for fish kept in a pen/freezer at a dock or on land need to be considered. Accommodations for charters to catch bait early in the day for all their customers need to be considered especially given fuel costs. Mackerel are key to successful striper fishing in this area, and we are trying to sell an experience that draws business into the area and benefits multiple businesses in the area.

Ritchie White (recreational angler NH):
I favor a 10-fish limit. This stock is not going to recover quick and is not showing any signs of doing that. If we have another two years of this same recruitment we'll be at a moratorium is my sense. You have to do what you can. If there is a spawning stock – recruit relationship, you're

going to have to build this up some before you get a big year class. You have to take some medicine now, take some hurt, and try to save what you can, because the next step may be severe, like other species. You need to be conservative.

Peter Whelan (Charter boat captain NH):
We all want the fishery to rebuild, but if you shut mackerel down we'll all be out of business. I favor a 15-fish limit, we'll know a lot more with the 2023 stock assessment. We have a lot of mackerel locally but I think that has to do a lot with global warning. I think we need to rebuild this resource and favor going to mandatory for-hire reporting ASAP to get a handle on effort and how many we're using but I'm in favor of a cutback the way the stock looks right now. It looks like every 10 years we get a bump in stock size.

Paul Hogg (Harbormaster, Bait and Tackle operator, charter operator, shellfish constable NH):
Looking at the numbers I agree something has to happen but I agree with Chris that the possession limit needs to be higher to help with multiple charters.

Chris Valaskatgis (Charter captain NH):
We need better data collection – use the various organizations to stress the importance of data collection to anglers. I'm in favor of the 15-fish limit. The stock is low but trending up a bit and the 2023 assessment will be important. There seem to plenty of bigger mackerel offshore on the bottom. I heard from some Rhode Island friends they found more than they've ever seen in deeper water. I have a good friend with an auto jigger for mackerel and they use the big mackerel trees so they physically don't get the little ones.

Dan Diodati (Commercial Striped Bass – MA & Recreational angler):
Clear something needs to be done but the data collection could be stronger. I would like to see a 25-fish possession limit for recreational anglers. I'm OK with getting a commercial mackerel permit for getting bait for striped bass and I'm open to reporting my mackerel.

#4: April 28, 2022 – Brunswick, ME

Attendees:

Megan Ware	Daniel Harriman
Costa Morehead	Robert Bernat
Rick Wallace	Jay McGowan
Daryl Webber	Doug Jowett
Brett Gilliam	Jay Farris

Summary:

Staff first provided an overview and addressed clarification questions.

Staff responses to clarification questions:

Staff described how MRIP estimates recreational catches.

Staff clarified that vessels without federal permits operating in state waters would only be subject to state rules. ME staff noted that the Council has not requested that states pursue any additional commercial measures, for example regarding inshore pound nets.

Staff described the general stock assessment process.

Comments:

Jay McGowan:
As a guide making my living from this, putting me in with general recreational is extremely unfair. The annual discards from commercial fishing is what all the guides the next 60 years would catch for bait. It's above what all the guides on the east coast would catch for bait. If you set it at 10-15 that's all I could catch for bait. With 10 fish and 6 clients I can only bait their lines 1.5 times for a 4-hour trip – I can't do that. I need fresh bait. With 7 people on my boat I should be able to have 70 fish. Storing fish in a pen won't work for me – I release or keep for lobster bait – I don't think they survive after swimming in my live well for 4-5 hours. You pick them up and there's no slime on them you know they are not going to live. I've tried keeping them overnight and they don't survive. People paying $450 on a half day trip don't want to go have to catch mackerel. Surveying my anglers drives them away – the minute they see someone in a uniform asking about fish the first thing they say is what did we do wrong. The interviewers need to explain quickly why they are surveying and it's not an enforcement issue but just collecting data to protect the fishery. I'm worried that once it's taken away we won't get it back, or it will get worse.

Name missed:
One of this things people don't realize – it was every cove in the bay had a dory – they'd close it off when the herring came in – you don't see herring – they caught them all at night out there – they learned the science and the fish – they know the herring come up at night and they take it all. Those people are not fishermen – they are the scabs of big business – they don't get where they're at without taking everything. And they have the voices in Congress and the power and the lawyers hammering you all the time. You people are making an effort to learn – listen to us – we don't have the funds to hire lawyers at $150 an hour to represent us at Congress or give money to get voted to give us a bigger share. Same with tuna – one big Italian family in NJ had all 5 licenses to purse seine. 35-40 years ago they came in the bay, caught 1,500 tuna in one set, that's all there was from Cape Elizabeth to Port Clyde – didn't catch another tuna that summer. That kind of operation can't be done. If they ever allow us to sell lobster licenses the big companies will buy them up because when people get poor they will sell whatever they have. When I was a kid every cove was full of herring.

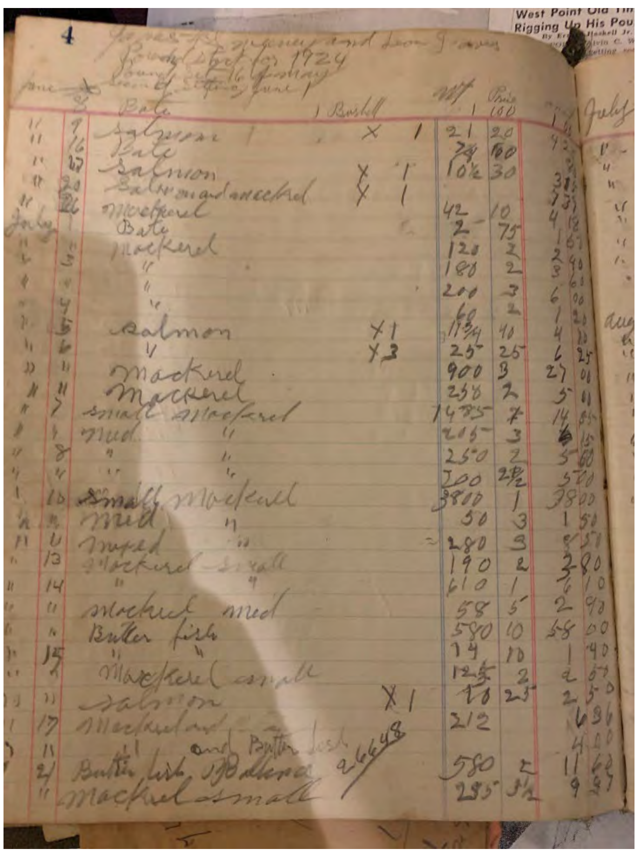
Robert Bernat (Commercial Fisherman)
Menhaden is a disaster. Herring and Menhaden rules may turn people to mackerel. Could nip that in the bud. (Is a legislative process in Maine)

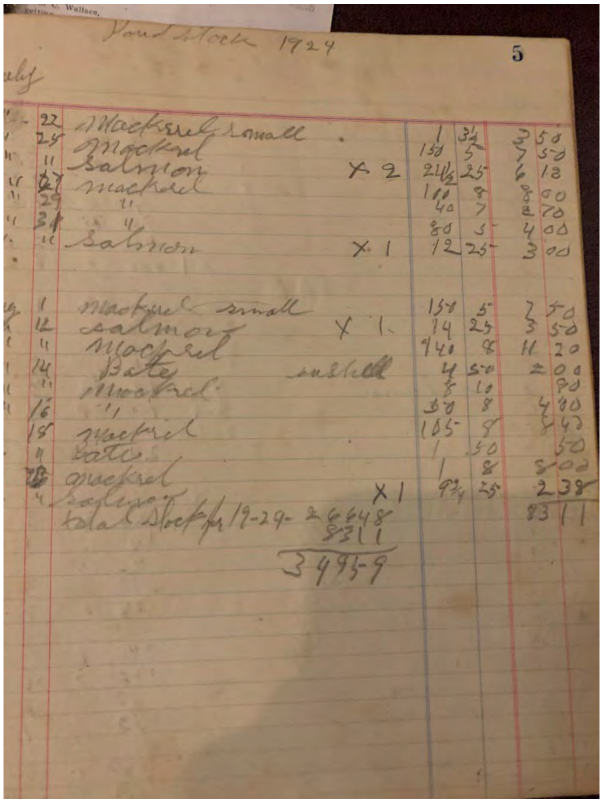
Doug Jowett (NY, RI, MA, ME guide)
The survey staff don't understand that we don't have for-hire permits in Maine and I'm not going to get in a legal discussion about the difference between for-hire and guiding. That's skewing the data. The guide fishery is not amounting to much mackerel. Regarding permitting, most folks don't know where the EEZ is, you are setting them up to break the law. We have too much government in our face – I'm just standing up for the little guy.

Brett Gilliam (Commercial Pound Net)
I started with gill netting mackerel but had to stop because they got so small. You don't know what's out there. The minute you see size declining you know you're overfishing (*The Unnatural History of the Sea* Callum Roberts). This science is flawed fatally – the cod, haddock, and pollock are gone, now the mackerel are gone. The only thing that survive is what's shut off like halibut. The East Coast must be the most mismanaged fishery in the entire world. Look at Alaska – the biologists are out on the water and look at the sizes. If we want to do management you need to get out on a boat with the people that are catching mackerel and herring brit (young) in harbors because that's what they feed on. All these agencies are looking at these fisheries and they are failing. Something needs to be changed – I only caught 57 bushels I can't even fish it again and they get smaller and smaller. I've got records from the 30s where they caught far bigger fish. Are we ever going to learn? The Gulf of Maine is about a fishless sea. You'll let a mid-water trawler go out and catch more in a night than I'll catch in a lifetime in my pound net. But they'll never get stopped because of money – money drives things and until that stops there will never be fish again. It could be too late now. Gulf of Maine was one of the most productive places for fish but there's been irreparable damage done. The Councils/biologists won't open up to the fact that they don't know what they are doing. This stock has been in trouble since the 1960s. All these years it's gone right to hell. My parents' families were fishermen, it's been my

life and I've watched it disappear. The only thing left is lobster and the environmentalists are going to drive us out of that. I'm done, thanks, you've really done a good job for me. And I hope you take that to the President – if I had my way I'd do away with the Mid-Atlantic Council, the ASMFC, NMFS, and probably Maine DMR. And we'd have just as much fish because they've done nothing to help us, nothing. I'd shut it right down, but let the recreationals have theirs within reason, 40-50 fish. They didn't cause this. It's been commercial fishermen and the biologists that have done nothing that's ruined the fisheries. Greed – insatiable greed. The stock should never be open until July 1 after spawning – leave them alone while spawning. All you have to do is look at the landings. We see haddock that are this thick because there's nothing for them to eat. And if you keep letting that squid fishery go on down at Cape Cod there will never be anything. Those squid fishermen are catching those little alewives. It's a dirty fishery, should never be allowed. They can figure out some other way to catch squid. That's what I believe. The Canadians are catching bigger fish – there are no big fish in our schools. If it was in my power there would be no commercial quota. If you could put the Guld of Maine back together it would feed a lot of people.

(see pictures below)





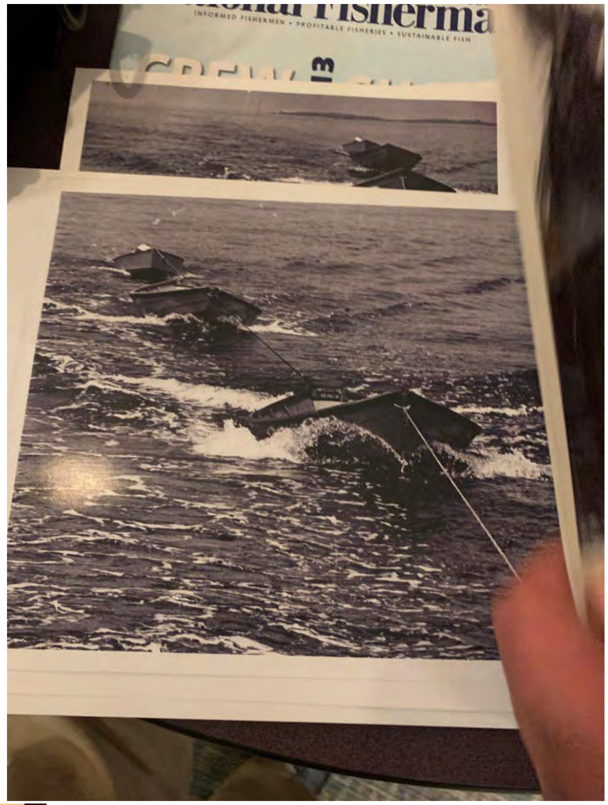
Pond Stock 1924

5

July

22	Mackerel small		1	3½	3	50
25	Mackerel		150	5	7	50
"	Salmon	× 2	24½	25	6	13
27	mackerel		100	8	8	00
29	"		40	7	2	70
31	"		80	5	4	00
"	Salmon	× 1	12	25	3	00
1	mackerel small		150	5	7	50
12	salmon	× 1	14	25	3	50
"	mackerel		140	8	11	20
14	Bate	[illegible]	4	50	2	00
"	mackerel		8	10		80
16	"		50	8	4	00
18	mackerel		105	8	8	40
"	bate		1	50		50
23	mackerel		1	8	8	00
"	Salmon	× 1	9¾	25	2	38
					83	11

total Stock for 19-29- 26648
8311
34959



West Point Old Timer Rigging Up His Pound

By Ernest Haskell Jr.

WEST POINT—Alvin C. Wallace, 73, will soon be getting ready to tend a mackerel pound for his 47th year. Forty-six years ago Alvin got 2c a pound for mackerel. The biggest mackerel he ever caught weighed 4½ pounds. Alvin caught the record fish off South Portland lightship. Alvin has made more money in recent years even though he has caught less fish. Forty-six years ago a mackerel pound cost $180 and lasted two years. Today the same type of pound lasts but a season and costs $800. Forty-six years ago Alvin fished in a 20 foot sailboat equipped with a pair of eight foot oars. He sold his fish either at Cundy's Harbor or Portland.

Mr. Wallace was born at West Point. He is the father of two veter-

Daniel Harriman (Commercial Pound Net):
Things have changed over my life and part was driven by greed. When I was a kid I could see the Russian and Portuguese boats, we pushed them out of the EEZ, we had this huge resource. My older brother had this little wooden dragger – they said look at this resource and they had applications for money to build boats – he wanted to build a 50 foot boat you could be home often, but they told him a 50-foot boat was not economically viable – you needed to build a 100-140 foot steel vessel. And 30 years later they said "Where the hell are the cod?!" "Look at what you've done!" My great-great grandfather came from Denmark in 1890, fished pound nets along the Cape. I truly believe everything would have been fine if no one had brought a mid-water boat from Europe and pounded hell out of the herring and mackerel. You talk about economics and saving the fleet – this is my fleet. My father went all the way to Chincoteague, VA in a 32-foot boat chasing mackerel. They fed 3 families off that boat and made a damn decent living. Build a 180-foot midwater boat that can carry 1,000,000 pounds. 5 guys make a half a million and then the corporation makes millions. They sell the fish for 15-20 cents – I average 50 cents to a dollar. 5 families make a living. This is the fleet you ought to worry about preserving. I'm an opportunist myself, but there's good opportunities for the fleet and the working guys and the islands and the coves and the harbors. If lobster goes to hell we're screwed, we're done, we're going to lose the coast of Maine. Grandpa is going to sell his pier. It's already happening. We chose a hard life, I don't mind it as long as we've got an equal shot. But when I see a boat come in with a million pounds and they pump fast so you don't see the haddock going down the chute. I'm allowed 5 river herring per count. It's been stacked against us. This is our resource. And how does mackerel fall under the Mid-Atlantic and why am I being regulated by…Didn't we kick the British out…isn't that regulation without representation? My family's been doing this for 120 years. Is an international fishery accounted for? (Staff noted it's not believed there's foreign fishing on our mackerel stock.) Everybody in the inshore fishery, 100s of families, doesn't match catch of one large boat.

Daryl Webber:
I grew up on Quahog Bay – late 1980s-90s I fished with Matt Waddle – steel-wood traps – "outside" was inside three miles. There weren't many people fishing then… We had a old steel tanker from Mississippi the Valencia and out target was 180 MT per day so I have an idea about big amounts of fish. I made a living off the water, clams, shrimp, groundfish. Mackerel is really close to me. I'd fish mackerel as a kid with my father. I pretty much know every year when the mackerel break up and come up in the bay because the moon jellyfish get their white eyes eaten out by the mackerel. Middle May to early June they come in– the one year (I'm 51) they didn't come up, I fish mackerel with my kids and grandkids it's my favorite, it was the only year the jellyfish grew to their full size – huge in the tidelines. Every other year the mackerel have come in. I'm mostly fishing recreational now – I'm thinking there's no doubt it's overfished, I've seen a difference. I'm thinking the 3-mile line and in, I'm tuna fishing and haven't had bait for hours, then mackerel come through scattered. The inshore fishery, recreational, guides, pound nets…I hate to lose this fishery. I'm just trying to buy some time before I die so I can take my grandkids out fishing…I think everybody should be able to enjoy the ocean. 10-15 fish…It's starts with a number, I worry it will be shut off in the future. We have almost nothing else in this area, but there's mackerel out there. I still catch big mackerel outside down deep, but they are depleted overall. There doesn't need to be a limit around here recreationally given the fishing levels and

looking down seeing the schools. The guides catching mackerel for bait, there's an inshore stock for that. Sometimes you have to move around to different spots. I'm as angry about the trawlers as the other guys. We just don't need to do anything for mackerel recreational and we don't have much else.

Rick Wallace:
How do you stop the processor boats? You should cut them down some. Are the squid boats discarding tons of mackerel? Years ago when I was on them they had 30,000-pounds bags of mackerel, maybe they had room for them maybe not – is that practice still going on?

Name Missed**:**
People paying $450 on a half day trip don't want to go have to catch mackerel. They want to catch stripers and they expect you to have the bait.

Costa Morehead (Charter Captain ME):
Customers expect us to have bait and having a 10-15 fish limit would absolutely kill running an efficient trip for any guides in the state, and other businesses would suffer. Mackerel is the most important part of sportfishing in the State of Maine. Without mackerel we won't have bait, same for lobster tours. That limit would not be good for the state in general regarding tourism. 25 per person could work because I need to secure baits. The floating traps don't work.

Possibly Costa Morehead:
Recreational fishing is not having an impact.

Jay Farris (Charter Captain ME):
We have to buy a license. Maybe if you have that then you get to have up to 60 onboard or however many per potential passengers. That would take care of most guides/trips. We ate a lot of mackerel growing up, 15 fish per person would be enough for dinner. The guides in Maine don't scratch the surface of the numbers you're talking about.

Name Missed**:**
As big as Maine is, it's a criminal act not to have at least 2-3 more meetings along the coast of Maine. It shows you what the federal government thinks about the State of Maine. They are just shoving it down our throat without public input.

#5: May 2, 2022 – Webinar

Attendees:

Ryan Cook
Steve V
Michelle Duval
Katie Almeida
Zack Greenberg
Earl Small
Willy Goldsmith
Wes Townsend
Albert Didden
Jeff Kaelin
Dan Farnham
Julia Beaty
Katie Schleit
Will Poston
Pam Lyons Gromen
Russ
Clarisse Brown
Betsy Fitzgerald
Al Williams
Purcie Bennett-Nickerson
Barry Gibson
John Paul Bilodeau
Melissa Smith
Peter Fallon
Brown
Nichola Meserve
Trevor
Jack Patrican

Summary:

Staff first provided an overview and addressed clarification questions.

<u>Staff responses to clarification questions:</u>

Given performance of our first rebuilding attempt projections, it is very hard to quantify significant differences in rebuilding probabilities among the alternatives other than less catch should lead to more rebuilding.

Alternative 4 and Alternative 5 have built-in one-time risk policy adjustments, similar to the first rebuilding action.

This action will set a rebuilding approach that should rebuild in 10 years, but only sets specifications for 2023, and the information from the 2023 management track assessment (MTA) will have to be integrated as it should constitute new best available science. Depending on how far off of projections the 2023 assessment indicates the stock is, the Council's response will likewise be affected.

The higher recruitments used in Alternatives 2-5 are dependent on stock size and given the thousands of runs that go into making projections, the effect is a slow increase in recruitment as stock size increases, and Alternatives 2-5's projections never fully return to full 1975-2019 median recruitment even when fully rebuilt given the spread of projected biomasses.

Purchased bait in exceedance of the possession limit could be on board a vessel but would require a bill of sale to document purchase. Unusual cases may depend on an officer's discretion and the exact circumstances.

States control the rules in state waters, but **if** a vessel has a relevant MSB permit, then the rules related to that permit follow them back into state waters.

Comments:

Purcie Bennett-Nickerson:

Alternatives 1-3 should not be deemed impracticable. Alternative 1 is best because it has the highest probability of rebuilding and we have a history of being over-optimistic. We need to shut the EEZ down in the short term and let it rebuild. Otherwise we are not acknowledging we're in a low recruitment period and creating a mathematical fiction.

Pam Lyons Gromen (Wild Oceans):
Wild Oceans supports Alternative 3 that was endorsed by the SSC that would close directed fishing in the EEZ at least for 2023, which is a necessary step. With a lower quota from the start, leaves more fish in the water as a key forage and for the past 30 years we've been overfishing. Leaving more fish in the water for a forage fish to rebuild is the right course of action. We need to remember there's not a forage control rule to incorporate predator needs when making projections – it's all very static how natural mortality is accounted for but it's a dynamic need. Alternative 3 also follows the Council's risk policy, which had high levels of public input and we were thinking about overfished stocks and setting risk lowest when the stock had the worst need. Alternative 3 is the only one that follows the Council's P* control rule.

Regarding the river herring and shad (RH/S) cap, strongly opposed to keeping the current 129 MT even just for one year – that cap was scaled for a quota over 17,000 MT. Even if the Council chooses alternatives 4 or 5, quotas will be 1,000-4,000 MT and a 129 MT RH/S cap will allow a much higher ratio – the incentive to avoid RH/S will be eliminated. The original purpose of the cap was to reduce RH/S catch and a static 129 MT cap diverges from that purpose. We have wrestled with lower quotas in the past, including 89 MT when landings were less than 10,000 MT. The 129 MT RH/S cap amount has no scientific basis and should not be in this Amendment.

Jeff Kaelin, Lund's Fisheries:
There's minimal difference in the probabilities of rebuilding among Alternatives 3-5, and it's important to keep getting fishery dependent data to the extent possible. We've adjusted to drastic quota reductions already, and future assessments will continue to require ongoing assessments.

The Council needs to understand how a 3-inch mackerel mesh or brailer is constructed and any regulations need to account for the unique construction of the nets used in this fishery. The current specific language for the mesh regulations may be premature. The Council should survey the fishery about use of brailers and can't assume the butterfish regulations would be directly transferable.

Katie Schleit (Ocean's North (Canada)):
Canadian Management Strategy Evaluation was pessimistic with no chance of rebuilding in 10 years even with no catch – seems in line with MAFMC's Alternative 1. More recent stock assessment in Canada was even more pessimistic. Canada for 2022 closed its commercial and bait fisheries – we'd be looking for the U.S. to take similar measures. Canada also has recreational measures in place and it would be good for the U.S. to do something similar. There is concern that Canada's efforts may just lead to more fish being available to the U.S. fishery, which is against the spirit of what Canada is trying to do to rebuild the stock.

Zack Greenberg (PEW Charitable Trusts)
Atl mackerel provide a wide variety of benefits – can't overestimate importance of mackerel as prey for the whole regional ecosystem. Stock is overfished and subject to overfishing and the population is in decline, subject to overfishing for most of last four decades. Mackerel is a data rich stock and we need to follow the science / assessments (U.S. and Canada). Next few years are critical - With a precautionary approach mackerel abundance can grow back to support the ecosystem as forage and thriving commercial and recreational fisheries in the U.S. and Canada. We were encouraged to see Canada take tough steps to reduce in 2021 and close their fisheries in 2022. NMFS made right decision to reduce U.S. catch in 2021/2022. We need to embrace this opportunity to rebuild in as short as time as possible and will only get so many chances to go back to the drawing board. We support Alternative 1 using only the lower 2009+ recruitment. We support the U.S. and Canada continue working together. The catch reductions are a wise investment in the longevity of the fishery, which will benefit the fisheries and the shared ecosystem.

Name garbled, likely either Ryan Cook or Steve V:
Accommodations for maintaining bait in a live-car or bait pen attached to a dock or in a dockside freezer would need to be extended to a mooring device, which is used similarly as a dock for securing a bait pen. Because mackerel fishing is better early, many charters will go out early to collect mackerel before a trip to catch mackerel for their charters that day, and could then exceed the individual possession limit that would accommodate their charters for the day. This activity needs to be accommodated, and having a multiplier tied to having a charter/guide license could accommodate the needs of the for-hire fishery.

May 6, 2022

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

Re: Comments on the Atlantic Mackerel Rebuilding Amendment

Dear Dr. Moore,

The States of Massachusetts, New Hampshire, and Maine provide the following comments to the Mid-Atlantic Fishery Management Council on the Atlantic Mackerel Rebuilding 2.0 Draft Amendment. The three states appreciate the efforts of the Mid-Atlantic Council staff to engage with New England stakeholders during the development of this Draft Amendment given the importance of this stock to many of our coastal communities.

Rebuilding Alternatives

Rebuilding Alternatives 1, 2, and 3 appear to be largely infeasible for US fisheries given they result in quotas which are below anticipated Canadian landings and the recreational catch deduction. Further, these options could lead to an increase in discards if no quota is allocated to the commercial fisheries. As a result, the New England states support the adoption of either rebuilding Alternatives 4 or 5, with a preference for Alternative 4 (61% Rebuilding Probability in 10 Years) given Alternative 5 has the lowest probability of increasing stock size by 2025. Alternative 4 balances the practicalities of landings and discards in US fisheries with a slightly higher probability of rebuilding in recognition that Atlantic mackerel play an important role in the ocean food web.

Canadian Catch Deduction

The three New England states recommend that the Mid-Atlantic Fishery Management Council deduct 2,197mt for Canadian landings in the 2023 specifications. Canada recently announced the closure of their commercial Atlantic mackerel fishery in 2022. While a new stock assessment will be used to determine Canadian quotas in 2023, it seems unlikely that Canadian catches will significantly increase given the status of the stock. As a result, a 2,197mt deduction provides some buffer for the Canadian fishery to potentially re-open in 2023 but also recognizes the recent management decisions of Canada.

Recreational Bag Limit
Of the two options provided, the New England states recommend the Mid-Atlantic Fishery Management Council adopt a 15 fish bag limit in the recreational fishery. The lack of recreational measures to-date in the Atlantic mackerel fishery means a bag limit could have severe consequences on individual businesses, including those who participate in HMS fisheries which rely on mackerel for bait and the for-hire fleet. These for-hire vessels often catch bait ahead of a client trip, meaning a possession limit will impact the amount of bait that can be caught by a captain before a trip. The introduction of a bag limit also poses several management questions. For example, several for-hire businesses in New England have noted that they traditionally use bait pens at the dock to hold live mackerel. If a possession limit is instituted, can multiple for-hire businesses co-mingle their mackerel possession limit in a single bait pen? The New England states note that a 15-fish bag limit is more conservative than the 20-fish bag limit recently implemented by Canada.

The New England states express concern with several of the assumptions related to the expected impact of the recreational fishery. As has been noted several times in public meetings, the assumption of a 100% discard mortality rate in the recreational fishery does not reflect industry's reports and use of mackerel. If mackerel has a 100% discard mortality rate, for-hire businesses would not hold live mackerel in bait pens at the dock or in livewells on their boat. While historically discards have not been a large portion of total mortality, given the likelihood of very low catch, the New England states encourage the Mid-Atlantic Fishery Management Council to conduct studies which investigate the discard mortality rate of Atlantic mackerel.

In addition, the New England states raise concerns regarding the Monitoring Committee recommendation to either maintain the current 2,582mt deduction for recreational catch, or take only half credit for any calculated catch reduction. While the three states acknowledge the role that angler behavior can have on catch, both options appear to be arbitrary in nature. As previously mentioned, the introduction of a bag limit will have severe consequences on many businesses in New England and assuming a discounted effectiveness of the measure undermines the expected impact on the recreational fishery. Further, should the Mid-Atlantic Fishery Management Council assume there is no impact from the implementation of a bag limit on recreational catch (i.e., maintain the current 2,582mt deduction), it places the New England states in a very difficult position as we consider management measures in state waters. Moreover, the states would be proposing management measures which, on paper, are expected to have no impact on catch. This very easily raises the conundrum at a public hearing where the states are asked why a management change is being proposed if there is no expected benefit. The New England states strongly recommend that the Mid-Atlantic Fishery Management Council assume an impact on recreational catch from the implementation of a bag limit, and preferably assume the full effectiveness of the measure.

Commercial Mesh Minimum
Given the limited information available to determine the impact of a 3-inch minimum mesh requirement in the commercial Atlantic mackerel fishery, the New England states do not support

adoption of this measure at this time. It is unclear what the magnitude of the biological benefit would be, particularly at very low quotas. It is also unclear how many permits would be impacted by this measure and the potential economic repercussions. Given the questions remaining, the New England states do not support adoption of a 3-inch minimum at this time but do support continued investigation and research on its impacts.

River Herring and Shad (RH/S) Cap

The New England states support the Mid-Atlantic Fishery Management Council continuing to maintain the 129mt river herring and shad catch cap (Sub-Option 1). The original intent of the river herring and shad catch caps in Amendment 14 was to "limit the mortality of the relevant RH/S species in the mackerel and longfin squid fisheries."[1] The current 129mt catch cap achieves this goal and avoids the challenges of monitoring a very small cap. As noted in the draft Amendment, the impacts of an outlier trip can have large consequences on the estimation of river herring and shad catch when the catch cap is set very low. The New England Fishery Management Council has taken a similar approach to their river herring and shad catch caps in the Atlantic herring fishery; the catch caps have remained steady in the midst of significant decreases in Atlantic herring quota. Given this approach has worked in the Atlantic herring fishery, the New England states recommend a similar approach in the Atlantic mackerel fishery.

Permitting Option

In general, the three New England states support the clarification of regulations to improve compliance in any fishery. The potential benefit of the proposed permit clarification is that, for vessels possessing mackerel in federal waters, all mackerel catch on a trip would need to be reported via an eVTR. That said, the expected benefit of this requirement is somewhat obfuscated by the fact that Atlantic mackerel purchased on the dock and then transported to federal waters would not be reported on an eVTR. As a result, while the permit clarification proposed would increase federal reporting requirements for potentially 1,000-2,000 permit holders, it would only improve the reporting of mackerel landings for boats who: 1) intend to possess mackerel in federal waters; and 2) catch, as opposed to buy, mackerel on a trip.

Outside of the proposed permitting clarification, there are several factors at play which will likely result in increased reporting of mackerel catch. The New England states forecast that some anglers who traditionally use mackerel as bait in federal waters and who catch them in state waters will likely purchase state and federal open-access commercial permits to possess mackerel in excess of the recreational bag limit. The purchasing of these permits will trigger reporting requirements for these harvesters. In addition, for-hire operators in state waters may purchase state open-access commercial permits to be able to possess mackerel above the recreational bag limit to catch bait for their clients ahead of a fishing trip. This too will trigger reporting requirements at the state level for additional participants in the mackerel fishery.

[1] Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan. Final Environmental Impact Statement. Submitted to NOAA on February 26, 2013. https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/53e3d5fbe4b0e88e72d231c6/1407440379012/Am14FEIS.pdf

In closing, we appreciate the opportunity to comment on the draft Atlantic Mackerel Rebuilding 2.0 Amendment. We particularly thank the Mid-Atlantic Fishery Management Council's for their responsiveness to the New England states' original concerns regarding stakeholder engagement in Massachusetts, New Hampshire, and Maine. Management of the Atlantic mackerel fishery is a critical issue for many fishers in New England, and the informational webinars and public hearings have provided an opportunity for individuals to learn, ask questions, and provide comments on this important issue.

Sincerely,

Daniel J McKiernan   Pat C Keliher   Cheri Patterson

Dan McKiernan	Pat Keliher	Cheri Patterson
Director	Commissioner	Chief, Marine Division
MA DMF	ME DMR	NH FGD

cc: Jason Didden, MAFMC
Tom Nies, NEFMC
Eric Reid, NEFMC

4

15 Comments Submitted as Emails (**EM1** – **EM15**)

EM1

The following is the written comment of Maine resident Thomas P. Atherton; MS Marine Ecology and Earth Sciences; and lifelong {1958 to present fishermen}.

I started Mackerel fishing in 1963 along with many other species.

To date my landings recreationally along the midcoast of Maine (Hancock County) is the same trip level catch as the last 50 years. I land between 50-150 mackerel a trip and freeze,smoke and salt my catch and it does wonders to lower my grocery bill. We have taught and encouraged many of our friends to join us over the years and the area we fish still produces lots of fish and lots of recreational enjoyment for communities throughout the state. On a calm morning you can see schools of mackerel surfacing all around the dock and floats around the public landing. There are far more fish than 20+ years ago after Russian fishing vessels (Glasnost) decimated every species of fish on shore and around the bays of midcoast maine.; Thanks US Gov't.!!

So your report actually uses no anthropological data like the story I just told. There is no such thing as "anecdotal" fishing knowledge. Instead what you scientist are doing is avoiding anthropology as a legitimate way to evaluate fisheries. What do other fishermen have for recreational info up and down the east coast?? My knowledge base has included predicting the east coast mussel collapse as early as 1983, using only anthropology as a guideline, I proved all the so-called experts wrong. My grandfather and I when I was just a boy told fishery managers the collapse of smelts in certain bays was a certainty, true again. You folks are just plain wrong on this one too. I have heard nothing about a lack of mackerel in Maine, instead we all see and hear differently and our catch illuminates that fact as some years we actually land two species of mackerel.

Here is another long list of potential errors and misleading ideas you all like to use.

1. The idea that stock rebuilding according to Magnussen Stevens is unlikely because the parameters have changed

2 What is the status of natural predation from larval to juvenile compared to your so-called target level years

3 what about fecundity of the egg and sperm population

4. how does ocean acidification effect the life-cycle and health

5 good old warming oceans are also unaccounted for and it's impacts

6 don't forget ocean currents, how are thermo and haloclines changing and how do they repress/enhance recruitment

7 Stock rebuilding is an inexact science that rarely leads to the chosen stock goals even under zero fishing pressure

8. Trawl data and the way you go about it raises lots more questions, because if you have different people running the gear you can get all sorts of outlier info that is not viable.

Here is the one tool scientists lack it is insight, feelings, ESP' it's the same way a shaman with no training has an ability to heal. There are fishermen like that who just have a nose for what is going on. I would never attempt a research project without there input. The leads those folks send me on are usually right.

There is no scientific substitute or data for thousands of days at sea and an inborne instinct for what you do.

Remember fishery managers said oyster reefs were not in danger

mussel reefs are in fine shape, now most are gone

lobster is overfished and unsustainable for the last 25 years, not true

green crabs are wiping out everthing/ they come and go

smelts are in danger, not on my property in my brook i fished all my life

The list just keeps going

Lastly I would like to say that the onshore mackerel recreational fishery is statistically insignificant. You have no clue what landings are compared to historical data, You are totally out of touch with value added income and local culture. Your way of gathering data can never be trusted for an onshore closure because you leave the people that know what is going on out of the data stream. In maine the DMR is not that good at getting data because those resources are to expensive and are unreliable. Like much of the historical data, soft stats.

Sincerely

Thomas Atherton

MS Marine Ecology and Earth Sciences

EM2

May 4, 2022

Christopher M. Moore, Ph.D.

Executive Director

Mid-Atlantic Fishery Management Council

800 N. State St, Suite 201

Dover, DE 19901

RE: Comments to the Atlantic Mackerel Stock Status and Rebuilding

Dear Dr. Moore:

I am again writing on behalf of the 100 plus members of the Cape Cod Charter Boat Association relative to the Atlantic Mackerel Stock Status and Rebuilding Efforts. Our previous submittal was in January of 2022, but we believe it is imperative to offer additional feedback.

- Our members, who spend countless days on the water - Cape Cod Bay and the Atlantic Ocean - quite honestly are perplexed some organizations and scientists believe a major decline in mackerel stocks has occurred. This is based on their recent history of being able to harvest mackerel basically whenever they target them, as well as observing larger commercial boats filling their holds in very short time.
- We also, yet again, strongly object to flawed MRIP being used to add to the justification for needing bag limits. Many fishery organizations, as well as ours, continue to point out how flawed MRIP data is used for decisions affecting other fisheries as well, with minimal corrective actions being taken. The continued use of such data to make fishery decisions which impact the livelihood of many is perplexing.
- The for-hire charter fleet depend on mackerel in a number of different ways;
- Live-lining for striped bass and bluefish
- Live-lining for bluefin tuna
- Chum when fishing for other, larger species
- Providing youngsters and novices with excitement, catching 2,3,4 at a time
- Providing leftover mackerel to population in economically depressed areas, soup kitchens, and families who use mackerel in recipes handed down through their ancestors

• To impose bag limits on for hire vessels would have a detrimental impact on the above activities, resulting in less successful charters, thereby potentially reducing the number of charters being taken, thus affecting the economic liveliness of Captains and staff. Additionally it would have a negative social impact - minimizing the joy of fishing for children and depriving people of healthy sustenance.

In conclusion, we believe prior to any bag limits being contemplated more study is needed on the mackerel biomass, including the shifting areas of where mackerel are actually concentrated due to changing water temperatures. Further, additional scientific data, better than MRIP data and egg larvae surveys, must also be utilized.

Very truly yours,

Captain Rich Wood

President, CCCBA

Beth Ann Charters

captainrichwood@comcast.net

860-716-0202 cell

Captain Rich Wood

Beth Ann Charters

860-716-0202

https://bethanncharters.com/

Beth Ann Charters would love your feedback. Post a review to our profile.

https://g.page/r/CcAsbLMs2zN2EB0/review

EM3

Good Morning,

My name is Jim Geaumont. My wife Amy and I own Maine Way Outfitters out of Scarborough, ME. We specialize in running inshore fishing trips, primarily targeting Striped Bass.

Our most productive fishing method is with bait, primarily Atlantic Mackerel. We often live-line fresh mackerel caught on each for-hire trip. Whatever bait we use and retain is frozen for lobster bait or future chunk bait. Retained live ones are released at the end of each trip. We consider ourselves excellent stewards of this valuable resource, and let nothing go to waste.

Amy and I, as well as many fellow Charter Captains throughout New England are generally in favor of rulings which can better all aspects of a fishery that we are involved in.

However, in this case when discussing retention, there is widespread belief that the proposed measures are way too aggressive. This will effectively remove mackerel as a viable resource for fisherman (both for-hire and recreational).

**** 10-15 fish bag limit seems very low, considering a previous unlimited bag limit with no size requirement. In comparison to other bait sources which have higher or unlimited bag limits (pollock, herring, alewives, menhaden), this seems to be a drastic change.

We propose a continuation of an unlimited OR 25+ daily bag limit, with a possession limit of 50-75 fish per person.

In addition, there should be stipulations regarding for-hire trips and retention of used bait from trips. This will eliminate waste of mackerel that would otherwise have to be retained by the passengers, or worse… discarded.

In passing comment on the commercial side of this resource; Once again it would seem that this proposal has the burden shouldered by the recreational and for-hire fleets.

As a former commercial fisherman, I am by no means placing a lesser value on this resource in their regard. A 3” net mesh requirement would do very little if anything to reduce catch numbers. This is not from any partially funded studies or science, just real world experience. I make this statement as I speak from many years of experience in net fishing including gill nets, seines and dragging. It would seem that commercial quotas are not even being discussed in this proposal????

Please consider these ideas as this proposal moves forward. This is a valuable resource that is a hinge in recruitment in our fisheries. I do not believe that this is as simple as a flat bag limit for all.

I welcome any dialogue, and I am available at any time moving forward. Thank you for you attention to this matter.

Best,

Captain James G. Geaumont

VP, Maine Way Outfitters, LLC

(207)286-6658

EM4

Hello,

I would like to submit these comments as public comments concerning the current rebuilding of the very important Mackerel Stocks. It has gone on for way too long to not have limits on Mackerel Recreationally. In the state of Maine there has not been any Mackerel Take limits and it is clear people take everything they catch for whatever reason. It is unreasonable to assume that Fish Stocks can handle such heavy pressure. There should be no problem with putting a Bag limit on Mackerel like every other baitfish. Something like 10-15 a day seems very reasonable, and may even cut down on the poaching and illegal selling of Mackerel.

Commercially Fishing Mackerel should be scaled back some as well to help the rebuild. There are many boats that use the excuse of targeting mackerel just so they can net menhaden. So clearly there is a flawed system that is allowing too much netting of ALL baitfish. This is why we are in the situation we are today with a lot of overfishing occurring.

I would look to Alternative 1: Eliminate most catch to rebuild as much as possible in 10 years. This is the most aggressive approach and is often this kind of action that is needed to rebuild fish stocks. Thank you for your time and I hope what's done is what is best for the Fish sake.

Thank you,

Germain Cloutier

EM5

Thank you for the opportunity to provide comments in support of the MAFMC Public Hearings, regarding Atlantic Mackerel Rebuilding.

The focus of my comments is to request that the traditional inshore, Cape Ann Mackerel Trap Fishery be given sufficient quota to continue what has been a traditional spring-time fishery for over 150 years.

Long before the advent of pair trawling or super-sized offshore seiners, the mackerel traps along the Cape Ann shore have been landing very high quality, fresh mackerel for the retail and foodservice markets in New England.

The trap fishery is unlike most any other fishery, in that the mackerel are dipped live from the trap and delivered to the wharf within an hour, (before rigor has even set in), creating a very high quality food fish.

Unlike the relatively new forms of large scale, mobile gear, fish traps are fixed, anchored along the shore, so as to lead the mackerel into the trap on the falling tide. A combination of wind, tide, water temperature and migrating mackerel schools must be in sync for the traps to be effective. On many days, the conditions are such that catches are small or non-existent. Fish traps are only viable if the catches on good days are supported by quotas that are structured and sufficient to support this traditional fishery. As such, it is critical that when conditions line up, that the quota is available for the trap fishermen to land their catch.

I appreciate that mackerel enjoy a wide geographical range, but request that providing quota for this traditional Cape Ann fishery be prioritized in light of its long history, the small boat nature of its operation and the very high quality mackerel that it delivers to New England consumers.

Thank you for considering my comments.

David Jermain

5 Walker Street

Gloucester, MA 01930

EM6

Hi. Mackerel are a very important bait used for runa fishing so I really hope there is a way to allow retention of at least a dozen recreationally through December. I also hope there is a plan in place to restrict where the midwater boats can fish now that they are again allowed to fish inshore off Cape Cod.

Sincerely.

James Goodwin

21 scotlin way

East harwich MA 02645

EM7

From: Michael Polisson <mikepolisson@yahoo.com>

Subject: Mackerel Rebuilding

Im curious why there is no meeting in Gloucester mass where there is usually a meeting

2 meetings in southerm mass and none in the biggest fishing port in mass   Gloucester

Then it jumps to Portsmouth NH   ????????

Seems like you don’t want to hear from us!!!!!

EM8

Hello Jason,

My name is Captain Costa Moreshead. I own and operate Hard to Port Fishing in Kennebunkport Maine, we are a for hire charter fishing boat. We target inshore species like Striped Bass and Mackerel as well as scenic lobster tours. My business relies on Mackerel as bait and a sportfish species.

A limit of 10-15 mackerel needs to be clarified: per angler? per vessel? Live baits vs. dead baits? To make my day viable the boat would need at least 25 live bait per angler as well as a decent quantity of dead baits. I keep all the leftover baits from the trips and use them as chunk bait the next day or as bait in my lobster traps. Having 10 Mackerel for recreational lobstermen in the state would mean 2 fish per trap, that makes having recreational traps absolutely pointless.

The proposed regulation would kill my business as well as kill saltwater recreational fishing in the state of Maine. For recreational fishing the regulation should be decided by the state.

I plan on attending the meeting on Thursday the 28th.

Thank you for your time reading my input. If more questions or comments are needed please feel free to contact me via email at hardtoportfishing@gmai.com or by phone at (207) 205-1257.

Thank you again.

Capt. Costa Moreshead

Hard to Port Fishing LLC.

EM9

Good afternoon,

Being a charter boat captain, Mackerel fishing is a very big part of the fishing experience I provide for my sports.

Many memories are created for young anglers catching mackerel, most of which are bigger than any fish they've ever caught.

On my vessel, these same mackerel are often used to help catch their first striper.

Farther up the coast of Maine, many boat and shore anglers don't have the opportunity to catch stripers due to the fact that they don't migrate that far north. Mackerel fishing is one of the only species they can target.

I feel strongly that the best way to help rebuild the fishery is to control the commercial quota.

I understand that there will need to be limitations to the recreational quota as well. I strongly disagree with a closed season for mackerel. This would directly affect my business which only lasts 3-4 months. I would be in support of a bag limit of 20 mackerel per angler.

Thank you for listening,

Captain Dan Couture

EM10

As a recreational lobsterman and commercial charter and bass guy, I catch mackerel as bait. As long as we are still allowed to catch a 5 gallon bucket of bait a day maybe max 1 tote I'm ok with limits. On the other hand, if we are going to allow mid water trawling in close then a recreational limit seems misguided from a conservative perspective.

Thanks,

John Herrick

EM11

Mr. Didden, I recently listened to your presentation on the status of Atlantic mackerel to the NEFMC and have read through the Public Hearing Document. I definitely agree that there is a need for action to help rebuild this important stock. However, I am really writing to make a comment on one small section of this proposal. Under Alternatives 4 and 5, I believe, there is a section about permitting and the need to close reporting loopholes.

While, this is a good idea, I believe there already is data being collected that covers the HMS Gen and CH/HB Category fisherman. And that is NOAA's Large Pelagic Survey (LPS). As has been stated mackerel is caught and used in the bluefin tuna fishery very regularly and this catch information on mackerel is recorded in the LPS. While I don't believe the survey produces an official estimate of mackerel harvest at this time I think they very easily could. It might be worth checking in with their group about it.

Thank you,

Chris Uraneck

EM12

From: Justin Boyce <impared@hotmail.com>

Sent: Thursday, April 14, 2022 6:38 AM

To: Didden, Jason <jdidden@mafmc.org>

Subject: Mackerel Rebuilding

I find it very ridiculous to be limiting recreational fishing to try to save a fish stock. I commercial fish for herring and Manhatten in Maine state waters and have seen a massive amount of mackerel in recent seasons both mixed with other fish as well as by themselves. I understand limiting commercial fishing efforts because that is what will hurt the fishery in the long term but for the hundredth of a percent recreational fishing is going to impact the fishery is just seems like a waste of time and money to try to enforce. Mackerel are not like ground fish and many of the fish are going to die even when released back into the water because of poor fishing tactics.

It would be interesting to see where stock numbers are coming from for the mackerel and even the herring populations. I have fished inshore waters for herring since the early 90s using stop seining and purse seining tactics and I honestly haven't every seen the amount of fish I have seen the past two years inshore. My problem has been that river herring have made a huge rebound and are mixed with the herring and mackerel at a rate of about 20 percent which is too high for me to be able to land. I think some of the science should be based on the stock that is moving closer to shore rather than just in federal waters. I think the population of all fish species right now is a lot better than we give them credit for just because the science is being skewed based off where surveys are being done. Fish move and change habits so we have to adjust and move with them not just push rules hoping to make them come back to places they have left...

EM13

From: Karen Chin-Mancini

Subject: Mackerel Rebuilding

When are they going to help us the Recreational fisher people? We need help because the Commercial fishing people have an advantage! Karen Chin-Mancini

EM14

Dear Mid-Atlantic Fisheries Management Council,

I am writing, in the case of Atlantic mackerel, as a recreational fisher. My catch area is Cape Cod Bay. I would like to encourage control and limits to the recreational fishery. Having bag limits and size limits or whatever governmental regulation should address both the 1. stock management aspect and 2. the prevention of wanton waste which I think is related.

Generally in recreational fishing the mackerel is caught on sabiki or like rigs that have multiple single hooks. So to fish mackerel, the fish is so often targeted several at a time and shaken off the hook to the deck. There are deads, stunneds and those that are ok for the bait well. Bait fishing for live bait mackerels to go in the well is therefore indiscriminate in nature, especially as fishers "catch the fever" when a school moves through, as speed is prioritized over care in handling. A catch limit will require of a fisher more care in handling for its specific use if that is live bait.

That said, as a concerned citizen, bycatch control is long overdue in all pelagic fisheries for river herring. Sympatric schooling should pretty much end Sea Herring fishery until river herring rebound (and reduction menhaden should also be ended). As to commercial mackerel fishing directly I can only say that river herring protection should be a top priority. Setting the catch cap is manifestly overdue because after negative review of river herring for the U.S. endangered species list in 2019 the health of the Atlantic population is not clearly appreciated or understood. Lack of comprehensive understanding combined with still low population numbers of itself spells jeopardy. Thus the need, clearly, is conservation over any other usage.

Sincerely,

Chris George

Yarmouth, MA

(508) 310-3021

EM15

Thank you thank you thank you.

I'm a recreational fisherman out of Plymouth and have noticed a drastic drop in the amount of mackerel in the areas I fish over the last few years. And it's no wonder as I see people abusing the resource including 6 or 7 guys on the same boat three days in a row fishing for Mack's for hours filing tote after tote.

I am 100% for a bag limit on recreational anglers. I don't know enough about commercial to comment other than saying they need to be capped too!

I don't think a recreational fisherman needs more than say 10 Mack's for a good day of striper fishing.

Thank you for attention to this!!

Also I'm all for catch and release on stripers too but I don't know if that's on the table.

Have a nice weekend

Jeff norton

Comments submitted via the mafmc.org web-form follow...

Name	Category	States	Comments
Seth Murray	Commercial, For-Hire, Private Recreational	Maine, New Hampshire, Massachusetts	never in my 24 years of fishing have i had an easier time finding or catching mackerel. full string after full string of sabiki constantly, was great. led to more time fishing for other species
French Jon	Commercial	Maine, New Hampshire, Massachusetts	I have been fishing the Gulf of Maine for over forty years out of the Merrimack. This has to be the most under studied project in the history. There is no shortage of mackerel and I will be happy to show you any time. Jon French F/V Ranger
earl sheesley	Private Recreational	Maine, New Hampshire, Massachusetts	I am in favor of a commercial quota, if necessary to regulate the stock. I am not in favor of a recreational bag limit. The fish belong to everyone not just the commercial people. While you are at it limit the commercial herring and pogie catch and watch the fish populations expand rapidly.
Tyler McLaughlin	Commercial, For-Hire	Maine, New Hampshire, Massachusetts, Rhode Island	I’ve been fishing my entire life. And have spent every year since childhood waiting for the spring mackerel run I’m now 34 years old and am seeing more mackerel of various sizes than I ever have. That being said I have noticed the spots the are at may be changing.

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Name	Category	States	Comments
Jack Patrican	Commercial, For-Hire	Maine, New Hampshire, Massachusetts	My name is Capt. Jack Patrican and I am a 27 year old commercial & charter fisherman from Gloucester, MA. I'm currently featured on National Geographic's "Wicked Tuna" as the youngest captain fishing on the smallest boat, Time Flies. Wether I am filming for Wicked Tuna or running a fishing charter, I completely rely on catching Atlantic Mackerel to use as bait, which are very plentiful and easy to catch inshore as well as offshore. In fact, they have been so plentiful over my lifetime that I decided to invest in hook & line gear to catch and sell them commercially, which has accounted for more than half my yearly income. On a daily basis, I am able to "fill the boat" with Atlantic Mackerel from May-December, and almost half of my catch are medium-large grade. I understand that Atlantic Mackerel aren't as abundant in the Mid-Atlantic as they once were, but it's a similar case for many species. Striped Bass no longer are caught in Virginia Beach and Lobsters have crawled out of Connecticut, just to name a couple. As water temperatures rise and windmill industrialization becomes more prominent, its no surprise that the Mackerel are moving North. I believe the biggest issue is that we have a predominately North Atlantic stock that is governed by a Mid-Atlantic Council. I also believe there were serious inadequacies with the MRIP survey's. I personally was interviewed over a dozen times last year, however I know other fisherman that have never even seen a surveyor. I have personally witnessed marina staff that do not let the interviewers on the property because they are thought to bother fisherman and their crews. I believe this has led to very skewed survey data that should not be relied on to make such important decisions for our fishery. On a final note, I find it very discouraging that a hook & line fisherman, practicing the most sustainable fishing methods possible, could be shut out of the fishery while mid-water trawlers are given the go-ahead to completely wipe out our stocks. The mid-water trawl fleet catches more mackerel in one day than a hook & line boat does all year. How is it fair and equitable to allow one party such a massive allocation of the resource? I personally have witnessed what the mid-water boats can do to an area such as Stellwagon Bank and it is very sad to see. One day Stellwagon is teeming with Mackerel and Herring, and after a couple days of mid-water trawling it becomes a barren wasteland. I truly believe that if the Atlantic Mackerel stocks are actually in decline, limiting the mid-water trawlers has to be the first action to recovery.
Jo Jones	Commercial, Private Recreational	Maine	We know All fish need to be regulated. Put a limit on mackerel you be better do it for everyone including all trawls and sieners. Just is not right. A fish is a fish no matter who catches it.
Todd Prock	Private Recreational	Maine	I have been fishing the coast of Maine for years and in the past 3 years I have never seen so many mackerel. There are mackerel of all sizes, no shortage that I have seen. I primarily fish around Monhegan Island.

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Name	Category	States	Comments
Eric Salamon	Private Recreational	Massachusetts	I'm in favor of the most aggressive measures taken for recovery. Recreational represents a very small percentage of the overall impact but I support the lower bag limits. Commercial fishing however is the main reason we are in such dire circumstances. Until there is a full recovery and a sustainable harvest can be maintained a full ban should be implemented
Neal E Melanson	Private Recreational, Other	Massachusetts	NOAA and MDMF need to develop and publish a plan to mitigate the impact of the GRAY SEAL population explosion. I have observed that last year, the Spring of 2021, just 4 GRAY SEALS decimate the population of Winter Flounder in Plum Island sound. I have not seen ANY gray seals in the Sound this year, BECAUSE THERE IS NO MORE FOOD FOR THEM!!! The same situation exists for the local mackerel fishery, and inshore lobster fishing. My catch in the early season 2021 was near ZERO. It did pick up a little in the late summer and early Fall, then cratered again at the start of October. Neal Melanson Rowley Ma.
Nicholas Scalli	Commercial, For-Hire, Private Recreational	Massachusetts	More mackerel last year then I've seen in the past 22 years of fishing. Not sure who does your surveys but they are clueless. Stocks are higher then ever before!!!!!
Ryan Kane	For-Hire	Massachusetts	The assumption that mackerel numbers are declining is based off a point in time sample that does not adequately address the warming sea state forcing mackerel to the colder waters south of cape cod and to the north in the gulf of Maine. I fish primarily out of Boston and South shore for Bluefin Tuna on Stellwagen Bank and Cape Cod Bay. I have fished 30 plus days a year since 2015 and have never not gotten brought mackerel to make bait for a trip. Lots of small juvenile tinker mackerel and mediums mostly. Larger horse mackerel more common south of cape cod. Please do not penalize small scale commercial, charter and recreational anglers for the sake of rewarding a few mid water trawlers in a dying industry in Gloucester and New Bedford. Not only does this wipe out a biomass of fish as by catch targeting Herring, it prolongs an inevitable collapse of all fisheries due to depletion.

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Name	Category	States	Comments
Tyler Parisi	Private Recreational	Massachusetts	There are plenty of Mackerel and Herron in the ocean. Please choose humans/fisherman!
Joseph Scalli	For-Hire	Massachusetts	I do not understand why there would be a limit on mackerel. I have fished my entire life off of Gloucester and have never seen a lack of mackerel. By contrary, its often an over abundance. Ive fished on charter boats and commercial boats for the past 10 years and mackerel have always been very abundant and plentiful. It makes absolutely no sense to regulate the mackerel fishery and it would crush the commercial and charter bass and tuna fisheries along with mackerel fishermen. This is not right.
Alan Murray	Commercial, Private Recreational	Massachusetts	I primarily fish recreational for striped bass and haddock; however, I also fish commercially for bluefin tuna. I have not experienced a lack of finding mackerel for bait. Not sure I understand the science used to determine the quantity of available mackerel and certainly do not understand how someone that fishes like i do should be limited to 10 to 15 mackerel per trip!?!? Most bait not used are returned to the ocean with the exception of some used as chum which is not significant. Go after the guys that may be depleting the stock that fish for Mackerel solely.
Dylan Webb	Private Recreational	Massachusetts	Can walk on the amount of mackerel out there. There are so many and they seem to be together in the millions. Any mackerel that aren't used are released to live another day.
Jared Morris	Commercial	Massachusetts	How can someone possibly make a living off of these ridiculous rules and regulations
Paul T Morrison	Private Recreational	Massachusetts	Commercial overfishing is killing off the striped bass, the bluefish, and the atlantic mackerel. Place a commercial moratorium of at least a few years on those fish before the few percent that are left are wiped out.
Timothy Peles	Private Recreational	Massachusetts	Fishing for Striped bass and Tuna in Massachusettes and over never seen so many mackerel on the fishing grounds. The mackerel population is alive and well. Don't touch it. Please.

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Name	Category	States	Comments
Michael Scalli	Commercial	Massachusetts	Good morning my name is Michael Scalli I'm an avid fisherman I've been fishing since I was three years old I'm 36 now I'm telling you guys right now there are so many mackerel out there it's not even funny from Maine to the Cape is where I fish . I heard a lot of stuff is going on trying to close it down saying there's no mackerel I disagree I'm sure you're going to hear a lot of this but me and a lot of fishing buddies are very avid fisherman we fish every day of the season possible ,before you guys think about shutting anything down you should really listen to the fisherman because we are out there every day trying to make a check we need the Mackerel thank you.
Jeffrey Fortin	For-Hire	Massachusetts	There is more mackerel in our waters than you could even imgine. I fished all the was threw December and every where I went weather it was the bank or out east of Chatham it was stacked with macks.
Tim Jones	Private Recreational	Massachusetts	There is so many mackerel out there we can walk across them. I've been fishing in mass the last 20 years and have never seen any Tim where there was lack of mackerel around in cc bay and points north. Stop with the leftist bullshit trying to control everybody's lives and let the people who are out there everyday have a say in this fishery. Because none of you have a clue to what's going on out there.
Alex Brown	Commercial, For-Hire	Massachusetts	I have seen more mackerel from dinks to jumbo in the past few years than in the previous 15 years. Whomever is trying to implement this is not out there like we are.
Ira Shank	For-Hire	Massachusetts	There is no evidence that charter or recreational fisherman impact the body of mackerel that enter and leave our waters So any attemp to change things must mean they have data that can and will be questioned ..

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Name	Category	States	Comments
Michael Fallon	Commercial, For-Hire, Private Recreational	Massachusetts	Mackerel fishing from my port in the Merrimac River in Massachusetts has been the best I have seen the past few years. I'm a charter captain, commercial bass fisherman, and a recreational angler. Limiting the mackerel take for any group below 25/person would be extremely detrimental to our fishing which is primarily based on live bait and dead bait mackerel fishing. Some will say that if you're fishing a long day you can run back out to catch more mackerel, but that requires a lot of time and fuel, which will be extremely expensive this season. On top of that, many days they are very easy to catch at first light but difficult in the afternoon when they spread out. Not that anyone is asking, but my suggestion would be a 100 mackerel boat limit for charter and commercial boats, and 25/person for recreational anglers. The commercial mackerel boats are harvesting many times over what recreational anglers harvest. We are also able to return unused live mackerel from our livewell after each trip. The money put into the economy from commercial mackerel fishing is FAR surpassed by money put into the economy by For-hire, commercial, and recreational striped bass fishing, all of which relies HEAVILY on mackerel. The past few years have been the easiest mackerel fishing my local fisherman and I have ever seen. It's very difficult to believe the data being presented is relevant and accurate based on how it's being collected. I fully understand the need to protect fisheries and it's really a shame that the idiots who came up with the 2 @ 28" striped bass limit are still forming policy decisions, but cutting off mackerel fishing or reducing below a certain threshold is certainly a step too far, and unlike striped bass who are in dire need of policy reform, mackerel are not.
tucker henderson	Commercial	Massachusetts	I use mackerel for bait almost every day of my life. I can assure you the population is strong. Although i will say, some of the draggers out there don’t have a care for anyone but themselves. this could use some regulation.
Philip Gulino	Private Recreational	Massachusetts	The mackerel population is strong. I have seen first hand, no change in the amounts of small tinker size to large jumbos for tuna over the last five years. Do not allow this overreach to continue to legislation
Steve Mcnally	Commercial, For-Hire	Massachusetts	I fish north and south of Gloucester and I see and catch all the mackerel that you want . There were school after school of mackerel all over Stellwagon bank all the way into Boston harbor. They are on Jeffries ledge from Gloucester to Maine

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Name	Category	States	Comments
Damon Sacco	For-Hire	Massachusetts	I have been a very active offshore charter captain since 2000. I regularly fish the waters in and around Cape Cod Bay. There are more mackerel in Cape Cod Bay and on the back side of the Cape now than there were 10 years ago. Each season there are masses of fish that stay all summer and fall season. There is absolutely no reason to curtail the rod and reel mackerel fishery. Thank you Damon Sacco
putnam maclean	Commercial	Massachusetts	I have been a commercial bluefin tuna fisherman for 50 years in the Gulf of Maine, mostly on Stellwagen Bank.Where we fished for tuna ,summer and fall we would hardly ever see a large Mackeral, for decades. Only some fingerlings in the fall.. . It was as if they were overfished. I suppose they were elsewhere- The larger Mackeral started to show up in great numbers in the inshore water some 10-15 years ago. It was a slow progression. We wanted to use them for tuna bait and would spend hours trying to catch a couple for live bait.. Worked hard at it.. Now the entire Coastline is awash in Mackeral, for 8 or 9 months of the year, maybe more. what works is that they are protected from large scale industrial fishing. In part becasue of Herring restrictions, and in part because inshore waters are a minefield of fixed lobster gear, or other, anchored tuna boats , whale zone and all manner of activity.. Mackeral sanctuary.. There did develop some of the jig gear fishery for mackeral, day boat fishery that was hook and line and could operate within fixed gear in shallow water(70-100ft). Maybe use airplanes for assessment counts. ? I have never seen more or larger mackeral , than now.
Jp Anusewicz	Commercial, Private Recreational	Massachusetts	The amount of mackerel in cape cod bay is mind boggling. When I go out at sunrise most mornings as far as you can see is massive schools of mackerel on the surface. When I’m fishing at stellwagen bank trying to catch bait more times than not I can’t reach the bottom nevermind drop down 50 feet before I get a full stringer of mackerel even with a 24 ounce weight. I seriously think this talk of the mackerel is foul and completely corrupt. This system is insane!!!
Derek Gauron	Commercial	New Hampshire	So you won't enforce the mid water boats from coming into the exclusion zone, but you're going to pick on the charter, party and rec guys that probably land 1% of a the species, a species that is overall fine.. I've been fishing mackerel my whole life and while some years they don't come in choose to shore, I've seen huge numbers where these big boats tow for bait/mackerel... You're seemingly hurting us on purpose, at a time when we need the inshore fishery the most. Stop 🛑!!!!!!!!!!

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Name	Category	States	Comments
Daniel Wilson	Private Recreational	New Hampshire, Massachusetts	This is total bullshit, another way to ruin fun and the local economies that depend on these highly abundant fish.
Angela LaGross	Private Recreational	New Hampshire, Massachusetts	Another way to ruin family fun !
Tom Mccrosson	Private Recreational	New Jersey	In favor
Eric Van Lill	Private Recreational	Other	I used to fish for them back in the 80's, and I do believe the stock has suffered, but other policies should have a positive impact. I fish out of Maryland. You already shutdown the sharking. The only time I use mackerel is for Bait / Chum. With the sharking closed I don't plan to target them.

May 9, 2022

Dr. Christopher Moore
Executive Director
Mid-Atlantic Fishery Management Council (MAFMC)
800 North State Street, Suite 201
Dover, DE 19901

Re: Atlantic Mackerel Rebuilding 2.0 Amendment

Dear Dr. Moore and members of the MAFMC:

Thank you for the opportunity to comment on the Atlantic Mackerel Rebuilding 2.0 Amendment, which considers several alternatives concerning rebuilding plans and additional commercial and recreational measures.

Our organizations represent for-hire fishing guides, small fishing-related businesses, and conservation-minded private anglers who recognize the importance of science-based approaches that ensure long-term stock health in order to sustain a vibrant recreational fishing economy. Our members and supporters rely on Atlantic mackerel (hereafter "mackerel") both directly—as a source of bait for species such as striped bass and bluefin tuna—and indirectly given their ecosystem role as forage for popular recreational targets and other marine species.

We are concerned by the troubling findings of the 2021 management track assessment, which revealed persistent low biomass, truncated age structure (lack of older fish), and continued depressed recruitment.[1] Even as spawning stock biomass (SSB) is estimated to have tripled from 2014-2019, the fact that the stock continues to be at less than 25% of the target SSB—coupled with the requirements of the Magnuson-Stevens Act (MSA)—makes additional action necessary at this time. While mackerel have been classified as a species that is vulnerable to climate change impacts,[2] and northward shifts in the resource have been documented, the poor findings of Canada's assessment for the northern mackerel contingent, whose 2020 SSB was the lowest on record, demonstrates that depressed abundance for the species is occurring across its range in the

[1] NOAA Fisheries. June 2021. Northwest Atlantic mackerel: 2021 Management Track Assessment Report [Draft]. https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/612c54d5f1970e234ac3dcce/1630295254487/c_2021+Atlantic+Mackerel+MT+assessment+report.pdf.
[2] NOAA Office of Science and Technology. Northeast Fish and Shellfish Climate Vulnerability Assessment. https://www.st.nmfs.noaa.gov/data-and-tools/northeast-fish-and-shellfish-climate-vulnerability/index.

northwest Atlantic.[3] In recent years, many of our members have witnessed high mackerel biomass in the western Gulf of Maine from Cape Cod to Maine; however, that observation is not inconsistent with the relatively stable results of the egg survey in the region (i.e., hyperstability) even as the overall survey index (used to estimate SSB) has declined.

In deciding on both a preferred rebuilding alternative and recreational measures, we are in favor of an approach that effectively recovers this critical species while distributing the burdens of doing so across the different sectors that rely on this fishery. Given the uncertainties associated with future mackerel recruitment and Canadian landings—which are "taken off the top" of U.S. landings due to lack of a transboundary agreement—a risk-averse approach that maximizes the probability of success amongst these unknowns is needed.

Preferred Rebuilding Alternative

In principle, we would be supportive of Rebuilding Alternative 3, which is based on the MAFMC's standard P* risk policy and was recommended by the Scientific and Statistical Committee. However, as the Public Hearing Document mentions, this alternative (along with Alternatives 1 and 2) does not appear practicable at this time given that it would result in zero or negative commercial quotas in 2023. A related concern with Alternative 3 is the possibility that, depending on the assumption regarding Canadian landings, it could also lead to a closure of the recreational fishery in 2023. We certainly appreciate the need for all sectors to make sacrifices when a stock is overfished. However, to suddenly move from a completely unregulated recreational fishery for mackerel to a prohibition on harvest in a single management action—especially given the high observed biomass of mackerel in the Western Gulf of Maine—would undermine the recreational community's faith in the Council and jeopardize its engagement on future issues.

As a result, at this time, we are supportive of Rebuilding Alternative 4, which would use a constant fishing mortality (F) of 0.12 and has a 61% probability of rebuilding the stock in 10 years. Alternative 4 would still lead to substantial decreases in commercial landings—28-80%—and thus put the stock on a path to rebuilding while recognizing the challenges and uncertainties that are unique to this fishery. Given that the next Atlantic mackerel management track assessment (MTA) is scheduled for 2023, our understanding is that the selection of a preferred rebuilding alternative at this time is largely for the purposes of setting fishery specifications for 2023. If the results of the 2023 MTA indicate some improvement in stock status, we recommend that the MAFMC revisit the possibility of implementing the P* rebuilding approach (i.e., Alternative 3).

Preferred Recreational Management Measures

As commercial landings have decreased in recent years, landings from the recreational sector, which have averaged about 2,600 mt since 2017, have become a relatively larger proportion of removals. This development, along with MSA's requirement that restrictions be allocated "fairly

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[3] Fisheries and Oceans Canada. July 2021. Assessment of the northern contingent of Atlantic Mackerel (Scomber scombrus) in 2020. https://waves-vagues.dfo-mpo.gc.ca/Library/4098865x.pdf.

and equitably" among fishery sectors,[4] underscores the need for recreational measures to be implemented as part of this amendment.

At the same time, it is important to recognize that some retention of mackerel is valued by the recreational community, both for personal consumption and for use as live and dead bait by anglers and for-hire captains targeting striped bass and pelagic species such as bluefin tuna and sharks. For charter captains during the summer months, a livewell full of mackerel can be the difference between an action-packed trip and repeat clients or a long, trying day on the water.

Moreover, as noted previously, the recreational mackerel fishery has never been subject to regulations; the prospect of moving from "nothing" to "something" has not only caused concern among members of the recreational community but could lead to management uncertainty regarding what the conservation impact of new measures would be. As the Public Hearing Document mentions, "there have been no recreational limits for mackerel before, so angler responses may be difficult to predict." As this amendment will only be used to set specifications for 2023, Marine Recreational Information Program (MRIP) estimates will be available in early 2024 to assess what impact any new measures may have had in 2023.

In balancing the importance of mackerel to the recreational community with the need for anglers to bear some of the burden in rebuilding the stock, **we are supportive of a 15-fish per person possession limit for the 2023 season**. Such a measure would provide some opportunities for harvest and enable live-bait anglers/charter captains to continue using mackerel while also making a meaningful contribution to stock recovery. Given the dynamic nature of the live-bait fishery for mackerel and the enforcement difficulties it can engender, we believe the limit should be for possession (i.e., how many fish are in the livewell at any one time), rather than a bag limit. As with the rebuilding plan, these measures could be revisited following an assessment of their impacts in 2023 (along with the findings of the 2023 mackerel MTA).

In addition to implementing a possession limit, we recommend that the Council consider provisions that account for the fact that anglers often use frozen mackerel (either purchased or caught on a previous trip) as chum or chunk bait. While we do not have any clear solutions to this challenge at this time, we are of the opinion that such bait should not count toward the per-person possession limit.

Permitting/Reporting

We are supportive of additional outreach and compliance assistance by NOAA Fisheries regarding the need for commercial and for-hire vessels possessing mackerel in federal waters to obtain the appropriate permits and report catch on vessel trip reports (VTRs). This information is critical for better understanding the "universe" of fishermen fishing for and catching mackerel and could eventually be used to develop catch estimates from the for-hire fleet. Better data will lead to a more favorable long-term outlook for this species.

[4] Magnuson–Stevens Fishery Conservation and Management Act, 16 U.S.C. § 1854 (2012).

Thank you for the opportunity to submit our comments, and we look forward to working with you to recover this stock.

Sincerely,

Willy Goldsmith, Ph.D.
Executive Director
American Saltwater Guides Association

Greg Vespe
Executive Director
Rhode Island Saltwater Anglers Association

Jason Didden
Fishery Management Specialist
Mid-Atlantic Fishery Management Council

RE: Atlantic Mackerel Stock Status and Rebuilding

First, accept my second-hand apologies on behalf of some of those participating in the public information webinar on Tuesday, January 12, 2022. Their behavior was embarrassing and is a bad reflection upon those of us willing to participate in a productive dialog. I would add that some fault lies in the moderation or lack thereof. You were obviously trying to do your best in handling a contentious issue.

Hopefully my comments below will be more constructive.

First and foremost I would echo the sentiments of commissioners from the three New England states: As we would feel the greatest impact of any proposed changes. "It is concerning that such a substantial and contentious action could be taken with little public input.... It would be instructive to New England stakeholders and decision-makers to conduct initial information-gathering hearings with the public to better understand potential impacts of a reduction before designing specific management actions."

1) **No shortage up north -** As you've heard, and will no doubt continue to hear, anecdotal observations from the recreational and commercial fishermen in state and federal waters of Maine are that there has been no lack of mackerel, from small to large, in these waters in the past several years. In recent years in Casco Bay and nearshore waters of the Gulf of Maine I have observed shoals of mackerel in late May and early June covering tens of acres, and spread out over several miles. I'm on the water from April through October and maintain regular contact with recreational fishermen other charter captains and there are always mackerel available as a directed catch or for bait. We catch them regularly offshore when fishing for bait from the surface to the bottom and while size is often variable, the last two years have produced a lot of larger fish, some up to 2 pounds.

2) Relocation - You may have addressed this in your presentation but the circus was a little distracting. Clearly, the stock has shifted farther north, as it has for several species, e.g. black sea bass. Fewer mackerel landings in the Mid-Atlantic may well be due to stock relocation to cooler waters rather than poor stock status. Continuing to survey for them in other areas, outside the Gulf of Maine might be something of a self-unfullfilling prophecy. If you don't look where they are, you won't find them.

3) Flawed Data - Have you looked at CPUE instead of just total catch? Since the commercial herring quota has been significantly reduced, fewer mackerel are being landed due to reduced effort, which could explain a substantial reduction in commercial mackerel landings.

4) More Flawed Data - The National Academy of Science recent MRIP review would suggest that this MRIP data needs to be reassessed and revised for it to be at all reflective of the New England fishermen's catch. A lack of dockside intercepts and/or telephone interviews necessitates flawed assumptions regarding recreational landings and distorts MRIP recreational data. We recently addressed this with regard to bluefin, which led to a second consecutive assessment and updating of models used to assess data.

5) Still More Flawed Data - It’s difficult to substantiate without empirical data but the 100% mortality assumption seems grossly inaccurate. Clearly more research is needed here but I can offer that when caught on a Sabiki and run on an 8/0 hook all day as tuna bait, mackerel remain quite healthy and alive. I find it hard to believe that being flipped off a Sabiki hook and released would result in 100% mortality.

6) Impact - The recreational, for-hire and commercial fishing communities in Maine rely heavily on mackerel for bait and as an alternative recreational fishery. We lack the variety and diversity of gamefish found in other regions like the mid-Atlantic. Striped bass are the foundation of Maine’s for-hire fleet and recreational saltwater fishery. Taking away the primary method of fishing - live mackerel as bait - could be financially devastating, and is unnecessary considering the minimal impact compared to that of the commercial fishery. Furthermore, implementing measures on New England fishermen without consideration of their input will most certainly create a loss of support and confidence in fisheries management in general, and resentment for distant council control.

I sincerely hope the MAFMC will consider taking a step back and slowing down the timeline to consider potentially flawed assumptions and the potential impact proposed measures could have on northeast fisheries.

Respectfully,

Capt. Bob Humphrey
President, Casco Bay Bluefin Bonanza
Member, Maine Association of Charterboat Captains
NOAA Fisheries Highly Migratory Species Advisory Panel
ASMFC Striped Bass Advisory Panel
727 Poland Range Road
Pownal, ME 04069
(207) 688-4966 o
(207) 831-7228 c
bob@bobhumphrey.com

May 9, 2022

Re: Mackerel rebuilding

Chris Moore, Ph.D.,
Executive Director, Mid-Atlantic Fishery Management Council,
800 North State Street, Suite 201
Dover, DE 19901
jdidden@mafmc.org

Dear Dr. Moore,

We are writing on behalf of two Canadian environmental NGOs. Both of our organizations have a focus on sustainable fisheries management and vibrant coastal livelihoods. We are members of the Atlantic Mackerel Advisory Committee and attend science and management meetings for Atlantic mackerel in Canada. Thank you for the opportunity to provide comments on the proposed U.S. amendment to rebuild Atlantic mackerel.

We have been concerned about the status of the Atlantic mackerel populations and corresponding management decisions from both Canada and the U.S. for years. According to the latest Canadian stock assessment, the northern mackerel contingent has been in Canada's "critical zone" since 2011, with spawner abundance reaching record lows in 2020. Against the backdrop of this overwhelming evidence of stock depletion, Canada reduced the Total Allowable Catch (TAC) to 4000 metric tonnes in 2021 and took the unprecedented step of closing the commercial and bait fisheries for 2022. We were encouraged that the U.S. reduced the commercial catch limit for 2022 to 4,963 metric tonnes. However, as this stock has been in decline for decades and given its critical importance as a forage fish for so many marine species, it is critical that fishing mortality be held to the lowest possible level. This should preferably be in conjunction with a closure of the commercial fishery throughout the entirety of the Atlantic mackerel stock range.

Fisheries and Oceans Canada (DFO) undertook a multi-year participatory Management Strategy Evaluation analysis which was completed in 2019. It concluded that the stock was unlikely to rebuild above our limit reference point with high probability (>75 percent) within the next 10 years if the catches—which included Canadian TAC and unaccounted-for mortalities—remained near recent levels. It is our view that DFO's 2021 Atlantic mackerel stock assessment results combined with the MSE assumptions and conclusions most closely resemble those in rebuilding alternative 1 provided by the Mid-Atlantic Fishery Management Council.

The level of fishing activity in the U.S. for Canadian-spawned Atlantic mackerel is a concern for both the future sustainability of this stock and for the future prosperity of Canadian harvesters. Canadian management decisions to encourage rebuilding could prove negligible if many of the same mackerel are still harvested when they migrate south in the winter months. U.S. scientists provided a preliminary estimate that perhaps 50 percent of mackerel caught in the U.S. winter fishery may be from Canada (the northern contingent). The U.S. has recently been establishing a TAC in their fishery that is double the recent Canadian established level (before this year's closure). It is imperative for the future health of this population and for harvesters on both sides of the border that the U.S. and Canada take commensurate action to rebuild.

We are concerned that in some of the proposed alternatives, the amount of catch that Canada is leaving in the water for rebuilding is in essence being made available to U.S. fishermen. We understand that U.S. law requires that Canadian catch be removed from the ABC. However, in the case that catches are deliberately kept low for the purpose of leaving the fish in the water, we think this is a problematic application that could hinder rebuilding.

In 2021, Canada passed a regulation pertaining to the recreational fishery. It put in place a seasonal closure (from January to March), a minimum size of 268 mm, and a bag limit of 20 fish per day per person. We support the U.S. going forward with a proposed 10 or 15 fish bag limit to mirror these efforts.

In, conclusion, we urge the Mid Atlantic Fishery Management Council to follow Canada's lead by eliminating most catch and closing the commercial fishery, as this is the fastest way to rebuild the stock and sustain thriving fisheries once again.

Sincerely,

Sebastián Pardo
Sustainable Fisheries Coordinator
Ecology Action Centre

Katie Schleit
Senior Fisheries Advisor
Oceans North

May 09, 2022

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

Re: Atlantic Mackerel Rebuilding 2.0 Amendment

Dear Dr. Moore and members of the MAFMC:

On behalf of the members of the Maine Association of Charterboat Captains [MACC], thank you for the opportunity to comment on the Mid-Atlantic Fishery Management Council [MAFMC] Atlantic Mackerel Rebuilding 2.0 Amendment.

Our members are split on aspects of our input to the MAFMC regarding next steps for mackerel management.

Not a topic of debate is the importance that mackerel play to many of our operators. They are far and away the primary and preferred live and dead bait choice for striped bass, bluefin tuna, and sharks. Here in Maine we don't have much else to target. Mackerel are also the primary target species on many "family fishing charters" and in regions of Maine where we don't have a reliable striped bass fishery and distance to tuna/shark grounds is substantial. Our members are also acutely aware of the role that mackerel play as forage for striped bass, bluefin tuna, and sharks.

Our members fall into two general categories regarding recommendations to the MAFMC that are well represented by two separate comments submitted by others.

Capt. Bob Humphrey [MACC member] submitted comments [copy attached] to the MAFMC that lays out an eloquent argument **against any of the 5 Rebuilding Alternatives** presented in the 2.0 Amendment. It includes important concerns held by many of our members regarding:

- Findings of local abundance
- Climate-driven geographic shift of stock
- Data limitations associated with stock assessment, MRIP, and release mortality
- Economic impact to our fisheries in Maine

- Limited impact to mackerel mortality by our sector
- Lack of representation from Maine on the MAFMC

Dr. Willy Goldsmith [American Saltwater Guides Association] and Greg Vespe [Rhode Island Saltwater Anglers Association] make an excellent case [comment letter attached] for **Rebuilding Alternative 4 and a 15 fish per person possession limit that** summarizes the perspective of many of our members, highlighting:

- Concern regarding disappointing findings of the 2021 Management Track Assessment
- Acknowledgement and support of the requirements of the Magnuson-Stevens Act and that all previous cuts to mackerel harvest have only affected the commercial sector
- Canadian findings challenging the assumption that mackerel have just moved north
- First time regulation of the fishery for the recreational sector is both an opportunity and a challenge, especially regarding permitting and reporting

Additional comment from another MACC member who's been active in fisheries management for a long time includes observations that:

- Mackerel science overall is inadequate
- Stock assessments and management measures should be conducted regionally not as a coastwide, international stock
- Displaced effort as a result of mackerel limits will increase harvest of river herring for bait

MACC members with disparate views on next steps have expressed common desire to treat frozen mackerel [previously caught or purchased] as separate and distinct from any daily bag or possession limit.

The 2022 National Saltwater Recreational Fisheries Summit provided an excellent forum on the need for improving recreational data collection and usage. Mackerel permitting requirements serve as the introduction to federal reporting for many inshore for-hire operators in Maine who focus on state managed striped bass. It behooves both the MAFMC and NOAA Fisheries to consider the "first impression" these regulations and outreach efforts will make on long-term acceptance of permitting/reporting requirements. Additionally, making good use of data collected through mackerel permitting/reporting will build buy-in from for-hire operators.

Going forward, you can expect good-faith participation in the mackerel management process from the Maine Association of Charterboat Captains. We're committed to continued engagement with the MAFMC, NOAA Fisheries, and Maine Department of Marine Resources. We stand ready to participate in cooperative research and support investment in advancing the science behind mackerel stock assessments and investigation into advancing better understanding of release mortality.

Thank you again for considering our input as you and the MAFMC make decisions as part of the Atlantic Mackerel Rebuilding 2.0 Amendment.

Sincerely,

Capt. Peter Fallon

President, Maine Association of Charterboat Captains
207-522-9900
pfallon@mainestipers.com

May 9, 2022

Chris Moore, Executive Director, MAFMC
Mike Luisi, Chair, MAFMC
Peter Hughes, Chair, MSB Committee
Sara Winslow, Chair, RH/S Committee
Mid-Atlantic Fishery Management Council
800 N. State St, Suite 201
Dover, DE 19901

Re: Comments on Mackerel Rebuilding Version 2: Amendment to the Mackerel, Squid, and Butterfish Fishery Management Plan: Measures to Rebuild the Atlantic Mackerel Stock Including 2023 Specifications and the River Herring and Shad (RH/S) Cap (Mackerel Rebuilding Plan Version 2)

Dear Mr. Moore, Mr. Luisi, Mr. Hughes, and Ms. Winslow:

We are writing on behalf of The Pew Charitable Trusts (Pew), Bennett Nickerson Environmental Consulting (BNEC), and Conservation Law Foundation (CLF) to provide comments on the draft Mackerel Rebuilding Plan Version 2. A healthy forage base is essential to the ocean ecosystem of the Northwest Atlantic. The Atlantic mackerel (mackerel) stock, like stocks of many other important forage species, has declined dramatically since 1970, in large part due to overfishing. Management decisions that ignored a strong retrospective pattern of low recruitment and overfishing resulted in mackerel being overfished for over 30 years[1] and a stock that, at its lowest point, had decreased to less than 10 percent of its target biomass.[2] The Mid-Atlantic Fishery Management Council's (Council) previous attempt to rebuild mackerel was based on decision-making that allowed overfishing to continue when managers should have been stewarding mackerel's rebuilding and recovery. In the Mackerel Rebuilding Plan Version 2, selecting a rebuilding plan with the greatest likelihood of success is paramount.

The Council should follow the best available science before long-term harm to the mackerel population and broader ecosystem occurs and while impacts on the fishery remain only temporary. Taking a precautionary approach to rebuilding will deliver the best chance to return this fishery to greater abundance and high value for the nation, which for fast growing species of forage fish like mackerel, can happen relatively quickly if fishing is set appropriately low. Following the best available science, the Council should select Alternative 1 for the Mackerel Rebuilding Plan Version 2, because it presumes lower, post 2009 recruitment persists throughout

[1] March 2022. MAFMC. Mackerel Rebuilding Version 2: Amendment to the Mackerel, Squid, and Butterfish Fishery Management Plan: Measures to Rebuild the Atlantic Mackerel Stock Including 2023 Specifications and the River Herring and Shad (RH/S) Cap. P. 9. (2022 Mackerel Rebuilding Plan Version 2).
[2] 2021. NOAA. Management Track Assessment for Atlantic mackerel

the rebuilding timeline and has the "highest overall probability of rebuilding."[3] The lower recruitment timeframe accurately represents the current status of the mackerel stock and should be the basis for determining how much, if any fishing should occur during rebuilding. While the Public Hearing Document deems Alternative 1 as "impractical," because under Alternative 1 directed U.S. catch would have to be brought down to essentially zero, we strongly believe this is the only viable alternative to recover this essential species of forage fish. Canada closed its fishery for 2022 and will follow the science for 2023. The Council must now make the necessary and difficult decision to close directed commercial and recreational mackerel fishing in the Exclusive Economic Zone (EEZ) to ensure the recovery of the stock. Additionally, the council should apply the P* deduction to Alternative 1 to comply with the Council's risk policy, scale the RH/S catch cap down when directed fishing resumes, and set an upper limit for the RH/S catch cap that prevents overexploitation if the mackerel stock thrives once more.

Specifically, the Council should:

- **Select Alternative 1 that presumes lower, post 2009 recruitment to calculate rebuilding Atlantic mackerel, because it represents the best available science, has the highest overall probability of recovering the stock, and essentially sets commercial and recreational directed fishing in the EEZ at zero;**
- **Apply the P* deduction to Alternative 1 to comply with the Council's risk policy;**
- **Follow the decision from the Mackerel Rebuilding Plan Version 1 and scale the RH/S catch cap to the mackerel Domestic Annual Harvest (DAH) with a lower limit of 89 mt and an upper limit of 155 mt;**
- **Implement a 10 fish bag limit for the recreational fishery; and,**
- **Require a minimum codend mesh size of 3 inches.**

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The Council should select Alternative 1 that presumes lower, post 2009 recruitment to calculate rebuilding Atlantic mackerel, because it represents the best available science, has the highest overall probability of recovering the stock, and essentially sets commercial and recreational directed fishing in the EEZ at zero

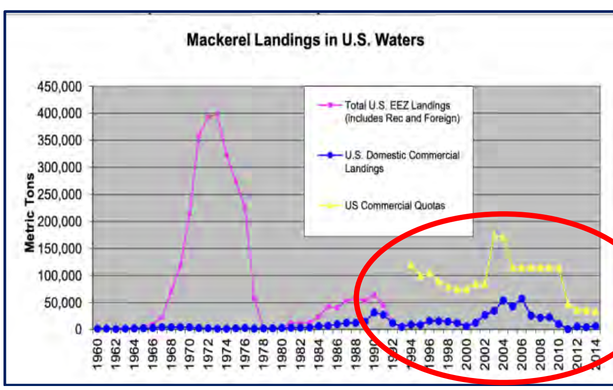
Alternative 1 is the only alternative offered in the rebuilding plan that represents the best scientific information available and presumes low recruitment when determining the rebuilding trajectory and allowable catch throughout the plan. All the other alternatives in the Public Hearing Document initially use the 2009-2019 low recruitment—the best available science—until spawning stock biomass (SSB) reaches 50 percent of the target, then they use an expanded timeframe of 1975-2019 to introduce the higher recruitment of the 1970s, 80s, 90s, and early 2000s to justify increasing catch during rebuilding. The higher recruitment levels prior to 2009 are not the best available science and have no bearing on the current status of the mackerel stock and should not be used to determine the allowable level of catch—especially when the stock is overfished and overfishing has been occurring for 30 years.[4] The two-tiered process used in alternatives 2 through 5 employ outdated recruitment data to justify increased catch levels that will undermine recovery by increasing fishing at the very moment the population is expected to

[3] 2022 Mackerel Rebuilding Plan Version 2. P. 21.
[4] 2022 Mackerel Rebuilding Plan Version 2. P. 9.

rebound. This is a demonstrated path for failure—the unsuccessful "Version 1" rebuilding plan took a similar approach, necessitating the now contemplated "Version 2"—for both the mackerel stock and the directed fishery. Instead, the Council must follow the best available science that indicates mackerel recruitment and SSB are alarmingly low and that "long-term rebuilding will be required for this stock."[5] Alternative 1 accomplishes this by essentially closing directed commercial and recreational fishing in the EEZ, which is necessary to allow for the stock to rebuild in earnest and to comply with Magnuson-Stevens Fishery Conservation and Management Act (MSA).

Background – Mackerel management and overfishing

There has always been uncertainty in management of mackerel. Prior to the 2018 Atlantic Mackerel Stock Assessment, the most recent assessment of the Atlantic mackerel stock was the Transboundary Resources Assessment Committee in 2010 (TRAC 2010) that analyzed data through 2008.[6] The results of that transboundary stock assessment were so uncertain that the TRAC agreed that "short term projections and characterization of stock status relative to estimated reference points would not be an appropriate basis for management advice."[7] The 2010 TRAC determined that assessments prior to 2010 were also unreliable and thus, until the 2018 Atlantic Mackerel Stock Assessment became available it was unknown if the stock was overfished or if overfishing was occurring.[8] Because underlying data was unreliable in guiding management, decades of management decisions were not rooted in science based determinations of how much fishing pressure the stock could sustain. Instead, Acceptable Biological Catch (ABCs) and U.S. quotas were based on average landings from previous years.[9] Specifically, for 2013, 2014, and 2015 the 80,000 mt ABC was based in landings data from 2006-2008.[10] And then for the decade from 2004-2014, there was only one year when commercial landings exceeded 50 percent of the quota. (See Figure 1) In fact: the U.S. quota has never constrained the fishery and has allowed overfishing to hammer the stock year after year.



Year	Harvest (mt) (Commercial and Recreational)	Quota (mt) (Rec+Com)	Percent of Quota Landed
2004	54,298	170,000	32%
2005	43,275	115,000	38%
2006	58,352	115,000	51%
2007	26,142	115,000	23%
2008	22,498	115,000	20%
2009	23,235	115,000	20%
2010	10,739	115,000	9%
2011	1,478	47,395	3%
2012	6,015	36,264	17%
2013	5,029	36,264	14%
2014	6,726	33,821	20%

Figure 1: *US commercial quota verses actual Mackerel landings*[11]

[5] 2022 Mackerel Rebuilding Plan Version 2. P. 3.
[6] 2010, O'Brien L, Worcester T. 2010. Proceedings of the Transboundary Resources Assessment Committee Mackerel Benchmark Assessment; 2015. Didden, J.MAFMC Mackerel AP Information Document.
[7] 2015. Didden, J. MAFMC Mackerel AP Information Document. P. 2.
[8] 2015. Didden, J. MAFMC Mackerel AP Information Document. P. 2.
[9] 2015. Didden, J. MAFMC Mackerel AP Information Document, 2014. Didden, J. MAFMC Mackerel AP Information Document., 2013. Didden, J. MAFMC Mackerel AP Information Document.
[10] 2015. Didden, J. MAFMC Mackerel AP Information Document, 2014. Didden, J. MAFMC Mackerel AP Information Document., 2013. Didden, J. MAFMC Mackerel AP Information Document.
[11] 2015 MAFMC, Mackerel AP Fishery Information Document. P. 3 and 8.

These risky management decisions continued even as precipitous declines in Spawning Stock Biomass (SSB), recruitment, and egg count were apparent. (See: Figure 3). Setting ABCs and U.S. specifications based on how mackerel was fished in previous years allowed overfishing to persist for decades, ultimately causing stock collapse and driving SSB so low that recovering the stock in 10 years will be challenging and managers are limited to only hard choices.

It is the Council's policy to manage Atlantic mackerel and all forage species with a precautionary approach when the stock is healthy, but even more importantly when the stock is in peril. The Council committed to "support the maintenance of an adequate forage base in the mid-Atlantic to ensure ecosystem productivity, structure and function and to support sustainable fishing communities."[12] Maintaining healthy forage stocks is essential for ocean ecosystem health and productivity and the economies of coastal communities along the mid-Atlantic coast. Atlantic mackerel is a key part of the forage base of the mid-Atlantic that supports the populations of many larger fish and their associated fisheries including bluefish, sharks, and tunas. A successful recovery of this species will improve more than just this species' population and its reliant fishery, it will also improve overall ecosystem health, and help support many other predator species that contribute to the ocean ecosystem and communities along the mid-Atlantic coast.

The mackerel stock is so severely depleted that its population is a mere fraction of what it was in the 1970's. Mackerel is not the only struggling forage species in the region. Atlantic herring are fished by many of the same boats as mackerel, and were declared overfished in October 2020 and entered a rebuilding plan in September 2021.[13] Butterfish are considered "below target level"[14] and 2021 specifications for butterfish reduced catch by 72 percent stating that "the 2020 butterfish management track assessment found butterfish to be not overfished with no overfishing occurring in 2019, but if the full ABC had been caught, projections suggest overfishing would have occurred and the stock would have become overfished."[15]
For all these species, more precautionary management is imperative.

What the Council should learn from the failed Atlantic Mackerel Rebuilding Version 1

After decades of setting specifications based on previous landings and allowing systemic overfishing that resulted in considerable decline in SSB, the mackerel stock reached a low point in 2012-2014 at around 8-9 percent of the biomass target.[16] The 2018 stock assessment declared that the mackerel stock was overfished and overfishing was occurring in 2016.[17] In response to the overfished and overfishing determination, the Council embarked on a mackerel rebuilding plan as required by the MSA. That plan went into effect November 2019. It set out a five-year rebuilding timeline that relied on an overly optimistic forecast of recruitment from the 2015 year

[12] 2022 Mackerel Rebuilding Plan Version 2. P. 15.
[13] Sept. 2021, NEFMC. Atlantic Herring: Council Approves Stock Rebuilding Plan and Adjustments to Accountability Measures in Framework 9.
[14] NOAA Species directory. Butterfish.
[15] Fisheries of the Northeastern United States; Atlantic Mackerel, Squid, and Butterfish Fisheries; Specifications.
86 Fed. Reg. 38586, 38587.
[16] July 13, 2021. Didden, J. Memorandum to C. Moore. Mackerel Rebuilding Modification/Re-assessment and Potential Emergency Action; SSC Meeting.
[17] 2018. Northeast Fisheries Science Center. 64th Northeast Regional Stock Assessment Workshop: Assessment Summary Report. Atlantic Mackerel Assessment Summary for 2017.

class, and predicted SSB would reach 162,796 mt in 2019.[18] The subsequent Management Track Assessment (MTA) demonstrated that the anticipated recruitment from the 2015 year class never materialized and determined that in fact SSB was only 42,862 mt in 2019, less than 25 percent of the rebuilding target.[19] The lack of a precautionary approach and resulting discrepancy resulted in the stock being overfished with overfishing occurring in every year of the plan,[20] leading to the plan's inevitable failure to rebuild the mackerel stock.

The first mackerel rebuilding plan failed because overly optimistic projections of recruitment guided catch levels for 2019, 2020, and 2021 that allowed overfishing to continue, preventing recovery of the stock. Mackerel catch in these years was significantly below the rebuilding quota, following the same pattern of overoptimistically setting catch and overfishing the stock.[21] The Council is poised to repeat this same mistake. In the Mackerel Rebuilding Plan Version 2, Alternatives 2-5 follow a similar, fatal logic. The two-tiered approach to the recruitment data implies a shift in recruitment that is neither supported by the science or data.[22] The persistent low recruitment in Alternative 1 represents the reality of the situation and has a slow but steady and reliable increase in SSB that recovers the mackerel stock in 10 years.[23] By contrast, the two-tiered approach used in Alternatives 2-5 brings considerable uncertainty in the probability that the stock will recover as projected, if at all. (See Figure 2).

The SSC outlined several other risks inherent in the two-tiered recruitment alternatives. These risks include: the possibility that the stock will not recover without lowing fishing mortality as proposed in Alternative 1; a concern that the shift to the expanded recruitment timeframe is triggered by a SSB threshold, which presumes a relationship between SSB and recruitment when this relationship is unknown for mackerel, and for which there is limited analytical support, and thus is potentially inaccurate; recruitment of mackerel has typically come in pulses and the SSB trigger that allows for increased catch may undermine the pulse of recruitment or be ill timed in relation to it; and the lack of a precedent in this approach makes determining its potential for success challenging. Knowing these concerns, the two-tiered approach is too uncertain and could potentially jeopardize rebuilding (again) and undermine the future of not just the directed fishery, but also the functionality of the northwest Atlantic marine ecosystem.

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[18] 2022 Mackerel Rebuilding Plan Version 2. P. 10.
[19] 2022 Mackerel Rebuilding Plan Version 2. P. 10.
[20] 2021. NOAA. Management Track Assessment for Atlantic mackerel.
[21] 2022. MAFMC, Atlantic Mackerel Fishery Information Document (Showing 2021 quota and landings); 2021. MAFMC. Atlantic Mackerel Fishery Information Document. (Showing 2020 quota and landings); 2020. MAFMC. Atlantic Mackerel Fishery Information Document. (Showing 2019 quota and landings).
[22] 2022 Mackerel Rebuilding Plan Version 2. P. 18.
[23] Staff projections of SSB for the 5 Alternatives in Mackerel Rebuilding Plan V2 as presented to the Science and Statistical Committee at the March 15-16, 2022 meeting.

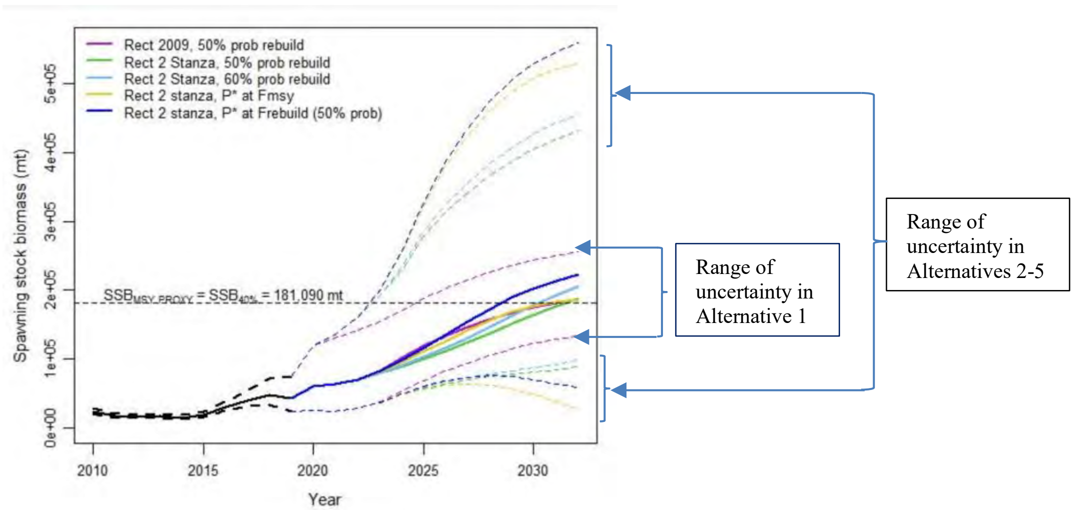

Figure 2: *Mackerel SSB rebuilding projections for all alternatives. For Alternative 1 (bright pink) the range of uncertainty and risk of not rebuilding is lowest*

<u>Low recruitment represents the true situation of mackerel stock and rebuilding specifications should be based on the low 2009-2019 recruitment levels</u>

Mackerel recruitment has been low since 2003. The cause of the reduced recruitment is unknown, but it is likely a combination of environmental conditions and reduced SSB. Regardless of cause, the dramatic and continued downward trend of mackerel SSB and its recruitment from 1960 to the present is undeniable.[24] Conversely, fishing has increased over this time period, creating a clear picture that decades of fishing pressure and overfishing coincide directly with the decline and ultimate collapse of the mackerel stock.

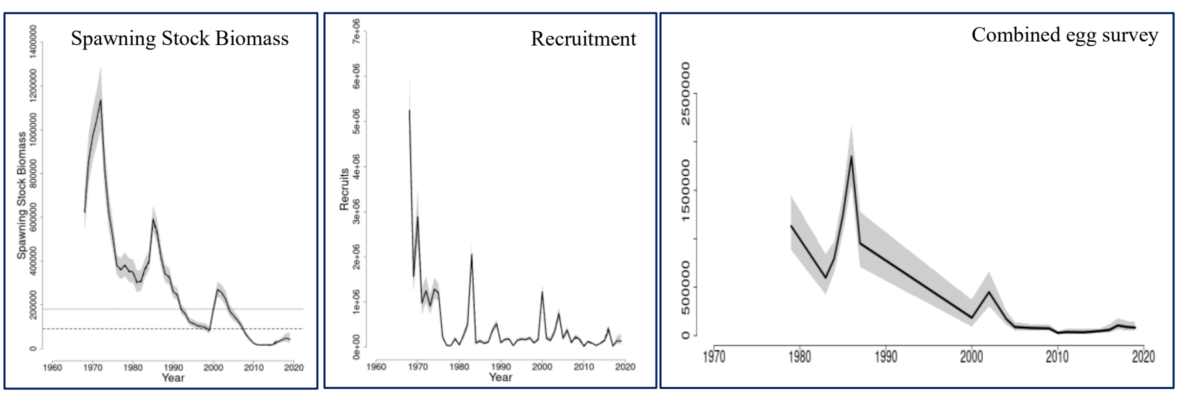

Figure 3: *Precipitous declines in Atlantic mackerel spawning stock biomass, recruits, and egg count as shown in the 2021 Management Track Assessment*[25]

[24] 2022 Mackerel Rebuilding Plan Version 2. P. 12.
[25] 2021. NOAA. Management Track Assessment for Atlantic mackerel

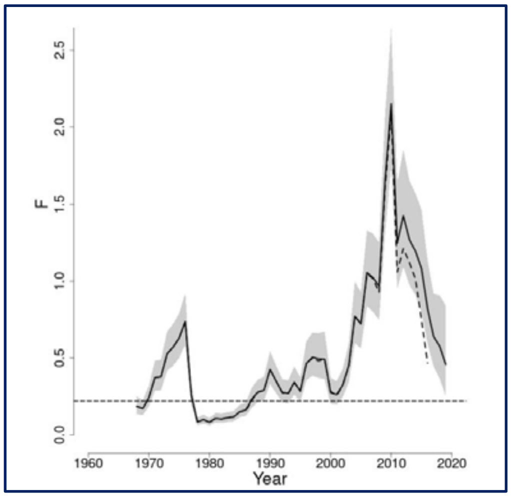

Figure 4: *2021 Northwest Atlantic Mackerel Management Track Assessment Report of fishing mortality[26], also found in Atlantic mackerel rebuilding plan Version 2[27]*

These graphs viewed together provide a clear picture of the impact overfishing has had on the mackerel stock. The health of mackerel in 1970 has no value in determining the ABC for mackerel in 2023, particularly in a revised rebuilding plan. However, these 1970 to present graphs demonstrate two things: 1) continuing the current management trend of setting ABCs based on previous catch levels and overly optimistic stock projections will only exacerbate the downward trend in SSB and recruitment that has been occurring since the mid-1970s; and, 2) if you initially remove and then limit fishing pressure, the stock can recover its historical vitality.

There have been four major recruitment events since 1976. Each of these recruitment events were followed by a spike in SSB, which never materialized into an enduring biomass increase, because fishing was increased shortly after increases in SSB. (See Figure 4). Alternatives 2-5 expand the recruitment timeframe as soon as SSB reaches the 50 percent rebuilt mark, following the historical pattern to allow for an increase in fishing as soon as the stock is beginning to recover—this lack of precautionary management is ultimately preventing enduring increases in SSB and the recovery of mackerel.

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[26] 2021. NOAA. Management Track Assessment for Atlantic mackerel
[27] 2022 Mackerel Rebuilding Plan Version 2. P. 11 and 12.

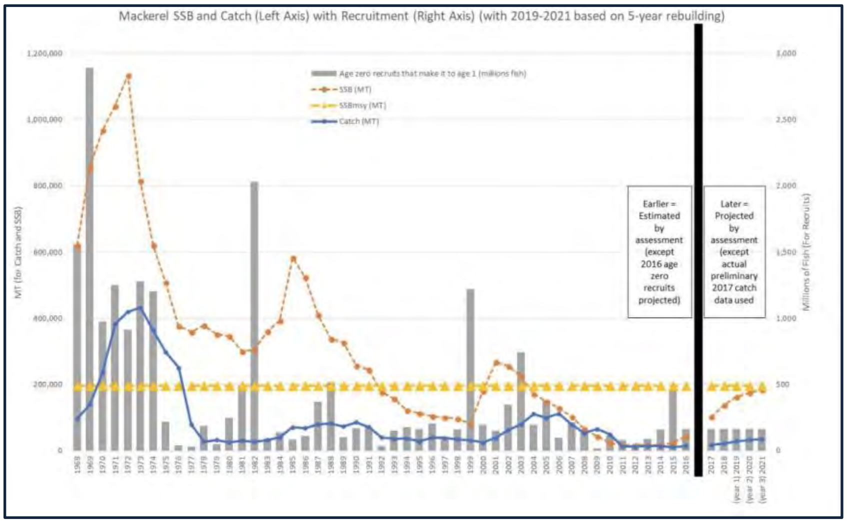

Figure 4: *Mackerel SSB and catch, including 2019-2021 rebuilding projections under the initial 5-year rebuilding plan*

<u>Canada cut catch by 50 percent last year, and has now closed their 2022 fishery</u>

Mackerel is a transboundary stock, which complicates management, because the mackerel ABC must be divided between the U.S. and Canada and there needs to be coordination as both countries make management decisions. Canada has determined that the mackerel stock has dropped below allowable levels and is implementing its own rebuilding plan. In doing so, Canada determined that none of their harvest control rules would result in the stock recovering to sustainable levels. As a result, Canada closed their directed commercial fishery for 2022, and determined that allowing directed commercial fishing would result in continued stock decline. While the recreational fishery remains open, Canada continues to apply a daily recreational limit that was instituted for the first time in 2021. Canada has a pending stock assessment that is projected for release in early 2023. While we cannot predict the future, we expect Canada to significantly limit future catch to enable rebuilding of the stock as the best available science demands. The U.S. should adopt similar policies and close its directed commercial and recreational fishing in the EEZ for 2023 to allow for recovery of the stock.

Apply the P* deduction to Alternative 1 to comply with the Council's risk policy

The Council's risk policy was adopted to address precisely the situation where a stock is overfished or overfishing is occurring. Additionally, the policy was designed to ensure the Council makes consistent and precautionary management decisions when faced with variable uncertainty. The risk policy was developed by the Council through a public process with input across resource stakeholders and was finalized in 2019. As it pertains to this rebuilding plan, the Council's risk policy has a sliding scale of acceptable probability of overfishing for a species with a typical life history. Specifically, healthy stocks are managed at a set risk of overfishing, while lower stock sizes trigger a lower probability of overfishing that decreases as the stock becomes more imperiled. Because the mackerel stock is only projected to be 32 percent rebuilt in 2023, the first year of the rebuilding plan, the risk policy would require an 85.5 percent confidence in avoiding overfishing (or only a 14.5 percent chance of overfishing) in 2023.[28] In this instance, given the huge volume of fish that can be taken in just one tow from the vessels participating in this fishery, the only way to reach that level of confidence would be to simply close the commercial and recreational fishery for 2023 in the EEZ. Even then, because this stock has been managed into its current, overfished/overfishing situation, it is possible that incidental catch and state recreational catch would cause overfishing.

Despite the recently updated risk policy, the Council allowed a "temporary adjustment" to the risk policy in the first, and failed, mackerel rebuilding plan. They chose to adjust the risk policy to implement the preferred alternative that allowed for higher catch and a longer rebuilding timeframe that ultimately resulted in overfishing throughout the rebuilding plan. The Atlantic Mackerel Rebuilding Plan Version 2 should not make a habit of adjusting the Council's risk policy to justify higher catch rates.

The Council should adjust Alternative 1 and apply the P* deduction to comply with the risk policy and set directed catch at zero for 2023. It is possible that when you apply the P* deduction to F at 0.01, the rebuilding timeframe will extend beyond 10 years. This highlights the hard truth that when you use the best available science and apply the appropriate risk of overfishing, this stock is so depleted that it's possible that it cannot be rebuilt in 10 years, even if directed fishing is closed in the EEZ. The MSA creates an exception to the 10-year mandate if "the biology of the stock of the fish…dictate[s] otherwise."[29] That is precisely the situation at hand. The Council should select Alternative 1, apply the P* deduction to comply with the risk policy, and close directed fishing in the EEZ.

The Council should follow its decision in Mackerel Rebuilding Plan 1.0 and scale the RH/S catch cap to the mackerel DAH with a lower limit of 89 mt and an upper limit of 155 mt

RH/S are important forage fish that tie our oceans and rivers systems together through their annual migrations. The best available science says that coastwide, RH/S stocks remain at or near historic low population levels, with some individual river systems on the verge of collapse. This is particularly true regarding the distinct population segment of blueback herring in the mid-Atlantic and southern New England that are being caught in the mackerel and Atlantic herring fisheries. Although the Council's original stated intent was to replace the RH/S cap with a biologically based limit, the Council has not done that, and the current level is *still* not based on the biology of RH/S or the needs of their many predators. The RH/S catch cap remains based solely on the directed catch of mackerel.

The original intent of the RH/S catch cap in the mackerel fishery (even one based in the allowable catch of mackerel) was to create a strong incentive to avoid catching RH/S and decreasing the catch of these species over time so that the RH/S population has an opportunity to recover. The status quo cap of 129 mt will not accomplish this.

[28] 2022 Mackerel Rebuilding Plan Version 2. P. 16.
[29] Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. § 304(e)(4)(A)(ii).

First, if rebuilding Alternative 1 is selected, a closure of the directed fishing will be necessary in 2023 and possibly for the foreseeable near future. In that instance, the RH/S cap would also be zero as the cap does not apply to incidental catch. Second, the Council should implement the 0.89 ratio of cap to catch on all mackerel trips with a floor of 89 mt and a cap of 155 mt. If allowable catch for mackerel is 10,000 mt or less, the RH/S cap should be 89 mt. If the mackerel catch is higher than 10,000 mt than the RH/S cap should be scaled up at 0.89 ratio of cap to catch, but not to exceed 155 mt. Additionally, when the mackerel U.S. commercial quota is over 10,000 mt the RH/S cap should start out low at 89 mt, and then when 10,000 mt of mackerel is landed, the RH/S cap scale up using the 0.89 ratio, but again not to exceed 155 mt. This slow start is to maintain a strong incentive to avoid RH/S bycatch early in the season and avoid a closure of the mackerel fishery that would prevent the mackerel fishery from realizing its full mackerel catch. If the 89 mt RH/S cap is reached before 10,000 MT of mackerel had been landed, the mackerel fishery would close. Additionally, if the scaled RH/S cap is reached before mackerel catch is realized, the fishery would close.

Implement a 10 fish bag limit for the recreational fishery

Regulation of the recreational mackerel fishery historically has been limited or absent, and there are currently no recreational management measures in place. While it remains unclear how much the recreational fishery contributed to the decline of the stock, with the future of mackerel in the northwest Atlantic in peril, it is appropriate to look across sectors for conservation gains. In the emergency rule issued this year 2,582 mt was set aside for recreational catch. This number was generated by calculating average catch from 2017 to 2021.[30] Again, this catch allocation was determined by how hard mackerel were fished from 2017 – 2021, not by the level of fishing mortality the stock can handle. In general, recreational catch of mackerel has been relatively low. However, in recent years including the three initial years of Mackerel Rebuilding Plan 1.0 recreational catch was a higher percentage of overall catch, making regulations for recreational catch an important and appropriate part of Mackerel Rebuilding Plan Version 2. Alternative 1 of the rebuilding plan would close all directed fishing in the EEZ, both commercial and recreational, in the near-term. Once mackerel recovers and allowing directed fishing is scientifically feasible, the Council should require a 10 fish bag limit for recreational fishing in the EEZ and encourage the states to follow suit in their waters.

Require a minimum codend mesh of 3 inches

We support the Council's inclusion of a 3-inch minimum mesh requirement that mirrors a similar requirement in the butterfish fishery for trawl vessels possessing more than 5,000 pounds (2.27 mt) of mackerel harvested in or from the EEZ. Selectivity in catch of forage species is important. Increased mesh size would allow for smaller and undersized mackerel to escape giving more individual fish the opportunity to contribute to the SSB, recruitment, and ultimately the recovery of the Atlantic mackerel stock.

[30] 2022 Mackerel Rebuilding Plan Version 2. P. 14.

Conclusion

The Council faces a crucial decision with the Mackerel Rebuilding Plan Version 2. The closure of directed commercial and recreational is never an easy choice to make. Allowing management to follow the historic pattern of relying on unsupported recruitment projections inconsistent with the best scientific information available will produce the same result: overfished with overfishing that has been the status quo for decades. The mackerel stock is estimated at less than one fourth of the rebuilding target. Other important forage species like Atlantic herring and butterfish are also struggling despite policy commitments from the Councils. The impacts of a weakened forage base reverberate through the entire ocean ecosystem as well as the fisheries and communities that depend on marine resources. To recover this ecologically important species, directed fishing must cease in the near term to allow for stock recovery. We urge the Council to adopt a rebuilding plan for Atlantic mackerel that will immediately end overfishing and has the highest overall probability of rebuilding this important forage stock to a healthy abundance.

Pew, BNEC and CLF appreciate the opportunity to comment on this action. Thank you for considering these comments in your deliberations and we look forward to the Council's final decision.

Sincerely,

Zack Greenberg

Zack Greenberg
Officer, Conserving Marine Life in the U.S. Project
The Pew Charitable Trusts

K. Purcie Bennett-Nickerson
Executive Director and Staff Attorney
Bennett Nickerson Environmental Consulting

Erica Fuller
Senior Attorney
Conservation Law Foundation

39 Industrial Park Road, Unit C
Plymouth, MA 02360
www.stellwagenbank.org

April 29, 2022

Christopher M. Moore, Ph.D.
Executive Director
Mid-Atlantic Fishery Management Council
800 N. State St, Suite 201
Dover, DE 19901

RE: Mackerel Rebuilding

Dear Dr. Moore:

On behalf of the Stellwagen Bank Charter Boat Association (SBCBA) whose membership includes the for hire fleet, recreational anglers and commercial fisherman that fish the state and federal waters off the coast of Massachusetts, we offer the following comments to the Atlantic Mackerel Stock Status and Rebuilding measures:

- The observations of the recreational and commercial fisherman in state and federal waters from Maine to south of Massachusetts is that there has been no lack of mackerel, from small to large, in these waters in the past several years.
- No doubt, due to increased temperatures, the stock has shifted farther north and/or east. Fewer mackerel landings in the Mid-Atlantic may well be due to stock relocation to cooler waters rather than poor stock status. Northerly shifting stock would be consistent with the movement of multiple other examples of species.
- As a result of lack of mackerel in the MidAtlantic waters a separate bag limit is recommended at the approximate 41 degrees latitude line where there fishery is dominated by sand eels with fewer mackerel found over the past several years and as one proceeds north the mackerel population significantly increases especially north of Cape Cod. A liberal bag limit north of latitude 41 degrees would be reflective of the significant biomass and shifting stock and as a result the reliance and use of such by the recreational, for hire and commercial fleet.
- On the surface most support a 15 fish per person bag limit for use of mackerel as bait to target for example striped bass and bluefin tuna. This does not accommodate those from the for hire fleet that

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	catch and keep live bait in bait pen at the dock for use of upcoming trips during the week. As a result a separate for hire or possession bag limit is recommended for the for hire fleet. We also question the 100% mortality assumption that based on our observations is significantly less and more in the range of 15%. • The present bag limit does not reflect the use of mackerel as chum. There is an accommodation in one has a receipt for a "flat of mackerel" on the boat that we assume would exceed the 15 fish bag limit if using as chum. This does not reflect the fact that many anglers catch and use mackerel as bait on trip and/or freeze them for use later on a trip. As a result there needs to be an accommodation for use of such by anglers. • The SBCBA recommends that the NMFS as well as each state detail and educate the public of the state and/or federal permitting and reporting requirements if fishing in state or federal waters or both when recreational, for hire or commercial fishing. Such is confusing and the SBCBA continues to reach out to its membership to educate and inform them of such requirements. • Since the commercial herring quota has been significantly reduced, fewer mackerel is being caught. This has contributed to a significant reduction in commercial mackerel landings. This is the likely main source of the 184% increase in the stock biomass since 2014. • Continued flawed MRIP results regarding recreational landings, distorts MRIP recreational data. The National Academy of Science recent MRIP review would suggest that this MRIP data needs to be reassessed and revised for it to be at all reflective of the New England fishermen' experience. • As set forth above, the recreational and commercial community rely on mackerel for live line or fresh bait to catch striped bass, bluefin tuna and many other species. Many also rely on a day of fishing, especially with kids, catching mackerel when few other species are available. • There are also those that catch and eat mackerel from a segment of the population that are not economically well off that will no longer have opportunity to feed their families and they will no longer book trips on for hire vessels with a 15 fish bag limit. We know that recreational landings are a drop in the bucket in comparison to the commercial landings. However, with current flawed MRIP landing data, even this reality does not appear evident.

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- The current means and methods associated with the spring and fall trawl survey to effectively land mackerel is questionable and as a result, NMFS also relies on egg larvae surveys with the combination of both surveys to assess the status of the stock. There is lack of egg larvae surveys in state waters that is not capturing the biomass and/or our observations of the tremendous biomass of mackerel of all sizes near or off shore in our waters. The survey limitations and ongoing fall and spring survey locations in combination with a shifting stock and changes in the location and timing of where the mackerel are currently found negatively impacts the results not capturing the actual biomass in US and Canadian waters.
- As a result the SBCBA recommends that the for hire fleet that presently is required to record landings, releases and details of each trip via eVTRs be part of the process. We encourage the NMFS to identify the details needed to assist in the stock assessments via eVTRs concerning the timing, location, egg bearing mackerel observed during each trip, etc. We have observed the change in timing, spatial distribution and extent of mackerel in our waters over many years now especially in state waters that is not reflected in the stock assessment.
- Unquestionably, there is no lack of mackerel in state and federal waters from ME to Massachusetts. Implementing measures on New England fishermen without consideration of their input will most certainly create a loss of support and confidence in fisheries management in general and resentment for distant Council control.
- Future stock assessments should consider alternatives that are less reliant on MRIP data such as the use of the Harvest Control Rule or Management Strategy Evaluation to assess stock status.
- Future recreational measures, if any, need to equitably establish the historically low recreational catch in relation to the commercial catch. Restricted access to mackerel for use as bait will dangerously compound the economic impact of future recreational reductions to seasons and bag limits.

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Plymouth, MA 02360
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If you have any questions or comments please email or give me a call.

Very truly yours,

Capt. Mike Pierdinock

Capt. Mike Pierdinock
SBCBA, President
sbcbamp@gmail.com

Capt. Timothy Brady

Capt. Timothy Brady
SBCBA, Vice President
tbrady@maritime.edu

Capt. John Bunar

Capt. John Bunar
SBCBA, Board of Directors
jbironskippy@gmail.com

Capt Mike Delzingo

Capt. Mike Delzingo
SBCBA, Board of Directors
ff_boston@yahoo.com

Capt. Tom Depersia

Capt. Tom Depersia
SBCBA, Trustee
hugetuna@aol.com

Capt. Peter Murphy

Capt. Peter Murphy
SBCBA, Trustee
l-ocharters@comcast.net

Cc: Tom Nies, NEFMC
Michael Pentony, GARFO
Russell Dunn, NMFS
Randy Blankinship, HMS
Dan McKiernan, MassDMF
Ron Amidon, MassF&G
Barry Gibson, RFA

• Blue Planet Strategies • Great Egg Harbor Watershed Association
• National Audubon Society • Riverkeeper • Theodore Roosevelt Conservation Partnership
• Wild Oceans

May 9, 2022

Dr. Chris Moore, Executive Director
Mid-Atlantic Fishery Management Council
Suite 201, 800 North State St.
Dover, DE 19901

RE: Atlantic Mackerel Rebuilding Amendment

Dear Dr. Moore,

We, the undersigned organizations, appreciate the opportunity to provide input on Mackerel Rebuilding Version 2: Amendment to the Mackerel, Squid, and Butterfish Fishery Management Plan (MSB FMP). There are a number of worrisome findings in the 2021 Management Track Assessment, which assessed both the northern and southern spawning contingents as a single stock: 1) Atlantic mackerel are overfished at just 24% of their target biomass; 2) overfishing has been occurring for the last 30 years; 3) recruitment has been below the median since 2008, with 2017 recruitment being the lowest in the record; 4) age truncation in the stock is apparent; 4) projections in the last assessment overestimated stock size by a factor of four; and, 5) rebuilding by 2023, the original rebuilding date set in the 2019 Atlantic Mackerel Rebuilding Framework, was not possible.[1]

Because of the poor condition of the mackerel stock, new rebuilding plan alternatives follow a 10-year timeframe, the maximum rebuilding period allowed under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Recruitment assumptions on which the alternatives are based are critical to rebuilding success.[2] Given the significant error in the projections from the 2018 benchmark assessment, future management track assessments, scheduled for 2023 and 2025, will be critical for measuring rebuilding progress. Revisions to this rebuilding plan would be warranted if adequate progress is not being made.[3]

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[1] Northeast Fisheries Science Center. 2021. Atlantic Mackerel Management Track Assessment. Available at https://apps-nefsc.fisheries.noaa.gov/saw/sasi/sasi_report_options.php.

[2] Two recruitment regimes are identified, low recruitment (2009-2019) and long-term "normal" recruitment (1975-2019) on which management reference points are based. Alternative 1 considers persistent low recruitment through the 10-year rebuilding period, and Alternatives 2-5 assume low recruitment (2009-2019 period) unless spawning stock biomass is above 50% of the target. Then 1975-2019 recruitments are used.

[3] 50 C.F.R. § 600.310(j)(3)(iv)

Taking into consideration the MSA rebuilding requirements, the shared nature of the Atlantic mackerel resource with Canada, and the importance of mackerel, river herring and shad in the Northeast Shelf Marine Ecosystem forage base, we support the following options:

- **<u>Atlantic Mackerel Rebuilding Alternative 3:</u>** This rebuilding alternative, recommended by the Council's Scientific and Statistical Committee (SSC)[4] uses the existing Council risk policy, the P* approach with the maximum fishing mortality threshold (MFMT) equal to the F_{MSY} proxy. This risk policy, originally adopted in 2011 and modified in 2020, safeguards stocks that have reached an overfished condition by reducing the risk of overfishing as biomass declines. Under this rebuilding plan for 2023 specifications, an 85.5% probability of not overfishing would be required, calling for near-zero U.S. commercial landings (i.e., the commercial Atlantic mackerel fishery would close). The stock is projected to be rebuilt by 2031.

  <u>Rebuilding Measures</u>

  - **10-fish Bag Limit for the Recreational Sector**. Recreational mackerel fishing has not been regulated to date because recreational catch historically accounted for a small portion of the overall quota. Because an estimated 90% of recreational harvest occurs in state waters, collaboration to develop complementary regulations in the states of Maine, New Hampshire and Massachusetts, where the bulk of recreational fishing occurs, are necessary for this measure to be effective.[5]

  - **3-inch Minimum Mesh Size for the Directed Trawl Fishery.** There are currently no minimum mesh size regulations for the mackerel trawl fishery. A codend mesh size of 3 inches allows for the escapement of juvenile mackerel so they can grow and contribute to the spawning stock biomass. Implementing mesh size requirements to improve size selectivity in trawl fisheries is a proven management tool.[6]

  - **No-action / Status Quo for River Herring and Shad (RH/S) Cap**. Under this option, if 2023 specifications allow for directed commercial fishing, the river herring and shad cap would be scaled to the quota using a median of annual RH/S catch to all retained catch ratios on mackerel trips from 2005-2012 (base years used as a reference period when the cap was first implemented with the purpose of reducing bycatch). This method was designed to create "a strong incentive for the fleet to avoid RH/S, allows for the possibility of the full mackerel quota to be caught if the fleet can avoid

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[4] In recommending Alternative 3, the SSC noted, "This alternative, (1) fulfills rebuilding plan requirements; (2) is the most responsive to new information on changes in stock status; (3) produces the highest rebuilding plan 10-year catch yield; (4) is fully consistent with the Council's P* risk policy; and (5) would avoid "break points" in catch limit advice, which would reduce year-to-year changes in the ABC."

[5] Memorandum from Jason Didden to Dr. Chris Moore. July 13, 2021. *Mackerel Rebuilding Modification/Re-assessment and Potential Emergency Action; SSC Meeting.*

[6] Taylor, N., Clarke, L.J., Alliji, K., Barrett, C., McIntyre, R., Smith, R.K., and Sutherland, W.J. (2021) *Marine Fish Conservation: Global Evidence for the Effects of Selected Interventions.* Synopses of Conservation Evidence Series. University of Cambridge, Cambridge, UK.

RH/S, and should reduce RH/S catches over time, compared to what would occur without a cap, given recent data."[7]

Atlantic Mackerel as a Shared Resource with Canada

The U.S. stock assessment findings are consistent with the 2020 assessment conducted by Fisheries and Oceans Canada (DFO), which concluded that the northern contingent has been in the Critical Zone[8] since 2011, age structure has collapsed because of overfishing, and recruitment has been near all-time lows in recent years.[9] In response, Canada closed its directed commercial fishery for 2022 and has implemented minimum size and bag limits for its recreational sector.[10] Canada's rebuilding plan flags potential U.S. catch levels as a threat to the recovery of the northern contingent and the future sustainability of the stock.[11] Scientific studies estimate that as much as 50 percent of mackerel caught in the U.S. winter fishery may be from the northern contingent.[12] Most troubling is that the U.S. specifications process for Atlantic mackerel allows for reductions in Canadian quota to be added to U.S. quota because one Acceptable Biological Catch (ABC) level is specified by the Mid-Atlantic Council's SSC for this shared resource. Alternative 3 best aligns with Canada's rebuilding strategy because it would close directed commercial fishing in 2023 while allowing for incidental catch and restricted recreational fishing.

Compliance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA)

The MSA is clear regarding requirements to rebuild an overfished stock:

> For a fishery that is overfished, any fishery management plan, amendment, or proposed regulations prepared…for such fishery shall specify a time period for rebuilding the fishery that shall be *as short as possible*, taking into account the status and biology of any overfished stocks of fish, the needs of fishing communities, recommendations by international organizations in which the United States participates, and *the interaction of the overfished stock of fish within the marine ecosystem;* and not exceed 10 years,

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[7] Memorandum from Jason Didden to the Mid-Atlantic Fishery Management Council. July 23, 2019. *Updated Annual River Herring and Shad (RH/S) Progress and Cap Review including Mackerel, Squid, and Butterfish (MSB) Monitoring Committee Input.*

[8] A stock in the "critical zone" has fallen below the limit reference point, triggering a rebuilding plan according to the DFO's Precautionary Approach Framework.

[9] DFO. 2021. Assessment of the Northern Contingent of Atlantic Mackerel (*Scomber scombrus*) in 2020. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2021/029. Available at https://publications.gc.ca/site/eng/9.901360/publication.html

[10] Canada, Fisheries and Oceans. "Rebuilding Key Forage Fish Stocks for Healthier East Coast Fisheries." *Canada.ca*, Government of Canada, 30 Mar. 2022, https://www.canada.ca/en/fisheries-oceans/news/2022/03/rebuilding-key-forage-fish-stocks-for-healthier-east-coast-fisheries.html

[11] Government of Canada, Fisheries and Oceans Canada. "Rebuilding plan for Atlantic mackerel – NAFO Subareas 3 and 4." Government of Canada, Fisheries and Oceans Canada, Communications Branch, 10 July 2020, https://www.dfo-mpo.gc.ca/fisheries-peches/ifmp-gmp/mackerel-atl-maquereau/mac-atl-maq-2020-eng.html

[12] Arai, K., M. Castonguay, and D. H. Secor. 2021. Multi-decadal trends in contingent mixing of Atlantic mackerel (*Scomber scombrus*) in the Northwest Atlantic from otolith stable isotopes. Sci Rep 11, 6667 (2021). Available at https://doi.org/10.1038/s41598-021-86116-2

except in cases where the biology of the stock of fish, other environmental conditions, or management measures under an international agreement in which the United States participates dictate otherwise.

16 U.S.C. § 1854 (e)(4)(A) (emphasis added). Because of Atlantic mackerel's prominent role in the food web as prey for a wide array of predators, including tuna, striped bass, swordfish, sharks, seabirds, seals, pilot whales and dolphins,[13] interactions within the marine ecosystem are considerable, and must be taken into account. All rebuilding alternatives are based on a 10-year rebuilding timeline following SSC advice that long-term rebuilding is required given the current state of the stock.

Compared with Alternatives 4 and 5, which are based on a constant fishing mortality rate strategy, Alternative 3 leaves more mackerel in the water at the onset of rebuilding, allowing fishing mortality to increase with biomass, and best accounts for mackerel's importance to dependent predators. Alternative 3 also produces the highest levels of catch over the 10-year time period, taking into account the needs of the fishing community as the law requires.

Maintaining the Scaled River Herring and Shad Incidental Catch Cap

We are advocating for a directed mackerel fishery closure in 2023 (Alternative 3). The catch cap does not apply to incidental catches of mackerel (40,000 lb. limit). However, if Alternative 4 or Alternative 5 is chosen by the Council, then a river herring/shad cap becomes an important component of 2023 specifications. **We strongly oppose maintaining the current cap of 129 MT for 2023 (a cap scaled for a commercial quota of 17,371 MT) when commercial quota options under Alternatives 4 and 5 range from 1,002 to 4,864 MT.**

A bycatch cap is only effective if it creates incentive for fishery participants to avoid reaching the cap limit. For this reason, the Mid-Atlantic Council chose to scale the bycatch cap to the quota by applying a median of the values generated using the annual RH/S catch to all retained catch ratios on mackerel trips during 2005-2012 (base years used as a reference period). The higher ratios of RH/S catch to mackerel catch that result from applying the 129 MT cap to the possible range of 2023 commercial quotas under Alternative 4 and Alternative 5 essentially eliminate the incentive to avoid river herring and shad and do not have a scientific basis tied to the purpose of reducing bycatch.

There is no evidence that Mid-Atlantic and Southern New England shad and river herring populations are in a state of recovery. The 2017 river herring stock assessment update concluded that while there were positive signs of recovery in some river systems, river herring populations remain depleted at near historic lows on a coastwide basis.[14] American shad are

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[13] Studholme A. L., Packer D. B., Berrien P. L., Johnson D. L., Zetlin C. A., Morse W. W. 1999. Essential Fish Habitat Source Document: Atlantic Mackerel, *Scomber Scombrus*, Life History and Habitat Characteristics. NOAA Technical Memorandum NMFS-NE-141. Available at https://repository.library.noaa.gov/view/noaa/3138

[14] ASMFC (Atlantic States Marine Fisheries Commission), 2017. River Herring Stock Assessment Update, Volume 1, August 2017.

not faring any better. The 2020 benchmark assessment found that American shad are highly depressed from historical levels and do not appear to be recovering.[15]

Incidental catch of river herring and shad continues to be a significant contributor to fishing mortality. Since the mackerel fishery cap was implemented in 2014, total river herring/shad extrapolated catch increased by nearly 300 mt (from 178 to 480 MT in 2018).[16] Other measures that have afforded river herring and shad some protection from bycatch, the SMAST Bycatch Avoidance Program and the Atlantic Herring Amendment 8 Buffer Zone, are no longer in effect,[17, 18] making the bycatch caps in the Atlantic Herring and Atlantic Mackerel fisheries the only measures in place in federal waters to protect river herring and shad from incidental catch.

If a static cap is desired because a scaled cap is not possible under low quotas as purported in the Public Hearing Document, it must still meet the original purpose of reducing bycatch as stated in Amendment 14 to the MSB FMP.[19] The median actual extrapolated river herring and shad catch from the Amendment 14 baseline years (2005-2012) is 89 MT, a value that was part of the RH/S cap measures in 2015.[20] The cap should be set no higher, and ideally lower, than this value for quotas under 10,000 MT.

We are at an important crossroads in Atlantic mackerel management, with climate change impacts adding uncertainty about the future of the stock and whether it can indeed build to withstand the high quotas of the past.[21] We urge the Mid-Atlantic Council to prioritize the health of the Atlantic mackerel resource and its role in the ecosystem as it moves ahead with the rebuilding plan. We support the Mid-Atlantic Council's forage fish policy "to support the maintenance of an adequate forage base in the Mid-Atlantic to ensure ecosystem productivity, structure and function and to support sustainable fishing communities,"[22] and call on the

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[15] ASMFC (Atlantic States Marine Fisheries Commission), 2020. American Shad Benchmark Stock Assessment and Peer Review Report, August 2020.

[16] *See* Note 7, the 2019 Annual RH/S Progress and Cap Review, Table 7.

[17] School for Marine Science and Technology (SMAST). "Bycatch Avoidance Programs." UMass Dartmouth, https://www.umassd.edu/smast/bycatch/

[18] NOAA Fisheries. "Court Order Vacates the Inshore Midwater Trawl Restricted Area." NOAA, https://www.fisheries.noaa.gov/bulletin/court-order-vacates-inshore-midwater-trawl-restricted-area

[19] MAFMC. 2013. Amendment 14 to the Atlantic Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP) Final Environmental Impact Statement.

[20] In 2015, a cap of 155 MT was set for a mackerel quota of 20,872 MT. The Council included a provision to start the cap at 89 MT until 10,000 MT of mackerel were landed, so there was still strong incentive to avoid RH/S catches even at the low levels of mackerel catch.

[21] Suitable Atlantic mackerel larval habitat in the Northeast U.S. Shelf has changed over the last 40 years with the Mid-Atlantic Bight becoming less suitable over time. [McManus, Michael Conor, "Atlantic Mackerel (*Scomber scombrus*) Population and Habitat Trends in the Northwest Atlantic" (2017). *Open Access Dissertations*. Paper 664. Available at https://digitalcommons.uri.edu/oa_diss/664]

[22] MAFMC. 2016. Mid-Atlantic Fishery Management Council Ecosystem Approach to Fisheries Management (EAFM) Guidance Document. Available at http://www.mafmc.org/s/EAFM_Guidance-Doc_2017-02-07.pdf

Council to act on this policy by selecting rebuilding plan options that best conserve Atlantic mackerel, river herring and shad populations.

Sincerely,

Pam Lyons Gromen
Executive Director
Wild Oceans

R. Zack Klyver
Science Director
Blue Planet Strategies, LLC

Fred Akers
River Administrator
Great Egg Harbor Watershed Association

Remy Moncrieffe
Policy Manager, Marine Conservation
National Audubon Society

George Jackman, PhD
Senior Habitat Restoration Manager
Riverkeeper, Inc.

Chris Macaluso
Center for Marine Fisheries Director
Theodore Roosevelt Conservation Partnership

Mackerel Rebuilding Version 2

Amendment to the

MACKEREL, SQUID, AND BUTTERFISH

FISHERY MANAGEMENT PLAN

Measures to Rebuild the Atlantic Mackerel Stock, Including 2023 Specifications and the River Herring and Shad (RH/S) Cap

Public Hearing Document

Prepared by the

Mid-Atlantic Fishery Management Council (Council) in collaboration with the

National Marine Fisheries Service (NMFS)

Council Address

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

NMFS Address

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

Overview – Atlantic Mackerel Rebuilding Version 2

For details and commenting opportunities see https://www.mafmc.org/actions/atlantic-mackerel-rebuilding-amendment. Hearings are April 25, 2022 to May, 2, 2022. Comments are due May 9, 2022. Contact: Jason Didden – jdidden@mafmc.org – 302-397-1131.

PURPOSE: The 2021 peer-reviewed stock assessment found that Atlantic mackerel was still overfished and that overfishing was still occurring. In response, the Council is considering a new rebuilding plan for Atlantic mackerel.

This action contains five rebuilding alternatives (see table), all of which have been endorsed by the Council's Scientific and Statistical Committee (SSC) as being consistent with the best available science. This action will also set specifications for 2023.

Recruitment Assumptions	Rebuilding Alternative	10-Yr Rebuilding Probability
Poor recruitment for all 10 years	**ALTERNATIVE 1:** Eliminate most catch to rebuild as much as possible in 10 years.	57%
Recruitment starts low (similar to 2009+) and then increases toward long term (1975+) typical recruitment	**ALTERNATIVE 2:** Use a risk buffer from a fishing mortality rate of 0.14. Results in negligible U.S. total catch (commercial or recreational) for several years.	62%
	ALTERNATIVE 3: Use standard Council risk policy. Initially requires near zero U.S. commercial landings until 2025 (may increase discards) but accounts for Canadian catch and U.S. recreational catch.	52%
	ALTERNATIVE 4: Use a fishing mortality rate of 0.12. Depending on set asides for Canadian catch and U.S. recreational catch, could allow for about 1,000-3,600 metric tons (MT) of U.S. commercial landings initially (slow increase predicted).	61%
	ALTERNATIVE 5: Use a fishing mortality rate of 0.14. Depending on set asides for Canadian catch and U.S. recreational catch, could allow for about 2,300-4,900 MT of U.S. commercial landings initially (slow increase predicted).	53%

MEASURES: The action proposes closures and trip limits to hold the commercial fishery near the target catches. The action considers a 3-inch minimum mesh for directed trawling. The action would also set a 2023 river herring and shad cap for the commercial fishery. The action will clarify whether any possession of Atlantic mackerel in federal waters (beyond 3 miles and including bait) by commercial or for-hire vessels triggers federal permitting and electronic vessel trip report (VTR) requirements. Recreational bag/possession limits of 10 or 15 fish are possible, which might decrease recreational catch by 10%-30%.

1.0 EXECUTIVE SUMMARY AND TABLE OF CONTENTS

This action considers measures to rebuild the Atlantic mackerel ("mackerel" refers to Atlantic mackerel hereafter in this document) stock with an Amendment to the Mackerel, Squid, and Butterfish Fishery Management Plan (MSB FMP). This action includes 2023 mackerel specifications and related management measures, including the mackerel fishery's river herring and shad (RH/S) cap. This action was originally going to set 2023-2024 specifications, but now proposes to only set 2023 specifications given a new Mackerel Management Track Assessment (MTA) is expected in 2023. If the assessment or subsequent specifications were delayed, then the 2023 specifications would roll-over into 2024 until new specifications were published. The MSB Monitoring Committee recommended this approach given the high degree of uncertainty that would have been involved in setting 2024 specifications based on 2019 data and then five years of projections. Setting 2024 specifications now would suggest too much stability for 2023/2024 (the initial rebuilding plan projections, which spanned only 3 years, were off by about a **factor of four**).

The purpose of this action is to rebuild the mackerel stock with appropriate measures so that Optimum Yield (OY) can be achieved on an ongoing basis. The action is needed because the recent 2021 Mackerel Management Track Assessment (MTA) found the mackerel stock to still be overfished, with overfishing still occurring through 2019 (NEFSC 2021). The 2021 Mackerel MTA determined that when implemented (11/29/2019), the original rebuilding plan (MAFMC 2019) was already out of date and did not provide a realistic rebuilding approach. The stock is estimated to have nearly tripled in size from 2014 to 2019 (from about 8% to 24% of rebuilt), but fully rebuilding on the original schedule (by 2023) appears impossible – the stock is now expected to be less than half rebuilt by 2023. This action incorporates the 2021 Mackerel MTA findings to continue rebuilding the mackerel stock.

Because none of the preferred alternatives are anticipated to be associated with significant impacts to the biological, social, economic, or physical environment, an Environmental Assessment (EA) documenting a "Finding of No Significant Impact" (FONSI) is planned, but this plan could change based on public comments or other analyses.

Summary of the Alternatives

The alternatives are based on rebuilding plans that all have at least a 50% chance of rebuilding mackerel within ten years, which is the maximum time typically allowed under the Magnuson–Stevens Fishery Conservation and Management Act (MSA). The alternatives focus on the probability of rebuilding by 2032 (ten years) due to the Scientific and Statistical Committee's (SSC) July 2021 Meeting advice that "Preliminary rebuilding scenarios indicate long-term rebuilding will be required for this stock" and that higher rebuilding probabilities "are associated with shorter rebuilding time and greater catch stability" (MAFMC SSC 2021). Final rebuilding scenarios did not differ substantially from the preliminary analyses (MAFMC SSC 2022). Additional management measures are paired with each rebuilding plan.

Summary of Impacts

Target Species Impact Summary

The alternatives should allow the mackerel stock to rebuild within 10 years. Changes in mackerel fishing should not impact other FMP species due to low catch of those species in the mackerel fishery, and separate management measures control catch of those species. While Atlantic herring and mackerel are often caught together, separate management measures in the Atlantic herring fishery should ensure that overfishing does not occur on the Atlantic herring stock.

Non-Target Species Impact Summary

Non-target interactions are relatively low in the mackerel fishery, and all of the action alternatives would reduce catch from the status quo, thereby limiting effort. The RH/S cap should continue to limit interactions between the mackerel fishery and RH/S, which have been the primary non-target species of concern for the mackerel fishery.

Habitat Impact Summary

All of the alternatives would reduce catch from the status quo thereby limiting effort, so no additional negative habitat impacts would be expected.

Protected Resources Impact Summary

All of the alternatives would reduce catch from the status quo, thereby limiting effort, so no additional negative protected resource impacts would be expected.

Human Communities Impact Summary

Human communities may have negative impacts in the short term due to lower catches/revenues from mackerel during the beginning of the rebuilding period, but in the long term rebuilding should lead to higher catches/revenues.

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2.0 LIST OF COMMON ACRONYMS AND ABBREVIATIONS

ABC	**Acceptable Biological Catch**
ACL	**Annual Catch Limit**
ACT	**Annual Catch Target**
ASMFC	**Atlantic States Marine Fisheries Commission or Commission**
B	**Biomass**
CFR	**Code of Federal Regulations**
CPH	**Confirmation of Permit History**
CV	**coefficient of variation**
DAH	**Domestic Annual Harvest**
DAP	**Domestic Annual Processing**
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**
FMAT	**Fishery Management Action Team**
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**
MSB	**Atlantic Mackerel, Squid, Butterfish**
MSY	**Maximum Sustainable Yield**
MT (or mt)	**Metric Tons (1 mt equals about 2,204.62 pounds)**
NE	**Northeast**
NEFMC	**New England Fishery Management Council**
NEFSC	**Northeast Fisheries Science Center**
NEPA	**National Environmental Policy Act**
NMFS	**National Marine Fisheries Service (NOAA Fisheries)**
NOAA	**National Oceanic and Atmospheric Administration**
OFL	**Overfishing Level**
OY	**Optimum Yield**
PBR	**Potential Biological Removal**
SNE	**Southern New England**
SSB	**Spawning Stock Biomass**
SSC	**Scientific and Statistical Committee**
U.S.	**United States**
VTR	**Vessel Trip Report**

Notes: "Mackerel" refers to "Atlantic mackerel" unless otherwise noted. Likewise “herring” alone refers to Atlantic herring.

3.0 LISTS OF TABLES, AND FIGURES

3.1 List of Tables

3.2 List of Figures

4.0 INTRODUCTION, BACKGROUND, AND PROCESS

4.1 Introduction and Background

Section 4.1 reviews several critical background topics including the 2021 Mackerel Management Track Assessment (MTA), the 2021 Canadian Mackerel Assessment, Current Management and Recent Catches, Rules on Rebuilding, the Council's Ecosystem Approach to Fisheries Management (EAFM), and the Council's P* Risk Policy.

<u>The 2021 Mackerel Management Track Assessment (MTA) (NEFSC 2021)</u>

Reference Points

"F" refers to fishing mortality, i.e. the rate at which fish die from fishing, expressed as the portion of the stock dying within a small amount of time. The rebuilding goal is based on F40% as the proxy for FMSY (MSY = "maximum sustainable yield") and was estimated to be F = 0.24[1], (dashed line in Figure 1) down from 0.26 in the previous mackerel assessment. Mackerel stock productivity has apparently declined. F40% was selected as a proxy for FMSY due to consistency with the Canadian reference point and ability to prevent stock collapse for stocks with similar life histories. F40% produces 40% of the "spawning stock biomass (SSB) per recruit" (equivalent to lifetime egg production) relative to that produced by an unfished stock. F in 2019 was estimated to be 0.46[2], so overfishing was occurring in 2019 and has been for 30 years (but 2019 was the lowest F in 15 years – see Figure 1). Past assessments (which used different methods and data) appear to have been overly optimistic about the stock's productivity, and too many fish were caught over a long period of time. The rebuilding biomass target is the SSB associated with the FMSY proxy or "SSBmsyproxy," and is estimated to be 181,090 MT. The 2019 spawning stock biomass (SSB) was estimated to be 42,862 metric tons (MT), or 24% of the SSB target so mackerel is "overfished" (below 50% of the target – see Figure 2). Once rebuilt, the MSYproxy (i.e. the proxy for maximum sustainable yield) is estimated to be 34,103 MT (total catch, U.S. plus Canada), which is lower than estimated in the previous assessment, reflecting the apparent reduced productivity of the stock.

[1] F = 0.24 equates to removing about 1/5 of the stock in a given year.
[2] F = 0.46 equates to removing slightly over 1/3 of the stock in a given year.

Projection Performance

Based on the recent 2021 Mackerel Management Track Assessment (MTA) (NEFSC 2021), the mackerel stock (measured by Spawning Stock Biomass - "SSB") will not rebuild as quickly as previously projected. The 2021 MTA found the mackerel stock to be overfished, with overfishing occurring through 2019 (NEFSC 2021) (see Figures 1 and 2 next pages). While the stock is estimated to have nearly tripled in size from 2014 to 2019 (from about 8% to 24% of rebuilt), rebuilding on the original schedule (by 2023) appears impossible – the stock is now expected to be less than half rebuilt by 2023. In addition, while both the 2018 and 2021 assessments concluded the stock reached a low point around 2011-2014 before starting to recover, the current assessment found that the stock was about 10% smaller at the low point. In the terminal year of the previous assessment (2016 – NEFSC 2018) the stock, while still recovering, is now estimated to have been 29% smaller in 2016 than originally estimated for that same year. While nearly all of the data in the 2021 assessment (data through 2019) represents the time period before the initial rebuilding plan took effect, the current assessment indicates we started rebuilding in 2019 at a stock size about 74% lower than anticipated (just 42,862 MT estimated in 2019 vs 162,796 MT projected). While not completely understood, factors contributing to this over-projection for 2019 include:

-starting from a lower low point in 2014 (retrospective pattern apparent but not strong enough to adjust for).
-summed 2014-2018 recruitment was 24% lower than anticipated (2017 year class lowest in time series).
-overfishing persisted.
-decreased maturity-at-age and SSB weight-at-age for some ages.

The scale of error observed in the previous three-year projection (2016 to 2019) provides some perspective for the four-year projection required to now set specifications for 2023 as the first year of the new rebuilding plan. This was part of the reason why the MSB Monitoring Committee recommended setting only a one year specification at this time, until the 2023 Mackerel MTA can be used to set 2024 specifications. The 2023 Mackerel MTA should include data through 2022, requiring only a two year projection for 2024 (2022 to 2024), versus the five-year projection that would be required to set 2024 specifications now (i.e. 2019 to 2024). While the lower recruitment inputs now being used in short term projections should help avoid as large of an over-projection, any potential improvement in projections will not be known until mid-2023 when then the 2023 Mackerel MTA is completed.

If 2022 catch happens to be lower than projected (e.g. due to recent Canadian closure), we could be slightly ahead of our final rebuilding projections, but given the general uncertainty and low stock size, lower 2022 catches are not expected to drastically change the rebuilding trajectories.

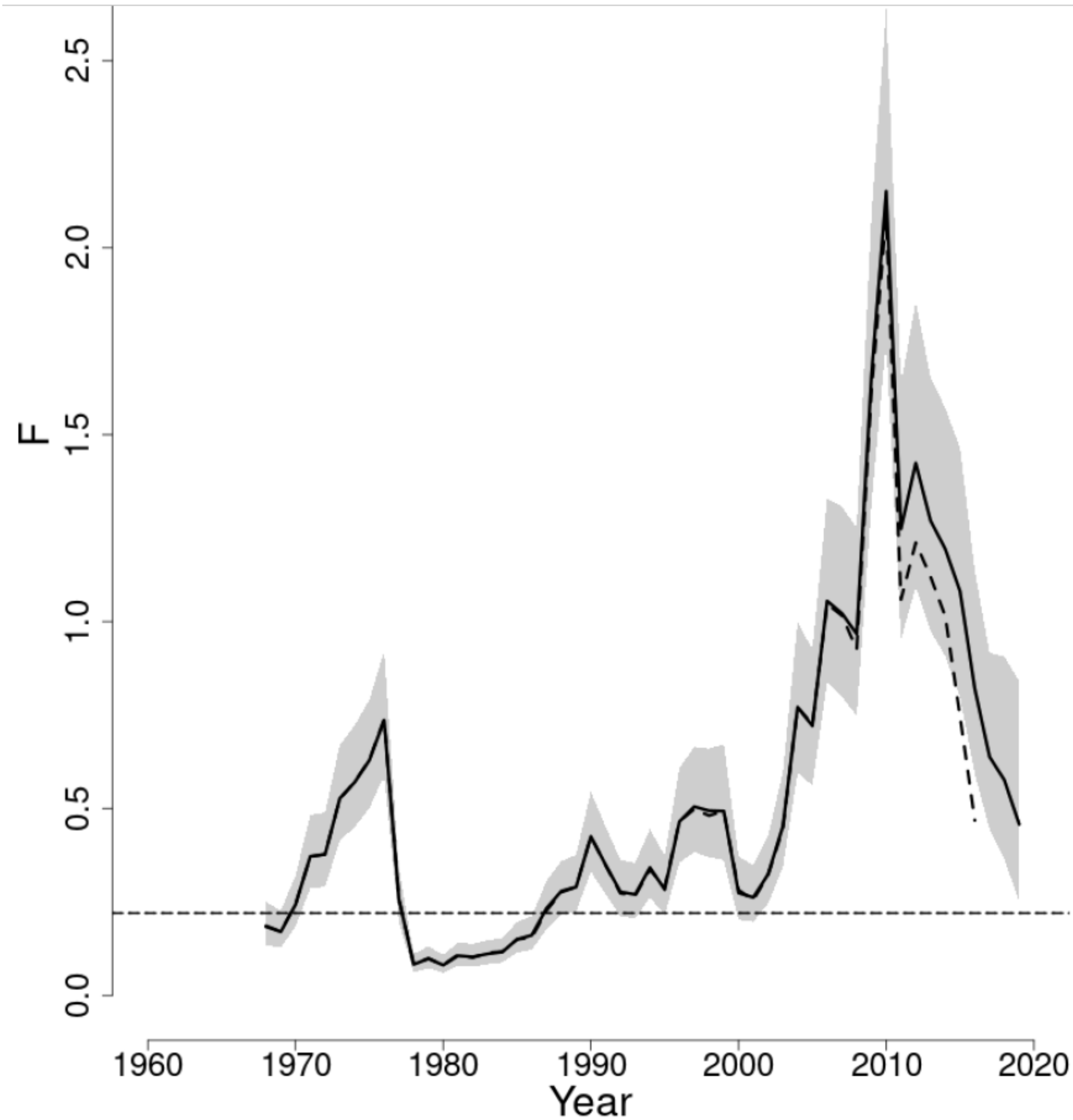

Figure 1. Trends in the fully selected fishing mortality (F) of northwest Atlantic mackerel between 1968 and 2019 from the current (solid line) and previous (dashed line) assessment and the corresponding FThreshold (FMSY proxy=0.22; horizontal dashed line). The approximate 90% lognormal confidence intervals are shown.

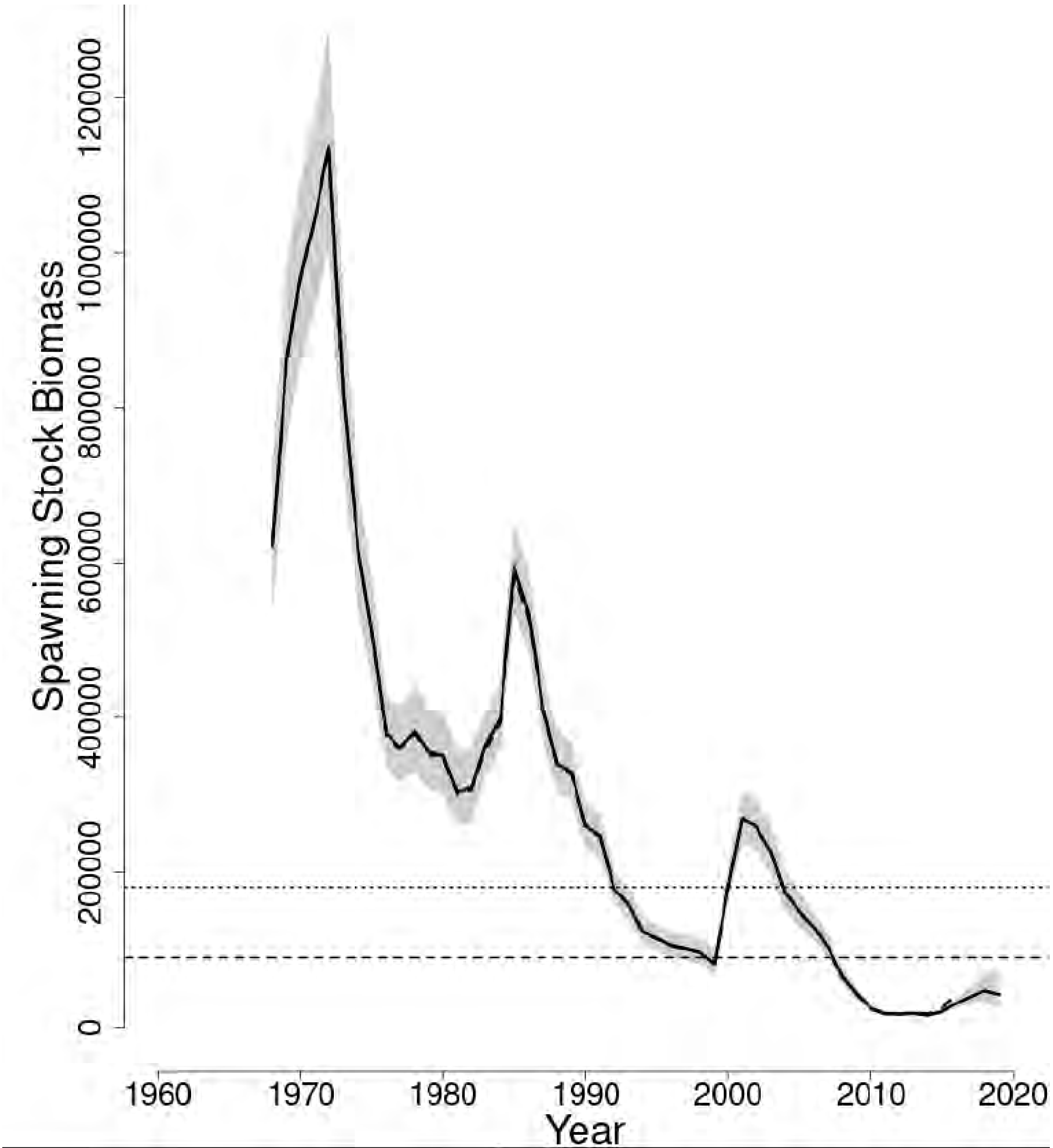

Figure 2. Trends in spawning stock biomass (MT) of northwest Atlantic mackerel between 1968 and 2019 from the 2021 MTA (solid line) and previous (dashed line, mostly the same) assessment and the corresponding SSBThreshold (1/2 SSBMSY proxy; horizontal dashed line) as well as SSBTarget (SSBMSY proxy; higher horizontal dotted line). The approximate 90% lognormal confidence intervals are shown.

The 2021 Canadian Mackerel Assessment and Recent Canadian Quotas

The Canadian stock assessment only assesses the northern mackerel contingent, unlike the stock-wide U.S. assessment. Excerpting from their summary and assessment:

- 2017-2020 Canadian landings occurred primarily in the Gulf of Saint Lawrence and off the northeast coast of Newfoundland.
- Recent genetic analyses confirmed previous studies that the Northwest Atlantic mackerel stock is distinct from the Northeast Atlantic (European) stock. These analyses also supported the previously established distinction between the northern and southern spawning contingents of our Northwest Atlantic stock. Genetic results showed some mixing of southern contingent mackerel in Canadian waters as well as northern contingent mackerel in U.S. waters.
- A fine-scale analysis of recruitment variability showed recruitment benefits from a spatial-temporal match between mackerel larvae and their preferred food as well as optimal population structure and dynamics (maternal condition, SSB, age-structure).
- The annual egg survey did not occur in 2020 due to restrictions incurred by Covid. The stock assessment model was still run (without a 2020 data point for the egg survey) to estimate stock status.
- The last notable recruitment event was in 2015. There has been no sign of any notable recruitment event in recent years. There are currently very few fish older than 5 years old (<1%) - The age structure of the population in 2020 was relatively evenly spread among individuals between 1 and 5 years, old with no single dominant cohort (the 2015 cohort represented about 7% of the SSB in 2020).
- The estimated fully selected exploitation rate (fish aged 5-10+) in 2020 was 74%, above the reference level of 51% (F40%). The fishery was concentrated on fish aged 2-5 (exploitation rate of 56%).
- The SSB in 2020 was the lowest ever estimated (58% of the Limit Reference Point - LRP). and has been in or near the Critical Zone for over 10 years. Rebuilding the stock will also require rebuilding the age structure of the stock which has been eroded by overexploitation.

The 2021 Canadian mackerel quota was set at 4,000 MT – landings at this level were estimated to have between a 2 in 3 chance and a 3 in 4 chance of facilitating at least some stock growth from 2021 to 2023. 2021 Canadian landings (preliminary) were 4,395 MT. Canada closed its fishery for 2022 so may have minimal landings in 2022. If Canada keeps its fishery closed for 2022 and 2023, their stock assessment indicates they have about a coin flip's chance (i.e. 50-50) of reaching at least 40% of their biomass target. With a 2023 Canadian assessment pending, 2023 Canadian landings are still challenging to predict. This action explores two options for deducting Canadian landings in 2023: Deducting their 2021 landings (4,395 MT) or half that amount (2,197 MT).

Current Management and Recent Catches

The commercial mackerel fishery is currently managed with an annual quota, in-season proactive accountability measures, and reactive accountability measures requiring paybacks if catches exceed the Annual Catch Limit (ACL). Canadian landings, U.S. recreational catch, and U.S. commercial discards are deducted off the total Acceptable Biological Catch (ABC) to derive the commercial quota. There are currently no recreational management measures. In 2022, based on an emergency rule by NMFS, total catch is expected to be 12,055 MT or less, with 4,395 MT deducted for assumed Canadian landings, 2,582 MT deducted for assumed recreational catch (the 2017-2021 average), and 115 MT deducted for assumed commercial discards (recent average). This leaves 4,963 MT for a commercial quota. When 90% of the quota is projected to be landed, trip limits of 40,000 pounds are implemented for Tier 1-3 directed permits and 5,000 pounds for incidental/open access permits[3]. When 100% of the quota is projected to be landed, a 5,000 pound trip limit is implemented for all permits for the rest of the fishing year to cover remaining incidental catches. The emergency rule will expire in early January 2023, at which point the previous specifications, with a much higher quota, would apply (see Alternatives Section below for details).

The 2022 emergency measures described above were designed to mirror 2021 catches while a new rebuilding plan is developed, but some differences exist due to projection approaches. 2021 catches are estimated to have been 12,220 MT, including 4,395 MT Canadian landings, 2,222 MT recreational catch, 127 MT commercial discards, and 5,476 MT commercial landings. See Section 6 for additional fishery descriptive information.

The mackerel fishery also operates under a river herring and shad catch cap (RH/S), which closes the directed mackerel fishery and implements a 20,000 pound trip limit for all permits once 129 MT of RH/S has been projected to be caught in the directed mackerel fishery. 129 MT was the amount of RH/S if the ratio of cap to all catch on mackerel trips (accounting for mostly Atlantic herring) was about 0.53% and the mackerel quota was 17,371 MT (or 0.74% applied to just the mackerel quota). Given the challenges with monitoring a very small cap, including potentially closing the fishery based on a few observed trips, the Council has kept the cap at 129 MT at the current lower mackerel quotas. This action proposes to either scale the RH/S cap with the mackerel quota or keep the RH/S cap at 129 MT if the mackerel quota is below 17,371 MT.

[3] When the fishery starts each year, the various commercial mackerel permit categories start with different trip limits. Tier 1 has an unlimited trip limit, Tier 2 has a 135,000 pound trip limit, and Tier 3 has a 100,000 pound trip limit.

Rules on Rebuilding

Section 304(e)(4) of the Magnuson–Stevens Fishery Conservation and Management Act (MSA) states:

> "For a fishery that is overfished, any fishery management plan, amendment, or proposed regulations…shall…specify a time period for rebuilding the fishery that shall--
>
> (i) be as short as possible, taking into account the status and biology of any overfished stocks of fish, the needs of fishing communities,…and the interaction of the overfished stock of fish within the marine ecosystem; and
>
> (ii) not exceed 10 years, except in cases where the biology of the stock of fish, other environmental conditions…dictate otherwise;
>
> …allocate both overfishing restrictions and recovery benefits fairly and equitably among sectors of the fishery…"

The Council's SSC advised the Council that "Preliminary rebuilding scenarios indicate long-term rebuilding will be required for this stock" and that higher rebuilding probabilities "are associated with shorter rebuilding time and greater catch stability." (MAFMC SSC 2021)

All options currently under consideration are projected to rebuild mackerel in 10 or less years so (ii) is addressed. Recreational catches have been relatively low in this fishery historically, but will be a higher percentage of total catch especially in the early part of the new rebuilding timeline, which is why recreational measures are being considered in this action.

The primary rebuilding considerations are to rebuild in a time period as short as possible, taking into account 1) the status and biology of any overfished stocks, 2) the needs of fishing communities, and 3) the interaction of mackerel within the marine ecosystem. Information on the status and biology of mackerel and interactions within the marine ecosystem (e.g. predation) is provided in Section 6.1.

Council's Ecosystem Approach to Fisheries Management (EAFM)

The alternatives in this document seek to rebuild mackerel to the SSBmsyproxy as defined in the recent mackerel MTA, i.e. to 181,090 MT of spawning stock biomass (SSB). The Council's Ecosystem Approach to Fisheries Management (EAFM) Guidance Document (https://www.mafmc.org/eafm) states "It shall be the policy of the Council to support the maintenance of an adequate forage base in the Mid-Atlantic to ensure ecosystem productivity, structure and function and to support sustainable fishing communities" and "the Council could adopt biological reference points (overfishing levels or OFL) for forage stocks that are more conservative than the required MSA standard of FMSY." Acknowledging that the science to evaluate the biological and socioeconomic tradeoffs of more precautionary management is lacking, the Council has adopted a policy that it would promote data collection and development of analyses to get to the point where the Council could evaluate the relevant tradeoffs and "establish an optimal forage fish harvest policy."

Views vary on the precaution inherent in using the recommended F40% as a proxy for FMSY (and for the resulting SSBmsyproxy target). Clark 1993, Mace 1994, Gabriel and Mace 1999, and Legault and Brooks 2013 generally recommended F40% for typical stocks. Clark 2002 notes that for typical stocks, fishing at F40% would be expected to result in a target biomass that is 20%-35% of an unfished biomass. Pikitch et al 2012 recommended more conservative approaches for forage species to support predators, and this has spawned ongoing debate (e.g. Hilborn et al 2017 to the contrary). The Council's P* risk policy, by reducing catch to account for scientific uncertainty, should lead to biomass being maintained above the reference point target in the long run.

While not a complete picture of forage, the 2021 State of the Ecosystem reports for New England and the Mid-Atlantic indicate that for the Planktivore group that includes mackerel, long term (30-year) trends in the Mid-Atlantic Bight, Georges Bank, and Gulf of Maine are all either steady or increasing for both the Spring and Fall survey aggregate biomasses[4] (NEFSC 2022a, NEFSC 2022b). The 2018 mackerel assessment examined predator consumption and determined that the presence of mackerel in fish stomachs collected during the NEFSC bottom trawl surveys was generally low from 1973-2016, with spiny dogfish being responsible for 67% of all mackerel as prey occurrences in the NEFSC Food Habits Database. Mackerel were found in only 1% of sampled spiny dogfish however. Additional potentially important predators of mackerel are <u>not</u> sampled in the NEFSC trawl surveys, including highly migratory species, marine mammals, and seabirds. For the 17 analyzed mackerel predators from the NEFSC Food Habits Database, while mackerel did not appear to be an important contribution to their diet, there was a marked decline in consumption from 2000-2016, the terminal year of that analysis, matching the trend in mackerel abundance for that time period. The 2021 Mackerel MTA found that from 2014 to 2019 mackerel biomass had nearly tripled, so substantially more mackerel should already be available as forage by 2019. The mackerel assessment uses a constant natural mortality rate, so as mackerel biomass grows, more predation on mackerel is assumed to occur.

<u>Council's P* Risk Policy</u>

The Council's standard risk policy states that the Scientific and Statistical Committee (SSC) should provide Acceptable Biological Catches (ABCs) that are the lesser of rebuilding ABCs or standard risk policy (P*) ABCs. The P* risk policy requires higher confidence that overfishing will be avoided when biomass is lower, which results in lower catches. At the projected 2023 biomass, because it would only be 32% of rebuilt, the Council's risk policy requires an 85.5% confidence in avoiding overfishing in 2023. For a stock 100% rebuild, the P* risk policy requires a 55% chance of avoiding overfishing. Some alternatives being considered by the Council would

[4] Planktivore Group includes Atlantic mackerel, butterfish, Atlantic herring, alewife, American shad, blackbelly rosefsh, blueback herring, cusk, longhorn sculpin, lumpfsh, menhaden, northern sand lance, northern searobin, and unclassified sculpin.

result in a 2023 rebuilding catch higher than what would be the standard P*-adjusted ABC. In these cases, the alternatives note this fact, and represent a temporary adjustment of the Council's standard risk policy that apply to this particular decision – future decisions would need to re-evaluate any diversion from the Council's standard P* approach (Alternative 3 uses the current, unmodified P* risk policy). The risk policy adjustment would only apply to this instance of initiating rebuilding for mackerel to consider the effects of different rebuilding timelines and would not apply to management decisions regarding future ABCs once the stock is rebuilt.

General SSC Input (MAFMC SSC 2022)

Mackerel recruitment has been low in recent years and various assessments have debated the underlying causes. Environmental conditions may be resulting in low recruitment. Alternatively low recruitment may be due to reduced spawning stock biomass. If stock size is low due to long-term environmental conditions, then severe reductions in ABC are required to achieve the rebuilding target. Alternatively, if stock size is responsible, then increases in recruitment could occur in response to lower rates of fishing.

Owing to the varying starting conditions and random effects of time varying recruitment, the population trajectories under the rebuilding scenarios result in a broad distribution of values. Measures of central tendency (i.e., median) were used to describe the expected rebuild times, the probability of rebuilding by 2032 and the expected catch trajectories. It was noted that not all of the realizations would successfully rebuild, even under the most aggressive reductions in fishing mortality.

The SSC reviewed all alternatives and recommended the P* approach with the maximum fishing mortality threshold (MFMT) equal to the Fmsy proxy (Alternative 3). This alternative, (1) fulfills rebuilding plan requirements; (2) is the most responsive to new information on changes in stock status; (3) produces the highest rebuilding plan 10-year catch yield); (4) is fully consistent with the Council's P* risk policy; and (5) would avoid "break points" in catch limit advice, which would reduce year-to-year changes in the ABC.

Risks and scientific uncertainties pertain to the two classes of alternatives: Alternative 1, which considers projections on the basis of only recent recruitment (2009+) and the remainder (Alternatives 2-5) that use the recent recruitment period under the condition of SSB<0.5 SSBMSY, and use the entire recruitment series (1975+) when SSB≥0.5 SSBMSY (Alternatives 2-5). See details on the next page.

Alternative 1 - Risks:

• ABC/Catch levels are quite low indicating risk of a depleted industry and foregone catch once SSB recovers.
• At low to nil catch levels, fishery-dependent data will become unavailable to support stock assessment.
• High discard potential if recruitment recovers under low catch

Alternative 1 - Scientific Uncertainties:

• Predictions of which recruitment regime exists is highly uncertain owing to lack of understanding on how recruitment is controlled (i.e., role of SSB, the environment, and the food web).
• Recreational catch/unreported removals may exceed low ABCs under this Alternative; knowledge about catch will needs to become more precise at low ABCs.

Alternatives 2-5 - Risks:

• Stock may not recover without the low F specified in Alternative 1.
• The SSB trigger implies a sudden change in recruitment state, which is not supported by current understanding of what drives recruitment
• The two recruitment stanza approach applies uses an SSB trigger for which there is limited analytical support (SSC Chairman's September 22, 2021 Report to MAFMC)
• An immediate shift towards a higher recruitment regime is assumed at SSB≥0.5 SSBMSY, whereas an unknown lag may occur between increased SSB and recruitment.
• Because a stock-recruitment relationship is unknown for this stock, it is uncertain whether SSB changes will be driven by increased recruitment or vice versa. This approach implies a S-R relationship, which may be arbitrary given that it has not been parameterized in the assessment
• The approach of shifting recruitment regimes can have unexpected effects later on with respect to stock rebuilding. The threshold is sensitive to the timing of a pulse of strong recruitment and may not reflect longer-term SSB rebuilding.
• Approaches rely on a SSB-based boost to recruitment that has not been observed recently (since 2007).
• The lack of strong precedence of this approach (but see Brodziak et al. 2001) conveys risk in predicting its performance in rebuilding.

Alternatives 2-5 - Scientific Uncertainties:

• We do not know the form of the underlying stock-recruitment relationship.
• Knowledge about catch will needs to become more precise at low ABCs.
• The trigger SSB for using one or the other recruitment series is deterministic, without consideration of error.
• Uncertainty in small amplitude changes in SSB
• Uncertainty in long projections

4.2 Process

The Council initiated a framework adjustment action in 2021 upon receiving the 2021 Mackerel MTA results. This action was later converted into an amendment due to the potential consideration of recreational bag/possession limits and/or closures, which had not been previously considered in detail, and it was uncertain whether such measures could be considered via a framework adjustment action. Closures are not being considered in this action. The Council intends to take final action at its June 2022 meeting, after public hearings in late April 2022. An emergency rule currently limiting mackerel landings expires in early January 2023, necessitating rapid progress on this action to implement new measures before the emergency rule expires.

4.3 Purpose and Need

The purposes and needs addressed by this action are described in the table below.

Table 1. Purposes and Needs

Need	Corresponding Purpose
Prevent overfishing, rebuild the Atlantic mackerel stock, and achieve optimum yield in the mackerel fishery.	Implement measures to specify levels of catch of Atlantic mackerel consistent with the MSA and the objectives of the FMP, including ending overfishing and rebuilding the stock.
Achieve the Domestic Annual Harvest ("quota") allocation in the mackerel fishery without exceeding it or closing the fishery in a manner that creates avoidable discarding issues.	Implement in-season management measures, including management uncertainty buffers, triggers, and post-closure trip limits.
Minimize bycatch of river herring and shad in the mackerel fishery to the extent practicable.	Implement catch caps for river herring and shad.

4.4 Regulatory Authority

The MSA states that Fishery Management Plans (FMPs) shall "contain the conservation and management measures… necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery." As discretionary provisions of Fishery Management Plans (FMPs), the MSA also allows restriction of fishing by gear/area/time/season. Seasonal management based on attainment of quotas has been previously incorporated into the MSB FMP and this action could modify the existing provisions regarding how the fishery closes due to attainment of the DAH or a portion of the DAH. The RH/S cap was previously implemented under the discretionary MSA provisions providing for conservation of non-target species.

The Council's risk policy was initially implemented via Amendment 13 to the MSB FMP (http://www.mafmc.org/msb/), which stated that the system would need to be "adaptive" and that "Flexibility is imperative and must allow for timely modifications given the dynamic nature of fisheries and the environment." Changing the desired probabilities of overfishing was contemplated as something that could be accomplished through even the annual specifications process. Major departures from the original risk policy were contemplated as needing to go through either an FMP framework adjustment or FMP amendment. Risk policy adjustments were explicitly provided for and anticipated by Amendment 13. See also implementing regulations at Title 50, Chapter VI, Part 648, Subpart B, §648.25(a)(1)(ii).

4.5 FMP History and Management Objectives

Management of the MSB fisheries began through the implementation of three separate FMPs (one each for mackerel, squid, and butterfish) in 1978. The plans were merged in 1983. Over time a wide variety of management issues have been addressed including stock rebuilding, habitat conservation, bycatch minimization, and limiting participation in the fisheries. The history of the plan and its amendments can be found at http://www.mafmc.org/fisheries/fmp/msb.

The MSA defines Optimum Yield (OY) generally as the amount of fish which A) "will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems"; B) "is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor;" and C) "in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery." The Omnibus ACL/AM Amendment (Amendment 13 to the MSB FMP) defined OY specifically for mackerel as: "The long-term average amount of desired yield from a stock or fishery. OY cannot exceed MSY. For Atlantic Mackerel, OY is the quantity of catch that is less than or equal to the ABC in U.S. waters."

The management goals and objectives, as described in the current FMP are listed below.

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

The Council recently updated the goals and objectives of the FMP through another action but that action has not yet been implemented:

<u>The updated MSB FMP objectives will be:</u>

Goal 1: Maintain sustainable MSB stocks.

> Objective 1.1: Prevent overfishing and maintain sustainable biomass levels that achieve optimum yield in the MSB fisheries.
>
> Objective 1.2: Consider and, to the extent practicable, account for the roles of MSB species/fisheries in the ecosystem.

Goal 2: Acknowledging the difficulty in quantifying all costs and benefits, achieve the greatest overall net benefit to the Nation, balancing the needs and priorities of different user groups and effects of management on fishing communities.

> Objective 2.1: Provide the greatest degree of freedom and flexibility to harvesters and processors (including shoreside infrastructure) of MSB resources consistent with attainment of the other objectives of this FMP, including minimizing additional restrictions.
>
> Objective 2.2: Allow opportunities for commercial and recreational MSB fishing, considering the opportunistic nature of the fisheries, changes in availability that may result from changes in climate and other factors, and the need for operational flexibility.
>
> Objective 2.3: Consider and strive to balance the social and economic needs of various sectors of the MSB fisheries (commercial including shoreside infrastructure and recreational) as well as other fisheries or concerns that may be ecologically linked to MSB fisheries.
>
> Objective 2.4: Investigate opportunities to access international/shared resources of MSB species.

Goal 3: Support science, monitoring, and data collection to enhance effective management of MSB fisheries.

> Objective 3.1: Improve data collection to better understand the status of MSB stocks, the role of MSB species in the ecosystem, and the biological, ecological, and socioeconomic impacts of management measures, including impacts to other fisheries.
>
> Objective 3.2: Promote opportunities for industry collaboration on research.
>
> Objective 3.3: Encourage research that may lead to practicable opportunities to further reduce bycatch in the MSB fisheries.

4.6 Management Unit and Geographic Scope

The management unit (fish stock definition) in the MSB FMP for Atlantic mackerel (*Scomber scombrus*) includes all mackerel under U.S. jurisdiction in the Northwest Atlantic, with a core fishery management area from Maine to North Carolina. The FMP also includes a deduction for mackerel caught by Canada - the U.S. assessment provides catch advice for the entire mackerel stock in the Northwest Atlantic (including Canadian waters), which is considered one unit stock.

5.0 WHAT ALTERNATIVES ARE CONSIDERED IN THIS DOCUMENT?

Notes: All of the rebuilding alternatives in this document utilize the peer reviewed and accepted 2021 Management Track Assessment (MTA) and associated projection methods. The Council's SSC also reviewed these specific projections in March 2022 and endorsed them as constituting the best available scientific information (for full report see https://www.mafmc.org/ssc-meetings/2022/march-15-16). All specifications will be reviewed and potentially revised annually and a MTA should be available in 2023 to set 2024-2025 specifications. The first alternative uses only 2009-2019 recruitments so it requires very low catches to rebuild. Options 2-5 utilize recruitment draws constrained to lower 2009-2019 estimates unless spawning stock biomass is above 50% of the target (then 1975-2019 recruitments, which the reference points are based on, are used). The SSC identified these two recruitment approaches as "defensible and supported by the data" at its September 2021 SSC Meeting (MAFMC SSC 2021b). The results of each rebuilding scenario are contingent on the assumed recruitment dynamics for the projection time period, which makes it difficult to compare Alternative 1 to the other alternatives. All alternatives assume less recruitment than the original mackerel rebuilding plan.

There will be Mackerel MTAs in 2023 and 2025 that both could result in revised rebuilding plans (they will be the new best available scientific information). Because the 2025 Mackerel MTA should consider catch through 2024, one way to compare across all alternatives in terms of relative probability of leading to stock growth by the 2025 Mackerel MTA is to just consider 2023-2024 combined catch. The higher the combined 2023 and 2024 combined catch, the relatively less likely stock growth will occur. The Action Alternatives 1-5 have been ordered from least to most 2023-2024 combined catch to facilitate comparison ("no-action" would result in the highest catch however, as described below). Conversely, the near-term socioeconomic effects would be most severe with Alternative 1 and least severe with Alternative 5. Longer term considerations are also discussed in the impacts section.

This action would only set specifications for 2023 given an MTA is expected in 2023, which should use data through 2022. Using the 2023 MTA to set 2024 specifications would only involve a two-year data lag from the 2023 MTA data (2022 to 2024). Using the 2021 MTA to set 2024 specifications would involve a five-year data lag (2019 to 2024). If the assessment or subsequent specifications were delayed, then the 2023 specifications would roll-over into 2024 until new specifications were published. The MSB Monitoring Committee recommended this approach given the high degree of uncertainty involved in setting 2024 specifications based on 2019 data. Setting 2024 specifications now is likely to convey more stability about 2023/2024 than warranted given the scale of changes observed in the 2021 Mackerel MTA versus the initial rebuilding plan projections.

NO ACTION ALTERNATIVE

For comparison purposes, "no action" would result in a return to the 2021/2022 published specifications for 2023 given the roll-over provisions in the regulations. Tied to the original rebuilding plan, these specifications would have a total catch of 29,184 MT, which would now result in overfishing in 2023 and fail to rebuild the mackerel stock in 10 years if maintained. While the stock is estimated to have nearly tripled in size from 2014 to 2019 (from about 8% of rebuilt to 24% of rebuilt), it has not increased enough to support the projected catch levels from the initial rebuilding plan. Due to the early January 2023 expiration of the current emergency rule, this is a rare case for MSB fisheries where no action does not equal status quo. The status quo catch (2022) is expected to be about 12,055 MT or less, but that would not be continued once the emergency rule expires in early January 2023. The no-action specifications that would re-commence in early January 2023 are detailed in the table below.

Table 2. No Action Specifications

Specification	Mackerel 2021-2022 (MT)
(a) Overfishing Limit (OFL)	Not available
(b) Acceptable Biological Catch (ABC)	29,184
(c) Canadian Deduction (10,000 MT)	10,000
(d) U.S. ABC = ACL (Canadian catch deducted)	19,184
(e) Recreational Allocation	1,270
(f) Commercial Allocation (rest of ACL)	17,914
(g) Management Uncertainty Buffer = 3%	537
(h) Commercial ACT (97% of allocation)	17,377
(i) DAH (0.37% set aside for discards)	17,312
(j) River Herring and Shad (RH/S) Cap	129

The mackerel fishery also operates under a river herring and shad catch cap (RH/S), which closes the directed mackerel fishery and implements a 20,000 pound trip limit for all permits once 129 MT of RH/S has been projected to be caught in the directed mackerel fishery. 129 MT was the amount of RH/S if the ratio of cap to all catch on mackerel trips (i.e. accounting for other species as well, mostly Atlantic herring) was about 0.53% and the mackerel quota was 17,371 MT (or 0.74% applied to just the mackerel quota). Given the challenges with monitoring a very small cap, including potentially closing the fishery based on a few observed trips, the Council has kept the cap at 129 MT at the current lower mackerel quotas.

5.1 ALTERNATIVE 1 – 10-year Rebuilding with Persistent Low Recruitment.

Alternative 1 assumes lower, post-2009 recruitment persists, which makes it nearly impossible to rebuild because the reference point "goal" rebuilding target is based on higher, typical recruitment (post-1975). The SSC identified this as one of two recruitment approaches that are "defensible and supported by the data" at its September 2021 SSC Meeting. With the low recruitment entering the population for the entire rebuilding period, only minimal catches allow rebuilding, based on a fishing mortality rate ("F") of 0.01. While one could argue this Alternative could be outright rejected given Canadian catches, incidental U.S. commercial catches, and state-waters recreational catches will easily exceed the proposed rebuilding catches, it illustrates the dependence on actually getting typical recruitment when trying to rebuild to a target that is based on typical recruitment. With the catches in this projection, and if lower recruitment persists, the probability of rebuilding by 2032 would be 57%, and the median probability is for rebuilding to occur in 2031. Because this probability is conditional on recruitment being similar to 2009+ recruitment, it is not directly comparable to the other alternatives, but because its catches are so low, Alternative 1 would have the highest overall probability of rebuilding regardless of the recruitments that actually end up occurring. This alternative would also have the highest probability of increasing stock size by the 2025 Mackerel MTA Because it leads to the lowest 2023-2024 catches.

The projected rebuilding period catches (which would be the Acceptable Biological Catches - ABCs) and biomasses under Alternative 1 are described in the table below.

Table 3. Rebuilding Alternative 1 ABCs and Biomass

	Catch (MT)	Biomass (MT)
2023	703	83,692
2024	865	101,492
2025	1,025	118,979
2026	1,169	133,914
2027	1,296	146,932
2028	1,406	158,172
2029	1,497	167,354
2030	1,574	175,260
2031	1,639	181,670
2032	1,692	187,093

In terms of setting specifications for 2023, Alternative 1 appears impracticable given the existing management framework. With a 2023 ABC of 703 MT, the U.S. ABC would be negative given just likely Canadian catches (see additional discussion regarding Canada catches in Alternatives 4 and 5). A complete EEZ closure would come closest to holding to the ABC.

5.2 ALTERNATIVE 2 – P* deduction applied to 50% Rebuilding Probability

Alternatives 2-5 utilize recruitment draws constrained to lower 2009-2019 estimates unless spawning stock biomass during the rebuilding period is above 50% of the target (then the higher 1975-2019 recruitments, which the rebuilding goal is based on, are used). The SSC identified this as one of two recruitment approaches that are "defensible and supported by the data" at its September 2021 SSC Meeting (see Alternative 1 for the other approach). Because the projection model selects the lower or higher recruitment stanza based on biomass in each year of each of 2000 runs, there is a transition toward higher median recruitment through the rebuilding period depending on the exact trajectory of each run.

Alternative 2 uses the Council's standard P* risk policy deduction applied to the 0.14 rebuilding F from Alternative 5, effectively treating a rebuilding F of 0.14 as an overfishing mortality rate (and then imposing a risk-policy deduction). The P* risk policy requires higher certainty in avoiding overfishing at lower biomasses. For example in 2023 the P* risk policy requires an 85.5% probability of not overfishing (or in this case of not exceeding F = 0.14) due to the low projected 2023 stock size, and catch is lowered accordingly. Higher certainty about avoiding exceeding even the rebuilding F means lower catches, which allows rebuilding by 2029 in this alternative. F starts at 0.04 and as biomass nears the rebuilding target, higher fishing mortality is allowed, but never rises above F = 0.13. The 10-year rebuilding probability for Alternative 2 given all 10 years of catches is 62.3% given the recruitments used. This alternative would also have the 2nd highest probability of increasing stock size by the 2025 Mackerel MTA because it leads to the 2nd lowest 2023-2024 catches.

The projected rebuilding period catches (which would be the Acceptable Biological Catches - ABCs) and biomasses under Alternative 3 are described in the table below.

Table 4. Rebuilding Alternative 2 ABCs and Biomass

	Catch (MT)	Biomass (MT)
2023	2,976	82,832
2024	4,168	98,752
2025	5,879	116,414
2026	8,127	134,870
2027	10,978	154,147
2028	14,519	172,753
2029	18,487	188,964
2030	21,394	202,302
2031	23,034	213,674
2032	24,459	222,817

In terms of setting specifications for 2023, Alternative 2 appears impracticable given the existing management framework. With a 2023 ABC of 2,976 MT, the U.S. ABC would be near zero, and the commercial quota would be negative given likely recreational catches (see additional discussion regarding Canada and recreational catches in Alternatives 4 and 5). A complete EEZ closure would come closest to holding to the ABC.

5.3 ALTERNATIVE 3 – P* approach with return to normal recruitment.

Alternatives 2-5 utilize recruitment draws constrained to lower 2009-2019 estimates unless spawning stock biomass during the rebuilding period is above 50% of the target (then the higher 1975-2019 recruitments, which the rebuilding goal is based on, are used). The SSC identified this as one of two recruitment approaches that are "defensible and supported by the data" at its September 2021 SSC Meeting (see Alternative 1 for the other approach). Because the projection model selects the lower or higher recruitment stanza based on biomass in each year of each of 2000 runs, there is a transition toward higher median recruitment through the rebuilding period depending on the exact trajectory of each run.

Alternative 3 uses the Council's standard P* risk policy as a rebuilding plan. The P* risk policy requires higher certainty in avoiding overfishing at lower biomasses. For example in 2023 the P* risk policy requires an 85.5% probability of not overfishing due to the low projected 2023 stock size, and catch is lowered accordingly. For a fully rebuilt stock, the risk policy requires a 55% probability of not overfishing, which causes the stock size to stabilize above the rebuilding target. Higher certainty about avoiding overfishing means lower catches (especially initially), which allows rebuilding by 2031 in this alternative. As biomass nears the rebuilding target, higher fishing mortality is allowed (slowing stock growth). The 10-year rebuilding probability given all 10 years of catches for Alternative 3 is 51.5% given the recruitments used. This alternative would also have the 3rd highest probability of increasing stock size by the 2025 Mackerel MTA because it leads to the 3rd lowest 2023-2024 catches.

The projected rebuilding period catches (which would be the Acceptable Biological Catches - ABCs) and biomasses under Alternative 3 are described in the table below.

Table 5. Rebuilding Alternative 3 ABCs and Biomass

	Catch (MT)	Biomass (MT)
2023	4,539	82,205
2024	6,207	96,378
2025	8,455	111,512
2026	11,245	126,811
2027	14,558	142,214
2028	18,391	156,433
2029	22,337	168,344
2030	25,981	177,517
2031	29,014	183,446
2032	30,564	186,886

As detailed above, this action would only set specifications for 2023 given a Mackerel MTA is expected in 2023, which can inform 2024-2025 specifications.

The SSC recommended the P* approach with the maximum fishing mortality threshold (MFMT) equal to the Fmsy proxy (Alternative 3). This alternative, (1) fulfills rebuilding plan requirements; (2) is the most responsive to new information on changes in stock status; (3) produces the highest rebuilding plan 10-year catch yield); (4) is fully consistent with the Council's P* risk policy; and (5) would avoid "break points" in catch limit advice, which would reduce year-to-year changes in the ABC.

The SSC also noted that this alternative provides lower initial catches (ABCs) than some other alternatives. In terms of setting specifications for 2023, Alternative 3 may be impracticable given the existing management framework and the needed Canadian and recreational deductions. Even if a relatively low deduction is made for Canada (2,197 MT as described below in Alternatives 4/5), the U.S. ABC would be 2,342 MT. With 2,195 MT being the smallest reduction for recreational catch recommended by the Monitoring Committee given the bag/possession limit options (see additional discussion regarding recreational deductions in Alternatives 4 and 5), there would be negligible catch for U.S. landings or discards. Discards could also increase if minimal retention is allowed. Accordingly, the P* approach does not appear practicable for 2023. However, at slightly higher stock sizes and ABCs the P* approach could be practicable, and is worth revisiting after the next Mackerel MTA. A complete EEZ commercial closure would come closest to holding to the ABC.

5.4 ALTERNATIVE 4 – 61% Rebuilding Probability in 10 Years

Alternatives 2-5 utilize recruitment draws constrained to lower 2009-2019 estimates unless spawning stock biomass during the rebuilding period is above 50% of the target (then the higher 1975-2019 recruitments, which the rebuilding goal is based on, are used). The SSC identified this as one of two recruitment approaches that are "defensible and supported by the data" at its September 2021 SSC Meeting (see Alternative 1 for the other approach). Because the projection model selects the lower or higher recruitment stanza based on biomass in each year of each of 2000 runs, there is a transition toward higher median recruitment through the rebuilding period depending on the exact trajectory of each run.

Alternative 4 uses an F of 0.12, which would be predicted to have a 61% probability of rebuilding the mackerel stock in 10 years given the recruitments used. The median rebuilt year is 2031. F stays the same for all 10 years, and as biomass increases, so does catch. This alternative would also have the 4th highest probability of increasing stock size by the 2025 Mackerel MTA Because it leads to the 4th lowest 2023-2024 catches.

The projected rebuilding period catches (which would be the Acceptable Biological Catches - ABCs) and biomasses under Alternative 4 are described in the table below.

Table 6. Rebuilding Alternative 4 ABCs and Biomass

	Catch (MT)	Biomass (MT)
2023	8,094	80,745
2024	9,274	91,738
2025	10,540	103,756
2026	11,906	116,857
2027	13,408	131,291
2028	15,004	146,553
2029	16,631	162,239
2030	18,261	177,731
2031	19,814	192,045
2032	21,215	204,796

As detailed above, this action would only set specifications for 2023 given a Mackerel MTA is expected in 2023, which can inform 2024-2025 specifications. Selecting this alternative would also modify the Council's risk policy for the purposes of beginning this rebuilding plan. The existing risk policy would otherwise cap the 2023 ABC at the standard P* catch calculation (4,539 MT).

The FMP accounts for Canadian landings, recreational catch, and commercial discards by deductions from the total ABC, with options described below.

Canadian Landings

Canada closed its fishery for 2022 so may have minimal landings in 2022. With a 2023 Canadian assessment pending, 2023 Canadian landings are still challenging to predict. This action explores two options for deducting Canadian landings in 2023: Deducting their 2021 landings (4,395 MT) or half that amount (2,197 MT). Given the uncertainty for 2023 and because under-specification of Canadian landings in 2023 would slow rebuilding, 2,197 MT is the lowest value considered.

Recreational Catch Restriction Alternatives

For 2022, 2,582 MT of recreational catch was deducted, the 2017-2021 average. 2017, with more catch than 2018-2021, was included to capture some of the historically-observed variability. Analysis of Marine Recreational Information Program (MRIP) and Vessel Trip Report (VTR) data suggest that replacing trips that caught higher numbers with the following bag/possession limits could result in the following harvest reductions, based on pooled available 2018-2021 MRIP/VTR data (2021 preliminary).

Table 7. Theoretical Bag Limit Reductions by Mode

	% Harvest Reduction		
Bag Limit	Private	Shore	For-Hire
10 fish	39%	27%	35%
15 fish	28%	19%	22%

Accounting for the proportion of each mode's harvest (77% private, 20% shore, 3% for hire), and that harvest is 83% of catch, then the calculated reductions in recreational catch would be (assuming that Maine, New Hampshire, and Massachusetts mirrored the Federal regulations):

Table 8. Theoretical Combined Bag Limit Reductions

	% Catch Reduction
Bag Limit	Combined
10 fish	30%
15 fish	22%

These bag limits appear to represent a reasonable range of initial restriction alternatives for the recreational sector for 2023. There have not been recreational limits for mackerel before, so angler responses may be difficult to predict. To avoid under-accounting for recreational catch the MSB Monitoring Committee recommended either maintaining 2022's 2,582 MT deduction for recreational catch, or only taking half credit for any calculated theoretical savings, which would result in deducting the amounts in the following table for recreational catch in each scenario. The "Recreational Deduction" is the amount of catch set-aside for anticipated recreational catch when commercial quotas are calculated:

Table 9. Theoretical Alternative Recreational Catch Deductions and Savings

	Recreational Deduction	
Bag Limit	Combined (MT)	Savings (MT)
10 fish	2,195	387
15 fish	2,298	284

The "Savings (MT)" column is the amount of fish less than the current 2,582 MT deduction each bag limit might entail. If less recreational catch is deducted, the commercial quota increases by the same amount.

The following specifications calculations assume that either the current approach of 2,582 MT of recreational catch is deducted (i.e. potential savings from recreational bag limits would not be assumed in 2023) or take the deductions from the above table. Staying with 2,582 MT could help account for the variability that can occur with recreational catch estimates – recreational catch (numbers of fish) has been stable from 2018-2021, but has varied substantially year to year in the past. It must be reiterated that these estimates are rough approximations given there is no history of bag limits in this fishery. Staff explored using a log regression to consider different increments given the apparent digit bias (at 5 and 10 fish increments) in the reported harvest data. While a log regression fit the data quite well, there did not appear reason to investigate further given there is already limited certainty about potential angler responses to a new bag limit for mackerel and subsequent effects on overall catch. Utilizing the digit bias could also simplify communications of regulations.

Commercial Discards

No changes are proposed to the averaging approach used by the NEFSC for 2022 projected catch – 115 MT is assumed for 2023 commercial mackerel discards.

Closure Approach

Averaging 2018-2021, the fishery landed 805 MT after April 1, and these were times when the directed limited access fishery was not active (range was 618 MT to 1,037 MT). As such, this time period should represent landings rates that could occur during a closure of the directed fishery. The proposed "first" closure approach is to buffer this performance by 10% and one month, so that before May 1 the directed fishery would close with 886 MT left in the quota, and from May 1 on, the directed fishery would close with 443 MT left in the quota. NMFS would also have the discretion to not close the fishery in November and December if performance suggests that a quota overage is unlikely. While it is possible that an early closure in January could result in more than 886 MT in additional landings, and it is possible that a closure in late April could result in unused quota remaining, this proposed system likely strikes a reasonable balance between achieving OY and regulatory simplicity. At this threshold for the "first" closure, additional trip limits would be implemented: 40,000 pounds for Tier 1-3 directed permits and 5,000 pounds for incidental/open access permits. There would be a final closure with 100 MT left in the quota where all permits were subject to a 5,000 pound trip limit to minimize any potential overages. With these trip limits any possible overages should be minimal, and would be deducted from subsequent years' quotas if an overall ACL overage occurs.

Specifications Summary

Based on the above proposed approaches to handle Canadian landings, recreational catch, commercial discards, and quota closures, the following specifications are possible for Alternative 4 – at the time of final action, the Council would need to identify the recommended Canadian landings and recreational catch deductions to determine the final quotas.

Table 10. Alternative 4 2023 Specifications Summary

Alternative 4 - 2023 Specifications (MT)						
ABC	8,094					
Canadian Catch Options	2,197			4,395		
Rec Catch Options (10, 15, na)	2,195	2,298	2,582	2,195	2,298	2,582
Commercial Discards	115	115	115	115	115	115
Commercial Quota	3,587	3,484	3,200	1,389	1,286	1,002
Before May 1 First Closure Threshold (-886 MT)	2,701	2,598	2,314	Insufficient quota for directed fishing - begin closed		
May 1/after First Closure Threshold (-443 MT)	3,144	3,041	2,757			
Final Closure Threshold (-100 MT)	3,487	3,384	3,934	1,289	1,186	902

"First" closure = 40,000 pound trip limit for Tier 1-3 directed permits and 5,000 pounds for incidental/open access permits. "Final" closure = 5,000 pounds for all permits.

For example following arrows to the left,, with an 8,094 ABC (=ACL), if 2,197 MT was deducted for Canada, 2,195 MT was deducted for recreational catch (10-fish bag limit), and 115 MT was deducted for commercial discards, the commercial quota would be 3,587 MT. At 2,701 MT before May 1 or 3,144 MT on/after May 1, the first closure trip limits would be implemented. At 3,487 MT the final closure trip limit of 5,000 pounds for all permits would be implemented.

Commercial Minimum Mesh Add-On Alternative

The Council has also requested inclusion of a 3-inch minimum mesh requirement that mirrors a similar requirement in the butterfish fishery. The regulatory wording would be: "Owners or operators of trawl vessels possessing more than 5,000 lb (2.27 mt) of mackerel harvested in or from the EEZ may only fish with nets having a minimum codend mesh of 3 inches (7.62 cm) diamond or square mesh, as measured by methods specified in § 648.80(f), applied throughout the codend for at least 100 continuous meshes forward of the terminus of the net, or for codends with less than 100 meshes, the minimum mesh size codend shall be a minimum of one-third of the net, measured from the terminus of the codend to the headrope.

Unfortunately there are not gear selectivity studies for Atlantic mackerel that allow quantitative analysis of this alternative. Casey et al 1992 examined an experimental midwater trawl codend of 60 mm polypropylene knotless square netting fished against a similar trawl fitted with a codend constructed from 40 mm knotted nylon mesh rigged in the conventional diamond configuration in the western English Channel. The size composition of the mackerel caught ranged from 18 to 37 cm (roughly almost age 1s to age 7s in our fishery) and a comparison of the length-frequency distributions indicated that there was no difference in the size composition, and hence selection, of fish taken by the two gears. Various studies on horse mackerel, a jack species of roughly similar size and shape of Atlantic mackerel have shown expected selectivity patterns. For example Campos and Fonseca 2003 saw small but significant effects on size selectivity across 65mm (2.6 inches) to 70mm (2.8 inches) and 80 mm (3.1 inches) meshes. The direct applicability to Atlantic mackerel would be uncertain, but the general literature on selectivity would support that some additional escapement of small mackerel should occur (e.g. https://www.conservationevidence.com/actions/2697#). Most Atlantic mackerel catch observations (raw data) in the observer data in the last 10 years occur from 48mm (1.9 inches) to 60mm (2.5 inches), with less then 10% of observations by weight occurring with mesh over 60mm (2.5 inches), making the observer data of limited use for exploring a mesh increase.

River Herring and Shad Cap

Sub-Option 1 (No-action / Status Quo for RH/S Cap)

Given the small 2023 directed fishery, the Council could simply retain the current 129 MT river herring and shad (RH/S) catch cap, which closes the directed mackerel fishery and implements a 20,000 pound trip limit for all permits once 129 MT of RH/S has been projected to be caught in the directed mackerel fishery. 129 MT was the amount of RH/S if the ratio of cap to all catch on mackerel trips was about 0.53% and the mackerel quota was 17,371 MT (or 0.74% applied to just the mackerel quota). Given the challenges with estimating and monitoring a very small cap, including potentially closing the fishery based on a few observed trips, the Council has kept the cap at 129 MT at the current lower mackerel quotas.

Sub-Option 2

The Council could also scale the RH/S cap with the quota selected in this Alternative, which would range the RH/S cap from 27 MT to 7 MT.

Permitting Option

There is some ambiguity in the current regulations regarding possession of Atlantic mackerel in federal waters (beyond 3 miles). If the prohibitions list is modified to include possession by commercial and for-hire vessels without an appropriate permit, any reporting loopholes would be closed, especially including possession of previously-caught or purchased Atlantic mackerel bait as triggering a permit requirement. Purchased Atlantic mackerel would not need to be reported, but all catch on all trips must be reported on vessel trip reports (VTRs) once in possession of a permit (regardless of the target species on a particular trip). This could add VTR reporting for a substantial number of vessels with Highly Migratory Species (HMS) permits (possibly 1,000-2,000 HMS for hire vessels and 1,000-2,000 HMS Atlantic Tunas General category vessels) if they wanted to possess mackerel in federal waters. The 1,000-2,000 vessel range is based on the total count of HMS permits and existing limited permit overlap.

5.5 ALTERNATIVE 5 – 53% Rebuilding Probability in 10 Years

Alternatives 2-5 utilize recruitment draws constrained to lower 2009-2019 estimates unless spawning stock biomass during the rebuilding period is above 50% of the target (then the higher 1975-2019 recruitments, which the rebuilding goal is based on, are used). The SSC identified this as one of two recruitment approaches that are "defensible and supported by the data" at its September 2021 SSC Meeting (see Alternative 1 for the other approach). Because the projection model selects the lower or higher recruitment stanza based on biomass in each year of each of 2000 runs, there is a transition toward higher median recruitment through the rebuilding period depending on the exact trajectory of each 2000 model runs.

Alternative 5 uses an F of 0.14, which would be predicted to have a 53.4 % probability of rebuilding the mackerel stock in 10 years given the recruitments used. The median rebuilt year is 2032. F stays the same for all 10 years, and as biomass increases, so does catch. Other than no action, this alternative would also have the lowest probability of increasing stock size by the 2025 Mackerel MTA Because it leads to the highest 2023-2024 catches.

The projected rebuilding period catches (which would be the Acceptable Biological Catches - ABCs) and biomasses under Alternative 5 are described in the table below.

Table 11. Rebuilding Alternative 5 ABCs and Biomass

	Catch (MT)	Biomass (MT)
2023	9,371	80,215
2024	10,591	89,949
2025	11,883	100,486
2026	13,252	111,737
2027	14,764	124,305
2028	16,365	137,457
2029	18,001	151,050
2030	19,665	164,694
2031	21,257	177,355
2032	22,672	188,731

As detailed above, this action would only set specifications for 2023 given a Mackerel MTA is expected in 2023, which can inform 2024-2025 specifications. Selecting this alternative would also modify the Council's risk policy for the purposes of beginning this rebuilding plan. The existing risk policy would otherwise cap the 2023 ABC at the standard P* catch calculation (4,539 MT).

The FMP accounts for Canadian landings, recreational catch, and commercial discards by deductions from the total ABC, with options described below.

Canadian Landings

Canada closed its fishery for 2022 so may have minimal landings in 2022. With a 2023 Canadian assessment pending, 2023 Canadian landings are still challenging to predict. This action explores two options for deducting Canadian landings in 2023: Deducting their 2021 landings (4,395 MT) or half that amount (2,197 MT). Given the uncertainty for 2023 and because under-specification of Canadian landings in 2023 would slow rebuilding, 2,197 MT is the lowest value considered.

Recreational Catch Restriction Alternatives

For 2022, 2,582 MT of recreational catch was deducted, the 2017-2021 average. 2017 was included to capture some of the historically-observed variability. Analysis of Marine Recreational Information Program (MRIP) and Vessel Trip Report (VTR) data suggest that replacing trips that caught higher numbers with the following bag/possession limits could result in the following harvest reductions, based on pooled available 2018-2021 MRIP/VTR data (2021 preliminary).

Table 12. Theoretical Bag Limit Reductions by Mode

	% Harvest Reduction		
Bag Limit	Private	Shore	For-Hire
10 fish	39%	27%	35%
15 fish	28%	19%	22%

Accounting for the proportion of each mode's harvest (77% private, 20% shore, 3% for hire), and that harvest is 83% of catch, then the calculated reductions in recreational catch would be (assumes that discards stayed similar and that Maine, New Hampshire, and Massachusetts mirrored the Federal regulations):

Table 13. Theoretical Combined Bag Limit Reductions

	% Catch Reduction
Bag Limit	Combined
10 fish	30%
15 fish	22%

These bag limits appear to represent a reasonable range of initial restriction alternatives for the recreational sector for 2023. There have not been recreational limits for mackerel before, so angler responses may be difficult to predict. To avoid under-accounting for recreational catch the MSB Monitoring Committee recommended either maintaining 2022's 2,582 MT deduction for recreational catch, or only taking half credit for any calculated theoretical savings, which would result in deducting the amounts in the following table for recreational catch in each scenario. The "Recreational Deduction" is the amount of catch set-aside for anticipated recreational catch when commercial quotas are calculated:

Table 14. Theoretical Alternative Recreational Catch Deductions and Savings

Bag Limit	Recreational Deduction Combined (MT)	Savings (MT)
10 fish	2,195	387
15 fish	2,298	284

The "Savings (MT)" column is the amount of fish less than the current 2,582 MT deduction each bag limit might entail. If less recreational catch is deducted, the commercial quota increases by the same amount.

The following specifications calculations assume that either the current approach of 2,582 MT of recreational catch is deducted (i.e. potential savings from recreational bag limits would not be assumed in 2023) or take the deductions from the above table. Staying with 2,582 MT could help account for the variability that can occur with recreational catch estimates – recreational catch (numbers of fish) has been stable from 2018-2021, but has varied substantially year to year in the past. It must be reiterated that these estimates are rough approximations given there is no history of bag limits in this fishery. Staff explored using a log regression to consider different increments given the apparent digit bias (at 5 and 10 fish increments) in the reported harvest data. While a log regression fit the data quite well, there did not appear reason to investigate further given there is already limited certainty about potential angler responses to a new bag limit for mackerel and subsequent effects on overall catch. Utilizing the digit bias could also simplify communications of regulations.

Commercial Discards

No changes are proposed to the averaging approach used by the NEFSC for 2022 projected catch – 115 MT is assumed for 2023 commercial mackerel discards.

Closure Approach

Averaging 2018-2021, the fishery landed 805 MT after April 1, and these were times when the directed limited access fishery was inactive (range was 618 MT to 1,037 MT). As such, this time period should represent landings rates that could occur during a closure of the directed fishery. The proposed "first" closure approach is to buffer this performance by 10% and one month, so that before May 1 the directed fishery would close with 886 MT left in the quota, and from May

1 on, the directed fishery would close with 443 MT left in the quota. NMFS would also have the discretion to not close the fishery in November and December if performance suggests that a quota overage is unlikely. While it is possible that an early closure in January could result in more than 886 MT in additional landings, and it is possible that a closure in late April could result in unused quota remaining, this proposed system likely strikes a reasonable balance between achieving OY and regulatory simplicity. At this threshold for the "first" closure, additional trip limits would be implemented: 40,000 pounds for Tier 1-3 directed permits and 5,000 pounds for incidental/open access permits. There would be a final closure with 100 MT left in the quota where all permits were subject to a 5,000 pound trip limit to minimize any potential overages. With these trip limits any possible overages should be minimal, and would be deducted from subsequent years' quotas if an overall ACL overage occurs.

Specifications Summary

Based on the above proposed approaches to handle Canadian landings, recreational catch, commercial discards, and quota closures, the following specifications are possible for Alternative 5 – at the time of final action, the Council would need to identify the recommended Canadian landings and recreational catch deductions to determine the final quotas.

Table 15. Alternative 5 2023 Specifications Summary

Alternative 5 - 2023 Specifications (MT)						
ABC	9,371					
Canadian Catch Options	2,197			4,395		
Rec Catch Options (10, 15, na)	2,195	2,298	2,582	2,195	2,298	2,582
Commercial Discards	115	115	115	115	115	115
Commercial Quota	4,864	4,761	4,477	2,666	2,563	2,279
Before May 1 First Closure Threshold (-886 MT)	3,978	3,875	3,591	1,780	1,677	1,393
May 1/after First Closure Threshold (-443 MT)	4,421	4,318	4,034	2,223	2,120	1,836
Final Closure Threshold (-100 MT)	4,764	4,661	4,377	2,566	2,463	2,179

"First" closure = 40,000 pound trip limit for Tier 1-3 directed permits and 5,000 pounds for incidental/open access permits. "Final" closure = 5,000 pounds for all permits.

For example following arrows to the left, with a 9,371 ABC (=ACL), if 2,197 MT was deducted for Canada, 2,195 MT was deducted for recreational catch (10-fish bag limit), and 115 MT was deducted for commercial discards, the commercial quota would be 4,864 MT. At 3,978 MT before May 1 or 4,421 MT on/after May 1, the first closure trip limits would be implemented. At 4,764 MT the final closure trip limit of 5,000 pounds for all permits would be implemented.

Commercial Minimum Mesh Add-On Alternative

The Council has also requested inclusion of a 3-inch minimum mesh requirement that mirrors a similar requirement in the butterfish fishery. The regulatory wording would be: "Owners or operators of trawl vessels possessing more than 5,000 lb (2.27 mt) of mackerel harvested in or from the EEZ may only fish with nets having a minimum codend mesh of 3 inches (7.62 cm) diamond or square mesh, as measured by methods specified in § 648.80(f), applied throughout the codend for at least 100 continuous meshes forward of the terminus of the net, or for codends with less than 100 meshes, the minimum mesh size codend shall be a minimum of one-third of the net, measured from the terminus of the codend to the headrope.

Unfortunately there are not gear selectivity studies for Atlantic mackerel that allow quantitative analysis of this alternative. Casey et al 1992 examined an experimental midwater trawl codend of 60 mm polypropylene knotless square netting fished against a similar trawl fitted with a codend constructed from 40 mm knotted nylon mesh rigged in the conventional diamond configuration in the western English Channel. The size composition of the mackerel caught ranged from 18 to 37 cm (roughly almost age 1s to age 7s in our fishery) and a comparison of the length-frequency distributions indicated that there was no difference in the size composition, and hence selection, of fish taken by the two gears. Various studies on horse mackerel, a jack species of roughly similar size and shape of Atlantic mackerel have shown expected selectivity patterns. For example Campos and Fonseca 2003 saw small but significant effects on size selectivity across 65mm (2.6 inches) to 70mm (2.8 inches) and 80 mm (3.1 inches) meshes. The direct applicability to Atlantic mackerel would be uncertain, but the general literature on selectivity would support that some additional escapement of small mackerel should occur (e.g. https://www.conservationevidence.com/actions/2697#). Most Atlantic mackerel catch observations (raw data) in the observer data in the last 10 years occur from 48mm (1.9 inches) to 60mm (2.5 inches), with less then 10% of observations by weight occurring with mesh over 60mm (2.5 inches), making the observer data of limited usefulness for exploring an increase to a 3-inch mesh.

River Herring and Shad Cap

Sub-Option 1 (No-action / Status Quo for RH/S Cap)

Given the small 2023 directed fishery, the Council could simply retain the current 129 MT river herring and shad (RH/S) catch cap, which closes the directed mackerel fishery and implements a 20,000 pound trip limit for all permits once 129 MT of RH/S has been projected to be caught in the directed mackerel fishery. 129 MT was the amount of RH/S if the ratio of cap to all catch on mackerel trips (accounting for mostly Atlantic herring) was about 0.53% and the mackerel quota was 17,371 MT (or 0.74% applied to just the mackerel quota). Given the challenges with estimating and monitoring a very small cap, including potentially closing the fishery based on a few observed trips, the Council has kept the cap at 129 MT at the current lower mackerel quotas.

Sub-Option 2

The Council could also scale the RH/S cap with the quota selected in this Alternative, which would range the RH/S cap from 36 MT to 17 MT.

Permitting Option

There is some ambiguity in the current regulations regarding possession of Atlantic mackerel in federal waters (beyond 3 miles). If the prohibitions list is modified to include possession by commercial and for-hire vessels without an appropriate permit, any reporting loopholes would be closed, especially including possession of previously-caught or purchased Atlantic mackerel bait as triggering a permit requirement. Purchased Atlantic mackerel would not need to be reported, but all catch on all trips must be reported on vessel trip reports (VTRs) once in possession of a permit (regardless of the target species on a particular trip). This could add VTR reporting for a substantial number of vessels with Highly Migratory Species (HMS) permits (possibly 1,000-2,000 HMS for hire vessels and 1,000-2,000 HMS Atlantic Tunas General category vessels) if they wanted to possess mackerel in federal waters. The 1,000-2,000 vessel range is based on the total count of HMS permits and existing limited permit overlap.

5.6 Considered but Rejected Alternatives

Given the extremely low catches required for even a 50% probability of rebuilding when lower recruitment is assumed for the whole rebuilding period (i.e. #1 above), higher probability options combined with the persistent low recruitment appeared redundant.

Even with the two phase recruitment scenario, achieving a 75% probability of rebuilding would require very low catches, and appeared redundant with remaining options that also required very low catches.

Given the unknown discard mortality, and potential enforcement issues related to chub mackerel mis-identification, minimum size options were “Considered but Rejected.”

6.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT AND FISHERIES

6.1 Description of the Managed Resource and Non-Target Species

Mackerel

Unless otherwise indicated, the information in this section is taken from the mackerel EFH source document at http://www.nefsc.noaa.gov/nefsc/habitat/efh/ and the recent mackerel MTA.

Atlantic mackerel is a semi-pelagic/semi-demersal (may be found near the bottom or higher in the water column) schooling fish species primarily distributed between Labrador (Newfoundland, Canada) and North Carolina. Based on the work of Sette (1943, 1950) and confirmed in the recent assessment, the stock is considered to comprise two spawning contingents: a northern contingent spawning primarily in the southern Gulf of St. Lawrence and a southern contingent spawning in the Mid-Atlantic Bight, Southern New England and the western Gulf of Maine. The two contingents mix during winter months on the Northeast U.S. shelf; however, the degree of mixing and natal homing is unknown. Mackerel in the northwest Atlantic were modeled as one stock for the recent assessment. The Canadian fishery likely primarily catches the northern contingent while the U.S. fishery likely catches both contingents.

Mackerel spawning occurs during spring and summer and progresses from south to north as the surface waters warm. Atlantic mackerel are serial, or batch spawners. Eggs are pelagic. Post-larvae gradually transform from planktonic to swimming and schooling behavior at about 30-50 mm. Approximately 50% of fish are mature at age 2 and about 99% were mature at age 3 from 2007-2016 according to the 2018 Benchmark Assessment (NSFSC 2018).

Atlantic mackerel are opportunistic feeders that can ingest prey either by individual selection of organisms or by filter feeding.

A wide variety of fish and other animals are predators of mackerel. Predator food habits on the Northeast US Shelf have been systematically sampled during the NEFSC bottom trawl surveys since 1973. In the recent benchmark assessment, these food habits data were evaluated for the top 17 mackerel predators based on the percent occurrence of mackerel in predator diets (NEFSC 2018, Appendix A4). The presence of Atlantic mackerel in fish stomachs was generally low from 1973-2016. A total of 1,284 out of 619,637 stomachs (~0.2%) contained mackerel, including unidentified mackerel Scombridae and Scomber spp. Spiny dogfish was the most dominant mackerel predator sampled by the trawl surveys, but the frequency of occurrence for mackerel in spiny dogfish diets only average 1%.

Additional potentially important predators of mackerel are not sampled in the NEFSC trawl surveys, including highly migratory species, marine mammals, and seabirds. Consumption from these predators is more difficult to estimate due to incomplete information on population levels and annual diet information. Furthermore, predator food habits were not available for the months the northern contingent was outside of the area sampled by the NEFSC trawl survey. Given this incomplete sampling, the low occurrence of mackerel in predator stomachs, and the resulting interannual variability in consumption estimates, the final model did not incorporate predator diets as an index of abundance. The temporal trends in consumption were consistent with trends from the range-wide egg index as well as abundance estimates.

Additional life history information is detailed in the Essential Fish Habitat (EFH) document for the species, located at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

The 2021 Mackerel MTA found mackerel continue to be overfished with overfishing occurring, as described previously.

Mackerel Non-Target Species

There have been very few recent observed directed mackerel trips due to the low directed effort toward mackerel in recent years. Various species will be caught incidentally to any mackerel fishing and will be impacted to some degree by the prosecution of the fishery. On the mackerel trips identified in this analysis, the 2017-2019 overall discard rate was 1%. For non-target species that are managed under their own FMP, incidental catch/discards are also considered as part of the management of that fishery. Data beyond 2019 was not analyzed due to potential Covid-19 impacts.

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. The case with mackerel is further complicated by the small size of the fishery recently and the few observed trips. However from 2017-2019 there were on average 7 observed trips annually where mackerel accounted for at least 50% of retained catch, and those trips form the basis of the following analysis. These trips made 65 hauls of which 89% 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.

The observed mackerel kept on these trips accounted for approximately 7% of the total mackerel landed (this is the overall coverage rate based on weight). While a very rough estimate, especially given non-accounting for spatial and temporal trends, one can use the information in the table immediately following and the fact that about 6,920 mt of mackerel were caught annually 2017-2019 to roughly estimate annual incidental catch and discards for the species in the table. Readers are strongly cautioned that while this is a reasonable approach for a quick, rough, and relative estimate given the available data, it is highly imprecise and does not follow the protocol used for official discard estimates. As a minimum threshold, only species estimated to be caught at a level more than 10,000 pounds per year are included (captures 95% of all discards). Species with a "*" are overfished, subject to overfishing, or otherwise considered depleted.

Table 16. Incidental Catch and Discards in the Mackerel Fishery

NE Fisheries Science Center Common Name	Pounds Observed Caught	Pounds Observed Discarded	Of all discards observed, percent that comes from given species	Percent of given species that was discarded	Pounds of given species caught per mt mackerel Kept	Pounds of given species discarded per mt mackerel Kept	Rough Annual Catch (pounds) based on 3-year (2017-2019) average of mackerel landings (6,920 mt)	Rough Annual Discards (pounds) based on 3-year (2017-2019) average of mackerel landings (6,920 mt)
MACKEREL, ATLANTIC *	3,207,485	585	1%	0%	2,205	0	15,258,755	2,785
HERRING, ATLANTIC *	626,320	4,639	9%	1%	431	3	2,979,549	22,068
HERRING, BLUEBACK *	28,805	9,570	19%	33%	20	7	137,031	45,529
FISH, NK	22,101	22,101	43%	100%	15	15	105,137	105,137
DOGFISH, SPINY	13,912	10,048	20%	72%	10	7	66,181	47,799
ALEWIFE *	7,580	1,793	3%	24%	5	1	36,061	8,531
HAKE, SILVER (WHITING	2,187	23	0%	1%	2	0	10,402	108

The observer program creates individual animal records for some fish species of interest, mostly larger pelagics and/or elasmobranchs, as well as tagged fish. There was only one such record for these trips, an unknown shark species.

6.2 Human Communities and Economic Environment

This section describes the performance of the mackerel fishery to allow the reader to understand the socio-economic importance of the mackerel fishery. The recent squid and butterfish specifications EA (MAFMC 2021) can be consulted for information on those species, but those fisheries are not expected to be impacted by this action. Recent Amendments to the MSB FMP contain additional information about the MSB fisheries, especially demographic information on ports that land MSB species. See Amendments 11 and 14 at http://www.mafmc.org/msb/ for more information or visit NMFS' communities page at: http://www.nefsc.noaa.gov/read/socialsci/community_profiles/. In general, the MSB fisheries saw high foreign landings in the 1970s followed by a domestication of the fishery, and domestic landings have been variable, but lower than the peak foreign landings. The current regulations for the MSB fisheries are summarized by NMFS at https://www.fisheries.noaa.gov/species/atlantic-mackerel#commercial, and detailed in the Federal Register at https://www.ecfr.gov/current/title-50/chapter-VI/part-648.

The most obvious way that human communities are affected by the MSB fisheries are from the revenues generated by the fisheries, 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 MSB fisheries have 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 general frustration by individuals due to management's impacts especially if they perceive management actions to be unreasonable or ill-informed.

Descriptive information on the fisheries is included, and where possible, quantitative commercial fishery and economic information is presented. 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.

Commercial Fishery Measures and Total Catches

There are four categories of mackerel permits. When the fishery starts each year, the various commercial mackerel permit categories start with different trip limits. Tier 1 has an unlimited trip limit, Tier 2 has a 135,000 pound trip limit, and Tier 3 has a 100,000 pound trip limit. An open access/incidental permit has a 20,000 pound trip limit. When 90% of the DAH is projected to be landed, trip limits of 40,000 pounds are implemented for Tier 1-3 directed permits and 5,000 pounds for incidental/open access permits. When 100% of the DAH is projected to be landed, a 5,000 pound trip limit would be implemented for all permits for the rest of the fishing year to cover remaining incidental catches.

Foreign catches dominated the fishery during the 1960s and 1970s, with total catch peaking at over 432,000 MT in 1973. Foreign catches declined and then were eliminated by the MSA, though there was also some joint venture activity from the mid-1980s through 1991. From 1992 through 2001, total catches (including Canada) averaged just under 36,000 MT before increasing to peaks over 112,000 MT in 2004 and 2006. Total catch then declined from 2011-2021 averaging just under 17,000 MT per year. It has been estimated by Canadian DFO staff that there could be between 2,000 and 5,000 metric tons of unreported historical catches per year[5] (not included in US assessments or catch accounting), which includes fishing mortality from various sources, notably recreational and some unreported commercial (including bait) harvests, discards, and other mortalities. Unreported Canadian commercial harvest may be lower in the most recent years due to stock concerns and additional focus on catch reporting.

[5] https://www.gazette.gc.ca/rp-pr/p2/2021/2021-05-26/html/sor-dors100-eng.html

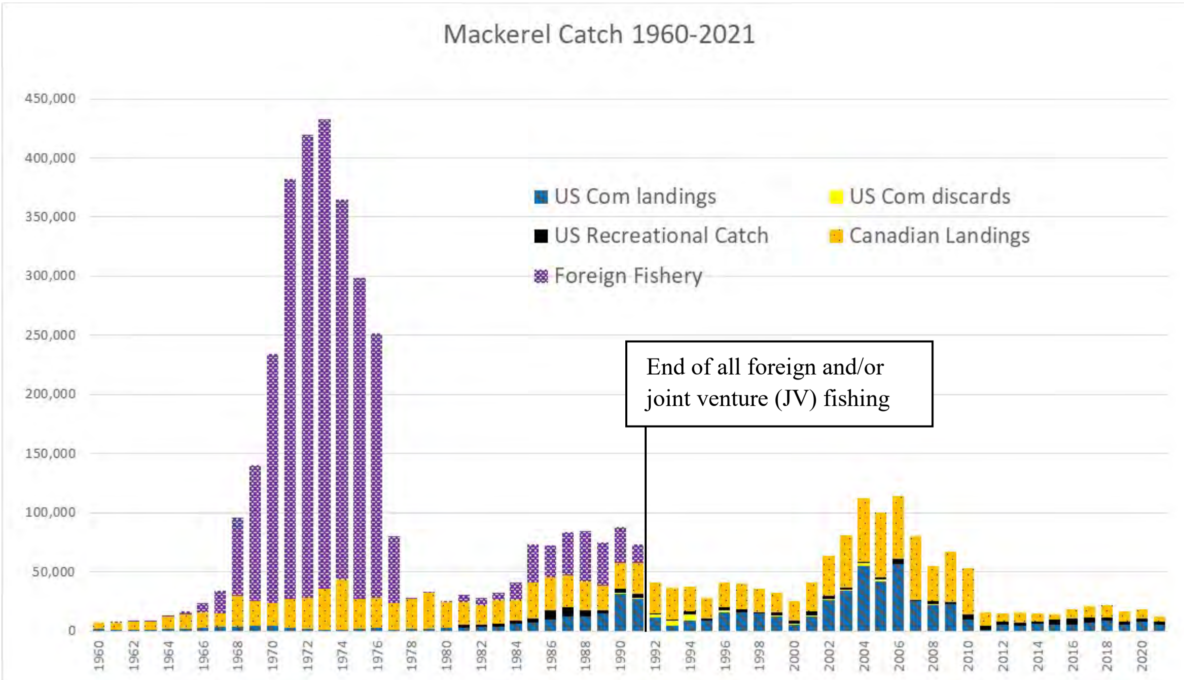

Figure 3. Recorded NW Atlantic mackerel catch (mt) 1960-2021.

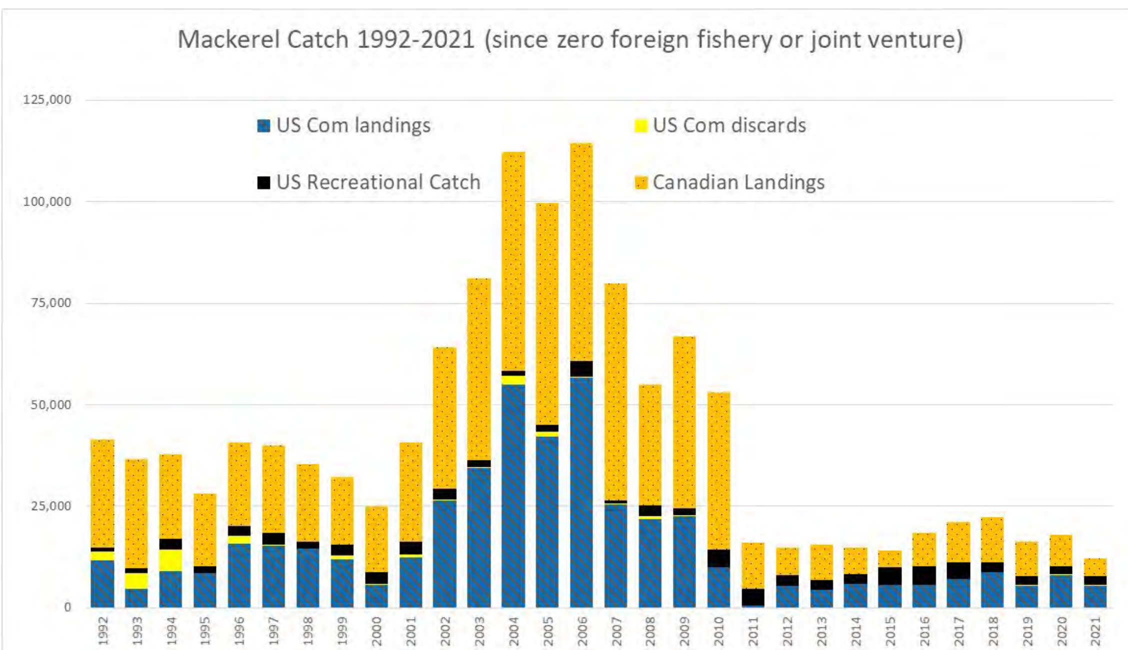

Figure 4. Recorded NW Atlantic mackerel catch (mt) 1992-2021.
(foreign fishery ended fully - note different scale and time period from Figure 3)

The figures below provides more detail on U.S. Commercial landings, ex-vessel revenues (in 2021 inflation-adjusted dollars), and prices per MT since 1996, when reporting was improved.

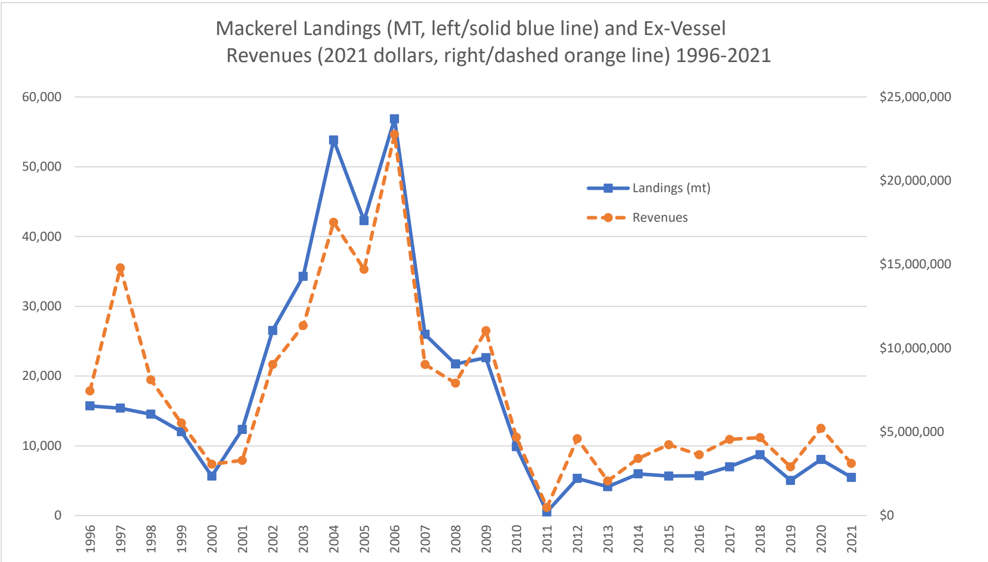

Figure 5. U.S. Commercial Landings and Ex-Vessel Revenues 1996-2021 Adjusted to 2021 Dollars Source: NMFS unpublished dealer data.

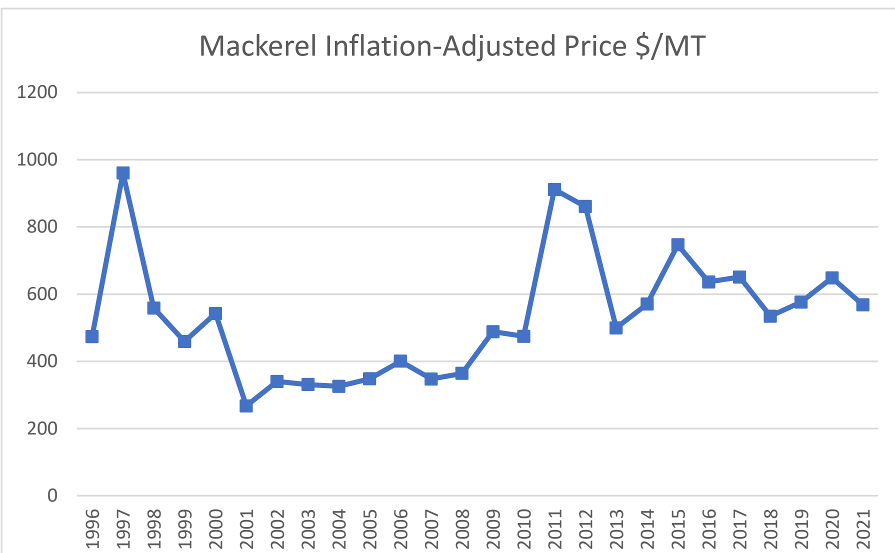

Figure 6. Ex-Vessel Mackerel Prices 1996-2021 Adjusted to 2021 Dollars Source: NMFS unpublished dealer data. [PRELIMINARY]

The mackerel fishery takes place in shelf waters as in the figures below. Landings were reported via dealer reports matched to a vessel trip report (VTR) when possible. From 2007-2011 80% of landings had location data, from 2012-2016 84% of landings had location information, and more recent years have also had a high percentage of landings with location information.

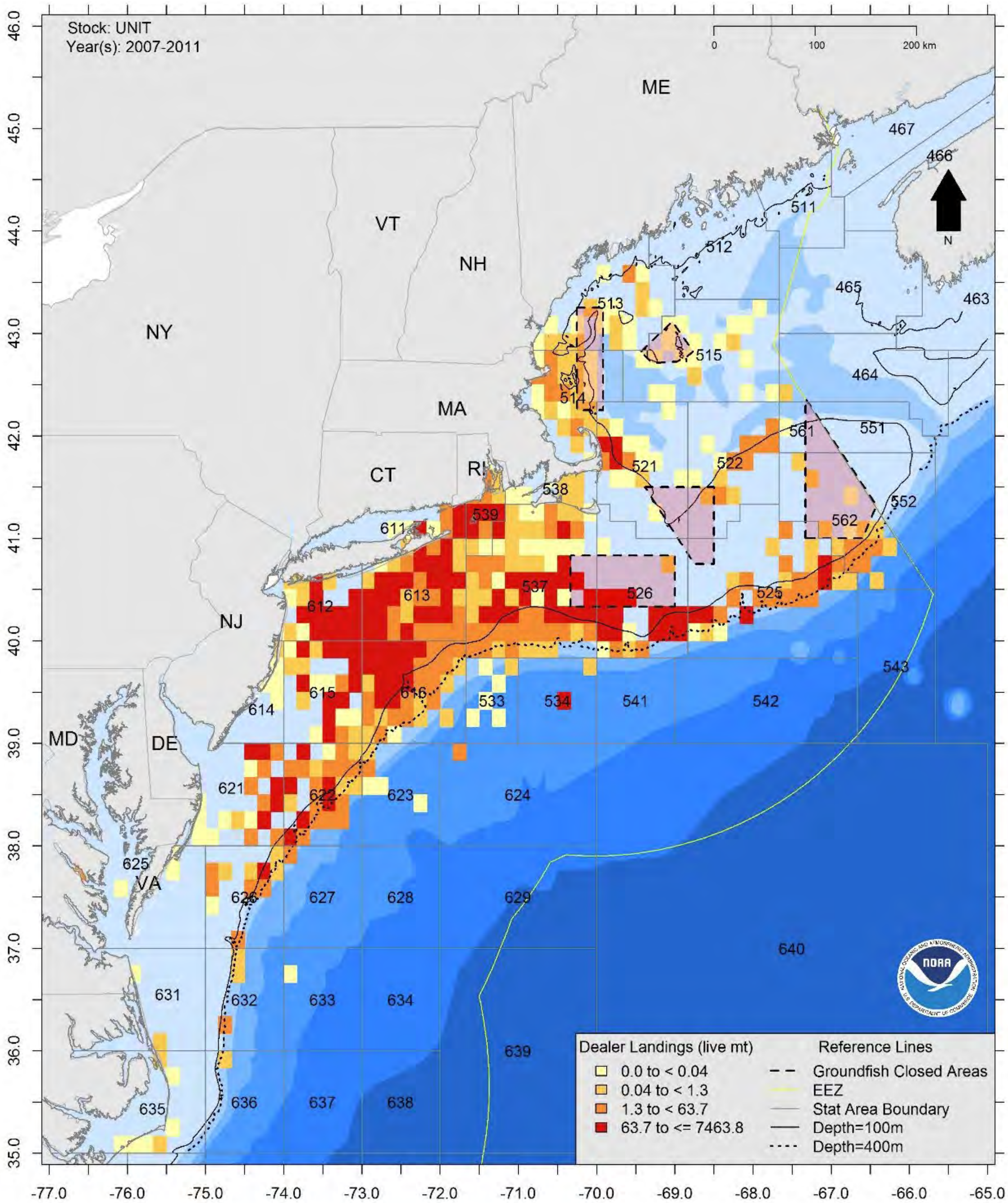

Figure 7. Spatial distribution of landings (mt) by ten-minute square, during 2007-2011.

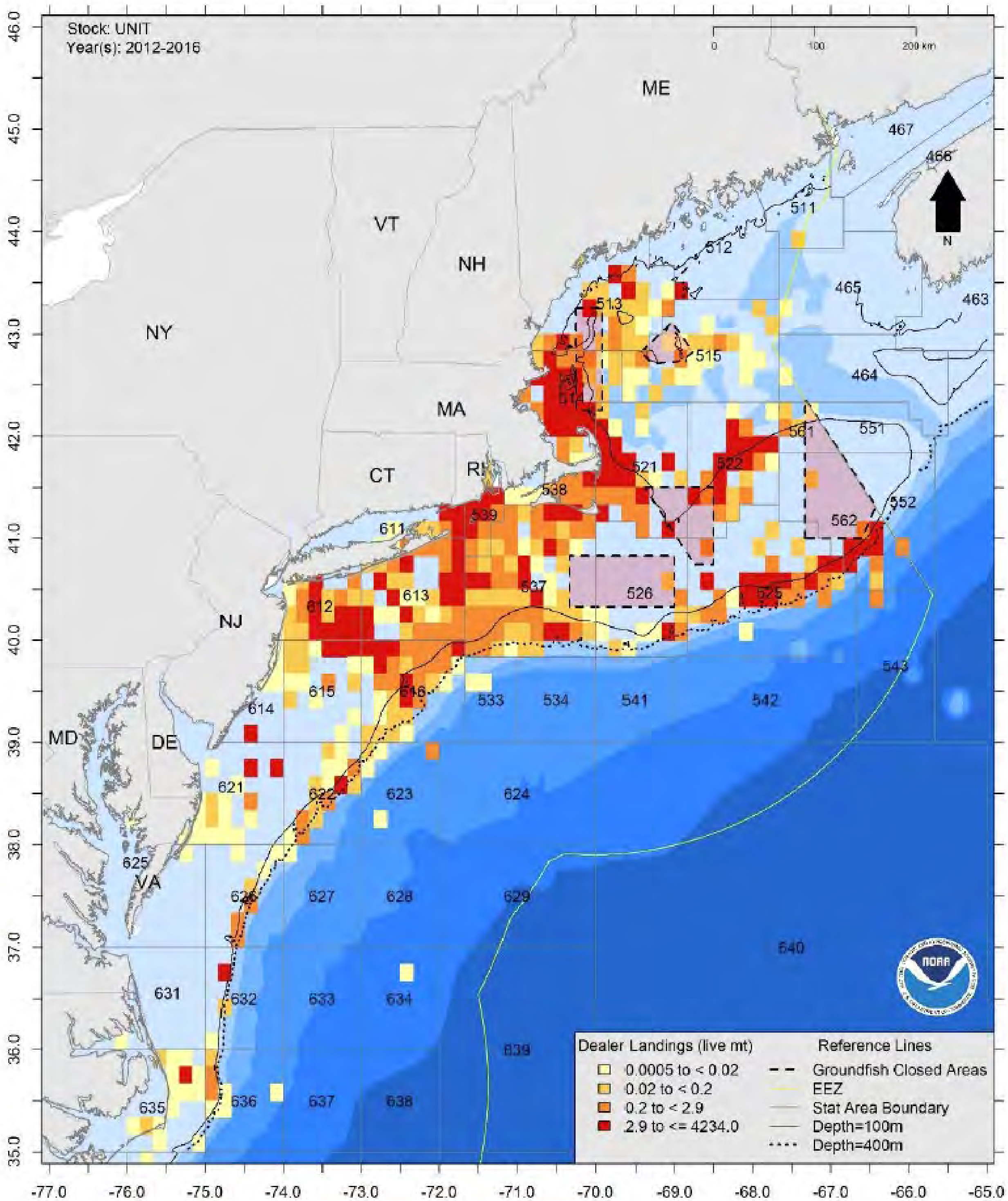

Figure 8. Spatial distribution of landings (mt) by ten-minute square, during 2012-2016.

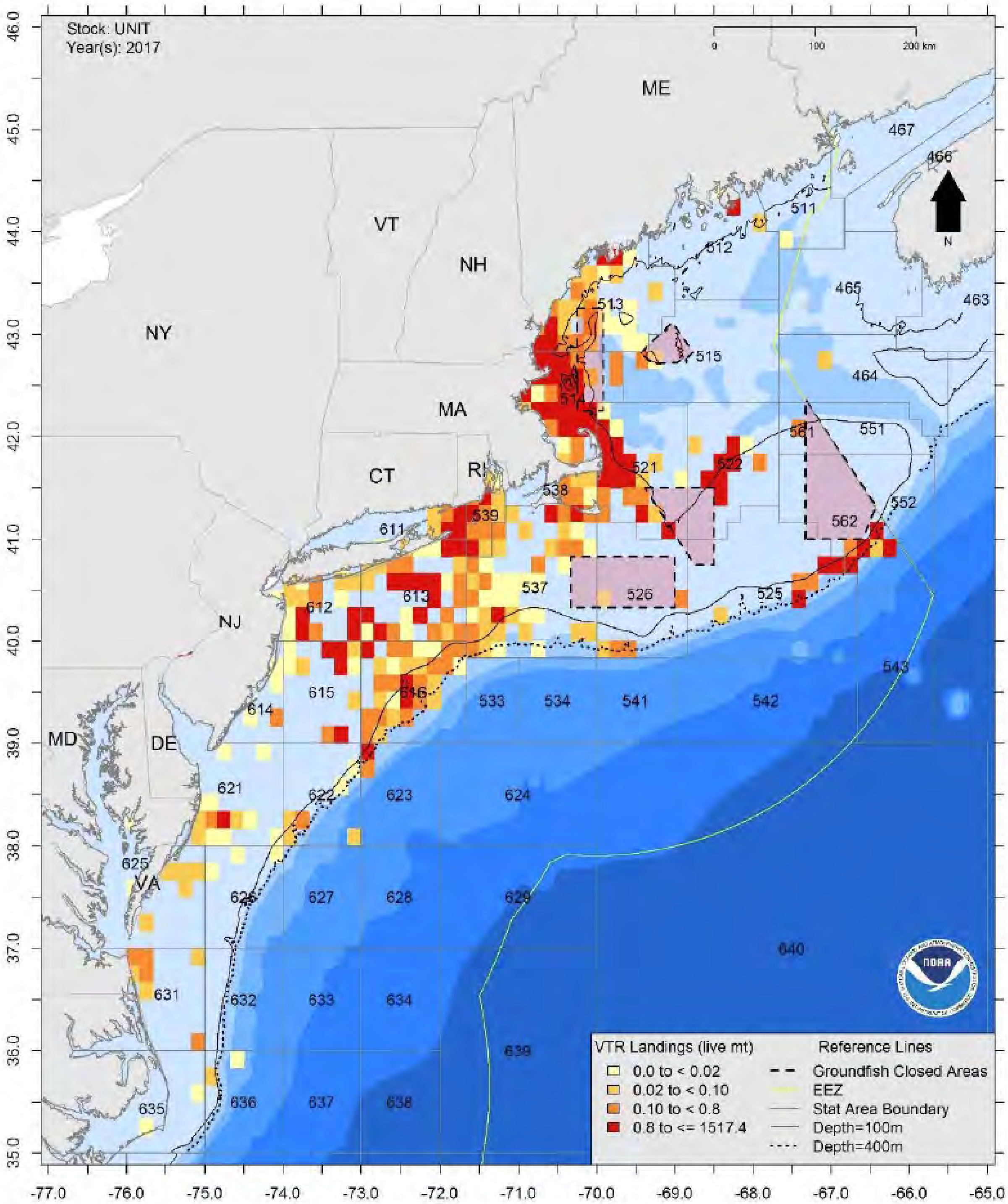

Figure 9. Approximate Primary 2018 Mackerel Catch Locations (from VTR data)

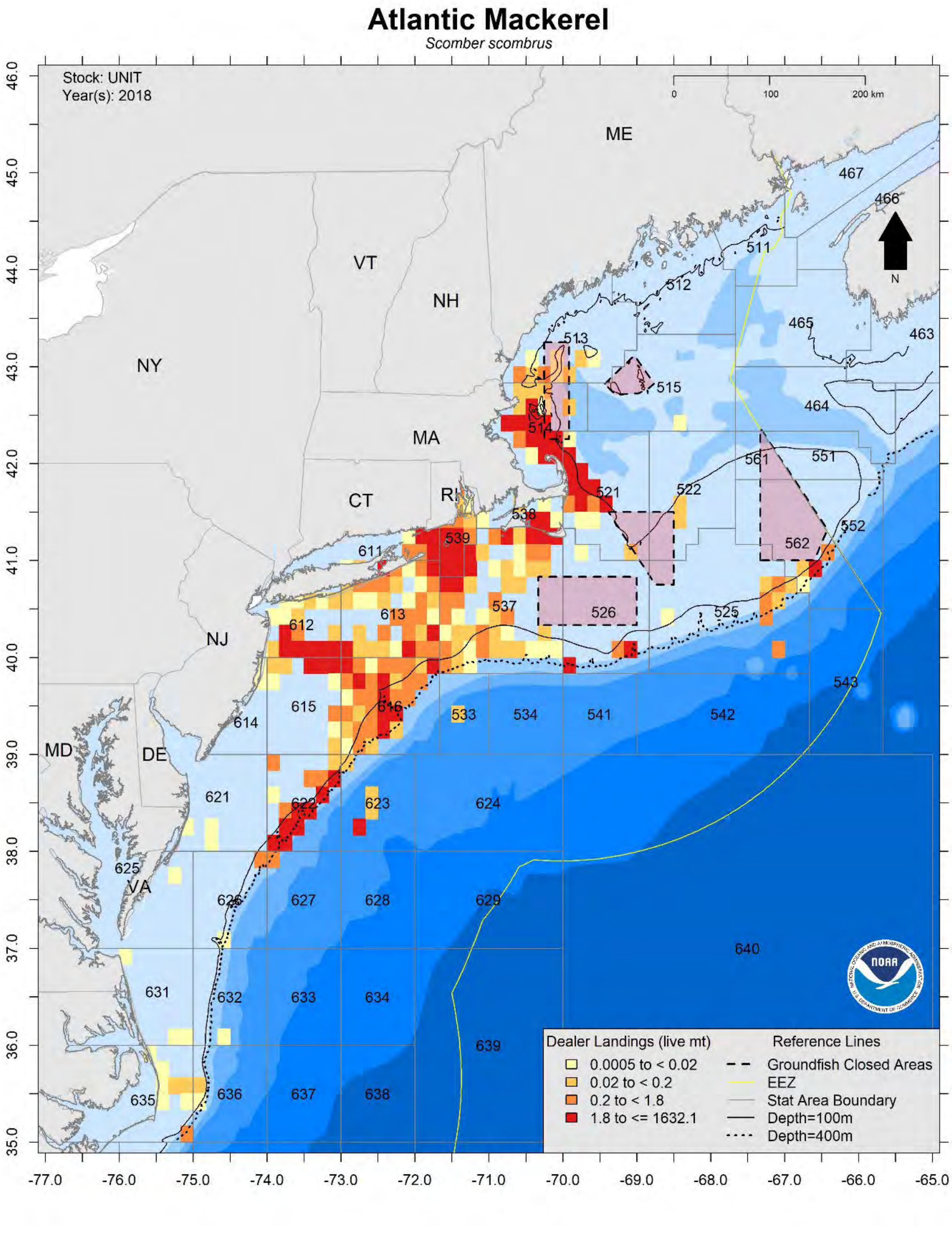

Figure 10. Approximate Primary 2018 Mackerel Catch Locations (from dealer and VTR data)

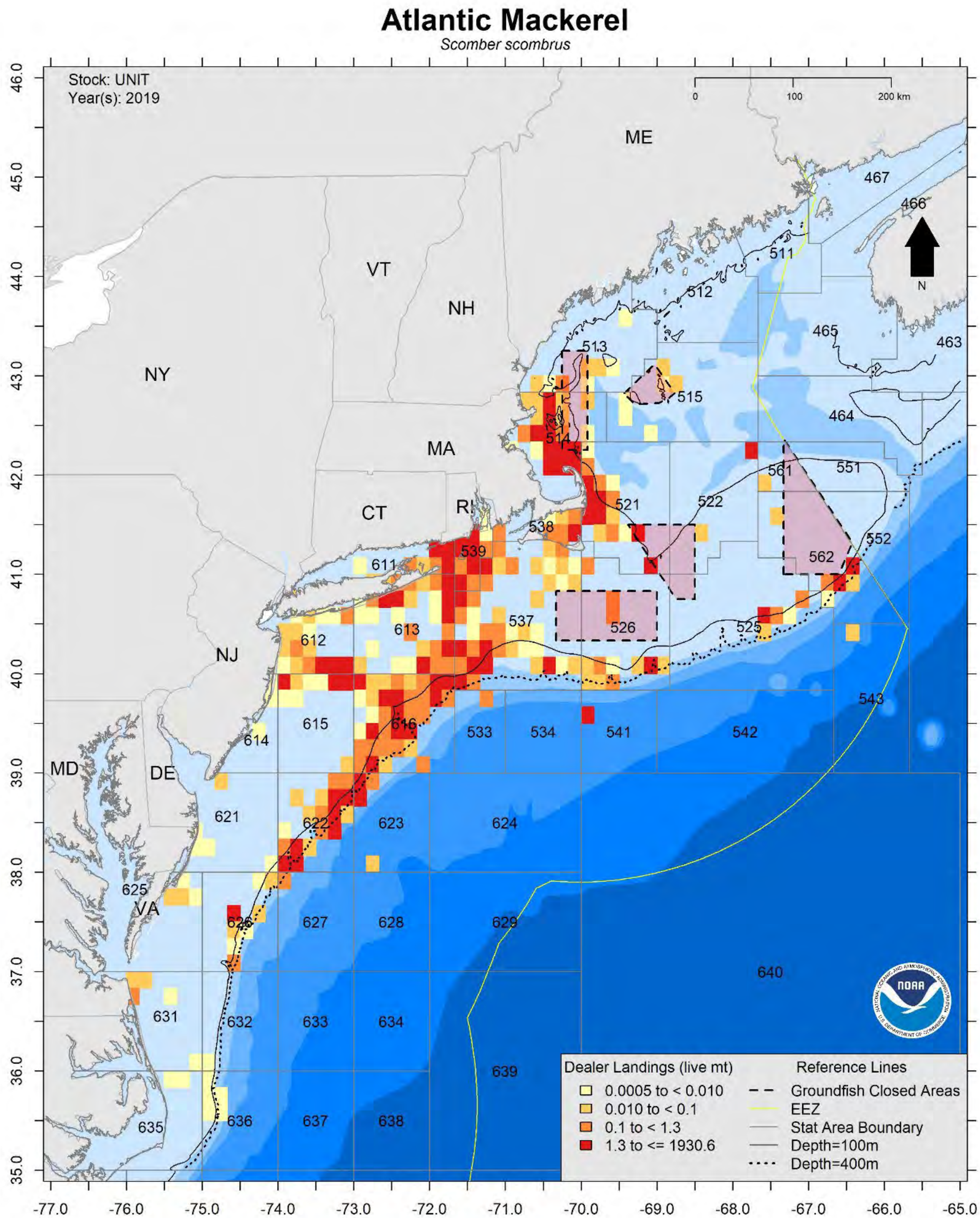

Figure 11. Approximate Primary 2019 Mackerel Catch Locations (from dealer and VTR data)

Updated maps are not available for 2020 and 2021, but the following tables bin mackerel landings by the same statistical areas noted on the figures above for 2020 and 2021, and the areas accounting for most 2020 and 2021 landings were not atypical. Area 514 is difficult to see on the above maps, but is just east of Massachusetts.

Table 17. Commercial mackerel landings by statistical area in 2020. Source: NMFS unpublished VTR data.

Stat Area	Metric Tons
613	2,900
521	1,164
612	1,152
616	806
615	738
514	705
Other/CI	580
Total	8,045

Table 18. Commercial mackerel landings by statistical area in 2021. Source: NMFS unpublished VTR data.

Stat Area	Metric Tons
522	2,023
521	1,854
612	992
514	450
Other/CI	332
Total	5,652

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In recent years (2017-2021) most mackerel landings have occurred in Massachusetts and New Jersey (see table below). There is more confidential information at the port level, but aggregate 2017-2021 landings and nominal revenues are also provided for major ports where possible.

Table 19. 2017-2021 Total Mackerel Landings by State

State	MT
MA	18,043
NJ	9,931
RI	3,979
ME	2,066
Other	254

Table 20. 2017-2021 Total Mackerel Landings by Port

PORT	MT
Cape May, NJ	9,849
Gloucester, MA	7,702
New Bedford, MA	7,108
Portland, ME	2,018
Point Judith, RI	1,703
Marshfield, MA	1,311
Chatham, MA	972
Other/CI	3,610

Table 21. 2017-2021 Total Mackerel Revenues by Port

Port	$ (Millions)
Cape May, NJ	4.3
Gloucester, MA	3.6
New Bedford, MA	3.5
Marshfield, MA	1.5
Portland, ME	1.3
Point Judith, RI	1.0
Chatham, MA	0.7
Other/CI	3.4

Table 22. Numbers of vessels that actively fished for mackerel, by landings (lbs) category, 1982-2021.

YEAR	Vessels 1 mil +	Vessels 100,000 - 1mil	Vessels 50,000 - 100,000	Vessels 10,000 - 50,000	Total
1982	0	10	10	43	63
1983	0	10	5	26	41
1984	0	11	14	29	54
1985	0	12	10	28	50
1986	1	10	5	37	53
1987	1	15	8	31	55
1988	2	20	8	40	70
1989	6	17	8	27	58
1990	6	16	7	39	68
1991	13	18	1	38	70
1992	9	17	13	48	87
1993	0	16	11	55	82
1994	2	27	14	44	87
1995	4	24	11	50	89
1996	7	45	15	53	120
1997	6	30	20	46	102
1998	9	16	6	39	70
1999	6	15	9	37	67
2000	5	3	0	26	34
2001	5	3	2	20	30
2002	12	3	1	22	38
2003	14	6	5	23	48
2004	18	6	1	14	39
2005	15	11	4	17	47
2006	20	12	5	10	47
2007	16	12	2	20	50
2008	15	5	1	17	38
2009	15	6	6	18	45
2010	10	9	2	14	35
2011	0	3	3	17	23
2012	3	9	1	9	22
2013	4	3	3	13	23
2014	6	5	1	13	25
2015	5	9	10	12	36
2016	3	16	7	26	52
2017	6	7	14	27	54
2018	8	6	3	24	41
2019	3	11	4	38	56
2020	7	9	1	10	27
2021	4	9	3	6	22

Recreational Fishery

The figure below describes total Atlantic mackerel recreational catch (numbers of fish) from 1981 to 2021 (2021 preliminary). Estimates before 2018 use calibration factors to account for substantial survey changes that were fully implemented in 2018, including the mail-based fishing effort survey and changes to the MRIP site-intercept survey (APAIS). Catch since 2018 has been relatively stable, but the time series includes substantial year to year variability.

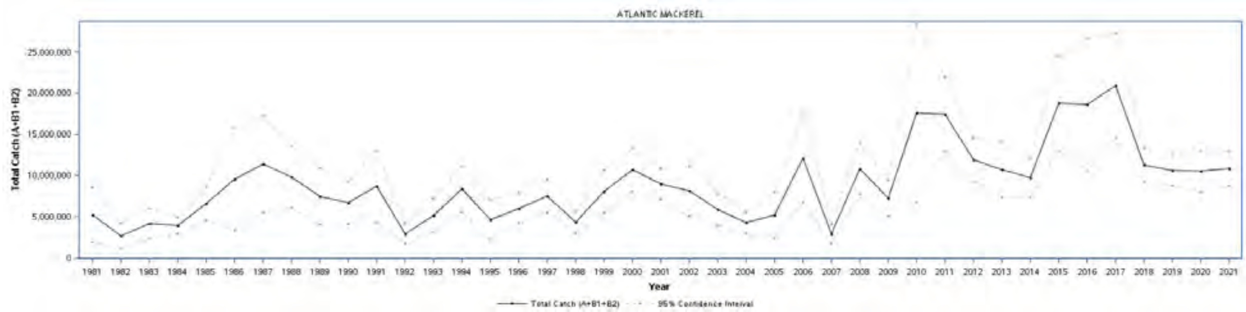

Figure 12. MRIP mackerel time series 1981-2021, total catch, numbers of fish.

The following more detailed discussion of recent catch focuses on data since 2018 to avoid any concerns about the effects of the calibration for pre-2018 data. Earlier discussions have highlighted that for-hire operators are not interviewed about trip catches but their anglers/customers could be, if they are at a site that is included on the MRIP site register. Anglers are to be asked about all fish caught and their disposition (available to be measured, harvested but not available, and/or released). PSE, or proportional standard error, expresses the standard error of an estimate as a percentage of the estimate and is a measure of precision.

Table 23. 2018-2021 MRIP Mackerel Estimates (#s) by Catch Type

Estimate Status	Year	Common Name	Observed Harvest (A)	PSE	Reported Harvest (B1)	PSE	Released Alive (B2)	PSE
FINAL	2018	ATLANTIC MACKEREL	2,330,587	23.3	7,164,214	11.3	1,782,338	19.9
FINAL	2019	ATLANTIC MACKEREL	2,646,784	16.3	5,913,593	12.6	2,041,877	18.8
FINAL	2020	ATLANTIC MACKEREL	3,136,063	19.6	6,439,192	17.6	964,581	15.2
PRELIMINARY	2021	ATLANTIC MACKEREL	705,745	18	8,663,790	12	1,473,430	19.5

Table 24. 2018-2021 MRIP Mackerel Estimates (#s) by State

Estimate Status	Year	State	Common Name	Total Catch (A+B1+B2)	PSE	** Contribution of Imputed Data to Total Catch Rate
FINAL	2018	CONNECTICUT	ATLANTIC MACKEREL	63	71.6	0%
FINAL	2018	MAINE	ATLANTIC MACKEREL	2,851,922	21	0%
FINAL	2018	MASSACHUSETTS	ATLANTIC MACKEREL	6,396,674	11.9	0%
FINAL	2018	NEW HAMPSHIRE	ATLANTIC MACKEREL	1,961,169	18.9	0%
FINAL	2018	RHODE ISLAND	ATLANTIC MACKEREL	21,119	71.5	0%
FINAL	2019	MAINE	ATLANTIC MACKEREL	3,275,535	20.8	0%
FINAL	2019	MASSACHUSETTS	ATLANTIC MACKEREL	5,647,588	10.5	0%
FINAL	2019	NEW HAMPSHIRE	ATLANTIC MACKEREL	1,637,111	16.9	0%
FINAL	2019	RHODE ISLAND	ATLANTIC MACKEREL	11,262	79.5	0%
FINAL	2020	CONNECTICUT	ATLANTIC MACKEREL	11,283	69.1	0%
FINAL	2020	MAINE	ATLANTIC MACKEREL	3,628,454	18.5	1%
FINAL	2020	MASSACHUSETTS	ATLANTIC MACKEREL	5,318,596	20.1	1%
FINAL	2020	NEW HAMPSHIRE	ATLANTIC MACKEREL	1,525,643	19.3	10%
FINAL	2020	RHODE ISLAND	ATLANTIC MACKEREL	1,420	62.5	77%
PRELIMINARY	2021	CONNECTICUT	ATLANTIC MACKEREL	1,311	92.3	0%
PRELIMINARY	2021	MAINE	ATLANTIC MACKEREL	3,913,997	17.6	1%
PRELIMINARY	2021	MASSACHUSETTS	ATLANTIC MACKEREL	5,384,078	14.5	0%
PRELIMINARY	2021	NEW HAMPSHIRE	ATLANTIC MACKEREL	1,317,292	13.1	0%
PRELIMINARY	2021	RHODE ISLAND	ATLANTIC MACKEREL	218,882	113	0%

PSE, or proportional standard error, expresses the standard error of an estimate as a percentage of the estimate and is a measure of precision. A PSE value greater than 50 indicates a very imprecise estimate and occurrences are highlighted in pink.

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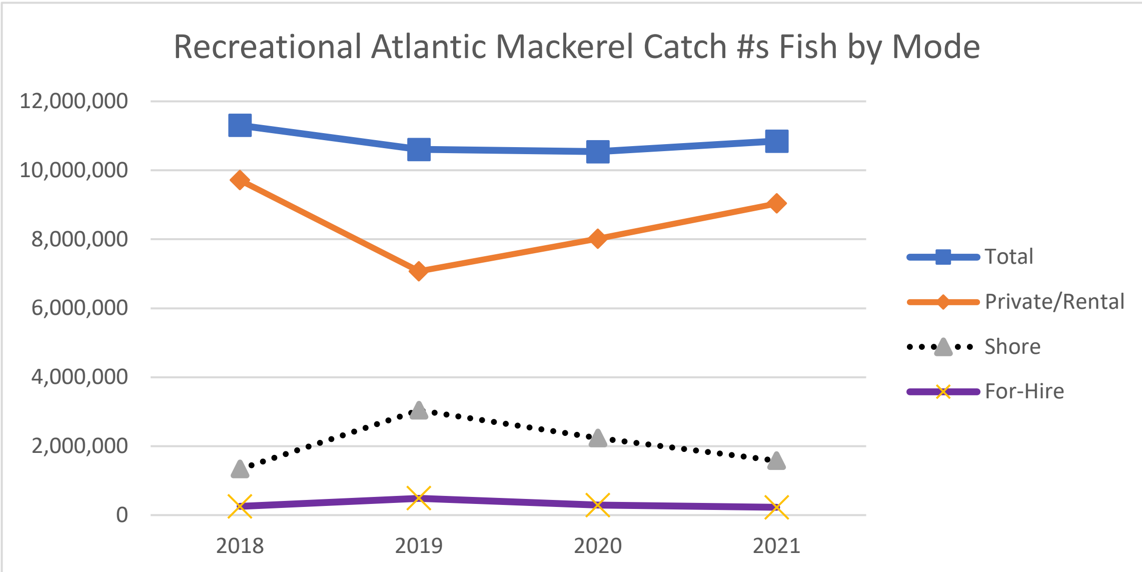

Figure 13. 2018-2021 MRIP Mackerel Estimates (#s) by Mode

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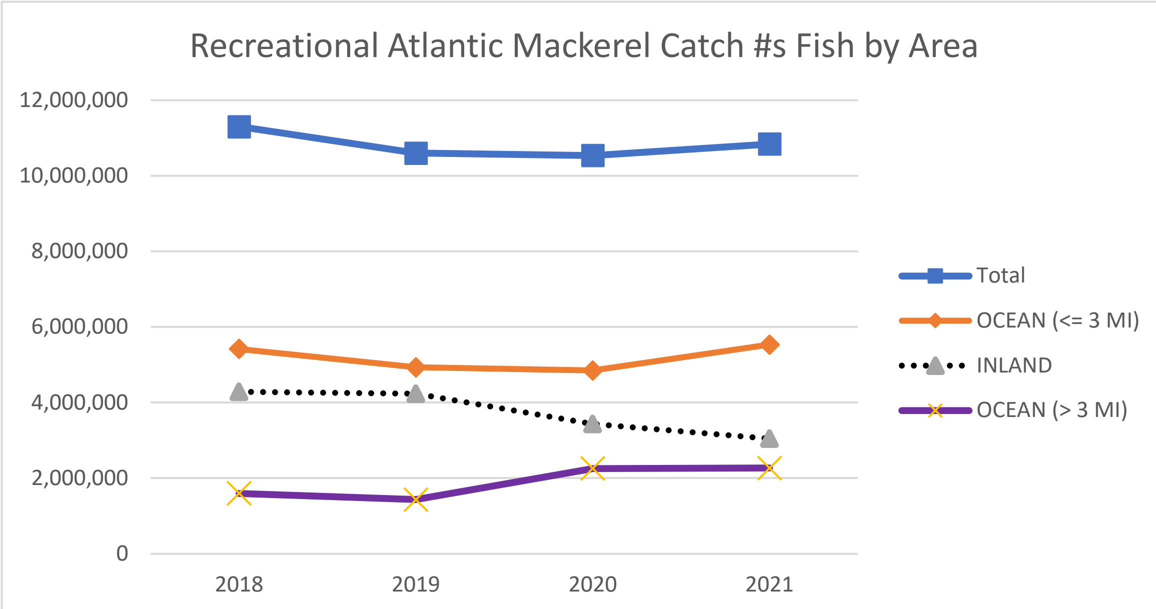

Figure 14. 2018-2021 MRIP Mackerel Estimates (#s) by Area

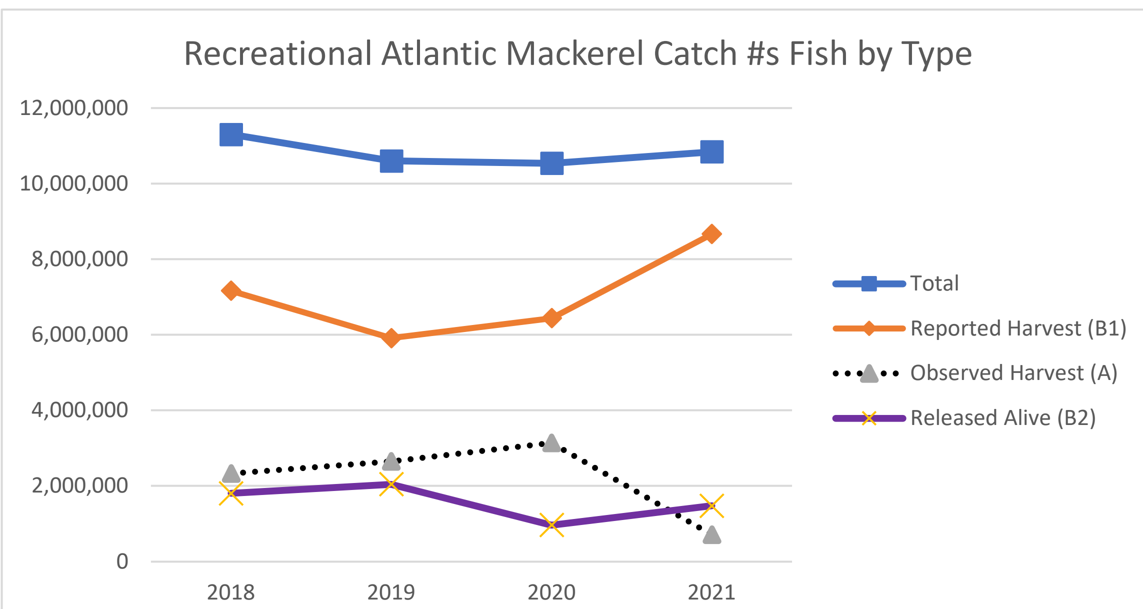

Figure 15. 2018-2021 MRIP Mackerel Estimates (#s) by Catch Type

6.4 Protected Species

Protected species are those afforded protections under the Endangered Species Act (ESA; species listed as threatened or endangered under the ESA) and/or the Marine Mammal Protection Act (MMPA). The Table below provides a list of protected species that occur in the affected environment of the MSB fisheries and the potential for the fishery to impact the species, specifically via interactions with MSB fishing gear (i.e., mid-water trawl and bottom trawl gear). The EA for this action will further describe interactions and impacts with these species, but all of the alternatives would decrease quotas compared to either no action (which would substantially increase quotas) or the status quo, so the action alternatives would not be likely to lead to increased effort or additional negative impacts on protected resources.

Table 25. Species Protected Under the ESA and/or MMPA that May Occur in the Affected Environment of the MSB FMP

Species	Status[2]	*Potential to interact with MSB fishing gear?*
Cetaceans		
North Atlantic right whale (Eubalaena glacialis)	***Endangered***	***No***
Humpback whale, West Indies DPS, (*Megaptera novaeangliae*)	Protected (MMPA)	No
Fin whale (Balaenoptera physalus)	***Endangered***	***No***
Sei whale (Balaenoptera borealis)	***Endangered***	***No***
Blue whale (Balaenoptera musculus)	***Endangered***	***No***
Sperm whale (Physeter macrocephalus	***Endangered***	***No***
Minke whale (*Balaenoptera acutorostrata*)	Protected (MMPA)	Yes
Pilot whale (Globicephala spp.)[3]	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

Species	**Status**[2]	***Potential to interact with MSB fishing gear?***
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
Beaked whales (*Ziphius and Mesoplodon spp*)[4]	Protected (MMPA)	No
Bottlenose dolphin (Tursiops truncatus)[5]	***Protected (MMPA)***	***Yes***
Harbor porpoise (*Phocoena phocoena*)	Protected (MMPA)	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)	No
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		
Atlantic salmon (*Salmo salar*)	Endangered	Yes
Atlantic sturgeon *(Acipenser oxyrinchus)*		

Species	Status[2]	*Potential to interact with MSB fishing gear?*
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
Giant manta ray (*Manta birostris*)	Threatened	Yes
Critical Habitat		
Northwest Atlantic DPS of Loggerhead Sea Turtle	ESA (Protected)	No
North Atlantic Right Whale Critical Habitat	ESA (Protected)	No

Notes: Marine mammal species (cetaceans and pinnipeds) italicized and in bold are considered MMPA strategic stocks. Shaded rows indicate species who prefer continental shelf edge/slope waters (i.e., >200 meters).

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

[2] Status is defined by whether the species is listed under the ESA as endangered (i.e. at risk of extinction) or threatened (i.e. at risk of endangerment), or protected under the MMPA. Marine mammals listed under the ESA are also protected under the MMPA. Candidate species are those species for which ESA listing may be warranted.

[3] 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 referred to as *Globicephala spp*.

[4] There are multiple species of beaked whales in the Northwest Atlantic. They include the cuvier's (*Ziphius cavirostris*), blainville's (*Mesoplodon densirostris*), gervais' (*Mesoplodon europaeus*), sowerbys' (*Mesoplodon bidens*), and trues' (*Mesoplodon mirus*) beaked whales. Species of *Mesoplodon* are difficult to identify at sea, therefore, much of the available characterization for beaked whales is to the genus level only.

[5] This includes the Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal Stocks of Bottlenose Dolphins.

Cusk is a NMFS "candidate species" under the ESA. Candidate species are those petitioned species for which NMFS has determined that listing may be warranted under the ESA and those species for which NMFS has initiated an ESA status review through an announcement in the Federal Register. If a species is proposed for listing the conference provisions under Section 7 of the ESA apply (see 50 CFR 402.10); however, candidate species receive no substantive or procedural protection under the ESA. NMFS recommends that project proponents consider implementing conservation actions to limit the potential for adverse effects on candidate species from any proposed action. Additional information on cusk can be found at: https://www.fisheries.noaa.gov/endangered-species-conservation/candidate-species-under-endangered-species-act. .

7.0 Biological and Human Community Impacts

For habitat and non-target species impacts, the key determinant is not so much the catch itself but the amount and character of the related effort, and the impact of that effort on stock status and the quality/quantity of habitat (see Table 26). The table immediately below illustrates that the availability of the target species can drive effort as much as any quota change, and as effort changes so would impacts on habitat, protected resources, and non-target species. Since limits on catch do cap effort, measures that limit catch are considered a factor related to changes in effort.[6]

[6] National Oceanic and Atmospheric Administration Administrative Order 216-6A and the Companion Manual contains criteria for determining the significance of the impacts of a proposed action and it includes the possibility of introducing or spreading a nonindigenous species. This potential impact does not fit into the sections below so it is addressed in this introduction. There is no evidence or indication that these fisheries have ever resulted or would ever result in the introduction or spread of nonindigenous species.

Table 26. Changes in effort as a result of adjustments to quota and/or fish availability.

Change in quota	**Fish abundance/availability**		
	Decrease in availability	**No change in availability**	**Increase in availability**
Decrease in quota	Fishing effort may decrease, increase, or stay the same depending on a combination of factors[7].	Effort likely to decrease or stay the same. If per trip catch stays the same, the fishery will be closed earlier with fewer trips taken (reducing effort). However managers may reduce trip limits or adjust regulations that extend the fishing season (keeping effort the same).	Effort likely to decrease or stay the same. A lower quota plus higher catch per unit of effort (CPUE) from higher availability should decrease effort. However, managers may reduce trip limits or adjust regulations that extend the fishing season which may keep effort relatively even.
No change in quota	Effort may increase or decrease. Even with no change, fishermen may take more trips to catch the same amount of fish (increasing effort) or may stop targeting a stock of fish if availability is low enough to decrease profitability (decreasing effort).	Fishing effort may remain the same given the quota has not changed and availability is expected to be similar.	Effort should decrease. While the quota has not changed, fishermen should be able to take fewer trips to catch the same amount of fish (decreasing effort).
Increase in quota	Fishing effort likely to increase or stay the same. A higher quota plus lower catch per unit of effort from lower availability should increase effort. However, managers may increase trip limits or adjust regulations to allow more efficient fishing (keeping effort the same).	Effort likely to increase or stay the same. If per trip catch stays the same, the fishery will be closed later with more trips taken (increasing effort). However managers may increase trip limits or adjust regulations to allow more efficient fishing (keeping effort the same).	Fishing effort may decrease, increase, or stay the same depending on a combination of factors.

[7] Factors affecting fishing effort include other species abundance, availability of other opportunities, weather, climate, fish movements/availability, variable productivity, and market forces/price changes.

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

Table 27. General definitions for impacts and qualifiers relative to resource condition (i.e., baselines)

General Definitions				
VEC	Resource Condition	Impact of Action		
		Positive (+)	Negative (-)	No Impact (0)
Target and non-target Species	Overfished status defined by the MSA	Alternatives that maintain or are projected to result in a stock status above an overfished condition*	Alternatives that maintain or are projected to result in a stock status below an overfished condition*	Alternatives that do not impact stock / populations
ESA-listed protected species (endangered or threatened)	Populations at risk of extinction (endangered) or endangerment (threatened)	Alternatives that contain specific measures to ensure no interactions with protected species (i.e., no take)	Alternatives that result in interactions/take of listed species, including actions that reduce interactions	Alternatives that do not impact ESA listed species
MMPA protected species (not also ESA listed)	Stock health may vary but populations remain impacted	Alternatives that maintain takes below PBR and approaching the Zero Mortality Rate Goal	Alternatives that result in interactions with/take of marine mammals that could result in takes above PBR	Alternatives that do not impact MMPA protected species
Physical environment / habitat / EFH	Many habitats degraded from historical effort	Alternatives that improve the quality or quantity of habitat	Alternatives that degrade the quality/quantity or increase disturbance of habitat	Alternatives that do not impact habitat quality
Human communities (socioeconomic)	Highly variable but generally stable in recent years (see condition of the resources table for details)	Alternatives that increase revenue and social well-being of fishermen and/or communities	Alternatives that decrease revenue and social well-being of fishermen and/or communities	Alternatives that do not impact revenue and social well-being of fishermen and/or communities
	Impact Qualifiers			
A range of impact qualifiers is used to indicate any existing uncertainty	Negligible		To such a small degree to be indistinguishable from no impact	
	Slight (sl), as in slight positive or slight negative		To a lesser degree / minor	
	Moderate (M) positive or negative		To an average degree (i.e., more than "slight", but not "high")	
	High (H), as in high positive or high negative		To a substantial degree (not significant unless stated)	
	Significant (in the case of an EIS)		Affecting the resource condition to a great degree, see 40 CFR 1508.27.	
	Likely		Some degree of uncertainty associated with the impact	

*Actions that will substantially increase or decrease stock size, but do not change a stock status may have different impacts depending on the particular action and stock. Meaningful differences between alternatives may be illustrated by using another resource attribute aside from the MSA status, but this must be justified within the impact analysis.

7.1 Managed Resource - Mackerel

Taking no action would lead to overfishing in 2023 and expected failure to rebuild due to the high catches that could be implemented without taking action and a reversion to previous specifications. This would be a high negative impact on mackerel, and highly negative compared to the action alternatives.

All of the action alternatives are predicted to rebuild mackerel within 10 years. Given the imprecision of 10-year projections, quantitatively comparing the relatively small changes in probability of rebuilding is likely to be uninformative and possibly misleading. The 4-fold error in the last 3-year projection estimate for 2019 SSB illustrates the degree of uncertainty. 2023 specifications alone require a 4-year projection from 2019, and projecting out to 2032 is really a 13-year projection (2019 to 2032). The probabilities of rebuilding are also dependent on the underlying recruitment assumptions, which makes comparing Alternative 1 to Alternatives 2-5 challenging in terms of the calculated probabilities, but the very low catches in Alternative 1 will create the highest probability of rebuilding in reality. Finally, the likely iterative nature of mackerel rebuilding with MTAs expected in 2023, 2025, 2027, and 2029 greatly complicates interpreting the probability of rebuilding. For example, if one were to lock in the projected catch trajectories for 10 years, Alternative 4 appears to have a higher probability of rebuilding (60.5%) than Alternative 3 (51.5%). However, the higher later catches in Alternative 3 that reduce its probability of rebuilding to near 50% would only occur if rebuilding is actually on track, and the initially lower catches of Alternative 3 mean that early rebuilding would be more likely with Alternative 3 than with Alternative 4. So while the overall rebuilding probability of Alternative 4 is calculated as higher with the full series of catches, Alternative 3 is in fact the more risk averse option (in terms of avoiding a failure to rebuild) due to the lower catches.

Accordingly, a simpler and probably better way to consider the impacts of the alternatives on mackerel is qualitatively based on allowed catches in years that would be considered in the 2025 Mackerel MTA, 2023 and 2024. The 2025 Mackerel MTA should consider catch through 2024, so one way to compare across all alternatives in terms of relative probability of leading to stock growth by the 2025 Mackerel MTA is to just consider 2023-2024 combined catch for each rebuilding path. The higher the combined 2023 and 2024 combined catch, the relatively less likely stock growth will occur. The Action Alternatives 1-5 have been ordered from least to most 2023- 2024 combined catch, so that is the same order from most likely stock rebuilding to least likely stock rebuilding by the 2025 MTA. Accordingly, that would also be the order of most to least positive impact on mackerel, though all are generally moderate in positive impacts given the predicted moderate stock growth predicted in the next few years.

7.2 Habitat/Protected Resources/Non-Target Species

The EA for this action will address these impacts in greater detail, but generally for these valued ecosystem components, there are relatively greater negative effects with more effort, and relatively less negative effects with less effort. Compared to no action, which would lead to substantially higher quotas, all of the action alternatives would be expected to have less negative effects. For 2023, the only year that this action proposes to set specifications, even Alternative 5, which would lead to the highest commercial quotas among the action alternatives, would also have quotas similar or less than the status quo, so negative impacts to Habitat/Protected Resources/Not Target Species would be expected to remain similar to or less than the status quo, and less than no action.

7.3 Socioeconomic Impacts

This action would primarily affect the mackerel fishery. As discussed above, the availability of the targeted species may drive effort (and catch and revenues) as much as any regulations.

Mackerel Commercial Fishery Current Condition:

Due to the year-to-year variation in catch and effort in the fishery, it is difficult to fully quantify human community impacts but the current fishery supports a number of vessels, as described in Section 6.3, and provides a variety of jobs related directly to fishing and also in associated support services. 22 vessels landed over 10,000 pounds of mackerel in 2021, with total mackerel landings valued at $3.1 million. From 2019-2021 mackerel ex-vessel revenues varied from $2.9-$5.2 million, averaging $3.7 million. The Council has received input from commercial tuna fishermen that commercial tuna fishing could be impacted by limitations on mackerel, but commercial vessels can get open access commercial incidental mackerel permits that would allow retention of up to 5,000 pounds of mackerel as bait (catch would need to be reported on Vessel Trip Reporting linked to that permit). Given the overfished status of mackerel and reduced productivity, the socioeconomic contributions of mackerel are reduced compared to historical levels.

Socioeconomic Mackerel Commercial Fishery Impacts:

Socioeconomic impacts related to commercial mackerel fishing are likely directly related to the quotas that are set. In the short run, the Alternatives sorted in order of 2023 quotas from most to least are No action, Alternative 5, Alternative 4, Alternative 3, Alternative 2, Alternative 1. Alternatives 1-3 would result in negative or near zero commercial quotas and do not appear practicable. All of the Alternatives would result in substantially lower quotas than no action, but the more relevant comparison is to the 2022 quota of 4,963 MT. Depending on Canadian and recreational deductions, Alternative 5 would result in a 2% to 54% reduction in quota. Depending on Canadian and recreational deductions, Alternative 4 would result in a 28% to 80%

reduction in quota. These ranges will be able to be refined at the time of final action. While no action would implement much higher quotas, it would not be a legal option given it would result in substantial overfishing. Over the 10 years in the rebuilding plan, total summed catches, in order of most to least would be Alternative 3, Alternative 5, Alternative 4, Alternative 2, Alternative 1. However, given the large error observed in the first iteration of projecting mackerel biomass even 3 years into the future, it is not clear what the meaningfulness of comparing summed 10-year catches would actually be. In the long run, rebuilding mackerel should result in high positive impacts due to achieving optimum yield, in a similar fashion among all the action alternatives.

Mackerel Recreational Fishery Current Condition:

Mackerel catch was relatively stable from 2019-2021, very close to the average of 10.7 million fish. The majority of fish are harvested, but are not made available to MRIP dockside interviewers – rather the majority of catch estimates result from "reported harvest" by interviewees. These fish may have been used for bait or the interviewee just doesn't want to show the fish to the MRIP interviewer. MRIP interviews are conducted with anglers by state staff, who also ask about fish that are discarded/released. These reported discards represented on average 14% of catch from 2019-2021. Almost all catch in recent years has been in Maine, New Hampshire, and Massachusetts. Private (and rental) boat catch is responsible for most catch, with about 20% from shore and a very small amount (5% or less) from the for-hire sector.

NMFS estimated the 2017 economic effects of recreational fishing in states including Maine, New Hampshire, and Massachusetts (Lovell et al 2020). The following describes their findings. Mackerel is not a frequent directed target, for example in 2021 only 5% of the 17.1 million marine fishing trips in New England targeted mackerel as a primary or secondary species, but mackerel has been reported as an important bait component for other fisheries, including striped bass and tuna.

Marine recreational fishing trips in Maine supported 714 full or part-time jobs, and contributed $75 million in sales, $27 million in income, and $45 million in gross domestic product (GDP) to the state's economy.

Table 28. Maine Marine Recreational Fishing Trips Economics

Fishing Mode	Expense ($1,000's)	# Jobs	Sales ($1,000's)	Income ($1,000's)	Value Added ($1,000's)
For-Hire	$2,863	52	$4,725	$1,644	$2,747
Private Boat	$15,322	138	$15,957	$5,353	$9,009
Shore	$40,223	524	$54,603	$20,012	$32,799
Total Trip	$58,408	714	$75,285	$27,009	$44,555

Marine recreational fishing trips in New Hampshire supported 378 full or part-time jobs, and contributed $37 million in sales, $15 million in income, and $25 million in gross domestic product (GDP) to the state's economy.

Table 29. New Hampshire Marine Recreational Fishing Trips Economics

Fishing Mode	Expense ($1,000's)	# Jobs	Sales ($1,000's)	Income ($1,000's)	Value Added ($1,000's)
For-Hire	$6,168	100	$9,393	$3,593	$5,680
Private Boat	$12,176	93	$9,555	$4,371	$6,376
Shore	$14,107	185	$18,166	$7,249	$12,569
Total Trip	$32,451	378	$37,114	$15,213	$24,625

Marine recreational fishing trips in Massachusetts supported 2,784 full or part-time jobs, and contributed $326 million in sales, $156 million in income, and $225 million in gross domestic product (GDP) to the state's economy.

Table 30. Massachusetts Marine Recreational Fishing Trips Economics

Fishing Mode	Expense ($1,000's)	# Jobs	Sales ($1,000's)	Income ($1,000's)	Value Added ($1,000's)
For-Hire	$30,563	463	$49,737	$19,342	$31,838
Private Boat	$181,933	1,118	$139,187	$68,344	$95,335
Shore	$100,756	1,203	$136,898	$68,646	$97,822
Total Trip	$313,252	2,784	$325,822	$156,332	$224,995

While there is some overlap with the above for-hire estimates, NMFS has also separately estimated the economic impacts of fishing for Highly Migratory Species (HMS) like tunas (Hutt and Silva 2019). These trips could be indirectly affected by limits on mackerel fishing due to use of mackerel as bait. Non-tournament HMS Angling Trips (Tournament trips were only estimated from Maine through Texas) in 2016 were estimated to have the following impacts:

Table 31. Total expenditures and economic contributions generated by New England non-tournament Atlantic HMS Angling trips, registered HMS tournament operations, and HMS tournament participating teams from Maine to Texas in 2016. Non-tournament trip expenditures are reported by region and nationally, while tournament-related expenditures are only reported nationally.

Type and Region	Total Expenditures	Employment (jobs)	Income	Value Added	Total Sales Output
Non-tournament Angling Trips					
New England	$5,172,293	37	$2,061,493	$3,056,170	$4,867,047
Tournament Angling[1]	$37,544,910	532	$26,153,290	$46,180,928	$84,671,666
Tournament Operation[2]	$20,170,466	295	$15,120,988	$26,099,884	$43,970,942

Recreational Impacts

There would be some reduction in the positive impacts the public currently derives from recreational mackerel fishing under the proposed bag limits. While it cannot be directly estimated what proportion of value would be lost if access to mackerel is limited (related to directed fishing or harvest for bait), the Council hopes to get additional public input on this issue. The Council has received input that a bag limit in the range of 10-15 fish per person should mitigate most of the potential negative effects of being limited in using mackerel for bait for the striped bass and/or tuna fisheries. In the short term, one would expect more negative effects from a 10 fish bag limit versus a 15 fish bag limit, and both would be more negative than the currently unrestricted fishery (i.e. no action). Given the expected catch reductions are moderate, one would expect the negative impacts to also be moderate. In the long term, there should be positive impacts as these restrictions contribute to mackerel rebuilding, allowing higher catches in the future.

8.0 LITERATURE CITED AND SELECTED BACKGROUND DOCUMENTS

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MID-ATLANTIC | FISHERY MANAGEMENT COUNCIL

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 26, 2022

To: Chris Moore, Executive Director

From: Jason Didden, Staff

Subject: Longfin Squid 2023 Specifications Review

As part of the multi-year specification process for longfin squid, the Scientific and Statistical Committee (SSC) and Council review the most recent information available to determine whether modification of the specifications is warranted. Neither staff, nor the SSC, nor the Monitoring Committee recommended any changes for the 2023 specifications for longfin squid, and no action is required by the Council. A Management Track Assessment is planned for 2023 to inform specifications for 2024 and beyond. A Research Track Assessment is planned for 2026 (https://s3.us-east-1.amazonaws.com/nefmc.org/2022-2026-Stock-Assessment-Schedules.pdf).

The following materials are included for Council consideration on this subject:

1) Monitoring Committee Summary – See Chub Mackerel Tab

2) Report of the May 2022 SSC Meeting – See Committee Reports Tab

3) Staff ABC Recommendation Memo (May 2, 2022)

4) Longfin Squid Advisory Panel Fishery Performance Report (April 2022)

5) Longfin Squid Fishery Information Document (April 2022)

6) NEFSC longfin catch and index figures

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 2, 2022

To: Chris Moore, Executive Director

From: Jason Didden, Staff

Subject: Longfin Squid ABC – Staff Recommendation

Longfin Squid

As part of the specification process for longfin squid, the SSC and Council will review the most recent information available to determine whether modification of the 2023 specifications is warranted. The longfin squid fishery is currently under multi-year specifications for 2021-2023. The ABC (23,400 MT) is not proposed to change from 2021-2023 under the multi-year specifications, based on previous SSC recommendations. After a review of the available information, staff recommends no changes to the previously-recommended 2023 ABC.

We are hoping to get an update of recent NEFSC trawl survey results before the SSC meeting and will post that information if/when available.

Longfin Squid Fishery Performance Report

April 2022

The Mid-Atlantic Fishery Management Council's (Council) Mackerel-Squid-Butterfish (MSB) Advisory Panel (AP) met via webinar on April 26, 2022 to review the Fishery Information Document and develop the following Fishery Performance Report. The meeting also addressed chub mackerel, but a separate report was generated for chub mackerel. The primary purpose of the report is to contextualize catch histories for the Scientific and Statistical Committee (SSC) by providing information about fishing effort, market trends, environmental changes, and other factors. The trigger questions below were posed to the AP to generate discussion. The AP comments summarized below are not necessarily consensus or majority statements.

Advisory Panel members present (7 of 16): Sam Martin, Emerson Hasbrouck, Katie Almeida, Greg DiDomenico, Dan Farnham Jr, Gerry O'Neill, Jeff Kaelin.

Others present: Carly Bari (GARFO), Julia Beaty (MAFMC staff), Jason Didden (MAFMC staff), Michelle Duval (MAFMC member), Gavin Fay (SSC member), Damiana Hartley, Mark Holliday (SSC member), Peter Hughes (MAFMC MSB Committee Chair), Mary Beth Tooley.

Discussion Questions:

1. What factors have influenced recent catch (markets, environment, regulations, etc.)?
2. Are the current fishery regulations appropriate? How could they be improved?
3. What would you recommend as research priorities?
4. What else is important for the Council to know?

General

Shifting thermal habitat suitability is impacting the distribution and/or productivity of MSB species, and needs to be taken into account by assessments/management.

There is concern that assessments will be hurt if surveys are limited by wind development. Similar concern exists regarding data gaps due to COVID-19.

Tariffs affect prices and profitability, and therefore trade. If a buyer is in China, that buyer may try to negotiate price based on what they know they will have to absorb in tariffs.

Management and research track assessments are upcoming (Management Track in 2023 and Research Track in 2026). Management Track input: The Council needs to communicate early with the Center so that fishery participants know what to expect and/or how they can participate or provide data. Research Track input: Having a facilitator was important for *Illex*, and would be good for longfin also. Data issues need to be addressed early as well.

Market/Economic Conditions

COVID-19 had drastic impacts on 2020 longfin demand. Retail trade provided an outlet for some longfin squid products. COVID-19 will continue to increase market uncertainties for the foreseeable future. Ex-Vessel prices dropped 40%-50% from early 2020 to April 2020. 2021 prices for Towndock were nearly the same as pre-Covid prices.

Supply/distribution issues (and increasing shipping costs) are also affecting all seafood markets. EU regulations and market preferences (squid size sorting requirements) also limit ability to re-shuffle squid products into Europe.

Fuel conditions in 2022 are a factor currently affecting the decision whether it's worth going after longfin, or how far participants are willing to travel.

Environmental Conditions

See point above in general section about shifting thermal habitat.

The low catches/effort in summer 2020 presented a natural experiment about laying off squid in the summer – had hoped for a productivity bump in late 2020/early 2021 (was not a boom).

Management Issues

Area/gear limitations negatively affect fishing/landings. Scup, Tilefish, and Fixed/Mobile Gear Restricted Areas (GRAs) have made longfin squid fishing more difficult. Large mesh requirements on George's Bank also restrict targeting of longfin squid in an areas where fishermen have been seeing signs of longfin squid. Until mid-2020, the Northeast Canyons and Seamounts Marine Monument may have also negatively impacted access to areas where longfin squid could have been caught. Northeast Canyons and Seamounts Marine Monument restrictions have been back in place since October 8, 2021. It's still not clear what impacts have been created by the Monument for MSB – could warrant additional analysis (the Monument also acts as a fence because you'd have to spend the time and fuel to get to the other side).

Other Issues

Appears observers starting to be aware of use of large mesh belly panel – is not clear how this may be being used for discard extrapolation. It's also a new gear designation for VTRs and we may need some outreach that this is a new VTR gear code. Same for observers to ensure gear types are matched correctly.

Upcoming potential for Turtle TEDs needs to consider/research how the new large mesh belly panel gear may interact with Turtle TEDs – research presented to date has been with older gear – potential effectiveness may be different with the current gear. (Cornell has submitted some related proposals, is collaborating with NMFS and proposals are under review.)

Windfarm development continues to be a major concern for the longfin squid fishery given expanding potential overlap between potential wind farm areas and squid fishery areas. Concerns involve **both** fleet displacement and effects on squid mortality/behavior from installation and/or operation of turbines/facilities.

Research Priorities

Investigate NEFSC survey catchability for longfin.

It needs to be more clearly described how the existing evidence supports two primary cohorts (which happen to align with the surveys).

Longfin Squid Fishery Information Document

April 2022

This Fishery Information Document provides a brief overview of the biology, stock condition, management system, and fishery performance for longfin squid ("longfin" hereafter, formerly known as "Loligo"), with an emphasis on 2021. Data sources for Fishery Information Documents include unpublished National Marine Fisheries Service (NMFS) survey, dealer, vessel trip report (VTR), permit, and Marine Recreational Information Program (MRIP) databases and should be considered preliminary. For more resources, including previous Fishery Information Documents, please visit http://www.mafmc.org/msb.

Key Facts

- 2021 landings, revenues, and average price for longfin squid were up in 2021 compared to 2020. Landings have generally been variable and well below the quota in recent years.
- 2022 landings are off to a moderate start – about double last year at this time but are still unlikely to achieve half of the 2022 Trimester 1 quota.
- Longfin had a management track assessment in 2020. Based on 2019 data the fishery was not overfished. Overfishing reference points are not available.
- Considerable variability is expected in abundance, availability, and landings for any squid fishery.

Basic Biology

Longfin squid is a neritic (from the shore to the edge of the continental shelf), semi-pelagic schooling cephalopod species primarily distributed between Georges Bank and Cape Hatteras, NC. The squid, and the fishery, generally occur offshore in the winter and inshore during the summer, with mixing and migrations from one to the other in spring and fall. Spawning/ recruitment occurs year-round with seasonal peaks in cohorts. The average lifespan of a cohort is about six months. Individuals hatched inshore during the summer are taken in the winter offshore fishery and those hatched in the winter are taken in the inshore summer fishery. Age data indicate that NEFSC spring surveys (March-April) capture longfin squid that were hatched during the previous six months, in the fall, and those caught in the NEFSC fall surveys (September-October) were hatched during the previous spring. Longfin squid attach egg masses to the substrate and fixed objects. Fishing and spawning mortality occur concurrently inshore during late spring through fall. The locations of spawning sites offshore at other times of the year are not well understood. Additional life history information is detailed in the EFH document for the species, located at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

Status of the Stock

Based on the last management track assessment, the status of longfin squid in 2019 was not overfished but there are no overfishing reference points available (available at https://apps-nefsc.fisheries.noaa.gov/saw/sasi/sasi_report_options.php). See Figure 1 for trends in biomass from the last assessment. We hope to get an update of Figure 1 before May 2022. The assessment also presented unaveraged trends based on the spring and fall surveys separately representing two dominant cohorts, and solicited input from the reviewers about switching to considering the two dominant cohorts separately. The reviewers supported moving forward with such an approach. Because the median fall biomass is about five times bigger than the median spring biomass, there could be considerable management implications if the surveys are ultimately used to manage two cohorts separately (e.g. consideration of either changes to trimester allotments or changes to the overall seasonal management approach might become warranted).

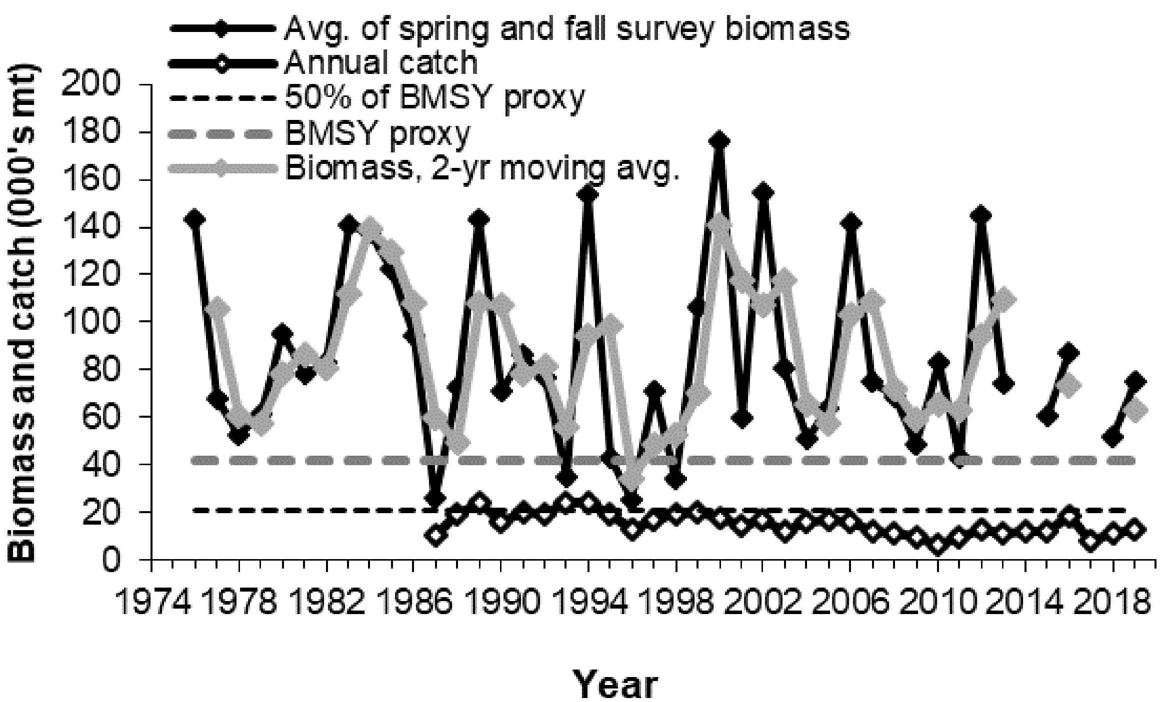

Figure 1. Annualized biomass estimates (annual averages of the NEFSC spring and fall survey biomass estimates in mt) of longfin in relation to the existing BMSY proxy (42,205 mt) and annual catches during 1987-2019 (when fishing was solely conducted by the USA fleet). The grey line represents the annualized biomass two-year moving averages which are used to determine stock status. Some years near the end are missing due to missing survey data.

Management System and Fishery Performance

Management

The Council established management of longfin in 1978 and the management unit includes all federal East Coast waters.

Access is limited with several moratorium permit categories. The quota is divided into three, 4-month Trimesters (T) - 43% (T1 Jan-Apr), 17% (T2 May-Aug), and 40% (T3 Sept-Dec). Unused quota can roll over into later trimesters within a year depending on the amount of longfin landed. Underages from T1 that are greater than 25% are reallocated to Trimesters 2 and 3 (split equally between both trimesters) of the same year. However, the T2 quota may only be increased by 50% via rollover and the remaining portion of the underage is reallocated to T3. Any underages for T1 that are less than 25% of the T1 quota are applied only to T3 of the same year. Any overages for T1 and T2 are subtracted from T3 of the same year as needed.

The 2022 longfin squid ABC is 23,400 MT, with a commercial quota of 22,932 MT. The 2023 quota is projected to be the same.

Recreational catch of longfin is believed to be negligible relative to commercial catch. There are no recreational regulations except for party/charter vessel permits and VTR reporting. MRIP does not collect information on invertebrates, but social media indicates a recreational fishery (private and for-hire) does occur.

Commercial Fishery

Figure 2 below from the last assessment describes longfin landings 1963-2019. We hope to get an update of Figure 2 before May 2022. Figures 3-4 describe domestic landings, ex-vessel revenues (2021 dollars), and prices (2021 dollars) since 1996. Figure 5 illustrates preliminary landings throughout the year for 2020 and 2021. Figure 6 illustrates preliminary landings for Trimester 1 for 2021 and 2022. The Gross Domestic Product Implicit Price Deflator was used to report revenues/prices as “2021 dollars.”

Table 1 describes 2021 longfin landings by state. Table 2 describes 2020 and 2021 longfin landings by NMFS Statistical Areas. Almost all landings that have gear identified are bottom trawl.

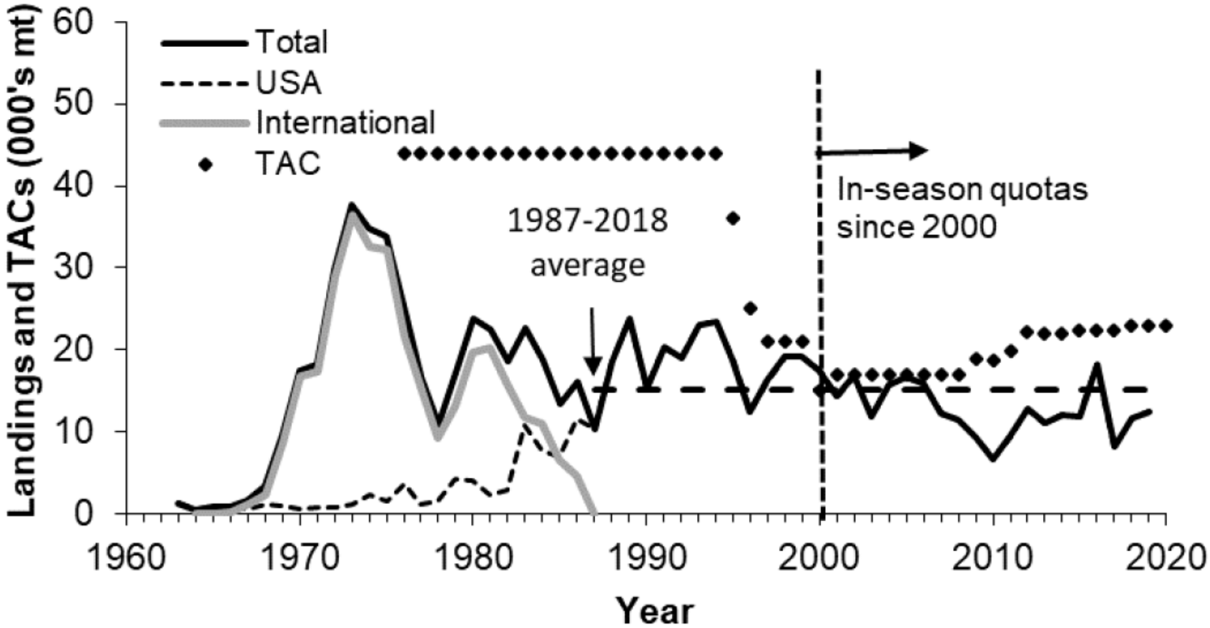

Figure 2. Landings (000s mt) of Doryteuthis pealeii, by USA and international fleets, on the Northeast USA continental shelf during 1963-2019 and annual TACs during1974-2020. In-season quotas were quarterly-based during 2001-2006 and trimester-based during 2000 and 2007-current.

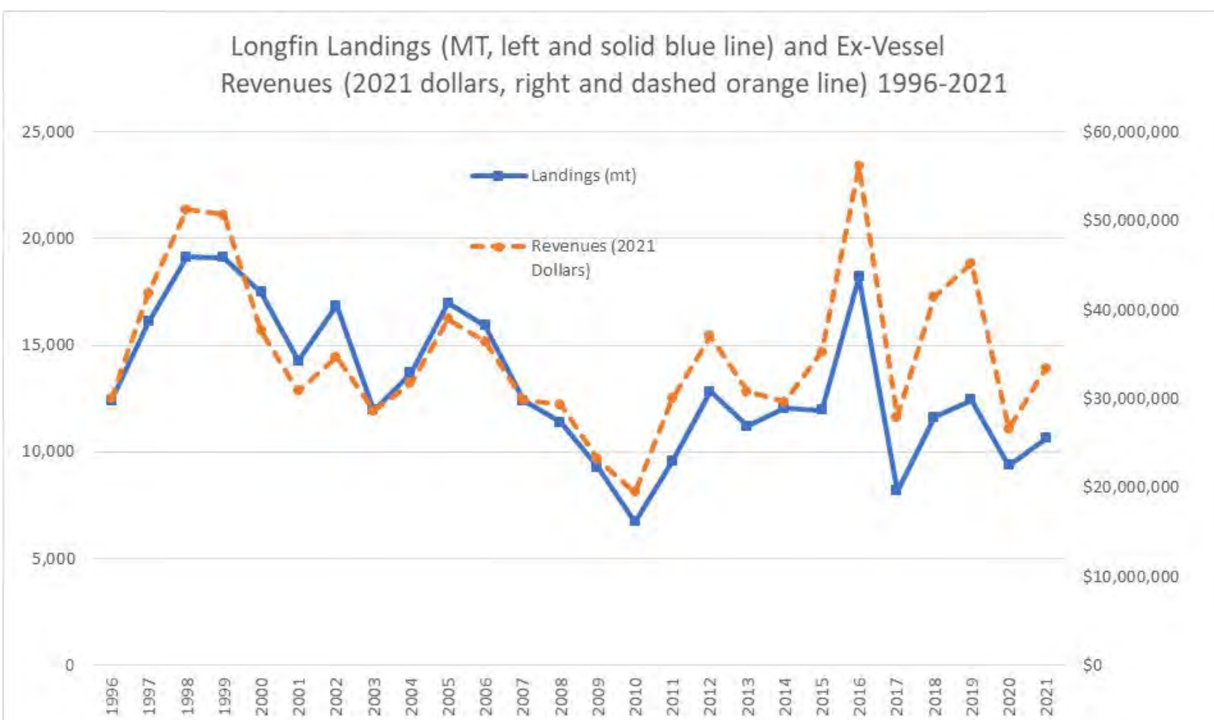

Figure 3. U.S. Longfin Landings and Longfin Ex-Vessel Values 1996-2021. Source: NMFS unpublished dealer data.

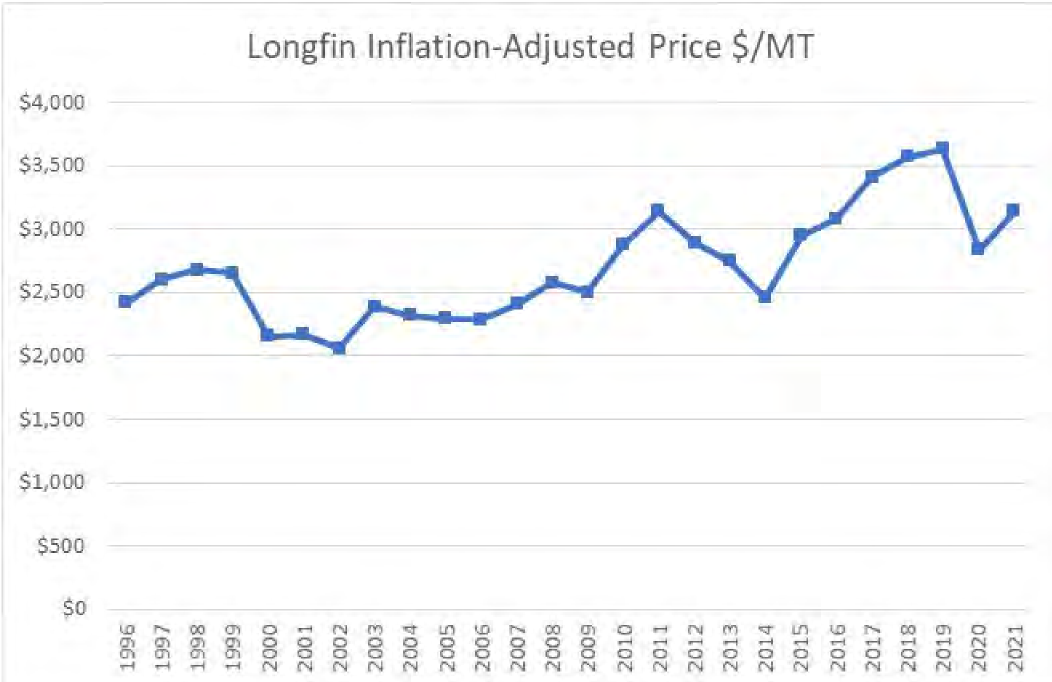

Figure 4. Ex-Vessel Longfin Prices 1996-2021 Adjusted to 2021 Dollars Source: NMFS unpublished dealer data.

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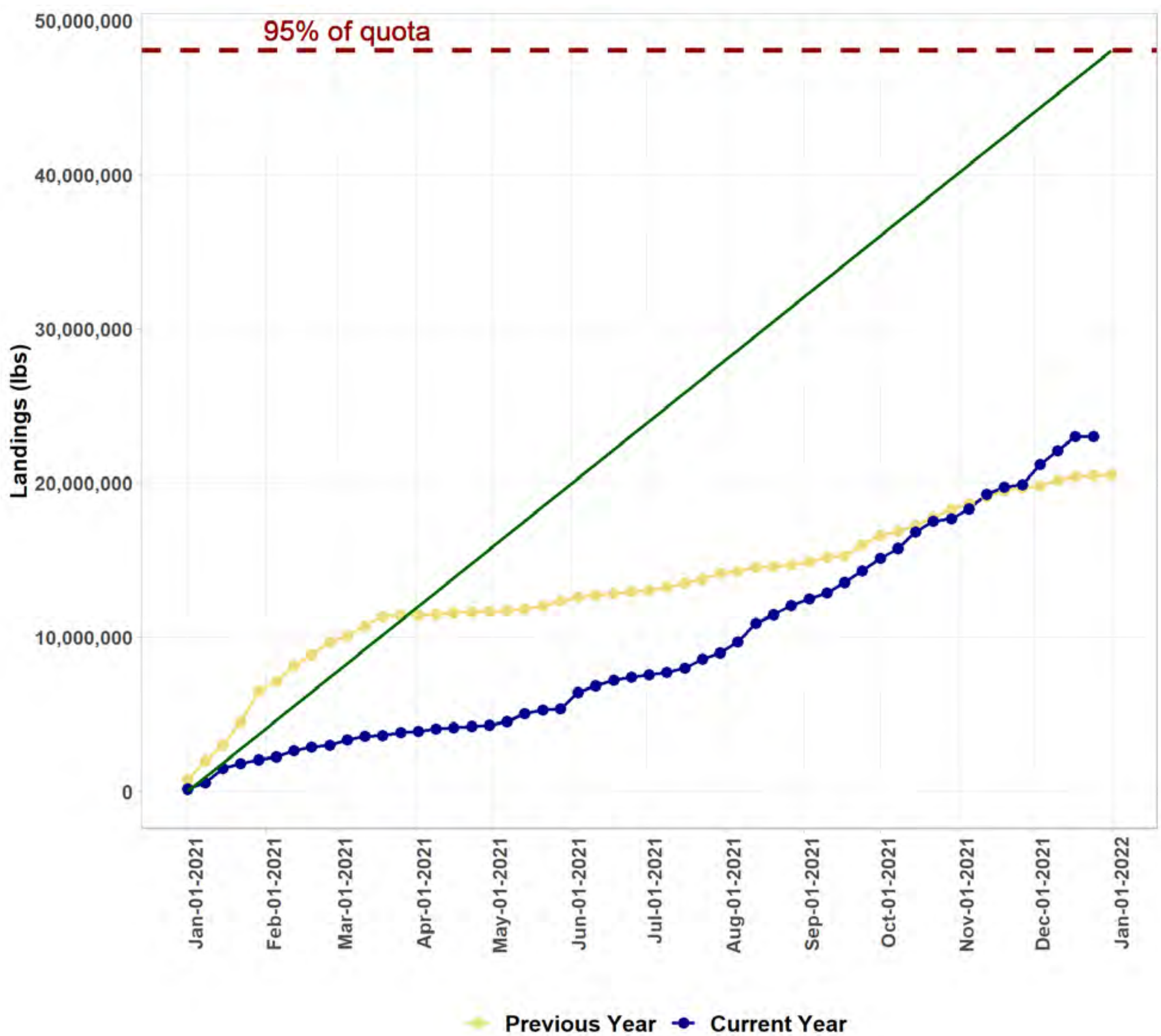

Figure 5. U.S. Preliminary Longfin landings; 2021 in blue, 2020 in yellow-orange. Source: https://www.fisheries.noaa.gov/new-england-mid-atlantic/commercial-fishing/quota-monitoring-greater-atlantic-region.

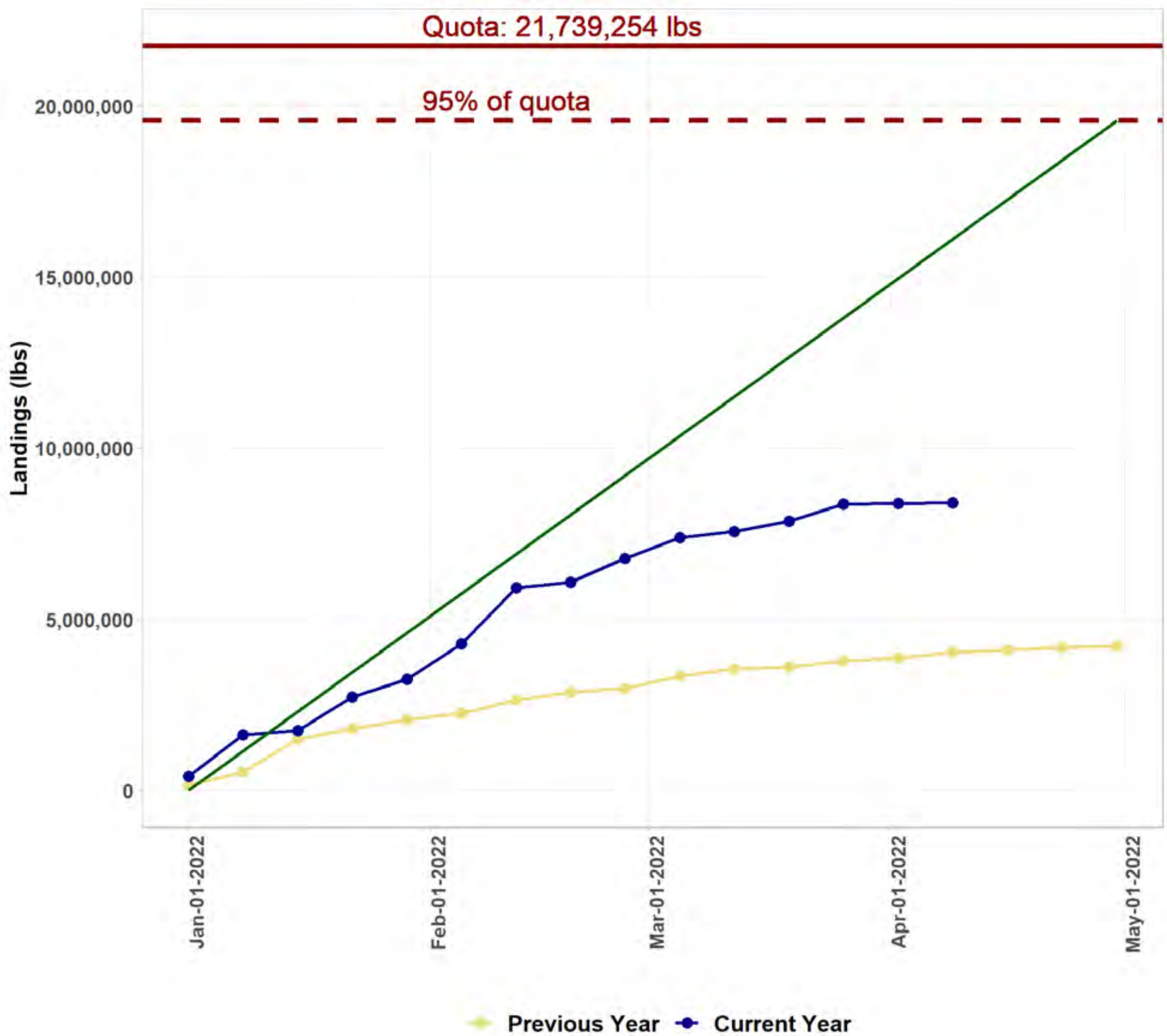

Figure 6. U.S. Preliminary Longfin landings; 2022 Trimester 1 in blue (through 4/14/22), 2021 Trimester 1 in yellow-orange. Source: https://www.fisheries.noaa.gov/new-england-mid-atlantic/commercial-fishing/quota-monitoring-greater-atlantic-region.

Table 1. Commercial Longfin landings (live wt) by state in 2021. Source: NMFS unpublished dealer data.

State	Metric Tons
RI	6,682
NY	2,111
MA	772
NJ	661
CT	356
Other	68
Total	10,650

Table 2. Commercial longfin landings by statistical area in 2020 and 2021. Source: NMFS unpublished VTR data.

2020	
Stat Area	Metric_Tons
622	1,784
616	1,770
613	1,038
626	777
525	748
537	534
612	396
526	323
611	227
562	216
538	206
539	197
623	191
632	76
615	57
627	53
Other	219
Total	8,812

2021	
Stat Area	Metric_Tons
537	2,030
613	1,983
616	1,660
622	1,157
626	462
526	316
539	309
538	288
611	260
525	191
627	131
562	123
632	114
167	100
615	69
612	65
166	62
623	51
Other	165
Total	9,535

Note: Expected to be lower than dealer database due to state landings.

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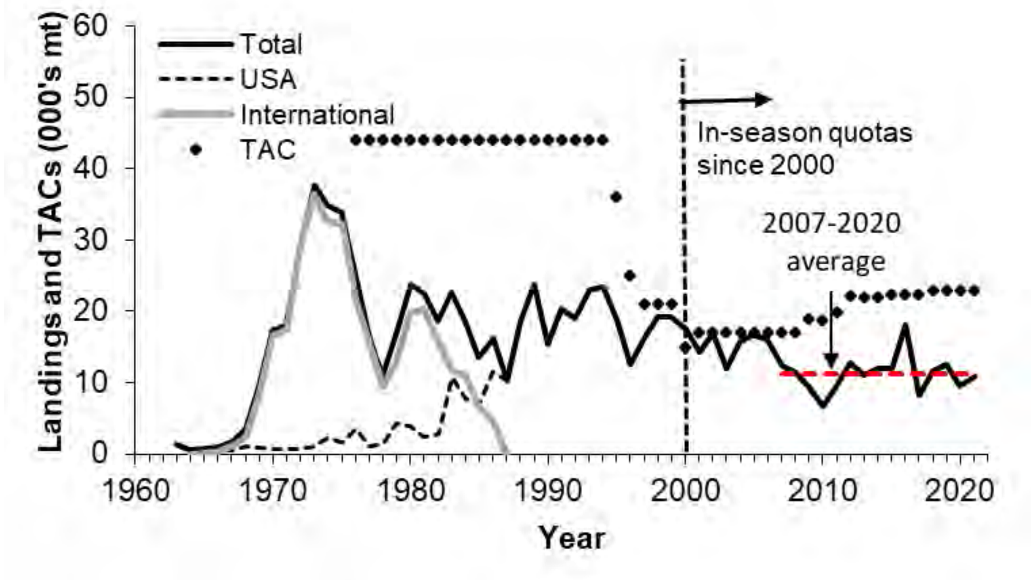

Figure 1. *Doryteuthis pealeii* landings during 1976-2021. The 2021 landings are preliminary because not all of the state data were available as of May 3, 2022. Trimester-based quotas have been in effect since 2007.

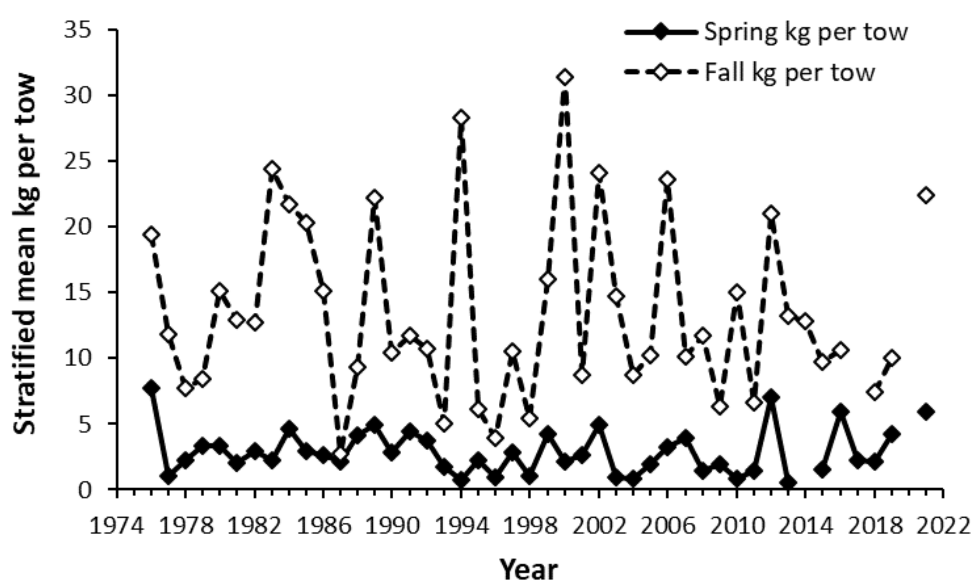

Figure 2. NEFSC spring and fall survey relative biomass indices (stratified mean kg per tow), for *Doryteuthis pealeii*, during 1976-2021. Indices were not computed for the fall of 2017 and 2020 (due to incomplete sampling of the species' habitat and the lack of a survey due to the COVID-19 pandemic, respectively) or the spring of 2014 and 2020 (due to incomplete sampling of the species' habitat).

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 27, 2022

To: Council

From: Julia Beaty, staff

Subject: 2023-2025 chub mackerel specifications setting

On June 8, 2022, the Mid-Atlantic Fishery Management Council (Council) will consider adopting 2023-2025 specifications for Atlantic chub mackerel. Council staff, the Scientific and Statistical Committee, the Monitoring Committee, and the Advisory Panel all recommend status quo specifications.

The following materials are provided behind this tab (unless otherwise noted) for the Council's consideration. Materials are listed in reverse chronological order.

1) Summary of the May 20, 2022 Monitoring Committee webinar
2) May 2022 Scientific and Statistical Committee report (*behind Tab 16*)
3) Staff memo on 2023-2025 specifications for Atlantic chub mackerel
4) April 2022 Advisory Panel Fishery Performance Report
5) 2022 Chub Mackerel Fishery Information Document

Mackerel, Squid, Butterfish Monitoring Committee
May 20, 2022
Webinar Meeting Summary

Monitoring Committee Attendees: Carly Bari (GARFO), Julia Beaty (MAFMC staff), Jason Didden (MAFMC staff), Lisa Hendrickson (NEFSC), Daniel Hocking (GARFO)

Additional Attendees: Katie Almeida, Greg DiDomenico, Jeff Kaelin, Meghan Lapp

Meeting Objectives: 1) Review recent longfin squid and chub mackerel fishery performance and management measure recommendations from the Advisory Panel, the Scientific and Statistical Committee (SSC), and Council staff; 2) Review, and if appropriate, recommend changes to the previously implemented 2023 longfin squid specifications; and 3) recommend 2023-2025 annual catch limits, annual catch targets, total allowable landings limits, and other management measures for chub mackerel.

Chub Mackerel 2023-2025 Specifications

The Monitoring Committee recommended that all chub mackerel specifications remain status quo in 2023-2025, with review and, if necessary, revision in interim years.

The Monitoring Committee agreed that expanded discard estimates based on the Standardized Bycatch Reporting Methodology would be beneficial for the purposes of chub mackerel catch accounting and specifications setting. To date, the Monitoring Committee has only considered a very simple analysis of the total proportion of chub mackerel reported in observer and vessel trip report (VTR) data that were discarded as opposed to retained. The Monitoring Committee agreed that they have much higher confidence in the observer data for discards compared to VTR data.

One Advisor who participated on the Monitoring Committee call recommended collection of biological samples from the recreational fishery, especially as recreational catches have been more consistent than commercial catches in recent years.

One Advisor who represents a commercial fish processing company said that although his company encouraged vessels to target chub mackerel in past years when *Illex* were not highly available, they have become more interested in exploring the potential for a thread herring fishery as an augment to the purse seine fishery. One Monitoring Committee member noted that an exploratory thread herring fishery would be the first case of considering an expanded fishery for an Unmanaged Forage Amendment Ecosystem Component species; therefore, thorough consideration would be needed regarding the most appropriate process.

Longfin Squid 2023 Specifications

After considering recent fishery performance, Advisory Panel input, and the SSC recommendation for status quo Acceptable Biological Catch (ABC), the Monitoring Committee found that modifications to the longfin squid specifications do not appear warranted at this time.

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Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 3, 2022

To: Chris Moore, Executive Director

From: Julia Beaty, staff

Subject: 2023-2025 specifications for Atlantic chub mackerel

Executive Summary

This memorandum includes information to assist the Mid-Atlantic Fishery Management Council's (Council's) Scientific and Statistical Committee (SSC) and Mackerel, Squid, and Butterfish (MSB) Monitoring Committee in recommending 2022-2025 catch and landings limits for Atlantic chub mackerel (*Scomber colias*), as well as the other management measures which can be modified through the annual specifications process.

Additional information on fishery performance and past management measures can be found in the 2022 Chub Mackerel Fishery Information Document and the 2022 Chub Mackerel Fishery Performance Report developed by advisors.[1]

The Council approved 2020-2022 catch and landings limits for Atlantic chub mackerel in March 2019 based on the SSC's acceptable biological catch (ABC) recommendations (Table 1). These measures were implemented through Amendment 21 to the MSB Fishery Management Plan (FMP) and became effective in September 2020 (85 Federal Register 47103). The SSC, Monitoring Committee, and Council reviewed these measures in 2020 and 2021 and recommended no changes.

During their May 2022 meeting, the SSC will consider chub mackerel ABCs for 2023-2025. The Monitoring Committee will then meet to recommend annual catch limits (ACLs), annual catch targets (ACTs), and total allowable landings limits (TALs) for 2023-2025, and other management measures which can be modified through the annual specifications process.

The Council will meet in June 2022 to review the recommendations of the SSC and Monitoring Committee, as well as input from advisors. They will then recommend catch and landings limits and other management measures for 2023-2025.

<u>Council staff recommend status quo chub mackerel specifications for 2023-2025.</u> There is no new information to suggest that these measures should be modified. In addition, advisors did not recommend any changes for 2023-2025.

[1] Both documents will be posted to https://www.mafmc.org/fishery-performance-reports.

Table 1. 2020-2022 catch and landings limits for Atlantic chub mackerel.

Measure	mil lb	mt	Basis
ABC	5.07	2,300	SSC recommendation
Expected SC-FL catch	0.08	38	Highest annual SC-FL landings shown in commercial dealer and MRIP data, increased by about 10% to account for discards, which are not well quantified.
ACL	4.99	2,262	ABC minus expected SC-FL catch.
ACT	4.79	2,171	ACL reduced by a 4% management uncertainty buffer.
Expected dead discards	0.29	130	6% of ACT based on based on the commercial discard rate during 2003-2017 from northeast observer data.
TAL	4.50	2,041	ACT minus expected total dead discards.

Recent Catch and Landings

After remaining below 0.5 million pounds per year for many years, commercial chub mackerel landings spiked to 5.25 million pounds in 2013, but decreased to pre-2013 levels by 2016. In 2021, 37,371 pounds of chub mackerel were landed by commercial fishermen from Maine through North Carolina. Recreational chub mackerel landings are variable and averaged 122,132 pounds per year during 2017-2021. In 2021, recreational fishermen from Maine through North Carolina harvested an estimated 174,839 pounds of chub mackerel (Table 2).

Over the past 20 years, commercial and recreational landings were less than half the 2020-2022 TAL of 4.50 million pounds in every year except 2013. During 2017-2021, commercial and recreational landings did not exceed 5% of the 2020-2022 TAL in any year (Table 2).

Table 2. Commercial and recreational chub mackerel landings, in pounds, 2002-2021, from Maine through North Carolina. Landings in some years are combined to protect confidential data associated with fewer than three vessels and/or dealers.

Year	Commercial landings	Recreational landings	Total landings
2002	471	0	471
2003	488,316	0	488,316
2004	126	0	126
2005	0	0	0
2006	0	0	0
2007-2009	21,039	0	21,039
2010-2011	192,301	1,613	193,914
2012	164,867	0	164,867
2013	5,249,686	0	5,249,686
2014	1,230,411	49,813	1,280,224
2015	2,108,337	0	2,108,337
2016	610,783	2,087	612,870
2017	2,202	13,310	15,512
2018	22,357	104,830	127,187
2019	60,522	49,892	110,414
2020	56,925	125,757	182,707
2021	37,371	137,468	174,839

Stock Status and Biological Reference Points

The stock status of chub mackerel in the western Atlantic Ocean is unknown as there have been no quantitative assessments of this species in this region. Since July 2018, the SSC has assumed that biomass is currently at or above biomass at maximum sustainable yield, as described in more detail in the following section.

Review of Prior SSC Recommendations

The SSC recommended the first chub mackerel ABC during their July 2018 meeting. They concluded that insufficient information exists to assess the status and trends of chub mackerel in the northwest Atlantic. They concluded that an overfishing limit could not be specified and recommended an ABC of 2,300 mt (5.07 million pounds) based on expert judgement. Their ABC recommendation is based loosely on the historic high for commercial and recreational landings (around 5.25 million pounds in 2013) and assumptions about discards. This level of ABC will prevent the fishery from achieving its historic high, but will allow landings to exceed those in every other year over at least the past 20 years (Table 2). The SSC agreed that this level of catch is unlikely to result in overfishing given the general productivity of this species in fisheries throughout the world combined with the relatively low fishery capacity in U.S. Atlantic waters. Based on their recommendations, the ABC applies to total dead catch (i.e., commercial and recreational landings and dead discards) from Maine through the east coast of Florida.

The SSC determined the following to be the most significant sources of scientific uncertainty associated with the ABC:

- Stock size and productivity cannot be determined, there is no information to determine reference points for stock biomass levels, and little information exists to determine reference points for fishing mortality rates.
- There is no information on the source of recruits; it is unknown whether chub mackerel are episodic in the Mid-Atlantic, whether this is a range expansion with localized spawning, or neither.
- There is no information on predation mortality, or on the role of chub mackerel in predator diets.
- There is very high uncertainty in recreational landings and discards. Observer coverage on fisheries likely to catch chub mackerel may be low (*Illex* fleet, Mid-Atlantic small mesh bottom trawl).

The SSC reviewed their recommendations in September 2020 and September 2021 and recommended no changes.

Annual Catch Limit

The ACL for chub mackerel is derived by subtracting expected catch in the South Atlantic (in this case, referring to South Carolina through the east coast of Florida) from the ABC (Figure 1). An 84,500 pound buffer for expected South Atlantic catch was used when setting the chub mackerel ACL for 2020-2022. This represents about 2% of the ABC and was intended to be a conservatively high estimate based on the highest annual South Atlantic landings shown in commercial dealer and Marine Recreational Information Program (MRIP) data (i.e., 76,835 pounds of landings in 2011, the vast majority of which were recreational landings), increased by about 10% to account for dead discards. Chub mackerel discards in the South Atlantic are highly uncertain.

When the Council first set this buffer in 2019, they considered data through 2017. Commercial and recreational fishery data through 2021 suggest that 84,500 pounds remains higher than past annual South Atlantic catch. For example, MRIP data for 2018-2021 show no estimated recreational chub mackerel catch from South Carolina through the east coast of Florida. Atlantic Coastal Cooperative Statistics Program data show commercial landings amounts that are confidential, but less than 250 pounds in total across 2018-2021 combined.

If the Monitoring Committee and Council wish to maintain the previous rationale and methodology for setting this buffer, then no changes are needed for 2023-2025 specifications. Therefore, if the SSC recommends a status quo ABC, staff recommend a status quo ACL of 4.99 million pounds (2,262 mt) for 2023-2025.

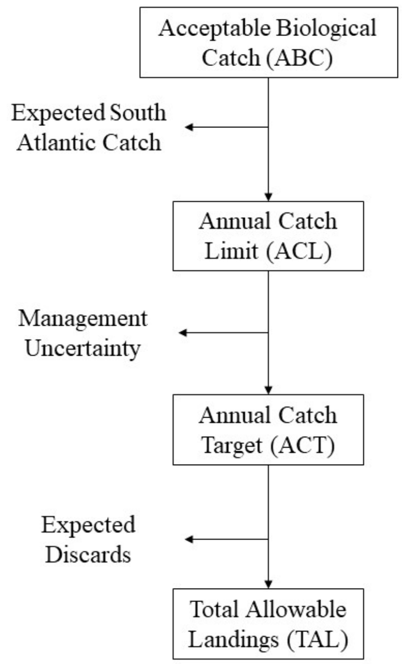

Figure 1. Flowchart summarizing chub mackerel catch and landings limits.

Annual Catch Target

As defined in the FMP, the ACT can be set less than or equal to the ACL to account for management uncertainty (Figure 1). The Council adopted a 4% management uncertainty buffer when they set the 2020-2022 specifications in March 2019. They did not recommend this buffer based on a quantitative methodology. This buffer was assumed to be sufficient to prevent ACL overages when used in combination with the in-season commercial fishery closure regulations described on the next page. Landings have remained well below the TAL. The 4% management uncertainty buffer has not proved to be constraining on the fishery as catch has been very low due to other factors (e.g., a focus on other commercial target species).

Council staff recommend a status quo management uncertainty buffer of 4%, resulting in a status quo ACT of 4.79 million pounds (2,171 mt) for 2023-2025, assuming the SSC recommends a status quo ABC.

Discards

Expected commercial and recreational discards in weight are subtracted from the ACT to derive the TAL (Figure 1). There are currently no expanded estimates of total chub mackerel commercial dead discards. MRIP provides estimates of recreational discards in numbers of fish.

When setting 2020-2022 specifications in March 2019, the Council agreed to reduce the ACT by 6% to account for expected discards. This was based on the commercial discard rate during 2003-2017 according to northeast observer data. The Council selected this as a preferred alternative because it was based on 15 years of data. It does not explicitly account for recreational data; however, based on information available at the time, the volume of recreational chub mackerel discards was assumed to be low compared to commercial discards, especially in years with targeted commercial fishing effort.

Observer data for 2021 are currently incomplete and preliminary; therefore, observer and vessel trip report (VTR) data through 2020 are shown in Table 3. The most recent 5 years of observer data show that 43% of total observed chub mackerel catch was discarded, considerably higher than the 6% assumed discard rate previously used to set specifications. As shown in Table 2, 2016-2020 were years with comparatively low commercial landings. As previously stated, the 2022 ABC is loosely based on the historic high for chub mackerel catch (2013). The average percentages over longer time periods are approximately 3% - 7%, depending on the time period and dataset (Table 3). After considering similar information in 2020 and 2021, the Monitoring Committee and Council did not recommend a change to the buffer between the ACT and the TAL to account for discards for 2021 or 2022 specifications.

<u>Staff recommend a status quo TAL of 4.50 million pounds (2,041 mt) for 2023-2025.</u>

Table 3. Percent of total commercial chub mackerel catch that was discarded, based on northeast fisheries observer and VTR data, 2007-2021, with associated number of trips.

Years	Observer Discard %	VTR Discard %
2006-2020 (15 years)	7% (337 trips)	3% (869 trips)
2011-2020 (10 years)	6% (301 trips)	3% (854 trips)
2016-2020 (5 years)	43% (193 trips)	4% (582 trips)
2013-2015 (top 3)	4% (95 trips)	3% (282 trips)
2013 (historic high)	3% (27 trips)	1% (63 trips)

Possession Limits

To date, the Council has not implemented a recreational chub mackerel possession limit. Specifications for 2020-2022 included no commercial possession limit until 90% of the TAL is projected to be landed. At that point, a 40,000 pound (18 mt) possession limit would be in effect. Once 100% of the TAL is projected to be landed, commercially permitted vessels would be limited to a 10,000 pound (4.5 mt) possession limit. When setting 2020-2022 specifications, the Council agreed that commercial fishery possession limits prior to in-season closure were unnecessary as the preferred in-season AMs were likely sufficient to constrain the fishery to prevent ACL overages. As previously stated, commercial and recreational landings, and presumably dead discards, have been well below the ACL, ACT, and TAL since they were first implemented in 2020.

According to stakeholder input provided during development of the Unmanaged Forage Omnibus Amendment, 40,000 pounds is approximately the amount of chub mackerel needed to fill a bait truck. Given the low value of chub mackerel (e.g., $0.53 per pound in 2021 dollars on average during 2002-2021), fishermen may not target chub mackerel when restricted to a 40,000 pound possession limit; however, they would have an incentive to land chub mackerel caught incidentally. A 40,000 pound possession limit could, therefore, discourage discards. The number of trips which landed more than 40,000 pounds of chub mackerel over the past 20 years is confidential as it is associated with fewer than three vessels and/or dealers.

Ten thousand pounds was selected as the possession limit to be implemented in-season after the TAL is projected to be fully landed because it is approximately the average trip-level landings of chub mackerel based on northeast commercial fishery data for 1998-2017. Considering data for 2002-2021, about 90% of commercial trips which landed any amount of chub mackerel landed less than 10,000 pounds of chub mackerel.

As previously stated, if status quo specifications are implemented for 2023-2025, then the TAL would be 4.50 million pounds (2,041 mt). If the commercial possession limits remain unchanged, a commercial possession limit would be triggered once 4.05 million pounds (1,837 mt) of chub mackerel are projected to be landed by commercial and recreational fishermen. This level of landings has been reached only once over the past 20 years (i.e., in 2013, Table 2).

Council staff recommend no changes to the commercial or recreational chub mackerel possession limits.

Other Management Measures

There are no commercial or recreational minimum fish size limits for chub mackerel in federal waters. Minimum fish size limits are typically used to reduce fishing mortality on immature fish; however, a commercial minimum size limit for chub mackerel may provide little additional biological benefits considering current fishery selectivity. According to an analysis of observer data for Amendment 21, about 88% of the chub mackerel caught in bottom otter trawls are at least 20 cm in length. As suggested in Daley and Leaf (2019)[2] and supported by comments from fishermen, it is possible that chub mackerel's fast swimming speed reduces the potential for capture of larger individuals in the commercial fishery. Several scientific studies have documented the length at maturity for chub mackerel in various regions. The length at maturity varies by study. Daley (2018)[3] examined chub mackerel caught in commercial fisheries in the Mid-Atlantic and Southern New England and found that 50% of females reached maturity at about 27 cm. According to observer data, about 73% of the chub mackerel caught in bottom trawls are at least 27 cm.

Given that chub mackerel are predominantly caught with bottom otter trawls in commercial fisheries off the U.S. east coast, it can be assumed that most discarded chub mackerel would not survive. Therefore, a minimum fish size likely would increase mortality on this species without notable benefits of protecting immature fish.

Most chub mackerel landed on the U.S. east coast over the past 20 years were caught on bottom trawl vessels which also participate in the *Illex* squid fishery. Regulations for that fishery specify gear requirements (see 50 CFR 648.23), including gear restrictions for specific regulated mesh areas (50 CFR 648.80). The Council did not see a need to develop additional gear restrictions for

[2] Daley, T. T. and R. T. Leaf. 2019. Age and growth of Atlantic chub mackerel (*Scomber colias*) in the Northwest Atlantic. *Journal of Northwest Atlantic Fisheries Science.* 50: 1-12.

[3] Daley, T. 2018. Growth and reproduction of Atlantic chub mackerel (*Scomber colias*) in the Northwest Atlantic. Master's thesis. University of Southern Mississippi.

chub mackerel beyond what vessels are currently subject to in other fisheries. There are also no recreational gear restrictions for chub mackerel in federal waters.

Staff do not recommend that the Council implement new chub mackerel management measures such as minimum fish sizes, closed seasons, or gear restrictions for 2022-2025. These measures have not been used in the past and catch has remained well below the ABC.

Chub Mackerel Fishery Performance Report

April 2022

The Mid-Atlantic Fishery Management Council's (Council's) Mackerel, Squid, and Butterfish Advisory Panel met via webinar on April 26, 2022 to review the 2022 Chub Mackerel Fishery Information Document and develop the following Fishery Performance Report. The meeting also addressed longfin squid, but a separate report was generated for longfin squid.

The primary purpose of this Fishery Performance Report is to contextualize catch histories for the Scientific and Statistical Committee (SSC) by providing information about fishing effort, market trends, environmental changes, and other factors.

Eight advisors were in attendance. Two additional advisors with experience in the commercial chub mackerel fishery were not in attendance.

Advisor comments described below are not consensus or majority statements.

Advisory Panel members present: Katie Almeida, Greg DiDomenico, Daniel Farnham Jr., Emerson Hasbrouck, Jeff Kaelin, Pam Lyons Gromen, Samuel Martin, Gerry O'Neill

Others present: Carly Bari (GARFO), Julia Beaty (MAFMC staff), Alan Bianchi (NC DMF), Jason Didden (MAFMC staff), Michelle Duval (MAFMC member), Gavin Fay (SSC member), Damiana Hartley, Mark Holliday (SSC member), Peter Hughes (MAFMC MSB Committee Chair), Mary Beth Tooley

Discussion questions:

1. What factors have influenced recent catch (markets/economy, environment, regulations, other factors)?
2. Are the current fishery regulations appropriate? How could they be improved?
3. What would you recommend as research priorities?
4. What else is important for the Council to know?

Summary of Advisor Comments

Factors Influencing Catch

One advisor noted that the commercial fleet hasn't been targeting chub mackerel in recent years because they have been focusing on *Illex* squid.

One advisor suggested that the increasing recreational catch in recent years is due to increased prevalence in this region with warming waters. He added that south of the Gulf of Maine, recreational fishermen are more successful at catching chub mackerel than Atlantic mackerel.

Management Issues

Three advisors agreed that the concept of chub mackerel as an emerging fishery with climate change has been missing from Council management discussions. They agreed that the Council is being overly precautionary rather than prioritizing and supporting the development of sustainable emerging fisheries which could bring economic benefits to the region. This mindset is preventing the Council from considering how fisheries can adapt to a changing environment.

Advisors did not recommend any changes to the catch and landings limits and other management measures for upcoming years. One advisor noted that the SSC will be asked to recommend acceptable biological catch levels for the upcoming three years. He said he hopes that three years from now we can have more information to make better informed decisions, especially in regards for the potential for the stock to support the fishery.

Research Recommendations

One advisor supported research on the range of the species, especially in regards to climate change, to help inform future management.

Chub Mackerel Fishery Information Document

April 2022

This document provides a brief overview of the biology, stock condition, management system, and fishery performance for Atlantic chub mackerel (*Scomber colias*) with an emphasis on the most recent few years. Data sources include commercial dealer reports, vessel trip reports (VTRs), and Marine Recreational Information Program (MRIP) data. All 2021 data should be considered preliminary. For more resources, including previous Fishery Information Documents, please visit https://www.mafmc.org/msb.

Key Facts

- The Mid-Atlantic Fishery Management Council developed the first management measures for Atlantic chub mackerel in U.S. waters. These measures became effective in 2017 and were modified in 2020.
- The stock status of chub mackerel in this region is unknown as there has been no quantitative stock assessment. The Scientific and Statistical Committee assumes that biomass is currently at a sustainable level.
- After spiking at 5.25 million pounds in 2013, commercial landings returned to low levels. In 2021, commercial fishermen landed 37,371 pounds of chub mackerel from Maine through North Carolina.
- It is estimated that recreational fishermen from Maine through North Carolina harvested 194,771 pounds of chub mackerel in 2021, the highest estimate in the MRIP time series (i.e., 1981 through present).

Basic Biology

Atlantic chub mackerel are a schooling pelagic species. They migrate seasonally and can be found throughout U.S. Atlantic waters in both inshore areas and to depths of about 250-300 meters.[1] Adults prefer temperatures of 15-20°C (about 60-70°F).[1,2] Some studies suggest that juveniles tend to be found closer inshore than adults.[3,4]

Atlantic chub mackerel grow rapidly during the first year of life.[2,3,5,6] They can reach at least age 13.[7] Daley and Leaf (2019) found that most fish sampled from commercial fishery catches off the northeast U.S. were age 3.[6]

Atlantic chub mackerel spawn in several batches. Spawning areas likely occur from North Carolina through the Gulf of Mexico.[8,9] Daley (2018) suggested that chub mackerel reach maturity around age two in the Northwest Atlantic, though other studies from various locations have published a range of ages at maturity.[3,9]

Chub mackerel are opportunistic predators with a seasonally variable diet of small crustaceans (especially copepods), small fish, and squid.[1,10] Adults tend to consume larger prey and more fish prey than juveniles.[4]

Very few quantitative estimates are available of the contribution of chub mackerel to the diets of predator species in the western North Atlantic. This is likely due in part to the difficulty of visually distinguishing partially-digested chub mackerel from related species such as Atlantic mackerel (*Scomber scomber*), bullet mackerel (*Auxis rochei*), and frigate mackerel (*Auxis thazard*).[11] The family Scombridae has been documented in the diets of some fish, marine mammals, sea birds, and sharks in the western North Atlantic.[12,13] However, few studies identify chub mackerel to the species level in the diets of any predators. A thorough literature review conducted by Council and NMFS staff in 2018 identified only one study with quantitative data on the role of chub mackerel in the diets of any predators off the U.S. east coast. [14] Manooch et al. (1984) found that chub mackerel made up 0.2% (by frequency of occurrence) of the diets of dolphinfish sampled off North Carolina through Texas.[15] Chub mackerel have been documented as prey for some predators in other parts of the world. For example, they are important prey for blue marlin at certain times of year off Portugal[16] and Cabo San Lucas.[17] They have also been documented as prey for Cory's shearwaters in the eastern North Atlantic, for long-beaked common dolphins off South Africa, and short-beaked common dolphins off the Iberian Peninsula.[18] It should be emphasized that diet composition of a predator species may vary by geography and can be flexible. Therefore, the importance of chub mackerel in the diets of predators in other parts of the world does not necessarily indicate its importance off the U.S. east coast. More diet information would be required to better establish this relationship.

To address this data gap, the Council funded a study with the goal of better delineating the role of chub mackerel in the diets of tunas and marlins, which were identified by stakeholders as predators of key interest. For this study, 758 non-empty stomachs from yellowfin and bigeye tunas were obtained from commercial and recreational fisheries, including recreational fishing tournaments, throughout the Mid-Atlantic and Southern New England, primarily in 2018 and 2019. Thirty-six white marlin and 17 blue marlin stomachs were also obtained. The marlin sample sizes were limited by regulations on landings. Chub mackerel were determined to be an exceptionally small component of the diets of tunas and marlins. Specifically, only two chub mackerel were identified in yellowfin tuna stomachs and seven chub mackerel were identified in two white marlin stomachs (Dr. Walt Golet, personal communication).

Status of the Stock

The stock status of chub mackerel in the western Atlantic Ocean is unknown as there have been no quantitative assessments of this species in this region. The SSC assumes that biomass is currently at or above biomass at maximum sustainable yield.[19]

Large fluctuations in abundance have been reported around the world, including in the mid-Atlantic and New England.[3, 20] These fluctuations may be partly the result of environmental influences such as temperature and upwelling strength on recruitment.[3] Given that chub mackerel are a fully pelagic species, ocean processes likely influence their availability in any given area, as well as their recruitment.

Management System and Fishery Performance

Management

The Mid-Atlantic Fishery Management Council manages Atlantic chub mackerel fisheries in federal waters from Maine through North Carolina. An increase in commercial landings during 2013-2015, as well as concerns about the potential role of chub mackerel as prey for tunas and marlins, prompted the Council to adopt an annual commercial landings limit and a commercial possession limit for chub mackerel as part of the Unmanaged Forage Omnibus Amendment.[13] These measures were implemented in September 2017 and were the first regulations for chub mackerel fisheries off the U.S. east coast. They were intended to be temporary measures and were replaced by longer-term measures developed through Amendment 21 to the Mackerel, Squid, and Butterfish Fishery Management Plan, which became effective in September 2020.[21]

The Council's SSC recommends annual acceptable biological catch (ABC) limits for chub mackerel. The Council must either approve the ABC recommended by the SSC or approve a lower ABC. Total catch (i.e., commercial and recreational landings and dead discards) from Maine through the east coast of Florida count against the ABC. Expected South Carolina through Florida catch is subtracted from the ABC to derive the annual catch limit (ACL). An annual catch target (ACT) is set less than or equal to the ACL to account for management uncertainty. Expected dead discards are subtracted from the ACT to derive a total allowable landings limit (TAL). The commercial and recreational fisheries do not have separate annual catch or landings limits (Figure 1).

The catch and landings limits for 2020-2022 included an ABC of 5.07 million pounds, an ACL of 4.99 million pounds, an ACT of 4.79 million pounds, and a TAL of 4.50 million pounds. Catch and landings remained well below these limits in 2020-2021.

Although total catch from Maine through the east coast of Florida counts against the ABC, the ACL, ACT, and TAL apply to Maine through North Carolina. Based on past landings trends, the Council agreed that catch from South Carolina through Florida is immaterial to proper management. Therefore, commercial and recreational fisheries in South Carolina through Florida are not subject to the permit and possession limit requirements described below.

A commercial mackerel, squid, or butterfish fishing permit is required of vessels which retain chub mackerel for sale in federal waters from Maine through North Carolina. Ten permit types meet this requirement. The owner of any party or charter vessel that fishes for, possesses, or retains chub mackerel while carrying passengers for hire must have the federal mackerel/squid/butterfish for-hire permit. There is no federal permit type specific to Atlantic chub mackerel in either the commercial or recreational fisheries.

There is no commercial possession limit for chub mackerel until 90% of the TAL is projected to be landed. At that point, a 40,000 pound possession limit is in effect. Once 100% of the TAL is projected to be landed, commercially-permitted vessels are limited to a 10,000 pound possession limit. There are no federal waters recreational possession limits for chub mackerel.

There are no commercial or recreational gear restrictions, fish size requirements, or closed seasons for Atlantic chub mackerel in federal waters.

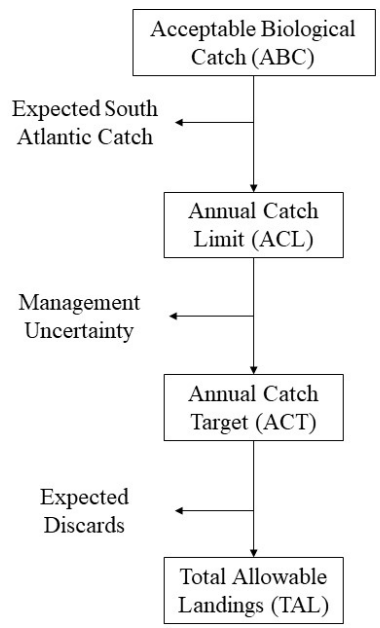

Figure 1. Flowchart summarizing chub mackerel catch and landings limits.

Commercial Fishery Trends

After remaining below 0.5 million pounds per year for several years, commercial chub mackerel landings spiked to 5.25 million pounds in 2013, but decreased to pre-2013 levels by 2016 (Table 1). [22] This temporary increase was the result of a small number of trawl vessels targeting chub mackerel. These vessels also participate in the *Illex* squid fishery. Some fishermen have described chub mackerel as a "bailout" species which they sometimes target when they are not able to harvest *Illex* squid. Chub mackerel tend to be harvested in the same areas and times of year when *Illex* squid are harvested; however, fishermen have said they typically will not harvest both species at the same time because the quality of both species suffers when they are stored together.

According to public comments, a small number of vessels on the east coast are capable of harvesting chub mackerel in profitable quantities because vessels need to be large, fast, and have refrigerated sea water or freezing capabilities in order to harvest this fast-swimming, low-value, warm water species. Landings data seem to support these statements.

Fewer than 5 vessels accounted for more than 95% of chub mackerel landings over the last 20 years (2002-2021). The chub mackerel landings from these vessels were sold to fewer than three dealers; therefore, much of the data associated with these vessels and dealers are confidential.[22]

At least 19 dealers across 6 states (MA, RI, CT, NY, NJ, VA) purchased at least 100 pounds of chub mackerel over the past 20 years combined (2002-2021), with only four dealers purchasing more than 10,000 pounds of chub mackerel. During this time period, an average of 10 vessels, with a maximum of 20 vessels, landed at least 100 pounds of chub mackerel per year from Maine through North Carolina.[22]

The annual average ex-vessel price per pound varied during 2002-2021, averaging $0.53 per pound (adjusted to 2021 dollars). There appears to be a relationship between price and volume landed; however, this relationship is neither linear nor consistent across time. In general, years with higher landings had lower average annual prices per pound, and vice versa (Table 1).[22]

According to VTR data, about 91% of the chub mackerel landed by commercial fishermen from Maine through North Carolina from 2002 through 2021 were caught with bottom otter trawls. About 9% of landings were caught with midwater trawls. All other gear types collectively accounted for less than 1% of total landings.[23]

Nearly all commercial chub mackerel landings (about 97%) from Maine through North Carolina over the past 20 years occurred during June-October. The highest proportion of landings occurred in September (38%). June, July, August, and October contributed about equally to commercial landings (13-16%).[22]

According to VTR data, nearly all commercial chub mackerel landings from 2002-2021 originated from statistical areas south of New York. Much of these landings came from statistical areas which overlap with the shelf break (Figure 2).[23]

Public comments received during development of Amendment 21 suggest that most chub mackerel landed on the east coast are processed for use as human food, much of which is sent overseas, and lesser amounts are used as bait in other fisheries.

Table 1. Commercial chub mackerel landings, ex-vessel value, and average price per pound, Maine through North Carolina, 2002-2021. Value and price are adjusted to 2021 dollars using the Gross Domestic Product Price Deflator. Landings in some years are combined to protect confidential data representing fewer than 3 vessels and/or dealers.[22]

Year	Landings (pounds)	Ex-vessel value (2021 dollars)	Avg. price/pound (2021 dollars)
2002	471	$299	$0.64
2003	488,316	$34,988	$0.07
2004	126	$91	$0.72
2005	0	$0	--
2006	0	$0	--
2007-2009	21,039	$7,797	$0.37
2010-2011	192,301	$40,458	$0.21
2012	164,867	$74,391	$0.45
2013	5,249,686	$1,159,920	$0.22
2014	1,230,411	$381,446	$0.31
2015	2,108,337	$548,723	$0.26
2016	610,783	$113,672	$0.19
2017	2,202	$2,914	$1.32
2018	22,357	$12,214	$0.55
2019	60,522	$41,917	$0.69
2020	56,950	$30,829	$0.54
2021	37,371	$23,837	$0.64
2002-2021 avg.	512,287	$123,675	$0.53

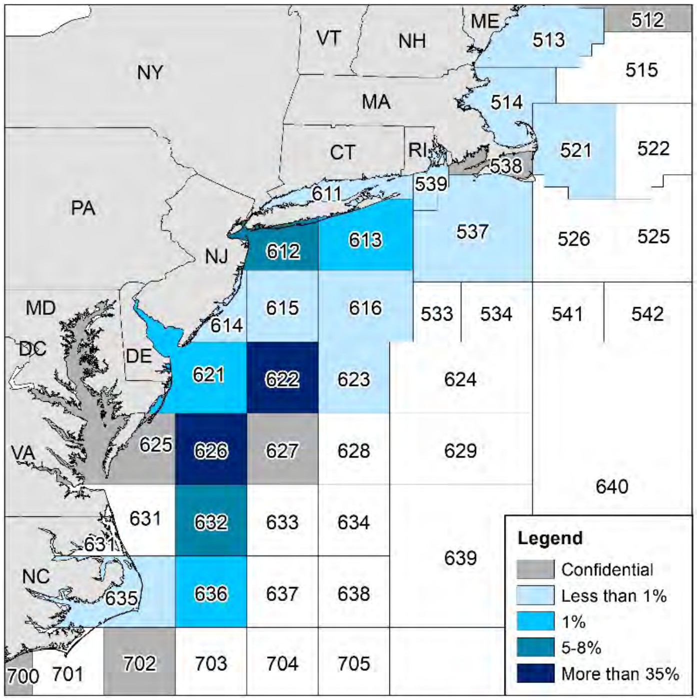

Figure 2. Percent of commercial chub mackerel landings by statistical area, 2002-2021 as shown in federal VTR data. Data associated with fewer than three vessels and/or dealers are confidential. Confidential landings collectively account for about 1% of the total.[23]

Recreational Fishery Trends

MRIP data from Maine through North Carolina show increasing recreational catch and harvest of chub mackerel nearly year from 2015 through 2021 (Table 2). In 2021, an estimated 215,631 chub mackerel were caught and 137,468 chub mackerel were harvested, corresponding to 194,771 pounds of harvested chub mackerel.[24]

The increasing recreational catch and harvest estimates in recent years could be due, at least in part, to improved reporting and improved differentiation between chub mackerel and other species which are similar in appearance, such as Atlantic mackerel. For example, in 2017 chub mackerel were added to the core list of species for trainings of MRIP field samplers from Maine through Virginia. In addition, the Council and partners at NMFS developed a small scombrid species identification guide and distributed over 3,700 copies to commercial and recreational permit holders and other interested stakeholders in 2019.[25]

MRIP data collection in 2020 was impacted by the COVID-19 pandemic. Specifically, the Access Point Angler Intercept Survey (APAIS), which serves as the basis for catch estimates in the shore based and private angler fishing modes, was suspended in all New England and Mid-Atlantic states in late March or April 2020 and resumed between May and August 2020, depending on the state. MRIP headboat sampling was also suspended in 2020 and resumed in 2021. NMFS used imputation methods to fill gaps in 2020 catch data with data collected in 2018 and 2019. These proxy data match the time, place, and fishing mode combinations that would have been sampled had the APAIS continued uninterrupted. Proxy data were combined with observed data to produce catch estimates using the standard estimation methodology.

It is not likely that the increase in recreational chub mackerel catch and harvest in 2020 is due to the use of imputed data as the imputed data match the 2018 and 2019 data. Any change from 2018 and 2019 would be due to changes in effort data (which are collected through mail and telephone surveys that were largely unimpacted by the pandemic) or due to changes during the locations and times of year that did not require use of imputed data.

During 2017-2021, about 56% of the recreational chub mackerel harvest from Maine through North Carolina (in numbers of fish) was caught in state waters, with the remaining 44% caught in federal waters. The proportion of harvest by mode averaged 57% from private and rental boats, 38% from party and charter boats, and 5% from shore (Table 3). Most recreational catch and harvest occurred in New York, Rhode Island, New Jersey, and Connecticut (Table 4). Most catch and harvest occurred during July and August (Table 5).[24]

Through development of Amendment 21, the Council heard anecdotal descriptions of recreational chub mackerel harvest, including reports of catch on for-hire vessels out of New York and New Jersey. There have also been reports of chub mackerel harvest for use as live bait on recreational trips out of Maryland and Virginia targeting white marlin, blue marlin, sailfish, spearfish, yellowfin tuna, bigeye tuna, and/or wahoo. According to public comments, this live bait fishery occurs on the edges of certain offshore canyons, especially Norfolk Canyon, where chub mackerel and their predators are concentrated in the late summer and early fall.[26]

Table 2. MRIP-estimated recreational catch and harvest of chub mackerel from Maine through North Carolina, 2002-2021.[24]

Year	Recreational catch (# of fish)	Recreational harvest (# of fish)	Recreational harvest (pounds)	% retained
2002-2010	0	0	0	--
2011	1,613	1,613	355	100%
2012	15,569	0	0	0%
2013	0	0	0	--
2014	60,191	49,813	48,087	83%
2015	0	0	0	--
2016	2,575	2,087	2,093	81%
2017	26,061	13,310	14,831	51%
2018	157,471	104,830	128,949	67%
2019	139,282	49,892	74,462	36%
2020*	199,919	125,757	149,578	63%
2021	215,631	137,468	194,771	64%
2017-2021 Avg.	**147,673**	**86,251**	**112,518**	**56%**

* Contribution of imputed data to total values for 2020: 19% for catch, 28% for harvest in numbers of fish, and 25% for harvest in pounds. This imputation method was only needed in 2020 due to COVID-related disruptions to the Access Point Angler Intercept Survey and subsequent data gaps.

Table 3. Chub mackerel harvest by recreational fishing mode in numbers of fish, 2002-2021, Maine through North Carolina.[24]

Year	Party/charter	Private/rental boat	Shore
2002-2010	0	0	0
2011	0	0	1,613
2012-2013	0	0	0
2014	49,813	0	0
2015	0	0	0
2016	1,889	198	0
2017	2,422	10,888	0
2018	43,424	58,817	2,589
2019	17,149	32,743	0
2020	35,901	70,676	19,180
2021	65,413	72,055	0
2017-2021 Avg.	**32,862 (38%)**	**49,036 (57%)**	**4,354 (5%)**

Table 4. Proportion of total chub mackerel catch and harvest in numbers of fish by state, 2017-2021.[24]

State	Recreational catch	Recreational harvest
ME	0%	0%
NH	3%	4%
MA	1%	0%
RI	30%	28%
CT	10%	8%
NY	40%	42%
NJ	17%	18%
DE	0%	0%
MD	Less than 1%	Less than 1%
VA	0%	0%
NC	0%	0%
Total	100%	100%

Table 5. Proportion of total chub mackerel catch and harvest in numbers of fish by wave, Maine through North Carolina, 2017-2021. Note that only North Carolina conducts MRIP sampling during wave 1.[24]

Wave	Catch	Harvest
1 (Jan-Feb)	0%	0%
2 (Mar-Apr)	0%	0%
3 (May-Jun)	3%	3%
4 (Jul-Aug)	55%	57%
5 (Sep-Oct)	42%	40%
6 (Nov-Dec)	0%	0%
Total	100%	100%

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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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

2022 Unmanaged Commercial Landings Report

June 2022 Council Meeting

Prepared By: Julia Beaty, Council Staff and Sara Turner, NOAA Fisheries
May 27, 2022

Background

The Council requested annual updates on commercial landings of unmanaged species as a follow on action to the Unmanaged Forage Species Omnibus Amendment. The goal is 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.

The tables on the following pages summarize commercial landings of unmanaged species from Maine through North Carolina. This information was compiled by staff at the Greater Atlantic Regional Fisheries Office (GARFO) Analysis and Program Support Division. In this context, "unmanaged landings" refers to landings only in locations where the species is not managed at the state or federal level with a possession limit, size limit, seasonal closure, and/or limited access. For example, the blue crab landings in this report represent only those landings in states where blue crab is not managed.

Data

The data were accessed from the Atlantic Coastal Cooperative Statistics Program Data Warehouse. The data account for state-only permitted dealers located in Maine through North Carolina, as well as all dealers with GARFO permits, regardless of location.

Table 1 contains the top 25 unmanaged species by weight landed during 2015-2021. Table 2 contains the top 25 unmanaged finfish species by weight landed. Table 3 lists landings of Mid-Atlantic Council ecosystem component species (i.e., those species subject to the possession limit implemented through the Unmanaged Forage Species Omnibus Amendment). Table 4 shows species with increasing rank order of landings every year from 2018 through 2021. Table 5 shows species with increasing landing (though not necessarily increasing rank order) every year from 2018 through 2021.

In all tables, species are listed in descending order of average 2015-2021 landings. Confidential values are not counted in the averages.

Changes Since 2021 Report

This report does not include aquaculture landings, as recorded in the dealer data. Previous versions of the report did not filter out aquaculture landings.

States provided updates on management measures through 2021. This required only two changes to the report compared to previous years. Specifically, sand lance landings in Rhode Island in 2021 were filtered out to account for a possession limit which became effective in 2021.

In addition, landings in Virginia's limited access penaeid shrimp fishery were also filtered out. Virginia has allowed an experimental penaeid shrimp fishery in recent years and developed regulations for a limited access commercial fishery off Virginia Beach, which became effective in August 2021. The limited access fishery includes gear, season, and licensing requirements. The Eastern Shore area remains an experimental fishery given low participation and limited data. Most penaeid shrimp landings in Virginia are of white shrimp and to a lesser extent exotic tiger shrimp and brown shrimp.

Maryland developed a commercial permit for penaeid shrimp, with associated gear restrictions and reporting requirements. These requirements became effective in March 2022 and will be reflected in future updates to this report.

Species with Highest or Increasing Unmanaged Commercial Landings

Blue catfish had the highest unmanaged commercial landings in 2019-2021 (Table 1). Some states have programs to encourage harvest of this invasive species.

Mussels had the highest unmanaged landings each year from 2015-2018. Conchs, hagfish, and striped mullet were all in the top five species each year during 2019-2021 (Table 1).

When ranked from lowest to highest unmanaged commercial landings, seven species had an increasing or stable rank every year during 2018-2021: blue catfish, gray triggerfish, Atlantic cutlassfish, mullets, pigfish, cunner, and houndfish. Landings of these species are summarized in Table 4.

Virginia has discussed the potential for managing gray triggerfish but has not yet determined their preferred path forward.

Changes in rank order can indicate species with noteworthy increases in landings relative to other species from one year to the next. However, species with steady but more incremental increases in landings may also be of interest. Atlantic cutlassfish, mullets, and houndfish had both increasing landings each year from 2018 through 2021 (Table 5) and increasing rank order in those years (Table 4). Sugar kelp, green crab (an invasive species), sea urchins, razor clams, blackfin tuna, shrimp (NK), and bank sea bass had increasing landings each year during 2018-2021 (Table 5), but not increasing rank order.

Table 1: Top 25 Unmanaged Species Annual Landings, 2015-2021

Report Run on: 2022-05-10. Values are in pounds.

Cells marked with a 'C' are confidential. Averages do not include confidential data.

Common Name	Code	2015	2016	2017	2018	2019	2020	2021	Avg
MUSSELS	781	15,342,427	11,578,754	10,480,326	5,642,701	879,771	1,486,785	3,394,199	6,972,138
CATFISH, BLUE	67	3,692,594	4,123,824	5,199,117	5,093,143	5,120,580	4,778,063	6,238,031	4,892,193
CONCHS	775	2,639,808	1,057,427	1,141,947	2,356,279	1,839,724	1,152,292	6,091,239	2,325,531
HAGFISH	150	2,204,603	1,871,105	1,558,251	C	C	C	C	1,877,986
QUAHOG	748	3,113,556	3,028,273	159,961	57,390	23,238	41,186	109,257	933,266
CRAB, BLUE	700	2,580,077	3,450,444	0	0	0	0	0	861,503
STRIPED MULLET	235	612,729	461,742	778,353	832,924	896,851	691,529	1,225,428	785,651
OTHER FISH	526	1,810,527	1,291,616	656,646	844,650	569,152	97,582	149,204	774,197
WHITING, KING	197	564,373	582,919	814,345	327,744	487,377	435,127	446,181	522,581
CUTLASSFISH, ATL	99	183,313	61,042	50,840	158,763	287,906	514,328	1,150,385	343,797
CRUSTACEANS NK	834	0	160,171	C	170,342	527,696	447,931	582,809	314,825
MOLLUSKS NK	804	678,936	129,909	272,061	183,138	165,369	191,365	211,972	261,821
TUNA, LITTLE	468	212,072	220,244	279,355	232,494	246,982	259,370	119,138	224,236
KELP, SUGAR	833	0	C	101,571	99,301	256,646	C	594,875	210,479
HARVEST FISH	165	237,082	209,841	172,931	130,037	99,184	102,916	75,862	146,836
JOHN DORY	188	206,857	209,695	246,233	122,198	102,405	61,267	69,352	145,430
CLAM, BLOODARC	743	113,270	104,888	212,229	98,894	128,054	97,976	47,894	114,744
PERCH, WHITE	506	135,060	139,261	79,294	99,326	117,733	87,888	62,012	102,939
SEA ROBINS	341	122,316	206,341	149,469	77,456	70,893	31,546	17,804	96,546
OYSTERS	789	0	44,409	79,442	105,637	141,905	125,238	138,884	90,788
CATFISH(SEA)	69	122,786	94,736	C	50,650	C	C	C	89,391
CRAB, ROCK	712	376,418	57,746	41,900	43,332	10,989	13,706	6,174	78,609
PUFFER, NORTHERN	429	91,413	102,934	100,928	70,606	88,374	36,665	12,188	71,873
CRAB, GREEN	708	26,873	23,849	14,888	52,592	64,727	130,606	173,598	69,590
SHRIMP (PENAEID)[1]	738	C	C	C	12,629	44,529	218,195	544	68,974

[1] The "species landed lbs" field in the dealer data was used for this species. "Species live lbs" was used for all other species.

Table 2: Top 25 Unmanaged Finfish Species Annual Landings, 2015-2021

Report Run on: 2022-05-10. Values are in pounds.

Cells marked with a 'C' are confidential. Averages do not include confidential data.

Common Name	Code	2015	2016	2017	2018	2019	2020	2021	Avg
CATFISH, BLUE	67	3,692,594	4,123,824	5,199,117	5,093,143	5,120,580	4,778,063	6,238,031	4,892,193
HAGFISH	150	2,204,603	1,871,105	1,558,251	C	C	C	C	1,877,986
STRIPED MULLET	235	612,729	461,742	778,353	832,924	896,851	691,529	1,225,428	785,651
OTHER FISH	526	1,810,527	1,291,616	656,646	844,650	569,152	97,582	149,204	774,197
WHITING, KING	197	564,373	582,919	814,345	327,744	487,377	435,127	446,181	522,581
CUTLASSFISH, ATL	99	183,313	61,042	50,840	158,763	287,906	514,328	1,150,385	343,797
TUNA, LITTLE	468	212,072	220,244	279,355	232,494	246,982	259,370	119,138	224,236
HARVEST FISH	165	237,082	209,841	172,931	130,037	99,184	102,916	75,862	146,836
JOHN DORY	188	206,857	209,695	246,233	122,198	102,405	61,267	69,352	145,430
PERCH, WHITE	506	135,060	139,261	79,294	99,326	117,733	87,888	62,012	102,939
SEA ROBINS	341	122,316	206,341	149,469	77,456	70,893	31,546	17,804	96,546
CATFISH (SEA)	69	122,786	94,736	C	50,650	C	C	C	89,391
PUFFER, NORTHERN	429	91,413	102,934	100,928	70,606	88,374	36,665	12,188	71,873
CUSK	96	82,397	58,323	56,440	48,825	42,774	50,775	68,874	58,344
EEL, CONGER	116	44,874	47,459	57,568	90,772	49,819	54,939	42,233	55,381
BONITO	33	69,033	47,030	51,819	41,514	63,544	59,969	22,401	50,759
HERRING (NK)	167	C	49,567	C	C	54,697	95,999	823	50,272
SILVERSIDE, NK	363	61,286	120,019	37,976	28,314	13,482	33,319	16,528	44,418
SILVERSIDE, ATL	362	20,810	32,470	23,132	16,805	68,371	54,914	61,732	39,748
RIBBONFISH	98	36,573	15,376	11,615	6,459	49,869	39,601	38,890	28,340
SPADEFISH	381	21,664	23,690	35,844	25,988	30,485	26,122	29,756	27,650
MULLETS	234	10,480	15,408	28,951	7,864	11,737	30,720	42,516	21,097
HERRING, ATL THREAD	174	C	C	30,482	11,515	13,432	C	C	18,476
TUNA, BLACKFIN	464	14,834	11,361	15,255	15,882	19,985	19,996	30,837	18,307
POMPANO, COMMON	272	13,975	17,301	11,041	13,364	20,700	9,204	11,063	13,807

Table 3: MAFMC Ecosystem Component Species Annual Landings, 2015-2021

Report Run on: 2022-05-10. Values are in pounds.
Cells marked with a 'C' are confidential. Averages do not include confidential data.
Other ecosystem component species had no reported commercial landings during 2015-2021.

Common Name	Code	2015	2016	2017	2018	2019	2020	2021	Avg
MOLLUSKS NK	804	678,936	129,909	272,061	183,138	165,369	191,365	211,972	261,821
HERRING (NK)	167	C	49,567	C	C	54,697	95,999	823	50,272
SILVERSIDE, NK	363	61,286	120,019	37,976	28,314	13,482	33,319	16,528	44,418
SILVERSIDE, ATL	362	20,810	32,470	23,132	16,805	68,371	54,914	61,732	39,748
HERRING, ATL THREAD	174	C	C	30,482	11,515	13,432	C	C	18,476
HERRING, ROUND	166	0	0	C	C	70	844	41,824	8,548
SQUIDS, LOLIGINIDAE	803	659	10,940	4,526	C	1,393	1,936	1,981	3,573
EEL, SAND (LAUNCE)	206	3,367	C	C	C	C	0	C	1,684
BAY ANCHOVY	6	C	C	C	C	C	C	223	223
ARGENTINE	171	C	0	0	0	0	0	0	C

Table 4: Species with Stable or Increasing Rank of Landings Every Year During 2019-2021

Report Run on: 2022-05-10. Values are in pounds.
Cells marked with a 'C' are confidential. Confidential data were accounted for in the rankings, but not in the averages shown below.

Common Name	Code	2015	2016	2017	2018	2019	2020	2021	Avg
CATFISH, BLUE	67	3,692,594	4,123,824	5,199,117	5,093,143	5,120,580	4,778,063	6,238,031	4,892,193
TRIGGERFISH, GRAY	457	0	0	C	898	2,121	1,456	2,461	1,156
CUTLASSFISH, ATL	99	183,313	61,042	50,840	158,763	287,906	514,328	1,150,385	343,797
MULLETS	234	10,480	15,408	28,951	7,864	11,737	30,720	42,516	21,097
PIGFISH	258	8,153	2,754	4,585	3,961	8,627	4,690	10,922	6,242
CUNNER	93	4,692	3,863	4,516	3,424	7,220	3,523	5,319	4,651
HOUNDFISH	20	C	C	C	C	C	C	C	C

Table 5: Species Increasing Landings Every Year During 2018-2021

Report Run on: 2022-05-10. Values are in pounds.

Cells marked with a 'C' are confidential. Confidential data were accounted for in the rankings, but not in the averages shown below.

Common Name	Code	2015	2016	2017	2018	2019	2020	2021	Avg
CUTLASSFISH, ATL	99	183,313	61,042	50,840	158,763	287,906	514,328	1,150,385	343,797
KELP, SUGAR	833	0	C	101,571	99,301	256,646	C	594,875	210,479
CRAB, GREEN	708	26,873	23,849	14,888	52,592	64,727	130,606	173,598	69,590
SEA URCHINS	805	49,941	56,548	C	23,984	26,044	28,370	36,145	36,839
CLAM, RAZOR	760	36,453	C	C	C	C	C	C	36,453
MULLETS	234	10,480	15,408	28,951	7,864	11,737	30,720	42,516	21,097
TUNA, BLACKFIN	464	14,834	11,361	15,255	15,882	19,985	19,996	30,837	18,307
SHRIMP (NK)	735	C	38,838	74,123	C	C	C	C	56,481
SEA BASS, BANK	328	0	0	0	0	390	1,017	2,503	559
HOUNDFISH	20	C	C	C	C	C	C	C	C

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 26, 2022

To: Chris Moore, Executive Director

From: Jason Didden, Staff

Subject: River Herring and Shad (RH/S) Spatial Analyses

To investigate whether spatial management may be useful for RH/S catch avoidance, staff coordinated with the NEFSC to produce revenue maps of several areas of interest that appear to have regular RH/S interactions based on raw observer data (off Cape Ann, MA, off Cape Cod, MA, off Rhode Island, and off northern coastal NJ).

NEFSC staff produced revenue maps both for the full year and the months when most RH/S observations occurred (January, February, November, December), with the above areas of higher RH/S catch outlined (several other off-shore closed areas are also noted).

Based on those revenue maps, there are no areas that could be closed to trawling to provide an obvious and consistent low-cost option for reducing RH/S catch. It may be possible to build upon these analyses, but such an effort would require substantial investigation and resources to sufficiently consider the potential impacts. The Council could weigh the relevant workload tradeoffs when developing future annual implementation plans.

The following materials are included for Council consideration on this subject:

1) Initial White Paper

2) Annual Revenue Analyses Maps
   Supporting Tables Link on Meeting Page

3) Seasonal Revenue Analyses Maps (Jan, Feb, Nov, Dec)
   Supporting Tables Link on Meeting Page

4) MSB and RH/S Advisory Panel Input (pages 6-7) - See Mackerel Rebuilding Tab

5) 2021 RH/S Update information is available on the October 2021 Meeting Page: https://www.mafmc.org/briefing/october-2021 under “Atlantic Mackerel Rebuilding”

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Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: January 28, 2021

To: Council

From: J. Didden

Subject: River Herring and Shad (RH/S) Spatial Considerations

Staff examined NMFS **observer** data from three time periods for this analysis: 2008-2011, 2012-2015, and 2016-2019. These time groupings were the "analyst's choice," to balance increasing the number of observations in a group versus the potential to see change (or consistency) over time. For this initial analysis, staff used all available observer data (no trip definition to limit data), and simply binned combined RH/S catch by ten-minute squares (TMS). There was no extrapolating (by area or gear type), so the results are impacted/biased by the observer deployment protocols (the Standardized Bycatch Reporting Methodology (SBRM)) and fishing effort. This admittedly simple approach seemed like a reasonable first step, and makes use of the most observer data possible – all trips with any recorded RH/S catch were included. Table 1 summarizes the trips that had some catch of RH/S by gear type. Like the spatial analysis, the summary trip counts are influenced by observer coverage levels.

Table 1. Included trips by gear type, which is also the number of trips that had any recorded RH/S catch.

Gear	2008-2011	2012-2015	2016-2019
Bottom Trawl	1,072	1,295	2,005
Gill Net	203	353	310
Mid-Water Trawl	199	107	46
Other	27	27	18

The TMSs (about 100 square miles each) were sorted from most to least RH/S catch, and then grouped and labeled "1", "2," "3," or "4." The TMSs with the most RH/S catch that totaled at least 25% of the RH/S catch for a time period were labeled "1s." In a time period, it may have been a single TMS, or several TMSs to make up that first 25% of observed RH/S catch (raw data). For each following group/label (2,3,4), the other TMSs that account for the next 25% of catch are grouped and labeled similarly. Since the TMSs are first sorted from high to low catch, it takes relatively few initial TMSs (which have the highest catch) to get the first 25% of total catch (group 1), more TMSs to get the next 25% of total catch (group 2), and so on. So there are few of the darkest blue TMSs and more lighter blue TMSs.

There do seem to be some areas that have repeated higher RH/S catches common among two or three time periods. Staff noted (subjective visual inspection and drawing by staff) four areas with green dashed outlined boxes in the figures below that appear to have repeated higher RH/S catches. As was considered with previous actions, the real effects of closing any area mostly depend on how the relevant fisheries respond to closures, and the proportions of both the targeted species and RH/S in the areas where any re-directed effort ends up. If a fishery is pushed into an area with lower abundance of RH/S but where the targeted species is scarce, the net effect could increase total RH/S catch if the fishery expends additional effort to compensate. Nevertheless, the four highlighted areas accounted for 65% of observed RH/S catch in 2008-2011, 61% in 2012-2015, and 57% in 2016-2019. In addition, most (74%-89%) of the RH/S in those four areas occurred during the months of January, February, November, and December. For reference, the approved (effective February 10, 2021) NEFMC inshore midwater trawl restricted areas are also included in Figure 4.

If the Council would like to explore this issue further, staff recommends that the Council request revenue maps from the NEFSC (like were done for the coral amendment) for small mesh bottom trawl and mid-water trawl gear corresponding to these time periods (January, February, November, and December of 2008-2011, 2012-2015, and 2016-2019). Then with those maps, staff could gather input from the advisory panel during planned 2021 meetings on whether possible restrictions in these times/areas could facilitate the fishery avoiding RH/S while still catching the relevant quotas (or whether restrictions could just re-shuffle effort in an inefficient manner). Based on the revenue maps and AP input, the Council could then consider whether to evaluate potential time-area closures in a 2022 action, with additional analysis conducted by an FMAT.

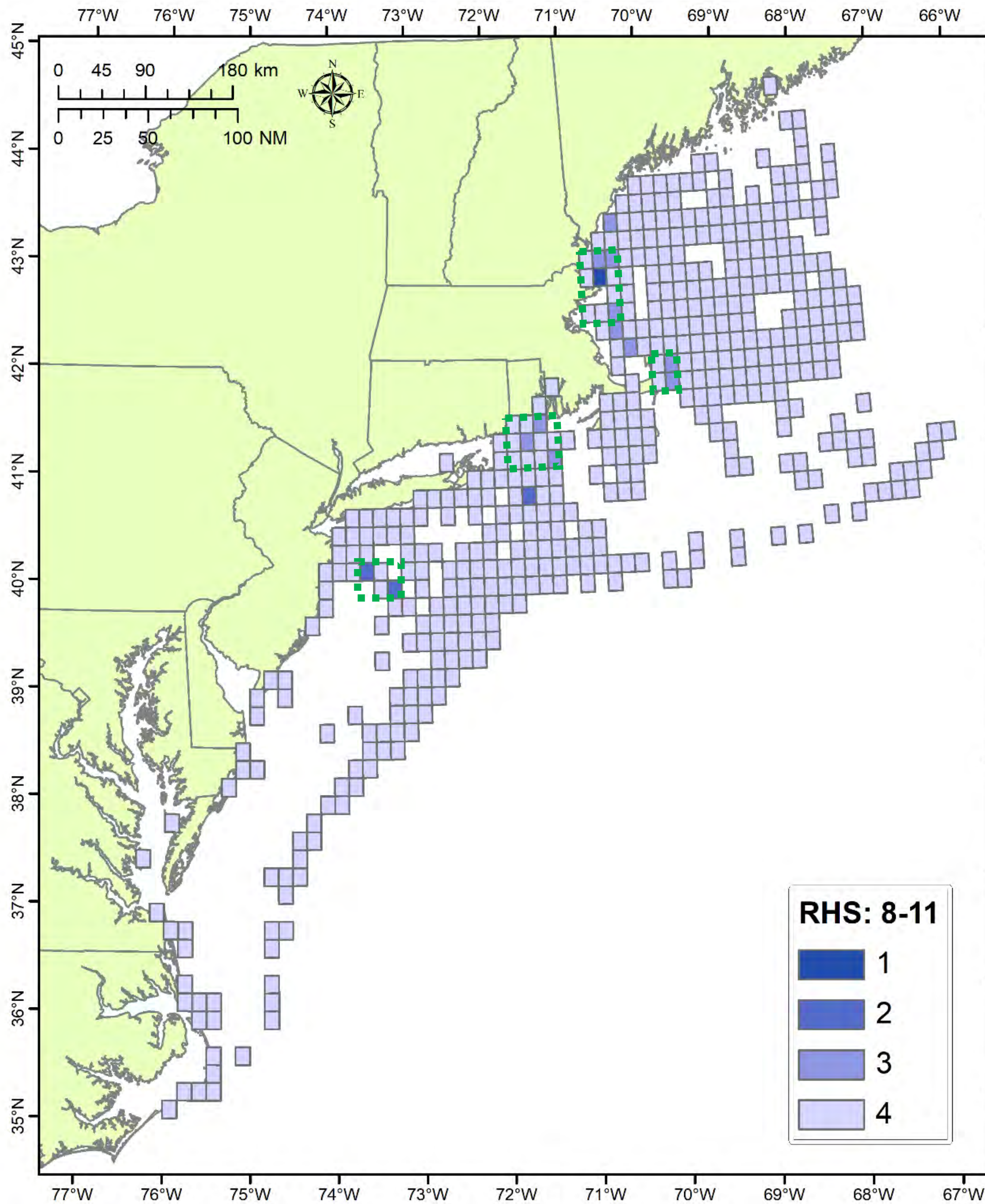


Figure 1. RH/S catch density (raw data) in 2008-2011 observer data, all gears. 1 = those ten minute squares that had highest RH/S catch and accounted for 25% of total observed RH/S catch, and so on for other quartiles of total RH/S catch and less dense groups of ten minute squares. Staff noted (subjective visual inspection and drawing by staff) four areas with green dashed outlined boxes that appeared to have repeated higher RH/S catches.

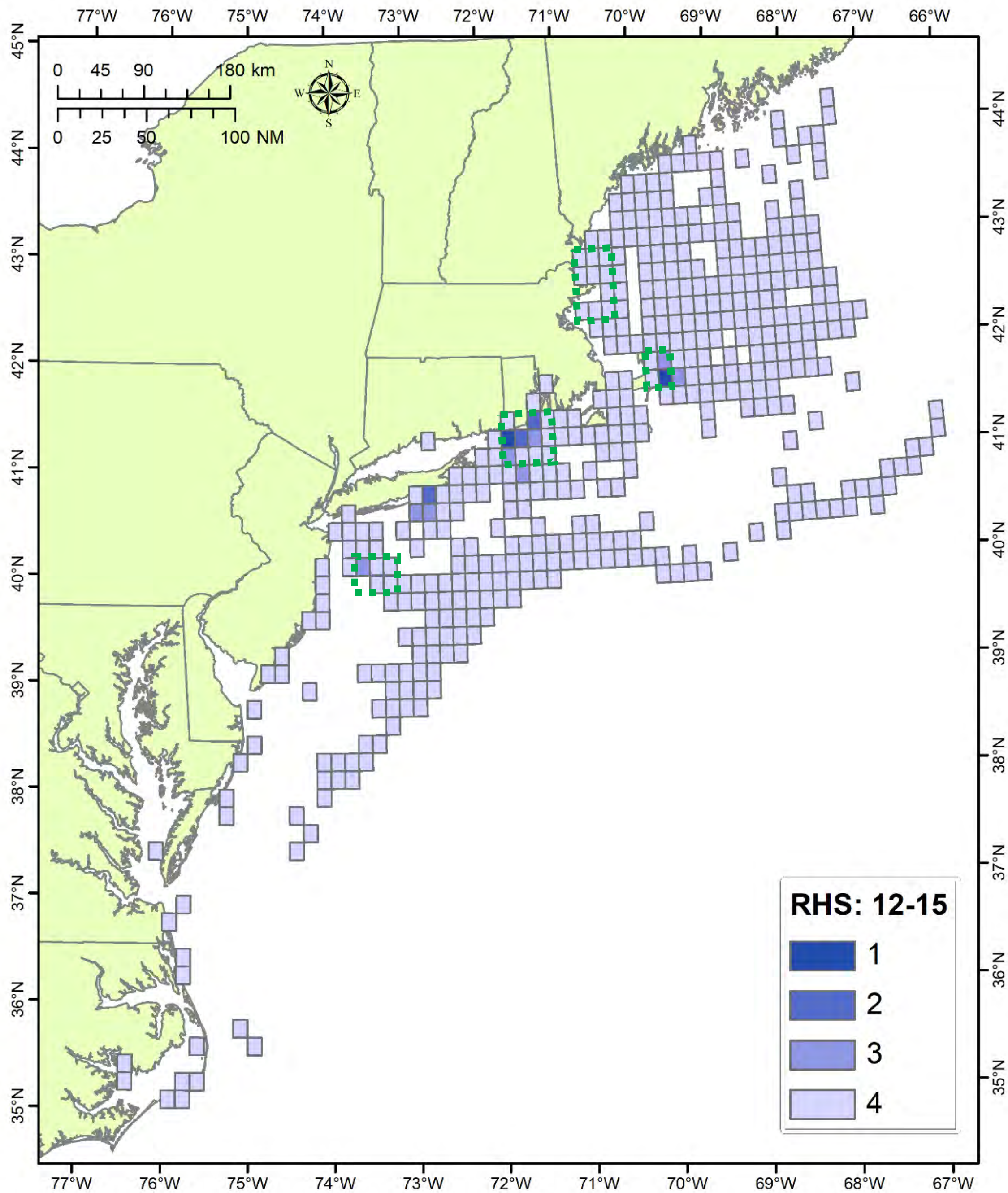


Figure 2. RH/S catch density (raw data) in 2012-2015 observer data, all gears. 1 = those ten minute squares that had highest RH/S catch and accounted for 25% of total observed RH/S catch, and so on for other quartiles of total RH/S catch and less dense groups of ten minute squares. Staff noted (subjective visual inspection and drawing by staff) four areas with green dashed outlined boxes that appeared to have repeated higher RH/S catches.

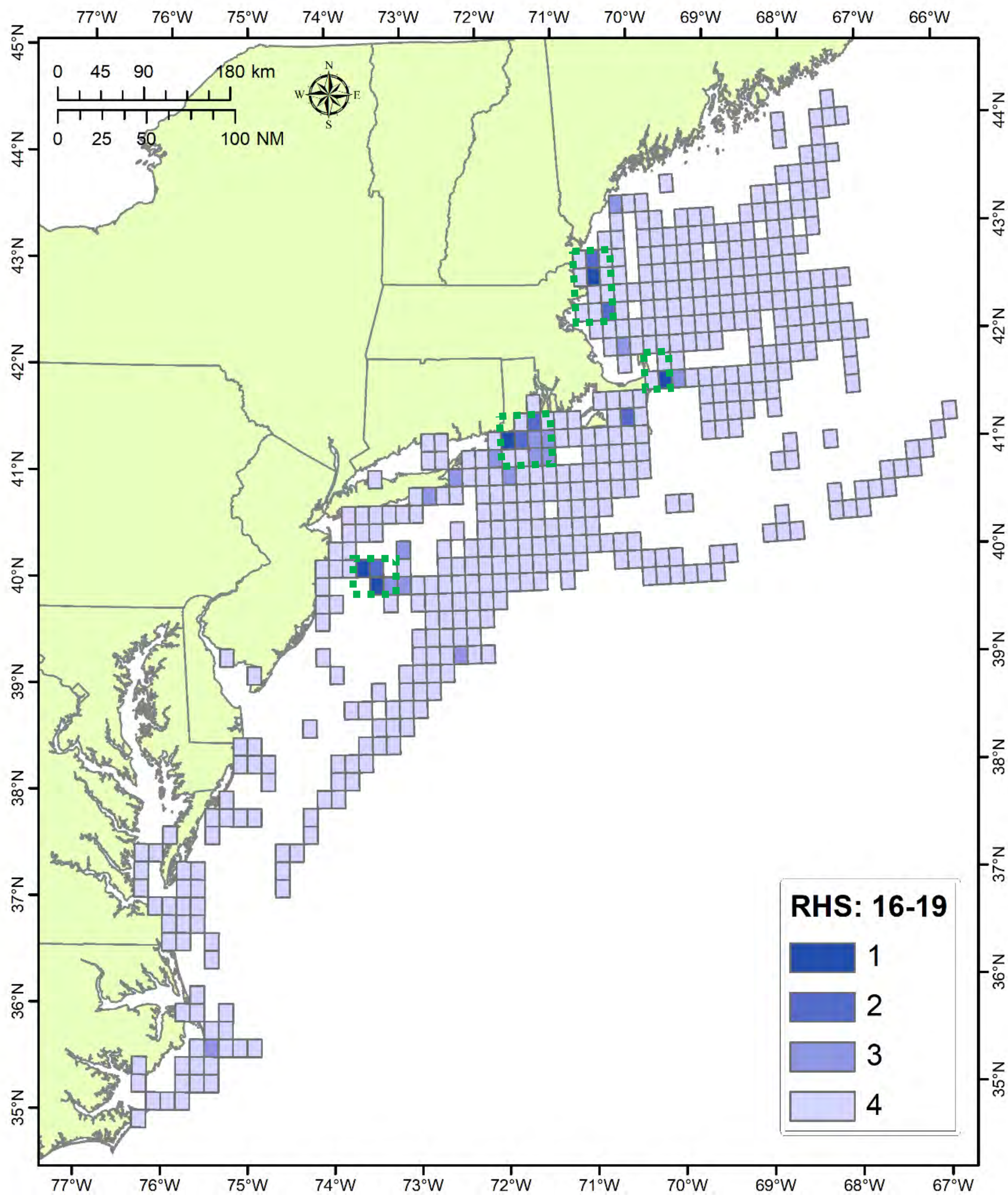


Figure 3. RH/S catch density (raw data) in 2016-2019 observer data, all gears. 1 = those ten minute squares that had highest RH/S catch and accounted for 25% of total observed RH/S catch, and so on for other quartiles of total RH/S catch and less dense groups of ten minute squares. Staff noted (subjective visual inspection and drawing by staff) four areas with green dashed outlined boxes that appeared to have repeated higher RH/S catches.

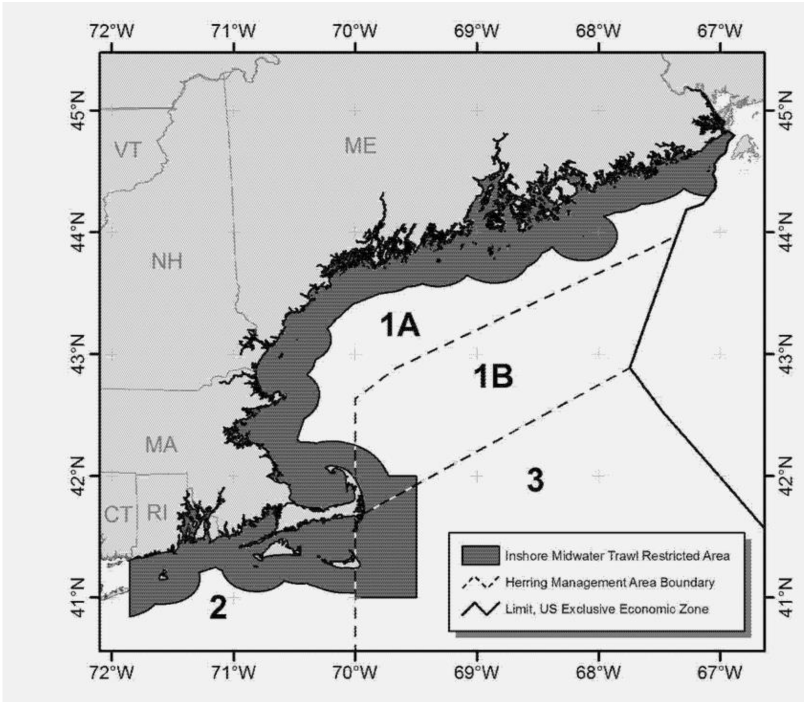


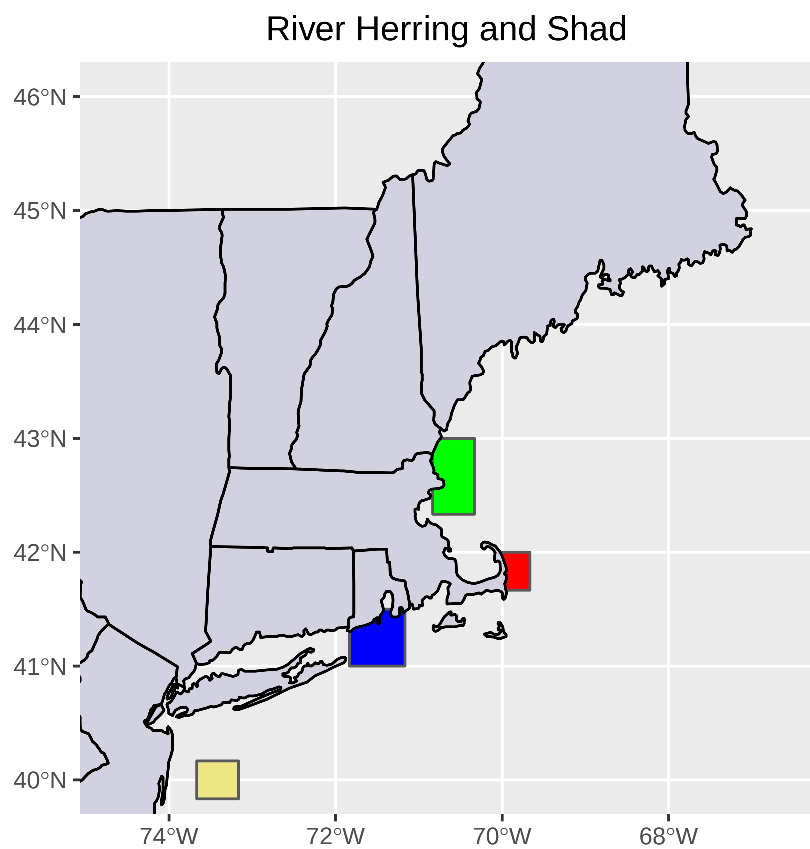
Figure 4. NEFMC Inshore Midwater Trawl Restricted Area (Effective February 10, 2021)

Maps for River Herring

Min-Yang Lee

June 09, 2021

Maps of Selected Fishery Landings and Revenue



Data sources:

Commerical Fisheries landings data, Vessel Trip Reports, and Surfclam/OceanQuahog Logbooks

Caveats and notes:

- When mapped, values are reported in nominal dollars per square kilometer.
- When mapped, values reported are nominal dollars per square kilometer.
- Pounds are reported in landed pounds.

- Data summarized here is based on vessels that are required to provide federal VTRs.

Selected Maps

Midwater Trawl River herring

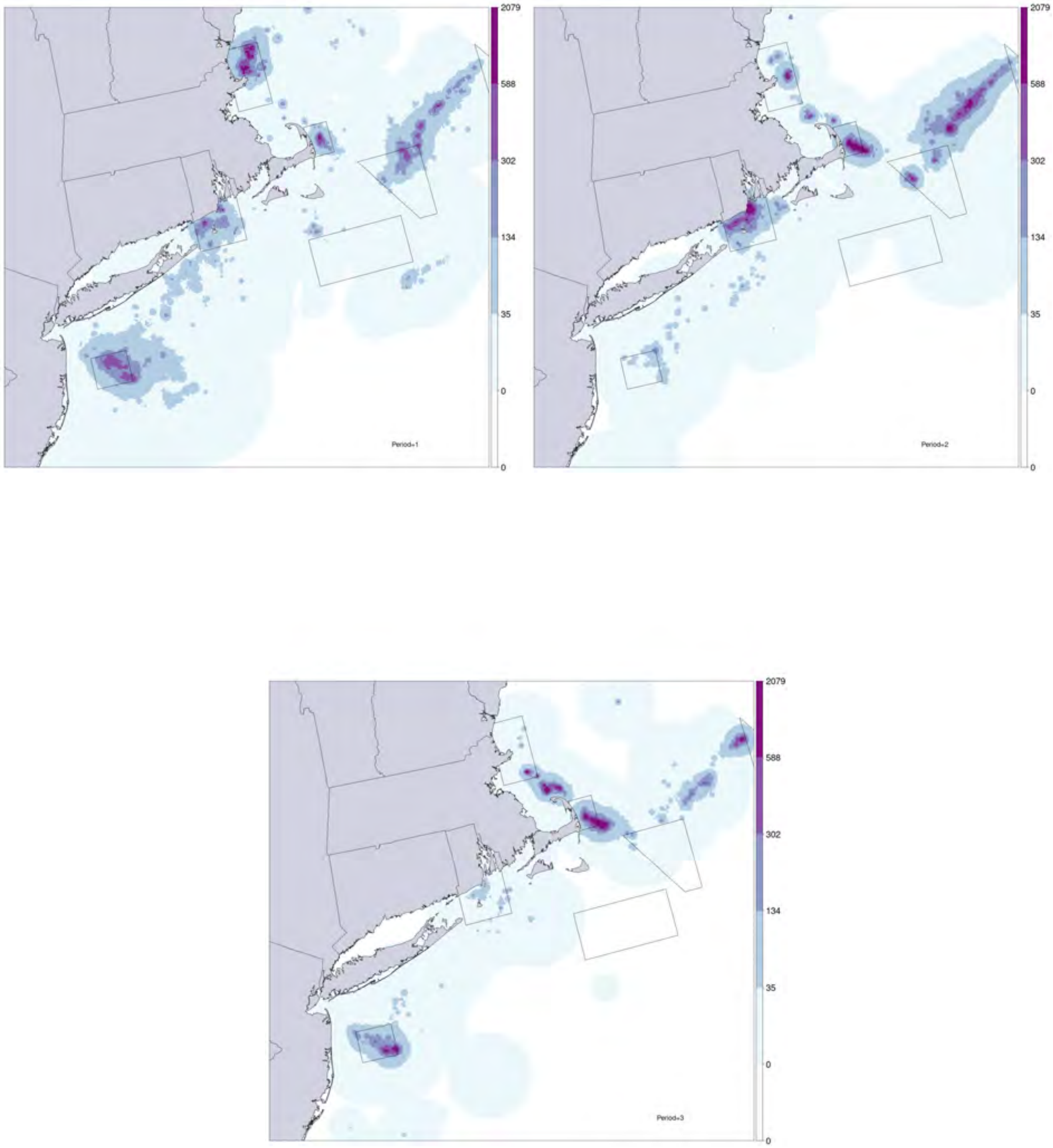


Figure 1: Total Revenue by Midwater Trawl. Top Left: 2008-2011. Top Right: 2012-2015. Bottom: 2016-2019.

Small Mesh Bottom Trawl River herring

References

DePiper GS (2014) Statistically assessing the precision of self-reported VTR fishing locations.
Benjamin S, Lee MY, DePiper G. 2018. Visualizing fishing data as rasters. NEFSC Ref Doc 18-12; 24 p.

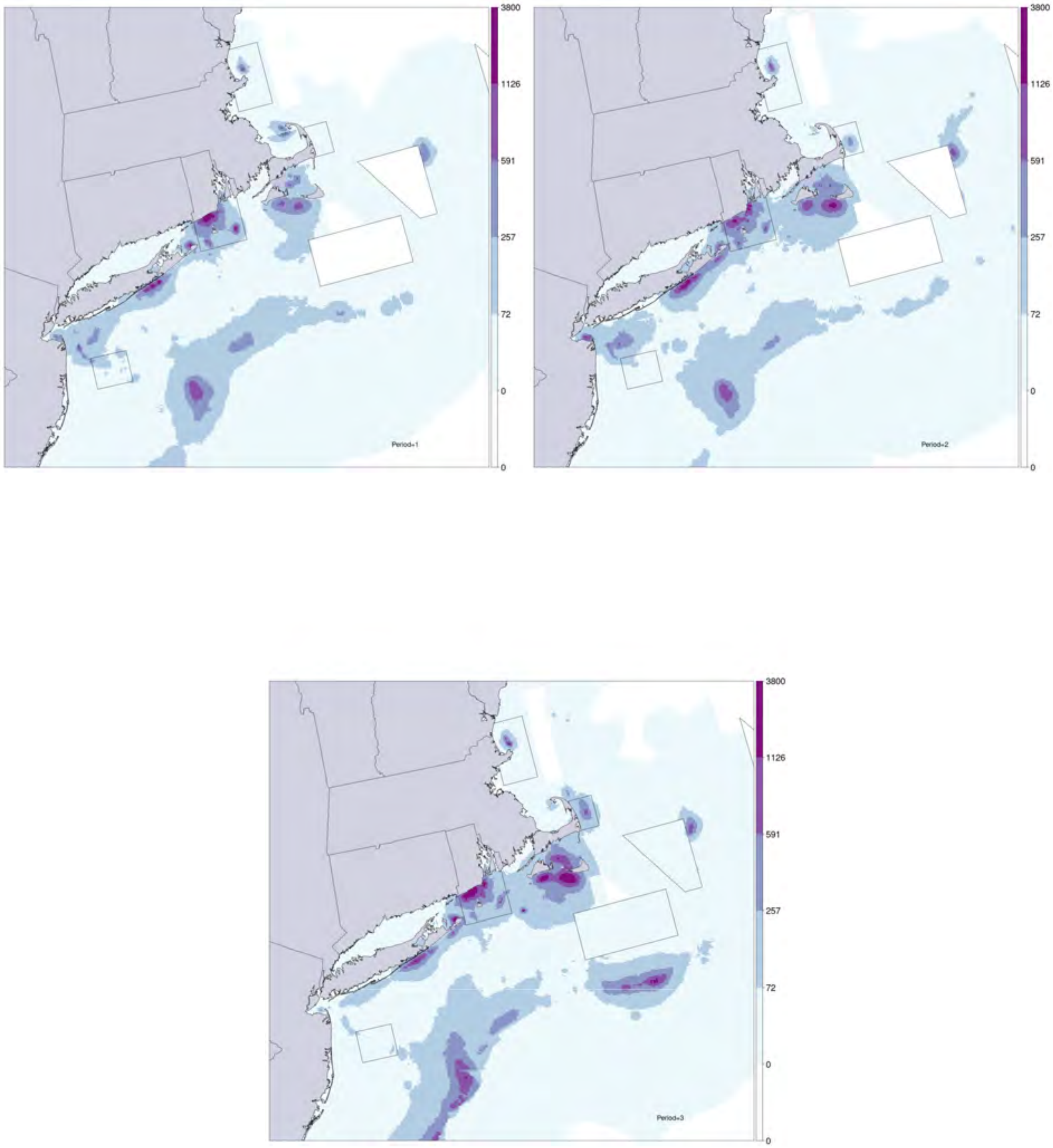


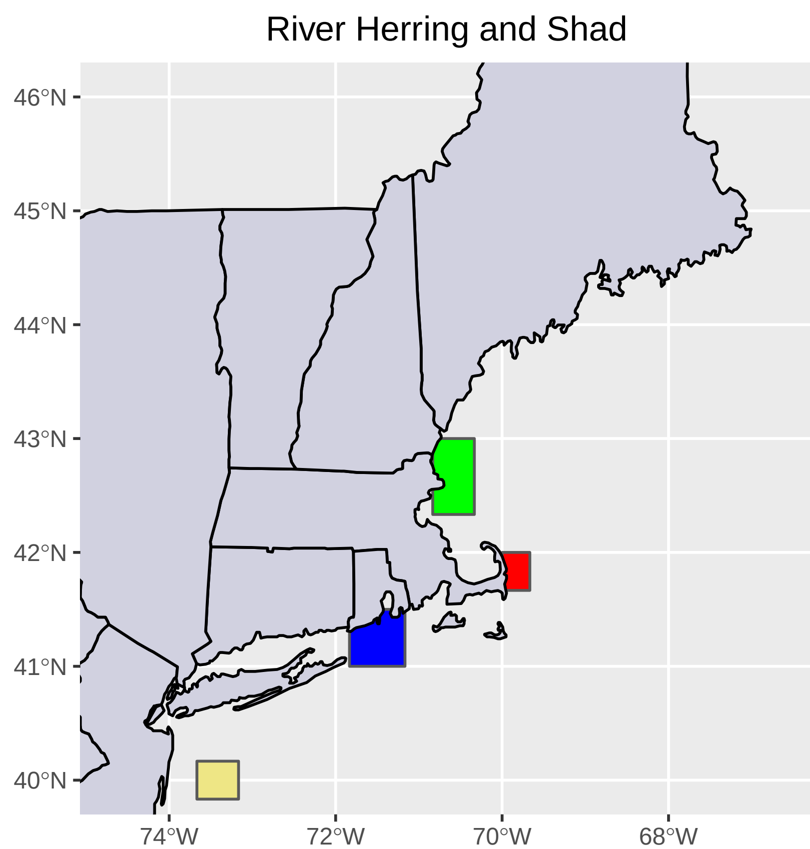
Figure 2: Total Revenue by Small Mesh Bottom Trawl.Top Left: 2008-2011. Top Right: 2012-2015. Bottom: 2016-2019.

Maps for River Herring: Jan, Feb, Nov, Dec

Min-Yang Lee

March 23, 2022

Maps of Selected Fishery Landings and Revenue



Data sources:

Commerical Fisheries landings data, Vessel Trip Reports, and Surfclam/OceanQuahog Logbooks

Caveats and notes:

- When mapped, values are reported in real (2019) dollars per square kilometer.
- Pounds are reported in landed pounds.
- Data summarized here is based on vessels that are required to provide federal VTRs.

Selected Maps

Midwater Trawl River herring

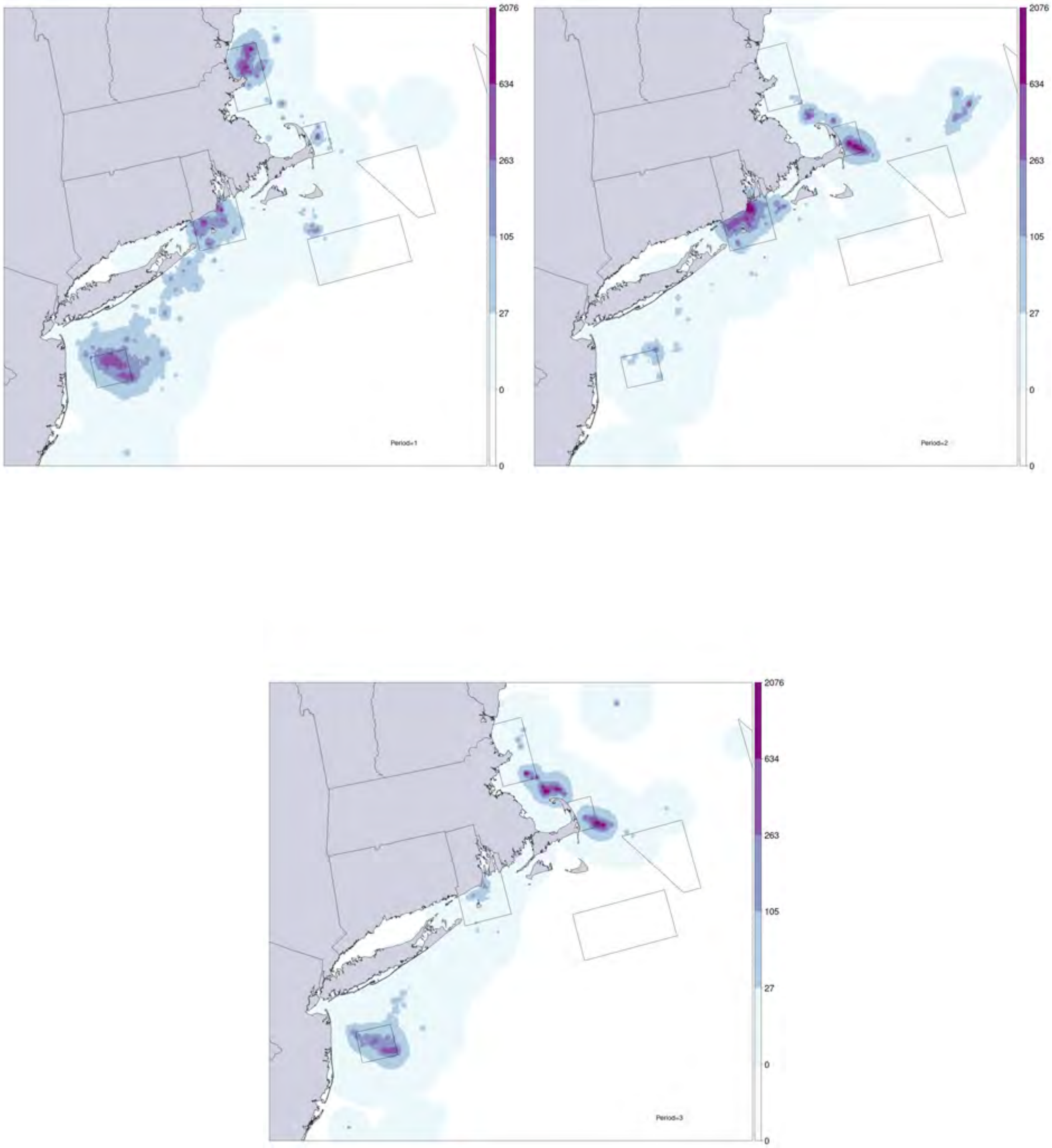


Figure 1: Total Revenue by Midwater Trawl. January, February, November, and December only. Top Left: 2008-2011. Top Right: 2012-2015. Bottom: 2016-2019.

Small Mesh Bottom Trawl River herring

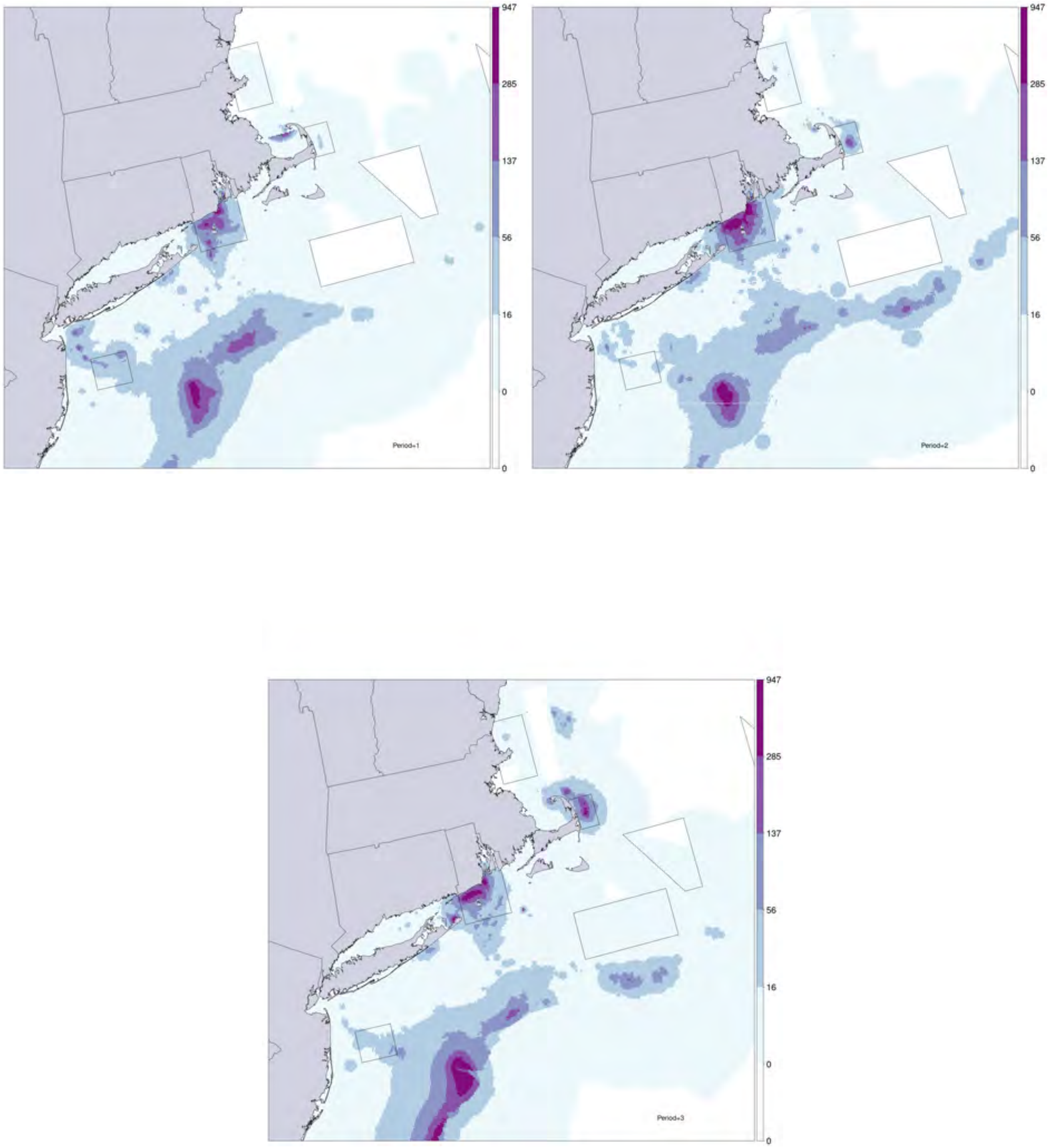


Figure 2: Total Revenue by Small Mesh Bottom Trawl. January, February, November, and December only. Top Left: 2008-2011. Top Right: 2012-2015. Bottom: 2016-2019.

References

DePiper GS (2014) Statistically assessing the precision of self-reported VTR fishing locations.
Benjamin S, Lee MY, DePiper G. 2018. Visualizing fishing data as rasters. NEFSC Ref Doc 18-12; 24 p.

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 26, 2022

To: Council

From: Karson Coutre, Staff

Subject: Atlantic Large Whale Take Reduction Team (ALWTRT) Phase 2 Update

On June 8, the Council will receive and update on phase two of the Atlantic Large Whale Take Reduction Plan (ALWTRP) which focuses on reducing the risk of entanglement to right, humpback, and fin whales in U.S. East Coast gillnet, Atlantic mixed species trap/pot, and Mid-Atlantic lobster and Jonah crab trap/pot fisheries. The ALWTRT met May 9-13 with the goal of developing recommended measures for Phase 2 which are meant to contribute to achieving the Agency's overall coast-wide goal of approximately 90% risk reduction. The meeting summary from this ALWTRT meeting is in development and will be included in supplemental briefing materials here. The May ALWTRT meeting agenda is provided behind this tab for further context, and more information can be found on the Atlantic Large Whale Take Reduction Plan webpage.

Atlantic Large Whale Take Reduction Team Meeting

May 9-13, 2022

May TRT Meeting Goals

Phase 2: Complete the team's work on developing recommended measures for our Phase 2 process for risk reduction in mid-Atlantic lobster trap/pot, U.S. East Coast multispecies trap/pot, and gillnet fisheries coast-wide. These measures must be considered in the context of the Agency's overall coast-wide goal of approximately 90% risk reduction, as described in the agency's November 2021 webinar.

Phase 3 (preparation): Gauge conservation benefits from the Phase 1 rule and begin discussing the data and analyses needed to inform future Phase 3 discussions that will identify additional risk reduction measures in the Northeast lobster and Jonah crab fisheries to reach the coast-wide goal of 90% risk reduction.

Agenda Summary

Day 1: Monday, May 9 (1:00 pm - 5:45 pm)
Welcome, our meeting goals, recalibrating and reconnecting as a team, informational briefings and initial review of potential measures.

Day 2: Tuesday, May 10 (9:00 am - 6:30 pm)
Detailed discussion of potential Phase 2 measures for mid-Atlantic lobster trap/pot, U.S. East Coast multispecies trap/pot, and gillnet fisheries coast-wide; crafting collections of measures to run through the Decision Support Tool.

Day 3: Wednesday, May 11 (9:00 am – 6:00 pm)
In the morning, Phase 3 preparation: review conservation value of Phase 1 rule and consider data & analysis needed to develop Phase 3 recommendations. In the afternoon, reviewing input so far on Phase 2 measures and receiving DST run results.

Day 4: Thursday, May 12 (9:00 am - 5:45 pm)
Reviewing and refining draft Team Phase 2 document.

Day 5: Friday, May 13 (9:00 am - 12:30 pm)
Finalize Team Phase 2 document.

Day 1: Monday, May 9 (1:00 pm - 5:45 pm)

Welcome, our meeting goals, recalibrating and reconnecting as a team, informational briefings and initial review of potential measures.

12:45- 1 pm	**Tech Check** • Team members join early for Zoom tech check and troubleshooting
1-1:30 pm	**Welcome and Getting Started** • Welcome and meeting objectives - Agency • Agenda review and ground rules • Technology tips • Participant check-ins
1:30-2:15 pm	**Recalibrating and Reconnecting as a Team** Small group and plenary discussions: • Why is this team's work so challenging? • What can we do as individuals to overcome these challenges? • What has this team done well? What can we build off of?
2:15-3:15 pm	**Informational Briefings and Updates** • DST updates • Relevant research
3:15-3:45 pm	**Break**
3:45-5:15 pm	**Initial Discussion:** Understanding Conservation Benefits Tied to Different OTP and Gillnet Measures
5:15-5:30 pm	**Public Comment**
5:30-5:45 pm	**Wrap-Up, Next Steps, and Adjourn**

Day 2: Tuesday, May 10 (9:00 am - 6:30 pm)

Detailed discussion of potential Phase 2 measures for mid-Atlantic lobster trap/pot, U.S. East Coast multispecies trap/pot, and gillnet fisheries coastwide; crafting collections of measures to run through the Decision Support Tool.

8:45-9 am	**Tech Check**
9-9:15 am	**Welcome and Review of Day** • Day Two approach and objectives • Brief opportunity for questions and observations from Team members from Day 1
9:15-10 am	**Initial Plenary Discussion: OTP and Gillnet Measures** • Question 1: Among these measures, which of these do you think should be most seriously considered? Why? • Question 2: If this type of measure were to be included in an eventual collection of measures, what would be the smartest way to design it - i.e. how could it be done to maximize benefit to NARW and minimize impacts to fishermen?
10-10:30 am	**Break**
10:30 am-12:15 pm	**Initial Cross-Caucus Discussion: OTP and Gillnet Measures:** • What are preferred measures and why? • What strategies could be employed to design these measures as wisely as possible?
12:15-1:45 pm	**Lunch/Break**
1:45-3:15 pm	**Building Collections of Measures to Test in the DST Model (Plenary, then Caucus)** • In plenary: Brief opportunity for reflections from morning discussion • In caucus: Start considering possible collections of measures to model in the DST this week (modeling ≠ commitment)
3:15-3:45 pm	**Break**
3:45-4:15 pm	**Caucus Report Back** • Provide feedback on collections of measures to run through DST
4:15-5:30 pm	**Break**
5:30-6:00 pm	**DST Group report back** • Review and confirm collection of measures for modeling over the next 24 hours
6:00-6:15 pm	**Public Comment**
6:15-6:30 pm	**Wrap-Up, Next Steps, and Adjourn**

Day 3: Wednesday, May 11 (9:00 am – 6:00 pm)

In the morning, Phase 3 preparation: review conservation value of Phase 1 rule and consider data & analysis needed to develop Phase 3 recommendations. In the afternoon, reviewing input so far on Phase 2 measures and receiving DST run results.

8:45-9 am	**Tech Check**
9-9:30 am	**Welcome and Review of Day** • Day Two approach and objectives • Brief opportunity for Team reflections • DST group check-in
9:30-10:45 am	**Preparing for Phase 3** • Review conservation value of Phase 1 rule and where risk remains
10:45-11 am	**Break**
11 am-12:30 pm	**Preparing for Phase 3** • Consider data and analysis needed to develop Phase 3 recommendations
12:30-2 pm	**Lunch**
2-2:30 pm	**Touch Base with DST Group** • Opportunity for DST group to pose clarifying modeling questions to Team
2:30-3:30 pm	**Phase 2 Measures - Emerging Team Perspectives** • Review what we have heard so far and clarify areas of convergence and divergence among the Team
3:30-4 pm	**Break**
4-4:15pm	**Public Comment**
4:15-5:45 pm	**DST Runs on Phase 2: Check-in/Refine the "Asks"** • DST shows (preliminary) results of runs requested on Tuesday regarding OTP and gillnet
5:45-6 pm	**Wrap-Up, Next Steps, and Adjourn**

Day 4: Thursday, May 12 (9:00 am - 5:45 pm)

Reviewing and refining draft Team Phase 2 document.

8:45-9 am	**Tech Check**
9-10:30 am	**Phase 2 Measures - Constructing a Team Document** • Reviewing the outline of an emerging Team Phase 2 document • DST run updates (if any)
10:30-11 am	**Break**
11 am-12:30 pm	**Phase 2 Measures: Caucus Opportunity** • Caucus meetings to review the emerging draft Team Phase 2 document
12:30-2 pm	**Lunch**
2-3:15 pm	**Phase 2 Measures: Caucus Report Outs and Begin Cross-Caucus Discussions** • Report back from each caucus; opportunity for Q&A • Additional discussions on potential collections of measures
3:15-4:15 pm	**Break**
4:15-5:15 pm	**Phase 2 Measures: Reviewing a Revised Draft Team Phase 2 Document**
5:15-5:30 pm	**Public Comment**
5:30-5:45 pm	**Wrap-Up, Next Steps, and Adjourn**

Day 5: Friday, May 13 (9:00 am - 12:30 pm)

Finalizing Team Phase 2 document.

8:45-9 am	**Tech Check**
9 am-12 pm	**Finalize Phase 2 Measures:** • Review and discuss near-final Team Phase 2 document; make a punch-list of revisions, as needed • Confirm Team message on OTP and gillnet measures
12-12:15 pm	**Public Comment**
12:15-12:30 pm	**Wrap-Up, Next Steps and Adjourn**

Action Plan to Reduce Atlantic Sturgeon Bycatch in Federal Large Mesh Gillnet Fisheries

Produced by the Atlantic Sturgeon Bycatch Working Group
Compiled by Spencer Talmage

NOAA National Marine Fisheries Service
Greater Atlantic Regional Fisheries Office, 55 Great Republic Drive, Gloucester, MA 01930-2276

Executive Summary

Bycatch of Atlantic sturgeon, an endangered species, in large mesh gillnet gear deployed in federal fisheries is a major concern for the recovery of the species. NOAA'S National Marine Fisheries Service convened the Atlantic Sturgeon Bycatch Working Group in response to the requirements of the May 27, 2021, Biological Opinion that considered the effects of the authorization of ten fishery management plans and the New England Fishery Management Council's Omnibus Essential Fish Habitat Amendment 2, on species listed under the Endangered Species Act, including all five distinct population segments of Atlantic Sturgeon, and designated critical habitat. The Working Group conducted a review of available information regarding Atlantic sturgeon distribution, bycatch in gillnet gear, bycatch mitigation, and post-release mortality. From this review, the working group produced this Action Plan, which recommends that the New England and Mid-Atlantic Fishery Management Councils, in coordination with the National Marine Fisheries Service and the Atlantic States Marine Fisheries Commission, consider a range of potential measures to reduce Atlantic sturgeon bycatch in federal large mesh gillnet fisheries. This Action Plan does not prescribe the measures that must be used, but provides recommendations based on the information considered on Atlantic sturgeon bycatch. These recommendations are: 1) Requirements to use bycatch mitigating low-profile gillnet gear; 2) implementation of closure or gear restricted areas in regions where Atlantic sturgeon bycatch is more common; and 3) limitations on soak time for gillnet gear. In addition, the Working Group recommends that the National Marine Fisheries Service lead work to identify and carry out steps needed to acquire more information regarding post-release mortality of Atlantic sturgeon captured by gillnet gear.

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Introduction: Biological Opinion, RPMs, and T&C

All five Atlantic sturgeon distinct population segments (DPS) in the United States are listed as endangered or threatened under the Endangered Species Act (ESA). The primary threats to these DPSs are entanglement in fishing gears, habitat degradation, habitat impediments, and vessel strikes.

On May 27, 2021, NOAA's National Marine Fisheries Service (NMFS) issued a Biological Opinion (Opinion) on the authorization of eight federal fishery management plans (FMPs), two Interstate Fishery Management Plans (ISFMPs) and the New England Fishery Management Council's Omnibus Essential Fish Habitat Amendment 2. The eight FMPs considered are the: Atlantic Bluefish; Atlantic Deep-sea Red Crab; Mackerel, Squid, and Butterfish; Monkfish; Northeast Multispecies; Northeast Skate Complex; Spiny Dogfish; and Summer Flounder, Scup, and Black Sea Bass FMPs. The two ISFMPs which were considered were the American Lobster and Jonah Crab ISFMPs. The North Atlantic Right Whale Conservation Framework for Federal Fisheries in the Greater Atlantic Region was considered in the proposed action. The Opinion evaluated the effects of the action on ESA-listed species, including all five DPS of Atlantic sturgeon, and designated critical habitat.

Section 9 of the Endangered Species Act of the ESA prohibits the take, including the incidental take, of endangered species. Pursuant to section 4(d) of the ESA, NMFS has issued regulations extending the prohibition of take, with exceptions, to certain threatened species. NMFS may grant exceptions to the take prohibitions with an incidental take statement or an incidental take permit issued pursuant to ESA section 7 and 10, respectively. Take is defined as "to harass, harm, pursue, hunt, shoot, capture, or collect, or to attempt to engage in any such conduct."

The ESA defines incidental take as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of sections 7(b)(4) and 7(o)(2), incidental take is not considered to be prohibited under the ESA provided that it is in compliance with the terms and conditions of an Incidental Take Statement (ITS). The 2021 Opinion includes an ITS which specifies the level of incidental take of Atlantic sturgeon anticipated in the federal fisheries and defines reasonable and prudent measures (RPMs) and implementing terms and conditions (T&C), which are necessary or appropriate to minimize impacts of the incidental take. The RPMs and T&Cs are non-discretionary and must be undertaken in order for the exemption to the take prohibitions to apply.

The RPMs/T&Cs of the Opinion include that NMFS convene a working group to review all the available information on Atlantic sturgeon bycatch in the federal large mesh gillnet (defined here as ≥ 7 inches stretched) fisheries and to develop an action plan by May 27, 2022, to reduce Atlantic sturgeon bycatch in these fisheries by 2024. Additionally, the Opinion requires that the action plan include an evaluation of information available on post-release mortality, identification of data needed to better assess impacts, and a plan, including timeframes, for obtaining and using this information to evaluate impacts.

On July 30, 2021, NMFS initiated work to establish the Atlantic Sturgeon Bycatch Working Group (ASBWG) to meet the requirements of the Opinion. Originally convened with NMFS staff in November

2021, the working group was expanded in January 2022 to include representatives from state fisheries agencies with expertise in Atlantic sturgeon and/or large mesh gillnet fisheries.

Atlantic Sturgeon Bycatch Working Group Members

- Spencer Talmage, Greater Atlantic Regional Fisheries Office
- Cynthia Ferrio, Greater Atlantic Regional Fisheries Office
- Lynn Lankshear, Greater Atlantic Regional Fisheries Office
- Henry Milliken, Northeast Fisheries Science Center
- Jason Boucher, Northeast Fisheries Science Center
- Kim McKown, New York State Department of Environmental Conservation, Bureau of Marine Resources
- Heather Corbett, New Jersey Department of Environmental Protection, Marine Fisheries
- Ian Park, Delaware Division of Fish and Wildlife
- Rebecca Peters, Maine Department of Marine Resources
- Eric Schneider, Rhode Island Department of Environmental Management, Division of Marine Fisheries
- Jacque Benway, Connecticut Department of Energy and Environmental Protection, Marine Fisheries Program

Purpose of Document

This Action Plan: (1) Communicates the results of the review of all available information regarding Atlantic sturgeon bycatch and highlight gaps in the available information; (2) describes regulatory measures that the New England and Mid-Atlantic Fishery Management Councils and NMFS should consider to reduce bycatch of Atlantic sturgeon by 2024; and (3) establishes a timeline for scoping and development of regulatory measures and completing or initiating work necessary to close information gaps.

Description of Fishery Management Plans Considered in the May 27, 2021, Biological Opinion

The following is a summary of the Fishery Management Plans which were considered in the May 27, 2021, Biological Opinion for their impact on ESA-listed species and habitat (NMFS 2021). Comprehensive descriptions of each fishery, including those which do not have gillnet components, can be found in the Biological Opinion.

American Lobster Interstate Fishery Management Plan

The American lobster fishery is cooperatively managed by the states and NMFS under the framework of the Atlantic States Marine Fisheries Commission. Vessels fishing for American lobster in the American lobster fishery primarily use trap gear. Though the American Lobster Interstate Fishery Management Plan includes a limited access non-trap permit that allows landing of lobster caught in other gear types, including gillnet, this is incidental to effort in other fisheries. There are no components of the targeted

American lobster fishery which use gillnet gear that would be directly affected by the eventual outcomes of this Action Plan.

Atlantic Bluefish Fishery Management Plan

The Atlantic bluefish fishery is managed jointly by the Atlantic States Marine Fisheries Commission and the Mid-Atlantic Fishery Management Council in state and federal waters. Management measures for the fishery include annual catch limits, catch targets, and total allowable landings for both the recreational and commercial sectors. The Atlantic bluefish fishery is primarily a recreational fishery, with 86 percent of the overall annual total allowable landings allocated to the recreational fishery quota and 14 percent allocated to the commercial fishery.

Gillnets are the primary gear type used in the commercial bluefish fishery. Hook and line gear (i.e. longline, handline, rod and reel, etc.), pound nets, seines, pots/traps, and trawls are also authorized gears. In the past five years, gillnets have accounted for around 65 percent of the commercial directed bluefish catch, with the next most common gear used various types of trawls (bottom, beam, midwater, etc.) (23 percent), and handline (8 percent). The combination of all other gear types, including traps, seines, and cast nets, comprised the remaining 4 percent.

There are no gear-specific requirements or area closures identified in the Bluefish FMP. Other federal FMPs have implemented these types of regulations which apply to vessels fishing with gillnet for bluefish and other species.

Atlantic Deep-Sea Red Crab Fishery Management Plan

The Atlantic deep-sea red crab fishery is managed by the New England Fishery Management Council. Vessels fishing for Atlantic deep-sea red crab in the Atlantic deep-sea red crab fishery primarily use trap gear. Vessels which have been issued a limited access red crab permit may not harvest red crab from any fishing gear other than red crab traps or pots which comply with marking requirements. An open-access incidental permit exists that allows landing of red crab caught in other gear types, including gillnet, but this is incidental to effort in other fisheries. There are no components of the targeted red crab fishery which use gillnet gear that would be directly affected by the eventual outcomes of this Action Plan.

Mackerel, Squid, and Butterfish Fishery Management Plan

The Mid-Atlantic Council manages Atlantic mackerel, chub mackerel, longfin squid, Illex squid, and butterfish through a single FMP called the Mackerel, Squid, and Butterfish (MSB) FMP. The FMP uses quotas and accountability measures for all species. Various permitting systems, mesh requirements, time-area closures, and trip limits are used in these fisheries to help achieve optimum yield. Species managed by the MSB FMP are typically harvested with bottom-tending otter trawl gear, jigging gear, single midwater trawls, and paired midwater trawls. There are no components of the mackerel, squid, or butterfish fisheries that use gillnet gear that would be directly affected by the outcomes of this Action Plan.

Monkfish Fishery Management Plan

The New England and Mid-Atlantic Fishery Management Councils jointly manage the monkfish fishery, which occurs year-round from Maine to North Carolina. A days-at-sea (DAS) system with trip limits per DAS is used to manage the fishery, along with a total allowable landings limit within an annual catch limit and accountability measures framework. There are two separate management areas: the Northern (NFMA) and Southern (SFMA). Landings in the SFMA peak in the late spring/early summer months when fish are migrating from deeper water, while landings in the NFMA peak in January through March.

In the commercial fishery, bottom trawl, gillnet, longline, dredge, and trap/pot gear are authorized, though bottom trawl and gillnet are the primary gear types used in the fishery. In 2018, bottom trawl accounted for 46 percent of landings, gillnet accounted for 45 percent of landings, and dredge and other gear types accounted for the remaining 9 percent.

The gear types and style of fishing used in the monkfish fishery differ between the NFMA and SFMA. In the NFMA, the monkfish fishery overlaps significantly with the Northeast multispecies fishery and landings are primarily made by vessels using bottom trawl gear. Landings from gillnet gear in the NFMA make up a small proportion of total landings during winter months and a larger proportion in the summer months. In the SFMA, the monkfish fishery is prosecuted more independently of other fisheries, and gillnet gear accounts for the majority of landings.

Vessels issued limited access monkfish permits are issued 45.2 DAS per fishing year, of which 37 may be used in the SFMA. An additional four DAS may be carried over if unused in the previous year, and can be applied in either area.

A substantial proportion of monkfish-permitted vessels additionally possess Northeast multispecies or scallop permits. Vessels with both a Northeast multispecies permit and a monkfish permit are subject to additional DAS measures which affect where and how they may fish, including gear configurations which may be used. Among these measures is a requirement for such a vessel to use a Northeast multispecies DAS whenever using a monkfish DAS. If a vessel's initial allocation of Northeast multispecies DAS is less than its monkfish DAS allocation, it receives an allocation of monkfish-only DAS equal to the difference. Monkfish-only DAS must be used in an exempted fishery program (Table 1), which are defined by the regulations of the Northeast Multispecies FMP.

Gear requirements in the Monkfish FMP establish a 10-inch minimum mesh size for gillnets, unless the vessel is fishing subject to gear requirements under a Northeast multispecies DAS or other exemption areas (Table 1).

Northeast Multispecies Fishery Management Plan

The New England Fishery Management Council manages the Northeast multispecies fishery through the Northeast Multispecies FMP. Sixteen species of groundfish are managed under the Northeast Multispecies FMP. Groundfish are found throughout New England waters, from the Gulf of Maine to southern New England. The Northeast multispecies fishery operates year-round. For management purposes, the fishing year runs from May 1 through April 30.

Thirteen species (20 stocks) are managed as part of the large-mesh complex, based on fish size and the type of gear used to harvest the fish, both as target species (Atlantic cod, haddock, pollock, yellowtail flounder, witch flounder, winter flounder, American plaice, Atlantic halibut, redfish, and white hake) and as non-target species (windowpane flounder, ocean pout, and Atlantic wolffish).

The commercial Northeast multispecies fishery is divided between the sector program and the common pool. Vessels voluntarily choose to enter into the sector program as part of a groundfish sector, each of which are allocated a quota of Northeast Multispecies stocks based on the collective fishing history of the sector's members. Each sector may determine how participating vessels fish that quota, also known as an Annual Catch Entitlement. Vessels that do not choose to participate in the sector program are placed in the common pool fishery. Common pool vessels are subject to possession limits and DAS requirements, as well as quotas managed in 4-month trimesters. Annual catch limits are in place for all participants in the fishery.

A variety of gears are used in the large mesh multispecies fishery. Groundfish vessels fish for target species with trawl, gillnet, and hook and line gear (including jigs, handline, and non-automated demersal longlines). For gillnet, minimum mesh sizes are 6.5 inches in all areas, except for vessels with the Large Mesh Individual DAS permit, which have a minimum mesh size of 7.5 inches diamond and 8.0 inches square in the Mid-Atlantic Regulated Mesh Area and 8.5 inches diamond and square in the Gulf of Maine, Georges Bank, and Southern New England Regulated Mesh Areas. Limits are in place regarding the number and type of nets which can be deployed, based on the area being fished.

Three species (silver hake/whiting, red hake, and offshore hake) are included in the FMP as the small-mesh complex, but are managed under a separate program through a series of exemptions to the Northeast Multispecies FMP. The small-mesh fishery operates under exemptions that allow vessels to fish for these species in designated areas, called exemption areas (Table 1), using mesh sizes smaller than the minimum mesh sizes otherwise allowed under the Northeast multispecies regulations.

Northeast Skate Complex Fishery Management Plan

The New England Fishery Management Council manages the skate fishery under the Northeast Skate Complex FMP. The fishery operates from Maine to Cape Hatteras, North Carolina. Skates are mostly harvested incidentally in trawl and gillnet fisheries targeting groundfish, monkfish, and sometimes scallops. The FMP manages a complex of seven different skate species: Barndoor; clearnose; little; rosette; smooth; thorny; and winter skates. Skates are harvested for two different market: skate wings for human consumption and whole skates for use as bait in other fisheries, such as lobster and Jonah crab. The skate wing fishery is allocated 66.5 percent of the federal total allowable landings (TAL) for skates, and the skate bait fishery is allocated 33.5 percent of the federal TAL. There are no closed areas identified with the Northeast Skate Complex FMP. However, area management within the Northeast Multispecies, Scallop, and Monkfish FMPs would impact the harvest of skates.

Otter trawl is the primary gear used in the bait fishery (99 percent of bait-only landings), while more skates in the wing fishery are landed with gillnet gear (81 percent of wing-only landings). Overall, gillnets are responsible for approximately 66 percent of skate catch, and trawls comprise about 32 percent. Skates are also consistently caught with traps, hook gear, and scallop dredges, although landings from these gears are relatively insignificant (about 2 percent of all catch combined). Vessels participating in the skate fishery must abide by the minimum mesh sizes and gear limits for gillnet and trawl gear required by the Northeast multispecies regulations. All vessels fishing for skates using a DAS are subject to the gear regulations of whichever limited access fishery it has declared into for that DAS. Otherwise, vessels fishing for skates must abide by the gear requirements of the Northeast Multispecies FMP.

An open access permit is required to land skates. Both a permit and a skate bait letter of authorization (LOA) is required to land whole skate for the bait fishery. Vessels fishing for skate wings must be on a Northeast multispecies, scallop, or monkfish DAS to land more than the incidental limit of 500 lb of skate wings. In general, vessels fishing for skate bait under a bait Letter of Authorization must also be on a DAS, unless the vessel is fishing in a DAS exemption area (Table 1).

Spiny Dogfish Fishery Management Plan

The New England and Mid-Atlantic Fishery Management Councils jointly manage the Atlantic spiny dogfish fishery under the federal Spiny Dogfish FMP. The Atlantic States Marine Fisheries Commission also manages the spiny dogfish fishery in state waters from Maine to North Carolina through its Interstate Fishery Management Plan for Spiny Dogfish. The spiny dogfish fishery is managed using a coastwide annual quota and possession limits. There is very limited directed recreational fishing for spiny dogfish, and no Federal recreational management. The commercial fishery is active year-round, although there is some seasonality in the distribution of landings due to the migratory nature of the species. In general, fishing effort follows the north-south seasonal migratory pattern. Spiny dogfish fishing is concentrated in the North Atlantic around Georges Bank, the Gulf of Maine, and Massachusetts state waters from May through October. Effort shifts further south (e.g., to Virginia and North Carolina) in late fall and early winter. Overall, the highest landings of spiny dogfish typically occur between June and October in Massachusetts. There are no closed areas specifically under the Spiny Dogfish FMP. However, permit holders are subject to the regulations and restrictions of the other permits they may be fishing under in conjunction with spiny dogfish (e.g., multispecies, monkfish, etc.).

Gillnets are the primary gear in the commercial fishery, responsible for approximately 66 percent of landings annually. The other most prevalent gears in the spiny dogfish fishery are bottom longline (25 percent of catch), and bottom trawl (4 percent). There are no specific gear requirements in the Spiny Dogfish FMP, but vessels targeting spiny dogfish must abide by the regulated mesh area requirements for gillnet and trawl gear specified in the Northeast multispecies regulations.

Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan

The Mid-Atlantic Fishery Management Council and the Atlantic States Marine Fisheries Commission jointly manage the summer flounder, scup, and black sea bass fisheries. These species are managed under a single FMP because these species occupy similar habitat and are often caught at the same time. The vast majority of these fisheries are harvested with bottom otter trawl gear (96 percent for summer flounder, 97 percent for scup, and 72 percent for black sea bass), and 18 percent of black sea bass are caught with pot/trap gear. As gillnets are not a significant gear in this FMP, participants are not likely to be directly affected by the eventual outcomes of this Action Plan.

Jonah Crab Interstate Fishery Management Plan

The Jonah crab fishery is cooperatively managed by the states and NMFS under the framework of the Atlantic States Marine Fisheries Commission. The Jonah Crab Interstate Fishery Management Plan limits participation in the Jonah crab fishery to vessels that possess an American lobster permit. As with the American lobster fishery, Jonah crab is primarily caught and landed using trap gear. A limited access non-trap permit exists that provides for incidental harvest of Jonah crab caught during the prosecution of other fisheries. There are no components of the targeted Jonah crab fishery which use gillnet gear that would be directly affected by the eventual outcomes of this Action Plan.

Exempted Fishery Areas

Exempted fisheries allow vessels to fish for specific species without being subject to certain Northeast multispecies regulations, including DAS, provided that bycatch of regulated Northeast multispecies stocks is minimal. Many gillnet fisheries in the region are conducted at least in part by vessels participating in exempted fishery areas, including the monkfish, spiny dogfish, and skate fisheries. As such, the exempted fishery areas define some of the gear requirements for vessels participating in these fisheries.

Table 1. Exempted fishery areas for vessels fishing with gillnet gear

Exemption Area	**Regulated Mesh Area**	**Gear Requirements**	**Target Species**	**Other allowable catch**	**Season**	**Other Restrictions**
Gulf of Maine (GOM)/Georges Bank (GB) Monkfish Gillnet Exemption	GOM, GB	10 inch minimum diamond mesh size	Monkfish	American Lobster	July 1 - September 14	
Eastern Cape Cod Spiny Dogfish Exemption Area	GOM, GB	6.5 inch minimum diamond mesh size	Dogfish	None specified	June 1 - December 31	
Nantucket Shoals Dogfish Fishery Exemption Area	GOM, GB	6.5 inch minimum diamond mesh size	Dogfish	Longhorn sculpin, silver hake, monkfish, lobster, skate	June 1 - October 15	
GOM/GB Dogfish Gillnet Exemption	GOM, GB	6.5 inch minimum diamond mesh size	Dogfish	American Lobster	July 1 - August 31	
Southern New England (SNE) Monkfish and Skate Gillnet Exemption	SNE	10 inch minimum diamond mesh size	Monkfish, Dogfish, Skate	Incidental species allowed in SNE Regulated Mesh Area*	Year-Round	
SNE Dogfish Gillnet Exemption	SNE	6 inch minimum diamond mesh size	Dogfish	Incidental species allowed in SNE Regulated Mesh Area*	May 1 - October 31	
Mid-Atlantic (MA) Monkfish/Spiny Dogfish Gillnet Exemption	MA	5 inch minimum mesh size, limited to 50 stand-up gilllnets	Monkfish, Dogfish, Skate	incidental species allowed in SNE Regulated Mesh Area*	Year-Round	Participating Vessels must be on a Monkfish Day-At-Sea

Existing Closure Areas and Gear Restricted Areas in Regions Used by Atlantic Sturgeon

Seasonal and year-round closures for the use of gillnet gear with ≥ 7 inches stretched mesh exist for the protection of other species (e.g., harbor porpoise, sea turtles) as well as for fisheries management (e.g., Gulf of Maine Cod Protection Closures). Such closures may afford some protection to the Atlantic sturgeon DPSs if they reduce large-mesh gillnet fishing effort at times and in areas where sturgeon also occur. For example, the Harbor Porpoise Take Reduction Plan and the Large-Mesh Gillnet regulations include seasonal closure areas for the use of ≥ 7 inches stretched mesh gillnet gear in mid-Atlantic waters (see https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/harbor-porpoise-take-reduction-plan and https://www.fisheries.noaa.gov/resource/map/large-mesh-gillnet-restricted-area-map-gis-data for additional information). The prohibitions on the use of ≥ 7 inches stretched mesh gillnet gear in these areas may benefit Atlantic sturgeon, particularly those belonging to the Chesapeake Bay and New York Bight DPSs, when the sturgeon are moving through marine waters to and from coastal estuaries. Similarly, measures such as the Gulf of Maine Cod Protection Closures (see https://www.fisheries.noaa.gov/new-england-mid-atlantic/rules-and-regulations/northeast-multispecies-closed-area-regulations for additional information) may also benefit Atlantic sturgeon, particularly the Gulf of Maine DPS, when sturgeon are moving through marine waters to and from coastal estuaries.

Review of Available Information on Atlantic Sturgeon Bycatch

Metadata

What information was reviewed?

The ASBWG reviewed a mixture of peer-reviewed scientific papers, available data from the Northeast Fisheries Observer Program database, grant program reports, workshop reports, Northeast Fisheries Science Center model-derived estimates of Atlantic sturgeon bycatch, and the 2017 Atlantic States Marine Fisheries Commission stock assessment, which is the most recent benchmark stock assessment available.

Table 1. Information Reviewed by ASBWG

Topic	Type of Information	Number Reviewed
Distribution and occurrence	Peer-reviewed literature	12
Bycatch analyses	Peer-reviewed literature	2
	NMFS NEFSC document	2
	ASMFC document	2
Bycatch mitigation	Peer-reviewed literature	3
	NOAA-NMFS Grant Report	4

These sources represent the known information available to the ASBWG.

In the literature that was reviewed, what types of data/methods were used?

Studies and other sources of information used data derived from fishery observer programs, tagging and telemetry, DNA sampling, fisheries independent surveys, and remote sensing and modeling.

What was the temporal range of the information which was reviewed?

The publication dates for peer reviewed articles considered by the Working Group ranged from 2004 to 2021, and available observer program data ranges from 1989 to 2020.

Was the information reviewed site-specific or region-wide?

NEFOP data are fishery dependent and was derived wherever vessels that were assigned observers fished. Seven peer-reviewed articles or workshop reports studied the entire region (Gulf of Maine to Cape Hatteras in most cases, some the entire Atlantic Coast), and seven peer-reviewed articles or workshop reports focused on smaller study areas. These included New York state waters, along the coast of Long Island and the mouth of New York Harbor, the New York Wind Energy Area, Delaware Bay, and the Mid-Atlantic Bight.

Characteristics of the Atlantic sturgeon bycatch in the study region

What fisheries and gear types most commonly interact with Atlantic sturgeon?

Fisheries which use gillnet and trawl gear most commonly interact with Atlantic sturgeon (Stein et al. 2004, ASMFC 2007, Dunton et al. 2015, ASMFC 2017). The ASBWG was formed to address bycatch of Atlantic sturgeon in the federal large-mesh (≥ 7 inches) gillnet fisheries. In particular, the Biological Opinion notes that the highest levels of bycatch occurred in the dogfish, monkfish, and Northeast multispecies sink gillnet fisheries. Gillnet gear configurations used in these fisheries are dependent on the species that vessels are targeting.

The minimum mesh size for most vessels fishing with gillnets in the Northeast multispecies fishery is 6.5 inches, though Large-mesh Individual DAS permitted vessels, which have a minimum mesh size of 8.5 inches in the Gulf of Maine, Georges Bank, and Southern New England Regulated Mesh Areas and a minimum mesh size of 8.0 inches square, 7.5 inches diamond in the Mid-Atlantic Regulated Mesh Area, also operate in the fishery. The minimum mesh size for gillnets used by vessels fishing under a monkfish DAS is 10-inch diamond mesh, unless the vessel is also fishing on a Northeast multispecies DAS or participating in certain exemption programs. There are no specific gear requirements in the Spiny Dogfish FMP, but vessels targeting spiny dogfish must abide by the requirements of the Northeast Multispecies Fishery Management Plan.

Two types of sink gillnets are used in these fisheries. Stand-up gillnets are constructed with floats on the float line and have no tie-down twine between the float line and the lead line. Stand-up gillnets extend vertically from top to bottom generally as a flat plane in the water column. Tie-down gillnets are either constructed with no floats on the float line or are constructed with floats on the float line and tie-down twine between the float line and the lead line. The float line on tie-down gillnets drop or is pulled towards the lead line such that the net forms a curved surface in the water column.

Vessels targeting Northeast multispecies typically use a mix of stand-up gillnets for targeting flatfish (i.e. flounder species and tie-down gillnets for targeting roundfish (i.e. cod) species. Vessels targeting monkfish typically use a 12-inch mesh size with large twine sizes, 12 meshes deep, with 48-inch tie-down line 24 feet apart. A string of monkfish gillnets is made up of 10 to 20 nets (He and Jones, 2013).

The ASMFC special report (2007) estimated Atlantic sturgeon bycatch in coastal Atlantic commercial fisheries and discussed factors associated with Atlantic sturgeon bycatch mortality in sink gillnets. Among these, ASMFC found a significant positive association between soak time to Atlantic sturgeon mortality when monkfish were targeted with tie-down nets, and when groundfish and striped bass were targeted with standup gillnets. The report stated “a clear relationship was apparent between increasing mortality and soak times, with soak times greater than 24 hours resulting in a 40-percent incidence of death and those less than 24 hours resulting in a 14-percent incidence of death.” Additionally, the report notes that longer soak times may increase Atlantic sturgeon bycatch and related deaths simply by increasing the likelihood of an interaction and, perhaps, through a baiting effect.

What gear modifications have been explored to reduce sturgeon bycatch?

A number of studies were reviewed which considered modifications to gillnet gear that could be used to reduce bycatch of Atlantic sturgeon. These studies have largely focused on comparisons between stand-up and tie-down gillnets, as well as modifications to net height and tie-down length. Generally, catch rate of sturgeon did not differ between stand-up gillnets and standard 12-mesh deep tie-down gillnets; stand-up nets tend to reduce monkfish catch (He, 2006).

Fox et al. completed a series of studies (2011, 2012, 2013) which progressively tested different configurations of gillnet, including comparisons between stand-up and tie-down gillnets, and comparisons of "low-profile" tie-down nets with commercial fishery standard nets. In these trials, the low-profile nets ranged between 6 and 8 meshes in height with 24-inch tie-downs, while commercial fishery standard nets were 12 meshes in height with 48-inch tie-downs.

Fox et al. found that the stand-up gillnet configuration reduced monkfish catch, made no difference in catch of Atlantic sturgeon, and greatly increased marine mammal catch. Levesque et al. (2016) conducted a comparison between the stand-up gillnet design typically used in the inshore southern flounder fishery in North Carolina and a heavily modified version with a 75-percent reduction in net profile from the standard design. This work demonstrated a reduction in incidental encounters of Atlantic sturgeon only relative to the gear used in the inshore southern flounder fishery in North Carolina.

Of the low-profile nets, Fox et al. found that the 6-mesh net reduced catch rates of both sturgeon and monkfish significantly. The 8-mesh net caught less sturgeon than the standard nets, but this difference was not significant. Sturgeon that were caught, however, were present in the upper half of nets, and so Fox et al. concluded that low profile nets were still potentially effective at reducing sturgeon bycatch.

He and Jones (2013) conducted their own comparison of the standard tie-down net to the low-profile 8-mesh net with 24-inch tie-downs. This study supported the concept that the low-profile experimental net reduced bycatch of Atlantic sturgeon. However, in sets where monkfish catch rates were high (i.e., a large amount of monkfish were potentially available), there was a reduction in overall monkfish catch for the low-profile net when compared to industry standard nets. There were no reductions in winter skate catch.

Fox et al. (2019) ran comparative trials of a low-profile sink-gillnet with 13-inch mesh size, 8-foot high net with 24-inch tie-downs spaced every 12 feet against an industry standard net with 12-inch mesh, 12-foot net height, with 48-inch tie-downs spaced at 24 foot intervals. The low-profile gillnet reduced Atlantic sturgeon bycatch by a ratio of 4.2:1, which the authors noted as promising for overall bycatch reduction in the future. Results regarding monkfish catch were somewhat mixed; catch rates by the vessel out of New York caught significantly fewer monkfish, while there was no significant difference between monkfish catch by the vessel fishing out of New Jersey. Winter skate and dogfish catch was similar across fishing locations and did not differ by gear.

Lastly, in 2006, Gessner and Arndt demonstrated in experimental conditions in freshwater ponds that the use of spacers to lift stand-up gillnets off the bottom by 0.3 meters (11.81 inches) "substantially" reduced catch of Siberian sturgeon. This concept was discussed at a NMFS and ASMFC gear workshop in 2013 as potentially applicable to Atlantic sturgeon, but it was noted that this type of modification would likely also reduce monkfish catch, an undesirable outcome for any gear measure intended to reduce sturgeon bycatch.

When and where does this interaction occur?

The Atlantic sturgeon's distribution in the marine environment has been described in a number of documents including the ASMFC's 1998 and 2017 Atlantic Sturgeon Stock Assessments, NMFS background information for the 2012 ESA-listing rules and the 2017 critical habitat designations, and in comprehensive literature reviews (e.g., Hilton et al. 2016). Based on incidental capture of Atlantic sturgeon in fishery-dependent and fishery-independent surveys as well as directed captures for research, and a variety of scientific methods (e.g., tagging and recapture, telemetry, genetic analyses), we know that, generally, Atlantic sturgeon in the marine environment:

- Are adult sturgeon as well as sexually immature sturgeon that have reached a certain stage of development to emigrate from the natal estuary;
- Typically occur within the 50-meter depth contour but may primarily occur within the 25-meter depth contour in some areas and at certain times of the year;
- Have the same overall marine range from Hamilton Inlet, Labrador, Canada, to Cape Canaveral, Florida regardless of DPS; and,
- Make seasonal coastal movements from marine waters to river estuaries in the spring and from river estuaries to marine waters in the fall.

Erickson et al. (2011) provided some of the most detailed information for Atlantic sturgeon in the marine environment based on data from pop-up satellite archival tags of 15 adult Atlantic sturgeon that were captured in the freshwater reach of the Hudson River. Upon leaving the Hudson River, all of the fish used a similar depth range in summer and fall, and 13 of the 15 continued to have a similar depth pattern in the winter through spring. Mean-daily depths typically ranged from 5 to 35 m and never exceeded 40 m. The sturgeons occupied the deepest waters during winter and early spring (December–March) and shallowest waters during late spring to early fall (May– September). Mean-monthly water temperatures ranged from 8.3°C in February to 21.6°C in August for the 13 fish that exhibited similar depth distributions. Of the remaining two fish, during December and January, one sturgeon occurred at shallower depths (5-15 m) and in warmer waters, while the second fish occurred at deeper depths (35-70 m) and in colder waters. Nearly all of the sturgeon stayed within the Mid-Atlantic Bight before their tags were released. However, the sturgeon did not appear to move to a specific marine area where the fish reside throughout the winter. Instead, the sturgeon occurred within different areas of the Mid-Atlantic Bight and at different depths, occupying deeper and more southern waters in the winter months and more northern and shallow waters in the summer months with spring and fall being transition periods. Three subsequent studies, Breece et al. (2018), Ingram et al. (2019), and Rothermel et al. (2020), using thousands of detections of acoustically-tagged Atlantic sturgeon within receiver arrays off of Long Island and New Jersey, Delaware, and Maryland demonstrated that depth and water temperature are key variables associated with sturgeon presence and distribution in Mid-Atlantic marine waters. All three studies provided further evidence of seasonal inshore and offshore movements with sturgeon occupying shallower waters closer to the coast in the spring and more offshore waters in the late fall-winter. Finally, similar to Erickson et al., both the Ingram et al. study and the Rothermel et al. study found very low residency time for individual Atlantic sturgeon within the receiver arrays for the respective studies. This suggests that sturgeon aggregation areas in the marine environment are not areas where individual sturgeon reside for extended periods of time but are used by many sturgeon for what they provide in terms of the most suitable environmental conditions as the sturgeon move through the marine environment.

Available information suggests a similar pattern for Atlantic sturgeon distribution and occurrence within the Gulf of Maine. Altenritter et al. (2017), Novak et al. (2017), and Wippelhauser et al. (2017) provide the most recent, published literature describing Atlantic sturgeon movements within and beyond the Gulf of Maine. Each of the studies used telemetry detections of acoustically-tagged Atlantic sturgeon, many of which were initially captured in a Gulf of Maine river, suggesting that they were more likely to belong to the Gulf of Maine DPS. Collectively, the studies encompassed the time period of 2006-2014. Their results demonstrate that the sturgeon primarily occurred in the Gulf of Maine, use more offshore waters in the fall and winter, and make seasonal coastal movements between estuaries. Some of the estuaries are known aggregation areas where sturgeon forage, and one (i.e., the Kennebec River Estuary) is the only known spawning river for the Gulf of Maine DPS.

In addition to the studies cited above, a new, comprehensive analysis of Atlantic sturgeon stock composition coast wide provides further evidence that the sturgeon's natal origin influences the distribution of Atlantic sturgeon in the marine environment. While Atlantic sturgeon that originate from each of the five DPSs and from the Canadian rivers were represented in the 1,704 samples analyzed for the study, there were statistically significant differences in the spatial distribution of each DPS, and individuals were most likely to be assigned to a DPS in the same general region where they were collected (Kazyak et al. 2021). The results support the findings of previous genetic analyses that Atlantic sturgeon of a particular DPS can occur throughout its marine range but are most prevalent in the broad region of marine waters closest to the DPSs natal river(s). In comparison to its total marine range, Atlantic sturgeon belonging to: the Gulf of Maine DPS are most prevalent in the Gulf of Maine; the New York Bight DPS are most prevalent in the Mid-Atlantic Bight and are the most prevalent of all of the DPSs in the Mid-Atlantic Bight; and, the Chesapeake Bay DPS are most prevalent in the Mid-Atlantic Bight, particularly from around Delaware to Cape Hatteras.

What are the characteristics of bycaught Atlantic sturgeon?

Available information related to characteristics of Atlantic sturgeon which are caught as bycatch is primarily derived from fisheries dependent sources, particularly the observer database. Observers collect catch, gear, fishing effort, and biological data in fisheries in the Greater Atlantic Region. The observer dataset includes information on weight, length, and status of bycaught sturgeon. External sex determination by fisheries observers is not possible, and so it cannot be inferred whether sturgeon of one sex are more likely to be caught than another.

Status data recorded by observers is categorical and not detailed; bycaught sturgeon are recorded as "alive", "dead", "dead, damaged", "dead, head only" or "unknown". Out of a total 2,991 individual sturgeon recorded by observers in the past 10 years, 52.6 percent of Atlantic sturgeon were considered alive, while 45.2 percent were dead; dead, damaged; or dead, head only. In both the Gulf of Maine and Mid-Atlantic, from waters south of Cape May to the Virginia-North Carolina state line, numbers of sturgeon released alive during this time period are greater than those released dead. In the Gulf of Maine, 61.7 percent of 480 individuals were considered alive, while 36.7 percent were considered dead or dead, damaged. In the Mid-Atlantic, 67.2 percent of 519 individuals were considered alive, with 32.2 percent recorded as dead or dead, damaged. In the waters off of New Jersey, New York, and south of Martha's Vineyard, however, this dynamic is flipped; 53.8 percent of sturgeon were considered dead, dead, damaged, or dead, head only, while only 43.2 percent were considered alive.

It is important to note that the number and proportion of sturgeon considered to have been released alive on observed trips is not the same as the number of sturgeon that ultimately survive interaction with fishing gear on observer trips. Not all sturgeon that are entangled in gillnet gear will remain in nets when they are hauled, and so the number of sturgeon of any status that actually interacted with gillnet gear on observed trips may be larger than what has been recorded. In addition, observers are recording status at time of capture; the data thus do not provide information regarding post-release mortality.

There is limited information available to characterize post-release mortality for sturgeon caught in gillnet gear. Fox et al. (2019) conducted field trials of an experimental low-profile gillnet design in conjunction with an examination of Atlantic sturgeon behavior in the presence of sink gillnets and an examination of post release mortality of incidentally landed Atlantic sturgeon. A total of 20 fishing trips were taken under the project by participating vessels, during which paired gillnets were deployed. Two to three strings each of a control industry standard gillnet and experimental low profile gillnet were deployed at each location. A total of 31 Atlantic sturgeon were incidentally caught over the course of this project, 18 of which were dead upon the net being hauled. The 13 remaining sturgeon were fitted with a p-sat transmitter and released alive. Of these, only four transmitters were recovered, and Fox et al. speculated that one (25 percent) of these individuals suffered a mortality post-release. A greater sample size is needed to make any strong conclusions about post-release mortality experienced by Atlantic sturgeon caught in gillnet gear.

Have any recently produced studies established new tools for management?

A few studies reviewed by the working group utilized remote sensing, biotelemetry, and other techniques to produce dynamic spatial models which may be used by managers and stakeholders as decision making tools to reduce overlap of fishing activity and sturgeon presence.

Breece et al. in 2016 translated the concept of landscapes, environmental partitions that index complex biogeochemical processes that drive terrestrial species distributions, into a seascape approach to understanding Atlantic sturgeon occurrence during their spring migration in the mid-Atlantic region, along the coast of New Jersey and in and around Delaware Bay. They used a global, publicly available seascape product which utilizes satellite derived measurements of remote sensing reflectance and daytime sea surface temperatures (SST) in conjunction with acoustic telemetry data for Atlantic sturgeon locations to determine whether Atlantic sturgeon were selecting for certain seascapes. Of six seascapes that dominated the study area (labeled A - F), Seascape class E was the most preferred by sturgeon and the only seascape to be significantly preferred. Seascape E was defined by an association with the coastline of Delaware Bay and Atlantic Ocean, with a mean SST of 19.8 °C and the second highest reflectance at

443 nm and 555 nm. This work confirms previous findings that mouths of estuaries and inlets concentrate Atlantic sturgeon in the coastal ocean, and that Atlantic sturgeon migrate along these locations using relatively narrow corridors along the coast. Additionally, the established preference of Atlantic sturgeon for Seascape E during the spring migration could be used to estimate spatial occurrence without direct observation of individuals, and thus a seascape product could be applied to inform reduction of Atlantic sturgeon bycatch in coastal fisheries.

In addition to this work, Breece et al. (2018) utilized biotelemetry observations of Atlantic sturgeon in concert with daily satellite observations to construct a spatial distribution model for the species which could determine the relationship between Atlantic sturgeon occurrence and environmental predictors on a daily basis throughout the year. Model estimations showed Atlantic sturgeon association with shallower waters in the spring, deeper waters relative to those used for model development in the fall, and containment to isolated patches at the mouths of estuaries in the summer. This supports previously established patterns of Atlantic sturgeon migration. The model also showed higher abundance of Atlantic sturgeon within water temperatures between 12°C and 25°C, day-of-year patterns consistent with known migratory patterns, and dimorphic migratory patterns in which male sturgeon arrive upon spawning grounds days to weeks prior to the arrival of females. Breece et al. contend that a projection of their base model onto dynamic SST and ocean color data could create a daily map of Atlantic sturgeon abundance over the coastal mid-Atlantic, which could be used as a dynamic management tool.

Actionable Conclusions

The ASBWG makes the following conclusions based on its review of the data and information available about Atlantic sturgeon bycatch in the federal large-mesh gillnet fisheries.

- Federal gillnet fisheries targeting monkfish, spiny dogfish, and Northeast multispecies with sink gillnet gear ranging from 5.5 to 10 inches in minimum mesh size requirements are primary contributors to Atlantic sturgeon bycatch. These fisheries use a mix of stand-up and tie-down gear depending on primary target species.

- Recent gillnet gear research has shown that low-profile gillnet designs with reduced net height, shorter tie-down length, and shorter tie-down spacing reduce Atlantic sturgeon bycatch, potentially without reduction in catch of target species. In particular, a gillnet configuration tested by Fox et al. (2019) with 13-inch mesh size, height of 8 meshes, and 24-inch tie-downs spaced every 12 feet was shown to reduce Atlantic sturgeon bycatch in New Jersey without significant reductions in monkfish catch.

- Soak time is a likely driver of Atlantic sturgeon bycatch rates and mortality, based on available research and the simple concept that time spent by fishing gear in the water strongly correlates with the chances that the gear interacts with sturgeon.

- Available research indicates that temperature and depth are primary drivers of Atlantic sturgeon movement and abundance. In particular, sturgeon tend to occur in waters shallower than 50 m in depth and shallower than 25 m during seasonal coastal movements from marine waters to river estuaries in the spring and from river estuaries to marine waters in the fall. Migratory pathways along the coast used by many sturgeon represent key areas of high abundance.

- Post-release mortality for Atlantic sturgeon is not well understood; only a small amount of information on the topic is currently available, and research that does exist is hampered by small sample sizes.

Actions to Reduce Atlantic Sturgeon Bycatch in Federal Large Mesh Gillnet Fisheries

Given the ASBWG's conclusions and review of available information, the ASBWG recommends that fisheries managers consider three primary approaches to achieve bycatch reductions by 2024. These are:

1. Modifications to gear,
2. Modifications to fishing practices, and
3. Consideration of areas of focus in regions of Atlantic sturgeon bycatch.

These approaches are not mutually exclusive; some combination of these could be implemented to achieve desired bycatch reduction while balancing the needs of affected fisheries.

For example, a restricted gear area which allows fishing in areas where Atlantic sturgeon bycatch is a possibility but requires the use of low-profile gillnet gear may be preferred over a time/area closure which completely prohibits fishing from that same area or a blanket requirement for all vessels to use a low-profile gillnet in the entire region.

Additionally, the lack of available information regarding post-release mortality severely inhibits the ability of managers and scientists to understand and respond to the degree of mortality occurring as a result of bycatch. The Councils, Atlantic States Marine Fisheries Commission, and NMFS should collaborate to establish a greater understanding of post-release mortality of Atlantic sturgeon entangled in gillnet gear.

Modifications to Gear

The ASBWG recommends that the Councils consider requiring the use of a low-profile gillnet by federally-permitted commercial fishing vessels using gillnet gear while on monkfish DAS, participating in a large-mesh exemption area with a 10-inch minimum mesh size requirement, or fishing under a Northeast Multispecies DAS in the Large-Mesh DAS Program.

A low-profile net design, as defined by successful gear studies from Fox et al. 2011, 2012, 2013, 2019 and He and Jones (2013), possesses the following characteristics:
- Mesh size ranging from 12 to 13 inches;
- Net height ranging from 6 to 8 meshes tall;
- Tie-down length of 24 inches;
- Tie-down spacing of 12 feet; and

- Primary hanging ratio of 0.50.

The low-profile net which showed the greatest success in reducing Atlantic sturgeon bycatch while not significantly reducing monkfish catch was the one used off New Jersey by Fox et al. 2019. This net had a 13-inch mesh size, an 8-mesh net height, tie-down length of 24 inches, tie-down spacing of 12 feet, and had 12 panels for a total length of 1,200 ft. This study, however, included two participants, one fishing in New York state waters, and another fishing in New Jersey waters. Though the results for the New Jersey trials were that monkfish landings in the low-profile net were not significantly different from those from the control net, the New York trials did show a statistically significant reduction in monkfish landings in the low-profile net. Landings of skate and spiny dogfish in both trials in the low-profile net were not significantly different from those in the control nets.

Continued collaborative experimentation by scientific experts and the fishing industry to identify net designs which optimize catchability of target species while retaining reduced bycatch of Atlantic sturgeon is encouraged. However, the ASBWG notes that this must be balanced by the need to implement meaningful bycatch reductions as soon as possible.

Modifications to Fishing Practices

The Councils should consider restricting the amount of soak time that nets can be deployed by federally permitted commercial fishing vessels using gillnet gear while on monkfish DAS, participating in a large-mesh exemption area with a 10-inch minimum mesh size requirement, or fishing under a Northeast Multispecies DAS in the Large-Mesh DAS Program.

Soak time is strongly related to the likelihood of bycatch and bycatch mortality. Reductions in the amount of time in which a given piece of gear is in the water will reduce both the likelihood that that gear will interact with an Atlantic sturgeon and that any interaction will result in mortality.

Soak time in the federal large-mesh gillnet fishery varies greatly across the relevant fisheries due to regional differences in fishing practices and conditions. Additional work is necessary to fully characterize current practices related to soak time in order to identify opportunities to reduce soak time in areas and at times during which doing so would provide the most conservation benefit. Reductions in soak time in areas known to likely hold aggregations of Atlantic sturgeon, or areas that are migratory corridors at certain times, might be most effective.

Implementation and enforcement of regulations which restrict soak time have been particularly challenging in the past, given a lack of mechanism to do so. NMFS in recent years has explored the development of data loggers which could be used to enforce soak time regulations, and has acquired funding to procure and test data loggers to ensure new technology and systems can record data effectively, indicate when an exceedance has occurred, withstand fishing conditions, and be reviewed and utilized by the Office of Law Enforcement to enforce any tow/soak duration limitations. These data loggers build on work described in Matzen et. Al., (2015) and utilize Bluetooth communications to easily transfer data from the systems. Additional regulatory changes which might be considered also include restricting gillnet vessels from leaving gear in the water between trips, as is currently allowed, for example, in portions of the Northeast multispecies fishery.

Areas of Focus

Available observer data suggests high incidence of Atlantic sturgeon bycatch in gillnet fisheries in several distinct regions along the Atlantic coast, which roughly correspond to available examples from the literature review.

The ASBWG used observer data to identify areas that might be important for reducing bycatch, and considered whether it would be possible to make recommendations for large closure areas which would effectively address Atlantic sturgeon bycatch. However, it did not evaluate the socio-economic impacts of these potential areas, or the relative importance of these areas to gillnet vessels. Because Atlantic sturgeon bycatch in the observer data is strongly related to fishing effort, it is likely that broad closure areas for this purpose would encompass the majority of fishing activity in the region and result in extensive closure and disruption to the fishing industry. This idea was discarded, as it was presumed to have a high negative impact on the fisheries involved.

The ASBWG recommends work to evaluate the trade-offs and potential impacts of smaller, more focused, and potentially seasonal closure or restricted areas. These might, for example, apply the recommended gear modifications, or soak time restrictions in locations and times which they might be most impactful.

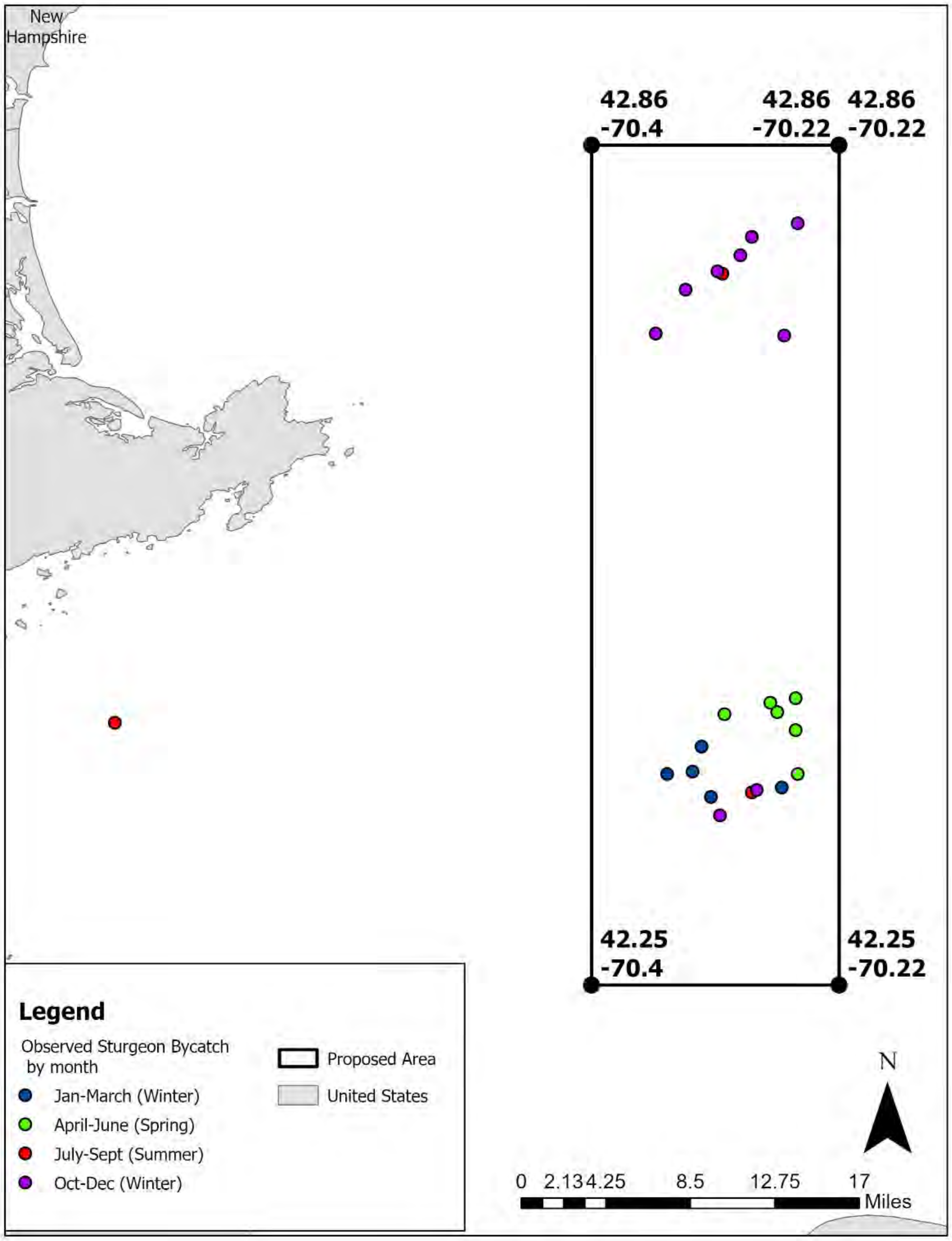
The areas of high incidence of Atlantic sturgeon bycatch, along with the observer data used to identify them, are shown in maps below. The Councils should prioritize these areas when developing measures to reduce Atlantic sturgeon bycatch in federal gillnet fisheries.

Particular areas which should be considered include:

Gulf of Maine

Available observer data shows a cluster of interaction between the large-mesh gillnet fishery and Atlantic sturgeon on Stellwagen Bank within the Gulf of Maine, with no discernible seasonal pattern. Notably, several instances of observed sturgeon interaction occurred along the border of the Western Gulf of Maine Closure Area on the 70˚ 15’ W. longitude line.

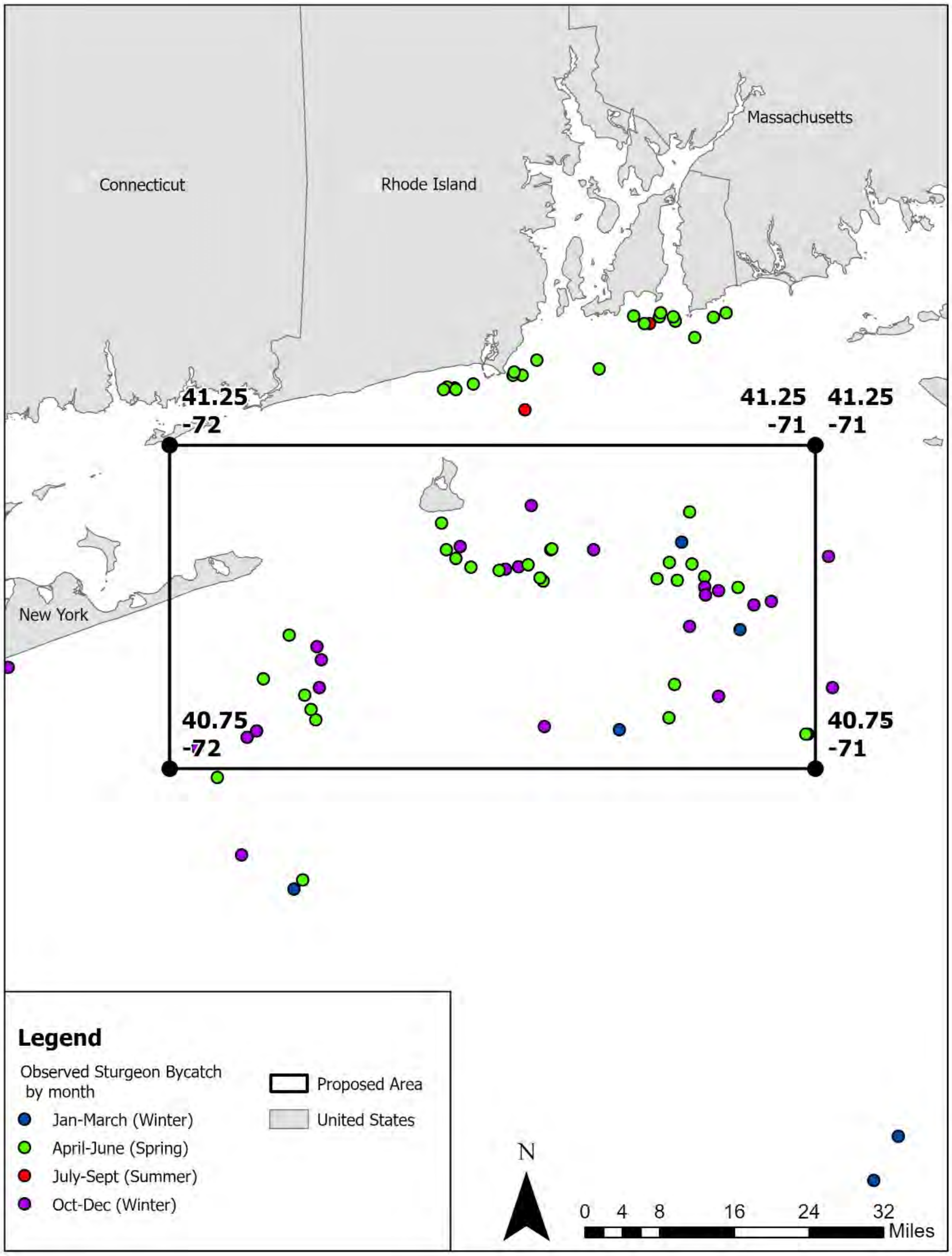
Figure 1. Area of Focus for the Gulf of Maine



Southern New England/Rhode Island/Cox's Ledge

Available observer data shows scattered interactions between Atlantic sturgeon and the gillnet fishery southwest of Martha's Vineyard, with no discernible seasonal pattern, except for interactions which occur within state waters directly off of the coast of Rhode Island, which all occurred in the month of May.

Figure 2. Area of Focus for Southern New England/Rhode Island/Cox's Ledge

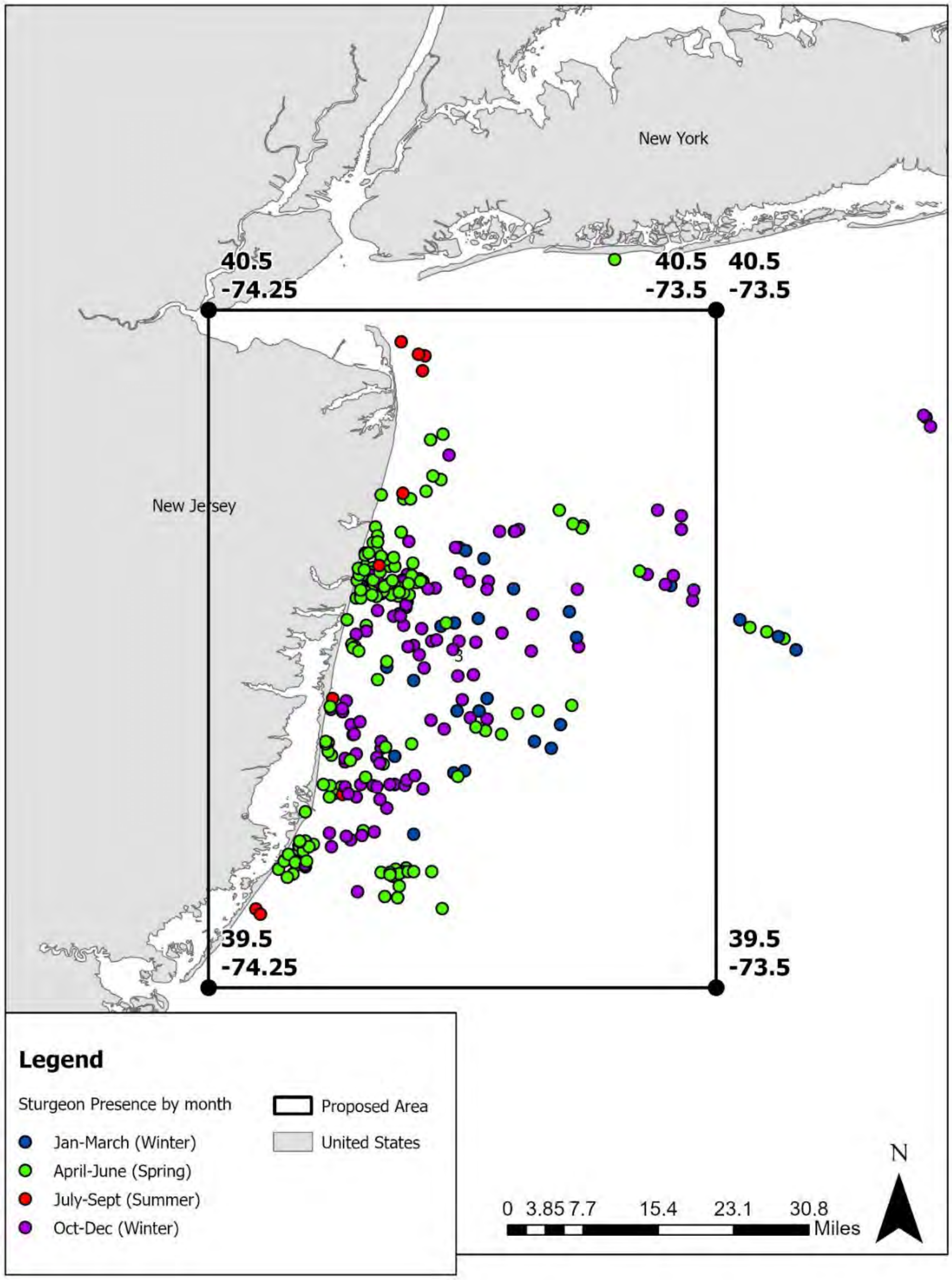


New Jersey Bight

When mapped, NEFOP data indicates that interaction with Atlantic sturgeon by gillnet gear in the last 10 years is concentrated off of the coast of New Jersey in two groups split temporally. The first is a spring concentration largely within and close to state waters in the months of April, May, and June, which coincides with coastal migratory patterns. The second grouping is less concentrated and occurs farther offshore in the New Jersey Bight during the late fall and early winter months of November and December.

This area also includes a small (85.47 km^2) area just off of Sandy Hook, which was recommended, among others, by Dunton et al. (2010) to protect habitat and juvenile sturgeon from fishing mortality. Additionally, Erickson et al. (2011) tagged 15 Atlantic sturgeon in the Hudson River, of which 13 remained in, and traveled throughout the Mid-Atlantic Bight. Erickson et al. also conducted a Kernal density analysis to identify oceanic aggregation areas and migratory corridors for adult Atlantic sturgeon tagged in the Hudson River. The areas of greatest aggregation identified by this analysis actually occurred on the northern side of Hudson Bay, the southern end of New Jersey, and southeast of the mouth of Chesapeake Bay. This information suggests that the area included in this recommendation likely acts as a migratory corridor for the aggregation areas to the south.

Figure 3. Area of Focus for New Jersey Bight

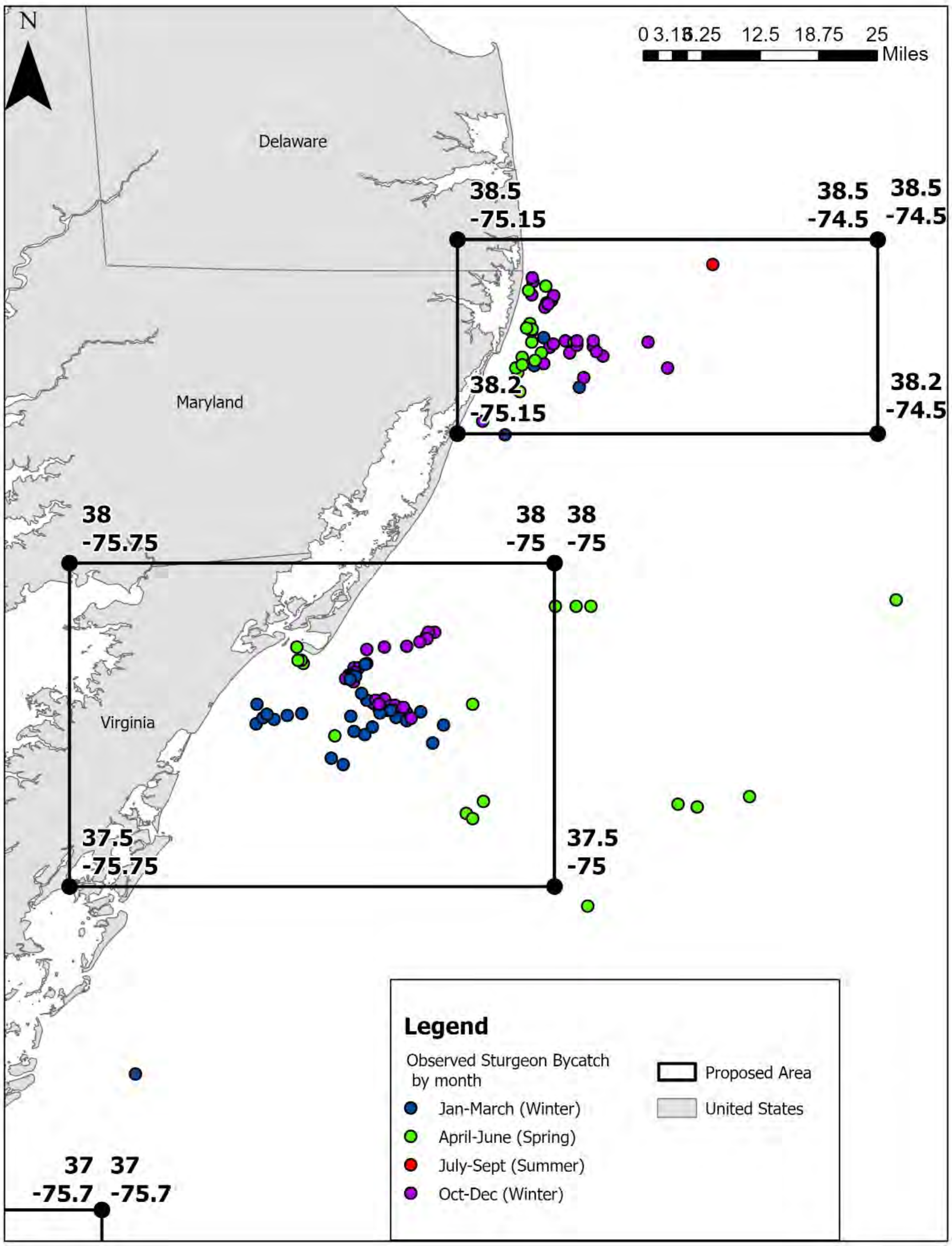


Maryland and Virginia Areas

Observer data indicates three general areas of interaction between Atlantic sturgeon and gillnet gear in the Mid-Atlantic Bight off Maryland and Virginia. The northernmost area, off of Ocean City, MD, is split seasonally and spatially, with some interactions within state waters during of April and May and an area of interactions in farther offshore in federal waters primarily in December and January.

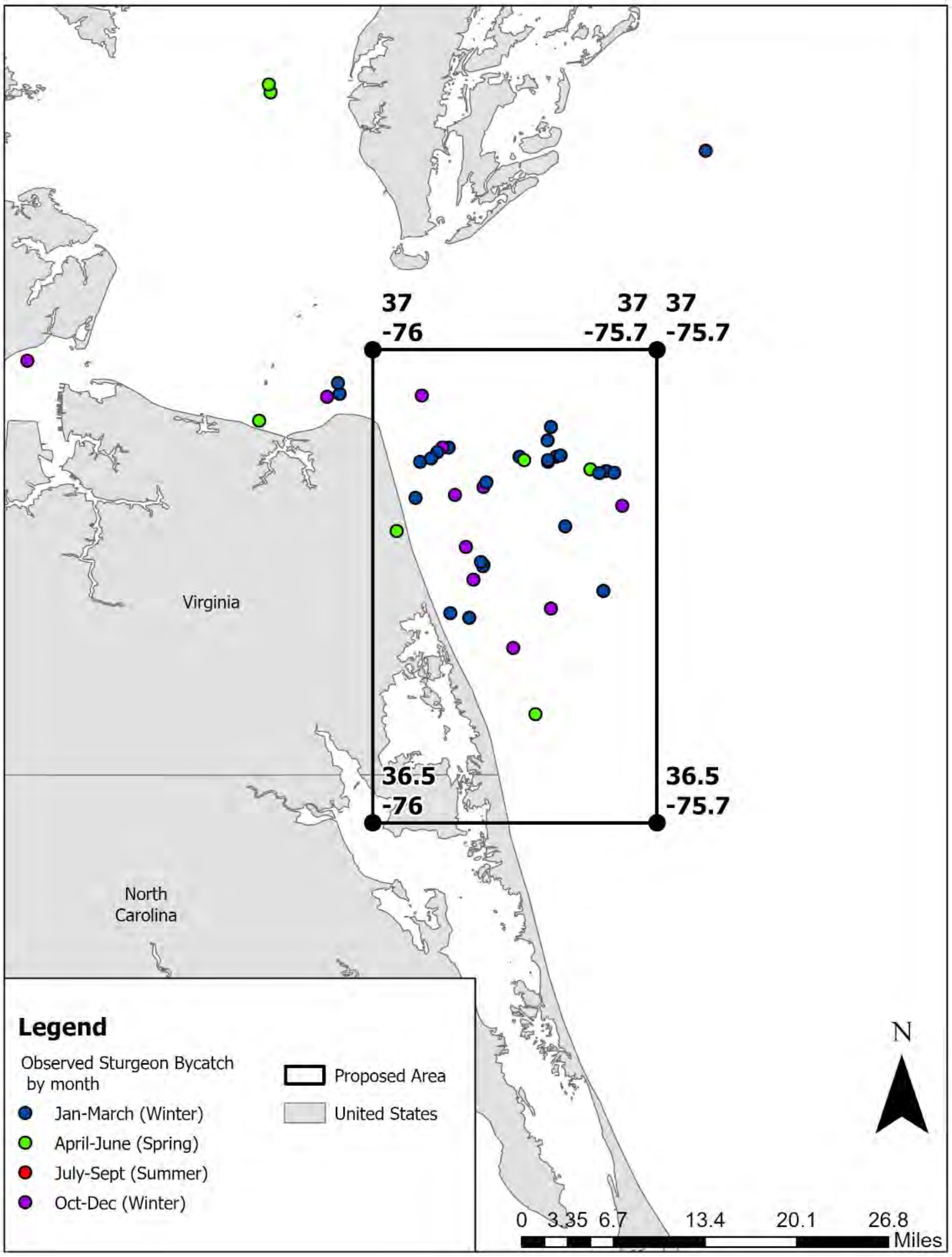
Farther south, there is a concentration of interactions east and southeast of Chincoteague, VA. The seasonal patterns in this area are less clear than those in the northernmost hotspot in this area. Though bycatch occurs most frequently in the months of April, May, January, and December, instances of observed bycatch of Atlantic sturgeon are spatially dispersed.

Figure 4. Areas of Focus for Maryland and Virginia



Finally, the area in and just south of the mouth of Chesapeake Bay, interactions between Atlantic sturgeon and gillnet gear are heavily concentrated along the boundary between state and federal waters, with no seasonal patterns evident.

Figure 5 Area of Focus South of Chesapeake Bay



Evidence from both Breece et al. (2016) and Erickson et al. (2011) support measures from the mouth of Delaware Bay to Chesapeake Bay. From Breece et al. 2016, the seascape feature in which Atlantic sturgeon most commonly associated was most prevalent along the coast of Delaware, Maryland, and Virginia in the months of April and May from 2009 - 2012. The kernel analysis from Erickson et al. (2011) resulted in a heavy concentration of Atlantic sturgeon just outside the mouth of the Chesapeake and surrounding coastline. It should be noted that both of these sources may indicate that closures just off Cape May might be appropriate; observed interactions between the gillnet fishery and Atlantic sturgeon, however, were not prevalent in this area.

Post-Release Mortality and Assessment of Bycaught Sturgeon

In order to improve our understanding of post-release mortality of Atlantic sturgeon caught in gillnet gear, the Councils, Atlantic States Marine Fisheries Commission, and NMFS should explore ways to prioritize focused research.

There are two subordinate research topics that should be explored:

- Quantitative estimates of post-release mortality rates for sturgeon entangled in gillnet gear, and
- Injury assessment for sturgeon entangled in gillnet gear.

Available research by Fox et al. (2019) has shown that tagging and telemetry is a feasible approach to developing post-release mortality estimates for sturgeon. Traditional methods by which the Councils, ASMFC, and NMFS support research development, such as grant issuance, is a recommended approach to encouraging research into post-release mortality estimation.

For injury assessment, the ASBWG studied the workshop-style approach which was used to develop technical guidelines for assessing injury of sea turtles from 2003 to 2011 would be feasible for assessing post-release mortality of Atlantic sturgeon. NMFS conducted an initial assessment of the magnitude of injuries from sea turtle interactions with Atlantic sea scallop dredge gear via the issuance of a detailed questionnaire sent to various experts in sea turtle veterinary medicine and rehabilitation. The results of this assessment were used to generate working guidance for serious injury determinations for hard-shelled sea turtles taken in the scallop dredge fishery and further used to help determine during Section 7 consultations to differentiate between non-lethal and lethal interactions. These determinations were specific to the scallop dredge fishery; to extend injury assessment guidance to other relevant fisheries, NMFS in 2009 held a Sea Turtle injury workshop. This workshop gathered various experts in sea turtle veterinary medicine, health, assessment, anatomy, and/or rehabilitation to (1) discuss case studies of sea turtles caught in fishing gear with varying levels of injuries; (2) critique NMFS' working guidance and approach for evaluating post-release survival, and (3) comment on the level of information collected by observers. The results of this workshop were used to revise working guidance and produce a 2011 document titled *Technical Working Guidelines for Assessing Injuries of Sea Turtles Observed in Northeast Fishing Gear* (Upite 2011). This work was extended and updated following a workshop held in 2015 to provide national consistency to assessment of post-interaction mortality of sea turtles captured in trawl, net, and pot/trap gear (Stacy et al. 2016).

The approach used in the sea turtle example cannot necessarily be used as a 1:1 template to develop a means to assess injury to Atlantic sturgeon entangled in gillnet gear. The network of experts in topics such as veterinary medicine and rescue/rehabilitation for sea turtles is fairly well developed. It is unlikely that such a network for Atlantic sturgeon exists to the same extent, which would make, for example, an initial assessment for Atlantic sturgeon similar to the one conducted for sea turtles in 2003 difficult, if not impossible.

As such, the timeline recommended by the ASBWG to improve understanding of post-release mortality of Atlantic sturgeon captured by gillnet gear places will occur in two phases and seek to achieve three objectives:

1. Develop protocols and criteria for the rapid visual assessment of live Atlantic sturgeon captured in gillnet gear and, based on the best available information, identify the risk (e.g., expressed as a percentage likelihood) of post-release mortality given the results of the visual assessments;
2. Facilitate the acquisition of new data suitable for scientific publication that quantifies the post-release mortality of Atlantic sturgeon captured in gillnet gear; and
3. Explore options for a citizen science program for gillnet fishermen to increase voluntary reporting of Atlantic sturgeon captures in gillnet gear and to increase data collection for long-term assessments of Atlantic sturgeon post-release mortality (e.g., training gillnet fishermen how to implant and/or check each captured sturgeon for a Passive Integrated Transponder (PIT) tag).

There is an immediate need for information on post-release mortality of Atlantic sturgeon in gillnet gear. However, acquiring new data will take some time. Objective 1 will provide information in the short-term and will be based on the currently available scientific information, the expertise and knowledge of sturgeon researchers, and the coordination of managers with other essential parties (e.g., the NEFSC, Northeast Fisheries Observer Program). Objective 2 will provide scientific data which, after being properly vetted and peer-reviewed, can be used to modify and improve upon the results of Objective 1 or to replace the product of Objective 1. Objective 3 would provide the necessary long-term data to better inform post-release mortality of Atlantic sturgeon captured in gillnet gear, including trends and any changes over time, and which cannot reasonably be replicated by any other method.

The ASWBG recommends NMFS lead the first phase to work with the Councils, the Atlantic States Marine Fisheries Commission, and others, as needed, to identify steps needed to acquire additional information to inform post-release mortality and to fulfill the above objectives. These steps should include:

- Outreach to develop a network of researchers and other subject matter experts regarding Atlantic sturgeon biology and related fields;
- Scoping within that network to identify research needs pertaining to injury assessment;
- Identification of funding sources which might provide opportunity for research, such as tagging and telemetry studies, regarding post-release mortality rates of Atlantic sturgeon; and
- Identification of necessary permitting.

Once steps have been identified, NMFS, the Councils, and the ASMFC should work collaboratively to carry them out to achieve the three objectives listed above. These steps could include a workshop, but other steps are likely required to achieve the three objectives. Once these steps are complete, NMFS should produce technical guidelines for NEFOP observers to make and record visual assessments of each Atlantic sturgeon captured in gillnet gear and released alive, and which will provide NMFS approach for assigning the likelihood of post-release mortality to each sturgeon based on the NEFOP observers visual assessment.

Timelines

Timeline for Action Plan and Development of Measures to Reduce Atlantic Sturgeon Bycatch in Gillnet Gear

May 26, 2022	Draft Action Plan is published online
June 7 – 9, 2022	Presentation at MAFMC Meeting
June 28 – 30, 2022	Presentation at NEFMC
August 1 – 4, 2022	Presentation at ASMFC Summer Meeting
September 2022	Finalized Action Plan is published online
September 27 – 29, 2022	NEFMC 2023 Priorities Setting Process Begins
October 4 – 6, 2022	Initial MAFMC Discussion of 2023 Implementation Plan
December 6 – 8, 2022	NEFMC 2023 Priorities Set
December 12 – 15, 2022	MAFMC 2023 Implementation Plan Finalized

If Councils develop action under MSA		**If NMFS develops action under ESA**	
January – April 2023	Council Action Development - Background Work	January – November 2023	NMFS Develops Proposed Rule
April – September 2023	Council Action Development and Final Action	November 2023	Proposed Rule Published; 30-day public comment period
December 2023	Council Submission of Action	January – May 2024	NMFS Develops Final Rule
January – February 2024	NMFS Review and Publication of Proposed Rule	May 2024	NMFS publishes Final Rule and Implementation
March – May 2024	NMFS publishes Final Rule and Implementation		

Actions to Address Post Release Mortality from Gillnet Gear

December 31, 2023	NMFS-led identification of the specific steps needed to acquire additional information to inform post-release mortality. Identify the steps and the participants needed to achieve each objective as well as the organization lead for each step (e.g., NMFS, NEFMC, MAFMC, ASMFC).
January 1, 2024 – December 31, 2025	Councils, ASMFC, and NMFS carry out steps to meet the three objectives using all opportunities within their authorities with regard to funding, permitting, and information gathering. NMFS will produce technical guidelines for NEFOP observers to make and record visual assessments of each Atlantic sturgeon captured in gillnet gear and released alive, and which will provide NMFS approach for assigning the likelihood of post-release mortality to each sturgeon based on the NEFOP observers' visual assessment. Other: NMFS will provide an update on the progress made for each objective to the public as appropriate via normally scheduled meetings of the Councils and the ASMFC and other available means.
December 31, 2026	Other steps deemed necessary to meet Objective 2 and Objective 3 are completed by this time even if the research conducted for Objective 2 to better inform post-release mortality is on-going and/or the final results have not yet been published.

Conclusion

In this Action Plan, the ASBWG presents a review of available information on Atlantic sturgeon bycatch in the federal large-mesh gillnet fisheries and several conclusions drawn from that review. Using these conclusions, we recommend consideration of the following measures which could be implemented in the Greater Atlantic Region to comply with the requirements of the Opinion. These include:

- Requirements for vessels fishing with gillnet to used low-profile gear shown to reduce catch of Atlantic sturgeon;
- Consideration of small time/area closures in areas where observer data has shown greater bycatch of Atlantic sturgeon; and
- Restrictions on soak time for gillnet gear.

In addition, the Action Plan identifies research needs and a process to develop technical guidelines for assessing post-release mortality of Atlantic sturgeon captured in gillnet gear.

NMFS and the ASBWG intends that this Action Plan provides the foundation for collaborative work between NMFS, the Councils, and the Commission to reduce the impact of gillnet fisheries on Atlantic sturgeon, an endangered species. The Action Plan does not prescribe the measures that must be used, but provides recommendations based on the information considered by the ASBWG on Atlantic sturgeon bycatch. The New England and/or Mid-Atlantic Fishery Management Councils can use the recommendations in this Action Plan as a base to begin further development and specification of measures which address Atlantic sturgeon bycatch by 2024 while accommodating the needs of the federal gillnet fisheries.

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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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 26, 2022
To: Council
From: Brandon Muffley, Council staff
Subject: Research Set-Aside Program Redevelopment – Background and Meeting Materials

On Wednesday, June 8, 2022, the Mid-Atlantic Fishery Management Council (Council) will consider the potential redevelopment of the Council's Research Set-Aside (RSA) program. The Council suspended the RSA program in 2014 due to a variety of concerns associated with the program that included administrative, enforcement and science issues. Initially included as part of the 2020 Implementation Plan, the Council supported the initiation of a workshop to review and consider the potential redevelopment of the RSA program. However, due to delays and planning considerations caused by the pandemic, the workshop was delayed until 2021. From July 2021 through February 2022, the Research Steering Committee (RSC) held a series of four exploration workshops[1] focusing on the key issues of RSA research, funding mechanisms, and enforcement, monitoring, and administration. In addition, the RSC held several meetings during this time to review the input from the workshops and develop a draft framework for a potentially revised RSA program that would seek to address the issues of the original RSA program. The workshops and RSC meetings were aided by input and guidance from the Scientific and Statistical Committee's (SSC) Economic Work Group who provided technical information and strategic advice regarding economic considerations and trade-offs associated with different components of a revised RSA program.

At the June meeting, staff will provide the Council with a presentation on a potential draft RSA framework, draft RSA program elements, and recommendations developed by the RSC for Council consideration. The SSC Economic Work Group will also present an overview of their final report regarding takeaways from their engagement in the process and economic considerations for a potential revised RSA program. The Council will then decide whether or not to continue the process of redeveloping the RSA program and further refine the framework and recommendations identified by the RSC. While the decision in June regarding the RSA program will be made by the Council, state partner engagement and support will be critical for any further RSA considerations given their significant role in the dockside administration and implementation of any RSA program. In addition, if/when appropriate, any potential management action considered by the Council through an omnibus framework or amendment

[1] For more information about the RSA workshops including the final reports and workshop materials, please visit: https://www.mafmc.org/workshop/rsa.

would need to be developed cooperatively with the Atlantic States Marine Fisheries Commission for jointly managed species to ensure a consistent and compatible RSA program across fishery management plans.

Materials listed below are provided for Council consideration of this agenda item. Council members may also want to review the Workshop #4 summary report (Workshop #4 Summary) for additional background information on the RSA program alternatives identified in the decision tree tables that the RSC and workshop participants considered for further evaluation.

Materials behind the tab:

- April 27, 2022 Research Steering Committee meeting summary
- Comparisons between old and a potentially revised RSA program
- SSC Economic Work Group RSA final report and appendices

The following supplemental document is available online:

- Staff Memo: "RSA Program Issues" dated July 30, 2014

Research Steering Committee

April 27, 2022
Webinar Meeting Summary

The Mid-Atlantic Fishery Management Council's (Council) Research Steering Committee (RSC) met on Wednesday, April 27, 2022 from 8:45 a.m. to 3:45 p.m. The purpose of the meeting was to review all the input received from the four previous Research Set-Aside (RSA) exploration workshops and make recommendations regarding the potential redevelopment of the Council's RSA program. The Committee's recommendations will then be considered by the Council during their June 2022 meeting.

Research Steering Committee Attendees: M. Duval (Committee Chair), A. Nowalsky (Committee Vice-Chair), C. Batsavage, P. Risi, K. Wilke, P. Geer, B. Beal, M. Pentony

Other Attendees: A. Loftus, L. Anderson, M. Holliday, Y. Jiao, J. Holzer, G. DePiper, B. Muffley, P. Rago, E. Hasbrouck, J. Cimino, M. Davidson, S. Lenox, T. Smith, L. Deighan, D. McKiernan, K. Almeida, J. McNamee, E. Powell, J. Cassin, S. Sakowski, S. Pearson

Dr. Michelle Duval, RSC chair, started with a review of the agenda and planned approach and scope for the meeting. It was noted that much of the agenda is structured to provide open discussion and feedback on all topics by the RSC, invited state/ASMFC partners, and the Scientific and Statistical Committee (SSC) Economic Work Group, but that final recommendations and decisions will ultimately need to be made by the RSC.

Prior to working through the agenda items, the RSC identified any outstanding issues that needed additional clarity or discussion during the meeting in order to make a recommendation by the end of the meeting regarding redevelopment of the RSA program. In general, recognizing more details and decisions will need to be made in the future, RSC members felt the prior meetings and workshops had covered the issues and potential solutions well and they had the information they needed. Two areas for additional discussion raised by the RSC were for-hire participation, monitoring, and accountability and the need for the RSC to make some progress making recommendations regarding the research components of a revised RSA program.

<u>Draft RSA Goals and Objectives:</u>
The draft goals and objectives help identify priority considerations and outline how a program might be structured to achieve the desired outcomes for the program. Staff gave a quick overview of the extensive process already undertaken by the RSC to develop, refine, and prioritize the draft goals and objectives being considered. The draft goals and objectives reviewed by the RSC included the recommendations made during the fourth RSA workshop which consisted of some language modifications to the goals and priority reordering of many objectives.

The RSC did not make any changes to the language or prioritization and recommended the draft goals and objectives as presented be considered by the Council. The recommended RSA program goals and objectives are as follows:

Goal 1: Produce quality, appropriately peer-reviewed research that maximizes benefits to the Council, management partners, and the public and enhances the Council's understanding of its managed resources (Research)

Objectives:

1. Support more applied management-focused research activities
2. Higher priority on proposed RSA projects whose results would likely have timely application to species management
3. Discourage commitments to longer-term monitoring projects
4. Ensure all data collected (funding and research) through the RSA program is open access

Goal 2: Ensure effective monitoring, accountability, and enforcement of RSA quota (Enforcement and Administration)

Objectives:

1. Apply enhanced, adaptive, and consistent enforcement standards and controls
2. Ensure compliance with the reporting and use of the RSA quota
3. Increase state-federal science, enforcement, and administration collaboration and cooperation
4. Minimize law enforcement and administrative (agency and researcher) burdens
5. Provide support for administrative and law enforcement activities
6. Improve states' ability to revoke RSA fishing privileges

Goal 3: Generate resources to fund research projects that align with the priorities of the Council (Funding)

Objectives:

1. Maximize revenues from RSA quota
2. Provide equitable opportunity to fund research across all Council-managed species
3. Increase scientific and industry partnerships
4. Evaluate fairness in fishing community access to RSA quota

Goal 4: Foster collaboration and trust between scientific and fishing communities and the general public

Objectives:

1. Ensure an open, accountable, and transparent process through all steps (funding and research) of the RSA program
2. Ensure all data collected (funding and research) through the RSA program is open access
3. Increase scientific and industry partnerships
4. Evaluate fairness in fishing community access to RSA quota

Review of the Program Elements in Comparison Tables:
The RSC then reviewed all of the RSA program elements considered in the comparison tables[1] which outlines the differences/similarities between the old and potential new RSA program given draft RSC decisions made to date and identifies how a revised program may address prior concerns relative to administration/enforcement, funding, and research.

The discussion included below only focuses on those topics in which there was extensive discussion, and the RSC made a new and/or different recommendation regarding a revised program element. Those topics in which the RSC continued to support their prior decisions are not covered and can be found in the comparison tables and previous RSC meeting or workshop summaries[2].

Administration and Enforcement

Call-in/notification/reporting requirements

- **Pre-landing notification** – the RSC continues to support a pre-landing call-in notification and is a critical need for law enforcement; however, the RSC decided not to specify an associated call-in time requirement at this time. Given the diversity of Mid-Atlantic fisheries and associated activities (e.g., gear types, vessels, state regulation differences), a universal call-in time may not be practical and a range (1-6 hours for ex.) may be more appropriate. The RSC noted that whatever the time requirement is, we need to ensure the state and federal requirements/timeframe are not in conflict and help to minimize the burden on states, GARFO, and fishermen to call in.

Shore-side monitoring of RSA quota

- **Electronic monitoring of participating vessels** – having participating vessels be equipped with AIS or VMS could be an important tool to help enforcement monitor RSA trips and activities. However, the RSC noted that most vessels in the Mid-Atlantic do not have VMS requirements and this requirement would impact both state and federally permitted vessels that may participate in the program. Additional conversations with law enforcement about the details and utility of the different electronic monitoring options will be needed should the RSA program continue to be redeveloped.

Number of vessels participating

- **Phase-in of participants** – the RSC continues to support allowing states to consider the potential to phase-in different participants into the program given their own unique circumstances. These phase-in options could apply to the sectors (commercial, for-hire) and vessel permit type (state, federal) and combination of both.

[1] The old versus revised draft RSA program comparison tables can be found in the June 2022 Council meeting briefing book at: https://www.mafmc.org/council-events/2022/june-2022-council-meeting.
[2] The January 18, 2022 Research Steering Committee meeting summary can be found at: https://www.mafmc.org/s/Tab05_Committee-Reports_2022-02.pdf. The February 16, 2022, RSA workshop #4 summary can be found at: https://www.mafmc.org/s/RSA-workshop-4-summary-recommendations-report.pdf.

- **Number of quota transfers** – the RSC supports limiting the number of RSA related quota transfers between vessels associated with both an RSA auction and bilateral agreements between the P.I. and collaborating vessels under limited circumstances (e.g., sale or damage to vessel). These quota transfers between vessels can make it difficult for enforcement to know what can/should be landed by a vessel operating under the RSA program. These transfers also increase the administrative burden to track which vessels are in/out of the program and state and federal exemption permits need to be modified each time. These vessel transfers (the amount of quota transferred) are not tracked by GARFO but transfers associated with the auction were tracked by the third-party and some states and the P.I. tracked transfers associated with bilateral agreements. Some allowance for quota transfers is needed, particularly under bilateral agreements, so that P.I.'s are not negatively impacted.

<u>For-hire reporting and verification</u>

- **Electronic reporting** – the RSC recommended standardized reporting and data collection elements for all for-hire RSA trips and harvest. In addition, the RSC supported the work necessary to implement/modify eVTR software programs to flag an RSA trip with the associated required data fields (the ACCSP eTRIPs software already has coding to flag an RSA trip). This would also apply to electronic dealer reporting, such as the ACCSP SAFIS software, to ensure there is consistency between the electronic two-ticket system of vessel and dealer. It was also noted that electronic reporting was not widely available and not mandatory during the old program, so opportunities should be utilized to take advantage of the eVTR software capabilities to fit the needs of a redeveloped RSA program.

<u>Administrative burden and costs relative to benefit</u>

- **Support to states (enforcement and monitoring)** – the group spent a lot of time discussing different ways support could be provided to the states, including funding opportunities. All agreed addressing this issue will be critical in order for a revised program to be successful. State representatives indicated that a number of the recommendations made by the RSC will have a significant impact on the enforcement and monitoring burden. Recommendations such as no mixing of trips, limits to the number of vessels, landing locations, call-in requirement etc. should all reduce the administrative burden.

  The RSC also discussed options and/or opportunities to provide funding directly to the states to help cover some administrative costs. Areas to consider or investigate further include:
  - Redirect federal funding line items to support RSA
  - Potential to increase funding under the Joint Enforcement Agreement (JEA)
  - Potential for the ASMFC to serve as the third party for auctions
  - Require a percentage of revenue generated through the program be dedicated to state administration
    - NOAA General Counsel has provided some initial feedback regarding this option
  - The use of contracts versus grants

It was noted, however, that it's unclear what the administrative costs might be to support the RSA program and how those costs compare to the total funds raised by the program.

The RSC supported those program elements that help alleviate the administrative burden outside of actual funding opportunities, including the development of best practices and standards across states. The RSC also recommended the need to continue to pursue avenues, including discussions with NOAA General Counsel, to find or dedicate funds to provide to states. In addition, the RSC supported collecting additional information and conducting a cost analysis to see what the overall administrative costs (enforcement, monitoring, auction) compared to the funds raised and costs of the research to understand the needs and potential availability of resources. This information could also support a broader, more comprehensive costs-benefit analysis of the program.

Funding

Portion of ABC set-aside

- **Set-aside amounts** – a fixed percentage of the ABC would be set-aside and could be different for each fishery. The RSC recommended this fixed percentage would serve as a set-aside cap where the Council could choose something up to the cap and allocate less than the cap in any given year to ensure the amount set-aside aligns with need.

RSA quota allocation

- **Separate allocation by sector** – of the fixed percentage of the RSA set-aside, the RSC continues to support the Council's ability to separate the RSA set-aside by sector. The decision to sperate the set-aside by sector could consider the type of project seeking funding. For example, if the project results and information will benefit the management of both sectors, the RSA set-aside would not need to be allocated by sector. The ability to allocate the set-aside by sector also allows for flexibility as to where in the process (e.g., ABC, sector ACL, quota or RHL) the allocation occurs. It was noted by the SSC Economic Work Group that running separate auctions by sector may lose some of the competitive advantages and understanding the value of each sector compared to a single auction approach.

Third-party auction process

- **Best practices** – while the Council and NMFS do not have the authority to run an auction, the RSC recommended developing best practices and guidelines that a third-party should consider implementing or possibly lose the ability to serve as a third-party in future auctions. It was noted that vessels participating in any auction process should know their respective state requirements (e.g., permits, regulations, reporting) to participate in the RSA program and would need to sign-off that they agree to comply. The RSC also recommends continued dialogue with NOAA General Counsel to get clarity as to what is feasible or not with an auction process.

Research

Lack of project proposals/P.I. disinterest

- **Long-term/monitoring projects** – the RSC recommended that funds generated through the RSA program could support some long-term/monitoring type projects (e.g., pilot or proof of concept) but would not support these or other types of projects long-term and no more than 1-2 years. This is consistent with objective #3 under Goal 1to discourage commitments to longer-term monitoring projects. The RSC noted the value in potentially supporting these types of projects to help get research started and gives the Council flexibility on the range and scope of projects to consider funding.

<u>Conflict of interest (COI)</u>

- COI determination will primarily be dictated by Department of Commerce federal grant regulations; however, the RSC also recommended developing internal Council COI guidelines related to the RSA program. For example, outlining potential COI for Council members that might be involved in the management review of project proposals. Identifying and making publicly available clear and consistent COI guidelines will set expectations and help build public trust in the RSA process.

<u>Quality research/peer review</u>

- While it is anticipated that a number of details and decisions regarding the proposal, research, and review process would need to be made at a later date should the RSA program be redeveloped, the RSC did provide a number of recommendations that should be considered and included in these processes. These recommendations include: pre and full proposal submission, a critical post-research review, consideration of prior Principal Investigator research outcomes, a greater use of the SSC and broader expert pool in the review process, and outreach/communication requirements for results dissemination.

<u>Data availability/open access</u>

- Ensuring all data collected as part of the RSA program (funding and research) is made open access and available to interested parties is an RSA program objective associated with both Goal 1 (Research) and Goal 4 (Collaboration and Trust) recommended by the RSC. Some data collected through the RSA program will be confidential and would be protected by any applicable confidentiality laws. The RSC recommended all data, to the extent practicable, is made publicly available and if confidential data is collected it should be compiled in such a way that results can still be presented publicly. In addition, the RSC recommends all RSA project proposals include a data sharing plan that will be a metric used as part of proposal review score/ranking.

<u>Use in science and management</u>

- The RSC made a number of recommendations in an effort to improve the overall utility and direct application of research results into the science and management decision making process, the primary goal of the RSA program. For example, the RSC recommended the SSC, species-specific APs, and the RSC all contribute to the research priority setting process. In addition, project proposals would need to identify how the research outcomes would address a timely management issue and reduce scientific or management uncertainty. Lastly, the RSC recommended greater emphasis on a communication and outreach plan to disseminate research results and potentially setting aside time at a Council meeting for P.I's to present their findings.

Process for ASMFC/State Engagement:

Close and continued engagement and cooperation between the Council, ASMFC, and state partners will be a critical requirement to be successful should the Council move forward with redeveloping the RSA program. States have a significant role in the shore-side monitoring and administration of the RSA program and a number of RSC recommendations for a potential new program defer specific decisions on some program elements to the states to help implement a program that is most effective and to the unique needs of each state. In addition, given the joint management responsibilities with the ASMFC for several species, there may be a need for joint action with the ASMFC to implement a revised program. Seeking input and working with the ASMFC's Law Enforcement Committee will also be important to help develop best practices and guidelines for participating states to follow.

The ASMFC's Policy Board will receive an update on the Council's progress and timeline regarding the RSA program to get some initial feedback on the level of engagement at this point. Depending on the Council's decision in June, a potential plan on how to move forward can be developed and an initial conversation could potentially be held at the August meeting.

RSC Recommendations Regarding RSA Program Redevelopment:

After considering the discussion and feedback during the course of the day, and all of the input over the last year through the workshops and Committee meetings, the RSC focused their discussion regarding a recommendation to redevelop the RSA program on the following two questions:

1. Given the general vision identified by the Committee, is there a viable path forward to redevelop the RSA program to appropriately address concerns of the prior program?
2. What would be the value of moving forward with a redeveloped RSA program vs. maintaining status quo?

After extensive discussion, there was **consensus by the RSC to conditionally recommended the Council consider redeveloping the RSA program**. Given the decisions made to date and all of the program components the RSC has considered and identified potential solutions and avenues to explore, the RSC felt there was a viable path forward to continue work on redeveloping the RSA program. The RSC felt there is value in the program and the opportunity to raise funds to produce quality research to benefit the science and management process is worth pursuing. However, the RSC recognized there is a lot of work remaining, details to be addressed, and additional questions still to be answered. Specifically, the RSC expressed concerns about addressing the state law enforcement and administrative burden and the overall cost-benefit of the program. Should those details or answers insufficiently address the issues raised, the Council is not committed to continued redevelopment or implementation of the program.

Potential Redevelopment of the Mid-Atlantic Council's Research Set-Aside (RSA) Program

Comparisons between previous and revised draft RSA programs

May 2022

The revised draft RSA program goals, objectives, and program elements provided here reflect the final decisions made by the Mid-Atlantic Council's Research Steering Committee at their April 27, 2022 meeting[1].

Goals and Objectives

Previous RSA program:

As specified in Framework Adjustment 1 in 2002

Goal: The purpose of the RSA program is to support research and the collection of additional data that would otherwise be unavailable. The Mid-Atlantic Council wishes to encourage collaborative efforts between the public, research institutions, and government in broadening the scientific base upon which management decisions are made. Reserving a small portion of the annual harvest of a species to subsidize the research costs of vessel operations and scientific expertise is considered an important investment in the future of the nation's fisheries.

Objectives:

1. Facilitate the collection of data that the Council and public deem important for fishery management purposes.
2. Create a mechanism whereby the data collected can be reviewed and certified acceptable for use by NMFS scientists and those individuals involved in the fishery management process.

In 2011, the Council considered a revised RSA program goal and identified five core principles (https://www.mafmc.org/s/2011a_2011-02_RSA-Committee.pdf, see page 2). Not clear if ever approved and implemented.

Revised draft RSA program:

[1] The April 27, 2022 Research Steering Committee meeting summary can be found on the June 2022 Council meeting webpage at: https://www.mafmc.org/council-events/2022/june-2022-council-meeting.

The goals and the associated objectives are in priority order.

<u>Goal 1:</u> Produce quality, appropriately peer-reviewed research that maximizes benefits to the Council, management partners, and the public and enhances the Council's understanding of its managed resources (Research)

<u>Objectives:</u>

1. Support more applied management-focused research activities.
2. Higher priority on proposed RSA projects whose results would likely have timely application to species management.
3. Discourage commitments to longer-term monitoring projects.
4. Ensure all data collected (funding and research) through the RSA program is open access.

<u>Goal 2:</u> Ensure effective monitoring, accountability, and enforcement of RSA quota (Enforcement and Administration)

<u>Objectives:</u>

1. Apply enhanced, adaptive, and consistent enforcement standards and controls.
2. Ensure compliance with the reporting and use of the RSA quota.
3. Increase state-federal science, enforcement, and administration collaboration and cooperation.
4. Minimize law enforcement and administrative (agency and researcher) burdens.
5. Provide support for administrative and law enforcement activities.
6. Improve states' ability to revoke RSA fishing privileges.

<u>Goal 3:</u> Generate resources to fund research projects that align with the priorities of the Council (Funding)

<u>Objectives:</u>

1. Maximize revenues from RSA quota.
2. Provide equitable opportunity to fund research across all Council-managed species.
3. Increase scientific and industry partnerships.
4. Evaluate fairness in fishing community access to RSA quota.

<u>Goal 4:</u> Foster collaboration and trust between scientific and fishing communities and the general public

<u>Objectives:</u>

1. Ensure an open, accountable, and transparent process through all steps (funding and research) of the RSA program.
2. Ensure all data collected (funding and research) through the RSA program is open access.
3. Increase scientific and industry partnerships.
4. Evaluate fairness in fishing community access to RSA quota.

Program Elements

Green italicized text indicates RSC has considered but not made a recommendation; *Purple italicized text* indicates Committee recommendations for state(s) consideration.

Program element/Area of concern	Old program	Revised draft program
Administration and enforcement		
Call-in/notification/reporting requirements	• Pre-trip notification to IVR system (implemented in 2014) • 6-hour, if less – immediately upon leaving fishing grounds, pre-landing notification with pounds harvested, VTR serial number and port of landing (implemented in 2014) • Was to be "real time" notification to law enforcement of all planned RSA activities (unclear if happened) • Federal vessels landings through IVR, paper VTR, and dealer reports • Encouraged state vessels to submit electronically to ACCSP	• Require a 24-hour pre-trip notification to declare what species, port of landing and anticipated time of landing • Implement standardized reporting for all participating vessels with use of an electronic platform (e.g., VMS, eVTR, eTRIPs for state vessels) • Require a pre-landing requirement that is consistent between federal/state requirements and provide RSA harvest and completed eVTR prior to entering port (timing of notification TBD) • Federal vessels landings through pre-landing notification (if recommended), electronic trip submission, dealer report
Shore-side monitoring of RSA quota	• Enforcement checks but dispersed and diffuse given nature of fishery and landing locations • EFP/state exemption permits to allow vessels harvesting RSA quota to land above trip/possession limits and/or during closed seasons	• Require RSA harvest of specific species to occur on separate trips from non-RSA harvest of that same species (i.e., no mixed trips for specific species, all landings for species applied as RSA). Applies to both commercial and for-hire RSA trips. • Require all RSA quota to be offloaded at same port as specified in pre-trip notification • Require all vessels to be equipped with AIS or VMS • *Recommend states consider limiting offloads to specific hours* • EFP/state exemption permits to allow for vessels harvesting RSA quota to land above trip/possession limit and/or closed season
Number of landing locations	• No limits on locations/ports or dealers to offload RSA harvest	• *Recommend states decide if there would be limits on locations/ports or dealers to offload RSA harvest*
Number of vessels participating	• NMFS cap of 50 participating vessels per project	• *Recommend states decide if there would be vessel participation caps (total/by sector) beyond NMFS project cap*

	• Both commercial and for-hire vessel participation • Participation of both federal and state permitted vessels	• Both commercial and for-hire vessel participation (no private recreational) (*Committee also supports states considering a possible phase-in of sector participation*) • Participation of both federal and state permitted vessels (*Committee also supports states considering a possible phase-in of state vessel participation*) • Limit the number of RSA quota transfers between vessels – both within the auction process and with bilateral agreements – to specific conditions (e.g., sale or damage to vessel)
Verification of for-hire harvest	• Reporting and monitoring differed by state but no verification	• Standardized reporting for all for-hire harvest with work to implement/modify eVTRs to flag as an RSA trip with associated required fields (ACCSP eTrips already has coding) • Committee has also discussed different for-hire reporting requirements (e.g., dated receipts for each passenger)
Administrative burden and costs relative to benefit	• Funds raised through auction used to support a full-time technician to work at NYDEC office	• Allow states to opt-in/out of shore-side participation in RSA program (e.g., providing state exempted permits) • Options under other categories – limit offload hours, vessel limits, no mixing of trips etc. would all help minimize burden • *Committee has discussed other options to minimize costs and how to provide admin/law support (e.g., the potential to use RSA funds to support activities, develop consistent guidance across states etc.) but need to continue to pursue options and avenues to find or dedicate funds to provide to states.*

Program element/Area of concern	**Old program**	**Revised draft program**
Funding		
Species/FMP potential RSA allocation was available	• All Council species/FMPs except for Surfclam and Ocean Quahog (only ITQ fisheries at the time)	• All Council species/FMPs

Portion of Acceptable Biological Catch (ABC) set aside	• 0% - 3% of total allowable landings (TAL) portion of the ABC • % set aside in any given year then converted into pounds • Any unused quota is returned back to the overall fishery for available to harvest by the sectors	• Fixed percentage of ABC for each fishery (i.e., different percentages for each fishery). The percentage would serve as a cap and set-aside could be lower if needs are less.
Funding mechanisms	• Compensation fishing (bilateral agreements between grant recipients/PI and vessels to share proceeds from harvesting RSA) or through third party auctions to bid off quota lots by species	• Ability to use both bilateral agreements and third-party auctions • Additional dialogue with NOAA G.C. to get clarity as to what is feasible or not (e.g., ability for ASMFC to administer auction)
RSA quota allocation	• RSA quota available for use was not allocated by sector	• Of the fixed percentage of RSA quota allocated, separate allocation of quota across sectors (e.g., x% of RSA quota allocated to commercial and x% to for-hire)
Lack of trust in third-party quota process	• Requirement to join and pay fee ($2,000-$250 per vessel) to third-party in order to participate in auction • Overhead fee to run and administer auction • Some data elements collected through auction not available for scientific use • Periodic program reviews conducted	• Conduct periodic review of funding mechanism(s) to determine approach supports or undermines project or program objectives • The Council and NMFS do not have the authority to run an auction. The Committee supports developing guidelines/best practices to be followed by any third-party conducting an auction
Less compensation fishing through greater use of the auction lead to greater disconnect and less collaboration between researcher and industry	• Use of a third-party auction became primary way to fund research and generated most revenue	• Where feasible, compensation harvest is coupled with research activity • Use of compensation fishing and third-party auction can be used to generate funds

Program element/Area of concern	**Old program**	**Revised draft program**
Research		
Lack of project proposals/Principal Investigator (P.I.) disinterest	• Supported long-term projects (and costly compared to funds raised), limited the number of funded projects	• Limited support for long-term/monitoring projects (e.g., proof of concept) with funding provided for only 1-2 years.
Perceived conflicts of interest (COI)	• Individuals participating in priority setting process could also apply/receive RSA funds • Management review process • Inequities and access to RSA auction	• Develop internal COI policies for entities engaged in RSA prioritization process • Increase awareness and publication of Dept. of Commerce COI policies

	• COI dictated by federal grant regulation	
Quality research/peer review	• Technical review on specific criteria by three subject matter experts, did include SSC members by end of old program • Management review by RSC and recommendations to NMFS who has final decision • PI submit interim and final reports – some review by SSC	• Additional decisions and factors will be needed in the future, but the Committee recommends considering: - Pre and full proposals - Comprehensive post-project review to determine value and utility - Outreach and dissemination of results - Greater use of SSC and broader pool of experts for review - Past performance of P.I.
Funding for species research	• Research to target species set aside, up to 25% of funds could be used for other species	• Allow specific percentage of projected revenue from species quota sale to be used for research on any other managed species (e.g., MAFMC, NEFMC, ASMFC)
Data availability/open access	• Dictated by federal grant regulation – data sharing, COI, and review	• Subject to applicable confidentiality laws, all data collected (funding and research) through the RSA program is open access, made readily available and results able to be presented • Inclusion of a data sharing plan in proposal and conflict of interest statement
Projects not used in science and management	• SSC identifies research needs through 5-yr research priorities document • RSC set top 10 research and management priorities • Solicitation to address these priorities	• Changes to research priority development process to allow for greater SSC, AP, and RSC input • Proposal requirements that would need to include: addressing timely management issue, reducing scientific and/or management uncertainty, include a data sharing plan etc. • Council outreach/communication with public regarding project results and utility (e.g., dedicated time at a Council meeting)

Potential Redevelopment of the Research Set Aside Program Final Report to the MAFMC

SSC Economic Working Group

May 26, 2022

Background

In December of 2020 the Mid-Atlantic Fishery Management Council (Council) agreed to conduct a collaborative case study led by an Economic Working Group created under its Scientific and Statistical Committee (SSC). The subject, jointly agreed upon after prior consultation, was an economic evaluation of the policy deliberation already underway by the Council's Research Steering Committee (Committee) to consider whether to recommend the Council renew a Research Set Aside (RSA) program. This is the final report of that Economic Working Group on the RSA case study.

The RSA program has been suspended in the Mid-Atlantic region since 2014 due to the purposeful misreporting and overutilization of quota by a number of fishermen engaged in the program.[1] The Council is considering redevelopment of the RSA program, due to the potential to fund priority research on species managed by the Council. There are many economic considerations that would underpin a successful RSA redevelopment and the case study was intended to highlight them for the Council.

Methods

The RSA redevelopment case study was a highly collaborative endeavor between the Economic Work Group, Council staff, and Council Members. In particular, the Economic Work Group focused on providing information, analyses, white papers and support for four stakeholder workshops organized by the Committee on the following topics: Research, Funding, Enforcement, and Final Recommendations. In addition to the four workshops, the Economic Work Group participated in three Research Steering Committee meetings to help inform economic considerations germane to their deliberations.

The initial Economic Working Group plan of providing scientific advice was predicated on the availability and access to economic data to conduct appropriate economic analyses of the prior RSA program and model possible future changes if a program were to be reestablished. Early on it became apparent that economic data that would be needed to assess the benefits and costs of the past program were not routinely collected by federal agencies. What data were collected were held and deemed proprietary by industry, and negotiations to make them

[1] http://www.mafmc.org/s/Tab-06_RSA.pdf

available to SSC economists for this case study were unsuccessful, beyond summary statistics. Thus, simulations and qualitative impacts have been substituted in lieu of empirical analyses from the prior RSA program. This missing data has a profound impact on the utility of the Economic Work Group's output for RSA redesign, and any future topic lacking such data will similarly be impacted. This represents a data gap we recommend the Council should give highest priority to closing.

For example, bids for federally managed public resources such as timber sales[2], oil gas and offshore wind leases[3] are part of the public record, which helps ensure transparency and informs management decision-making. Controls that balance data access for resource management needs with business protections work successfully in many other federally managed natural resources. Any data concerning sales of fishing quota should be viewed as in the public interest and is key to understanding program performance. Bidding data information has the potential to provide ancillary benefits such as understanding relative value across sectors and informing multispecies management, as outlined in the Workshop 2 (Funding) white paper presented in Appendix 1.2. The Economic Work Group suggests that this type of information should be routinely collected when possible, as a relatively direct way of building capacity towards true benefit cost analysis. Benefit-cost analysis is the standard by which the value of alternative policies should be assessed within the economics discipline, and is required by law for any federal rule making.[4]

Results

All the background material developed by the Economic Work Group for these workshops and Committee meetings can be found in the Appendix. In Section 302(g), the Magnuson Stevens Act describes the role of the Scientific and Statistical Committee to provide its Council ongoing scientific advice for fishery management decisions. This final report summarizes the RSA redevelopment case study within the following four subordinate SSC areas of engagement: I) Review; II) Scientific Specifications; III) Focused Analyses; and IV) Scientific Advice for Decision Making.

I. Review

Review is one of the SSC's primary functions as a scientific body, with a recent example being peer review of the Recreational Models in support of the Recreational Harvest Control Rule Framework/Addendum. Beyond peer review, the SSC engages in less formal review of processes and scientific products as a normal component of their meetings, such as the annual review of the State of the Ecosystem report. Although not focused on a specific scientific product, much of the work of the Economic Work Group can be viewed through this Review function. For example, the six one-page white papers developed in support of Workshop 1

[2] https://www.fs.usda.gov/resourcedetail/bdnf/landmanagement/resourcemanagement/?cid=FSEPRD977995)
[3] https://www.boem.gov/renewable-energy/state-activities/new-york-bight-results-round-round
[4] https://www.archives.gov/federal-register/executive-orders/pdf/12866.pdf

(Research), found in Appendix 1.1, present a critical review of the historic RSA program, with a focus on addressing perceived performance deficiencies through program design. Nine take away points were identified and are discussed in the section below.

1. **Peer review and PI communications: before, during, and after completion of RSA projects.**
2. **Approved statistical design integrity and risk/adaptability**

Contrary to popular belief, all but two of the 44 projects in the historic RSA programs have final reports that were accepted under peer review by NOAA Fisheries. However, a revised RSA program presents an opportunity to rethink how proposals are evaluated to ensure that they meet the standard of "best scientific information available". The following issues in particular should be addressed explicitly in any redesigned program:

A. What is the structure of the proposal selection process? Is there a pre-proposal stage? How is reviewing structured? What are the review criteria and are these criteria well-matched to reviewer expertise?
B. How are requests by Principal Investigators (PI) for changes to proposed research evaluated?
C. How are project outputs (e.g., final and perhaps interim reports) assessed for their scientific validity and use to guide management? Leave it to the journal peer-review process? Ask the SSC or a subgroup of SSC members to review results? Is there an iterative process of peer-review and response by the PI?

3. **Financial integrity: No conflicts of interest**

The historic RSA program undermined the public's perception of the science/management nexus, working directly against a major objective of the program itself. Full and transparent accountability should be viewed as a non-negotiable pillar of any RSA redesign to ensure the program leads to credible outcomes. Best practices would suggest extending the Conflict of Interest policy to all aspects of the RSA program, if redeveloped. This would include the preliminary ranking of RSA research priorities, engagement of the SSC as an additional pool of peer review expertise, sale of quota, and other decision points in which less than full transparency could reduce public trust in the RSA program. To a great extent, this extension merely entails codifying practices already used by the MAFMC and other bodies related to RSA administration.

However, it could be important to have a formal process by which the conflict of interests are publicly identified and addressed for transparency. The extent to which third parties such as clearing houses, auctioneers, or other entities facilitating the buying and selling of quota could be held to a conflict of interest policy depends on the exact manner in which that entity is engaged. Nevertheless, it would be important that any entity engaged in such a manner understand that public perception is a key metric by which the success of the RSA program will ultimately be judged, and that public conflict of interest policies, or lack thereof, could play a key role in public perception.

4. **Consistency with stated Council plans/objectives & linkages to management goals**

The Research Steering Committee already has stated certain kinds of research it wants the new RSA to focus on (e.g., more applied; management focused; short term outcomes). In addition, the Council has endorsed the content and process described in its new 5-year Research Plan in October 2020 relative to their seven strategic research themes, including species-specific priorities. The topic areas of assessment priorities have also been linked to the Research Track Assessments, so there is ample raw material to form a consensus of research criteria to sit alongside the stated management goals (State and federal) for each managed stock that ultimately the Council process would endorse for a new RSA program. These are all reasonable objectives. Whatever final process chosen needs to be open, transparent, inclusive, well documented, and managed for performance over time (via accountability/performance measures).

5. **Universal data access and transparency**

The previous RSA program was a federal financial grant assistance program. Since 2013, a data sharing and management plan is required for all the federal funded projects (OSTP 2013; OMB 2013; NOAA 2013, 2016; EPA 2016). Historically, data access was not a requirement of RSA-funded projects, and data stewardship plans were not weighed in the peer review and evaluation process.

Data sharing is clearly important for ensuring replicability of results, transparency and trust. It is also value-added to the economic investment made, as the data may be useful in research being conducted by other researchers for both Council and non-Council purposes.

6. **Application of Benefit/Cost principles in proposal evaluation**

Economists look to the value of a research project to point us in the right direction using benefit-cost analyses, and this is where the past RSA program critics conflated "quality" with "usefulness" of the science. Some of the RSA research may have been statistically well designed and analytically correct in their analysis but did not address a relevant scientific question to resolve an assessment dilemma or management impediment, i.e., it lacked value/benefit or relevance. The lesson learned is to ensure a strong linkage/collaboration/partnership between the RSA researcher and the intended consumer of the research results to make sure the research product will be relevant, useful and at a minimum considered in a direct scientific or management application. Future proposals lacking such linkages would be down-rated.

While making the linkages between conducting research and subsequent management consequences is always difficult, with limited research funds it is key to understanding where the Council should invest their RSA funds. The sort of performance metric that research proposals should be asked to submit are those related to their proposed impacts relative to reductions in model uncertainty, potential impacts on ABC, relaxation of gear and other fishing restrictions, etc. Tools and analyses, such as MSEs, that could be useful to measure such changes should be incorporated where feasible into the projects such that the Council can evaluate its investments adequately.

7. Social equity implications of RSA awards

There is a proposal on the record of the Research Steering Committee to have funds from a species auction only used for research on that species. This resolves the issue of one fishery subsidizing another. However, fisheries with low ex-vessel values that have critical research needs may never be able to generate sufficient funds to support an RSA on their own. Without further changes, RSA could only be supported in "wealthy" fisheries and "poorer" fisheries would have to find other sources of research funds. This could have a differential negative impact on fishing communities reliant on low margin bait and forage fisheries where research is already scant on these species, scientific uncertainty high, and management approach usually ultra conservative as a result. These smaller scale fisheries and their communities receive less political attention than major fishing ports.

In such a case the Council may need to consider a broader discussion of Council standards/priorities of when to use RSA funds in the larger context of other sources of research funds, i.e. Council programmatic/appropriated funds, State funds, other NOAA/ federal grant funds, etc., to ensure that its complete range of FMP research needs get covered. This could include rotating RSAs across different high-valued fisheries and years, or focus on multispecies/ecosystem research rather than single species research to pool resources and take advantage of economies of scale that benefits the entire Mid-Atlantic.

8. Coordination, Integration with State, other Researchers

It is important that potential researchers are aware of related ongoing or planned research in order to avoid duplication and to foster possible collaboration. A relatively straightforward manner to ensure broad communication of ongoing work is utilizing existing Council groups and coordinating bodies to assess duplication and the possibility of collaborative efforts. These groups include Advisory Panels, Fishery Management Action Teams, and the SSC species leads, among others.

9. Decoupling Allowances and Forage and Ecosystem Species

Decoupling the research data collection from the harvest of the RSA quota has important benefits. It allows for allocation of the RSA quota through a market such as an auction, which maximizes revenues available to fund research, and if efficient allocates quota to individuals who value it most. A market mechanism can provide data on quota value across sectors, which can inform allocation discussions. The auction data would also provide information on the economic value harvesters attached to the regulatory waivers associated with the RSA quota, which can be used to assess the cost restrictions imposed on unexempted vessels. There are auction designs that could help generate funds for forage species. This could be done, for example, by bundling the quota of forage species with the quota for high value species. The bundle would then be auctioned off as a single unit.

Decoupling the research data collection from the use of the RSA quota could also have (serious) drawbacks, especially if the auction market is poorly designed and implemented. All the benefits associated with a competitive market (i.e., auction) rely on a transparent process for allocating that quota. Without participants' trust in the process (e.g., due to collusion, unclear rules for awarding winners, etc.) the auctions will not be competitive and will not maximize revenue. Likewise, all the information associated with the bidding for the quota that could be used for management is only valuable if it is accurate and readily available to the Council. The market for RSA quota should be run by a third party following clear guidelines specified by the Council. Decoupling the data collection from the harvesting of the RSA quota makes enforcement of quota reporting requirements significantly harder due to an increase in the number of participating vessels/ports and increased monitoring/enforcement complexity. Decoupling the data collection from the harvesting of the RSA quota may also prevent researchers from developing long-term relationships with industry counterparts.

II. Scientific Specifications

The SSC provides the Council Scientific Specifications through tasks such as informing research Terms of Reference, and bounding specific analyses to ensure that the science used in management adequately assesses uncertainty (e.g., model structure, parameterization) through robust statistical and mathematical approaches.

In the RSA redevelopment assessment, the Economic Work Group provided a similar function by highlighting the need to set specific goals and objectives for the RSA program as a key first step to the process. The reason being is that the program should be designed to meet specific goals and objectives to maximize probability of success. Without the goals and objectives in hand, there is no way in which to understand how different program design choices would be expected to impact program performance. The Economic Work Group worked collaboratively with Committee leadership and Council Staff to draft and organize alternative goals and objectives, which were drawn predominantly from documentation of the historical RSA program and discussions during Workshops 1 - 3 and Committee meetings. This work ultimately led to the Committee's development, ranking, and adoption of the goals and objectives, as presented in the Committee's April 27, 2022 meeting report.

Additionally, the Economic Work Group framed the choices of program design within the context of trade-offs across the proposed goals and objectives by developing a decision tree around three main design characteristics: 1) Who is involved in the RSA program, 2) How would you allocate/divide RSA quota, 3) What does an RSA trip look like?[5] The Economic Work Group illustrated how program design decisions affect the ability to achieve differing goals and objectives. The decision tree was used to frame discussions during Workshop 4 (Final

[5] https://www.mafmc.org/s/6_Decision-Tree-Tables_01_2022.pdf

Recommendations), in order to focus the conversation on the components of the program design which engendered the most concern and/or disagreement.

III. Focused Analyses

Relatively frequently, SSC members help to develop novel analyses to inform Council decision-making, often directly in response to a Council request for information. One example is the work currently underway by the SSC's Ecosystem Working Group and collaborators to understand the potential impact of climate on the performance of alternate control rules.

The Economic Working Group developed an analysis in support of Workshop 2 (Funding), presented in Appendix 1.2. Ultimately, the lack of individual bid data from the original RSA quota auctions precluded the development of specific guidance on how much revenue would be expected to be generated from different market designs for quota, and the Economic Work Group strongly suggests that this information be collected within any redesigned program due to the wealth of information on management performance that it provides, as detailed under Topic 9 of the Review section of this document. Nevertheless, the Economic Work Group was able to access summary statistics by which relative trade-offs across market designs could be demonstrated through simulations.

Importantly, the simulated scenarios provided were **hypothetical** and only intended to illustrate relative performance on revenue generation rather than to estimate dollar amounts raised under each approach. The simulations only explore a few plausible scenarios and do not represent an exhaustive list. Each scenario is replicated 1,000 times. The simulations assessed the performance of sequential English auctions for 40 summer flounder lots of 10,000 lbs of quota against bilateral agreements for the same lots. The auction scenario assumed 150 bidders with a seller reserve price of $1.50/lb. A total of six scenarios were developed for the workshop. The baseline case represents an auction entry fee of $100/vessel and 4% of sales to administrative costs with recreational and commercial fishermen allowed to bid on all lots and no collusion in bidding strategy. The Separate Com. & Rec RSA Auctions scenario allows commercial fishermen only to bid against other commercial fishermen and recreational fishermen only to bid against recreational fishermen. The Auction with high Admin/Entry costs changes the fees to $500 and administration costs of 12.5% of sales. The auction with collusion allows groups of bidders to work together by all bidding the lowest value of the group. The Separate Com. & Rec. RSA Auctions with High Admin/Entry costs scenario separates commercial and recreational lots and imposes the $500 entry fee and 12.5% administrative fee structure. Results of the simulation are presented in Table 1. The results indicate that, relative to bilateral agreements, the performance of an auction depends critically on its design.

Table 1. Comparison of additional revenue generated from an auction relative to bilateral agreements, under alternate assumptions on market structure.

Scenario	Comparison (Excess Revenue in the Auction)
Baseline Case	28%
Separate Com. & Rec. RSA Auctions	15%
Auction with high Admin/Entry costs	17%
Auction with Collusion	20%
Separate Com. & Rec. RSA Auctions with High Admin/Entry costs	5%

IV. Scientific Advice for Decision Making

Recent work by an ad hoc sub-committee of the SSC on elucidating impacts of alternatives being considered under the Recreational Harvest Control Rule Addendum/Framework presents an example of how the SSC provides Scientific Advice for Decision Making. The Council asked the SSC to answer very specific questions around the relative risk of alternate harvest control rule specifications.

To some extent, the Economic Work group functioned in that capacity in support of RSA Workshop 3 (Monitoring and Enforcement). In the material for that workshop[6], the Economic Work Group highlighted the incentives underlying the mislabeling that ultimately doomed the original RSA program.

The goal of the Workshop 3 was to identify potential program modifications that could prevent recurrence of previous enforcement issues. The Economic Work Group was asked to outline what role economics could play in identifying effective program modifications. Economic theory can provide guidance through theoretical models of mislabeling. Fishermen will mislabel if the expected loss (probability of being caught, indicted, and convicted multiplied by the penalty once convicted, which could include not only fines but also subjective costs of jail time or loss of social status) is less than the expected benefit from mislabeling (probability of not getting caught multiplied by the profits generated from the additional fish sold). This suggests two main levers by which mislabeling can be curtailed: 1) increasing the probability of being caught, indicted and convicted, 2) Size of the penalty. Neither of these variables are directly under control of the Council or Office of Law Enforcement, which means that in reality only increased monitoring & enforcement effort is an option, limited by budgets as it is.

However, it should be noted that numerous proposals coming out of Workshop 3 would be expected to decrease the cost of program monitoring and enforcement. Although not without

[6] https://www.mafmc.org/s/RSA-workshop-3-enforcement-summary-report-Final.pdf

tradeoffs in program performance, as highlighted in an Economic Work Group Memo to the Committee[7], changes in program administration which decrease monitoring and enforcement costs are likely warranted given the serious issues exposed by the previous RSA program enforcement actions.

<u>Conclusion</u>

The Economic Work Group's engagement in the Research Set Aside program illustrated how the SSC's expertise can be utilized by the Council to inform management decision-making. The roles of Review, Scientific Specifications, Focused Analyses, and Scientific Advice for Decision Making are traditional for the SSC and should be extended more readily to the economic discipline. The work outlined in this report is not exhaustive of the work undertaken by the Economic Work Group. For example, the Economic Work Group illustrated trade-offs across RSA program goals based on different design decisions heading into Workshop 4 (Final Recommendations)[8] in something akin to a role as Scientific Advisor. The roles themselves can also be blurred, as most typologies ultimately fail. However, the report highlights major contributions of the Economic Work Group to the RSA redevelopment discussion as an illustrative case study of how economic expertise can be further utilized in the future.

As with any science, the quality of the analyses, recommendations, and ultimate advice that the Economic Work Group provides the Council will depend on the data available. It is important for the Council to begin collecting economic data to further inform management decisions. The SSC has previously submitted recommendations and priorities to the Council for economic data collection, and if the Council decides to act on those recommendations, we would welcome the opportunity to collaborate on a plan of action.

[7] https://www.mafmc.org/s/5_Memo_to_RSC_RSA-Decision_tree_01_11_22.pdf
[8] https://www.mafmc.org/s/Memo_SSC_Econ_WG_Workshop_4_Feb_16_2022.pdf

Appendix 1.1

Research Set Aside Workshop - July 15, 2021
SSC Economic WorkGroup One-Pager Briefing on:

Topic 4. Consistency with Stated Council Plans/Objectives & Linkages to Management Goals;
Topic 6. Application of Benefit/Cost Principles in Proposal Evaluation

The purpose of this one-pager is to highlight the major challenges faced by the previous RSA program in the selection of fisheries/prioritization of research projects with regard to consistency with stated Council plans/objectives, especially linkages to management goals. The SSC Economic Workgroup's primary recommendation is the broader application of benefit/cost principles in future RSA program implementation.

1) The issue:

The Council's long-term role is to obtain the greatest benefits to the nation from the living marine resources under its legal stewardship. In some cases, these management goals and objectives are compromised by uncertainty in the science and subsequent application of policy. Research is paid for and conducted by many entities to fill knowledge gaps with the intent to improve management outcomes. Getting the most "bang-for-that-buck" is critically important.

The Council historically created Research Set-Asides taking a 3-percent share of annual quota to generate revenue to support research. Acting rationally, the Council implicitly assumed that the value of the resultant research met or exceeded what the quota would have been valued at by the fishermen in the subsequent sale of quota. No economic data exist to support this conclusion. Because the species value varies widely across fishery management plans, the absolute amount of funding for research projects by species differed widely, affecting the quantity and type of research projects solicited. This had a direct impact on the return on investment of the proposed research on the Council's management objectives.

2) Past RSA experience:

The objectives of the Council's original RSA program were not purposely aligned with economic performance, efficiency, or revenue outcomes. Rather, as the initial Environmental Assessment stated, the RSA Program was originally established to regain the public trust:

"One of the original objectives of the RSA Program was to foster collaboration between the scientific community (from both government and academia), the fishing community, and the general public. "

The Council was not trying to maximize the amount of research for a given dollar; its objective was to engage fishermen directly in the conduct of research because many had no faith in the science being conducted by NOAA or the states, and this lack of confidence was creating management and enforcement issues. This was, and could still be, a legitimate Council goal.

Notwithstanding the efficiency intention, however, what was the relationship of RSA research to improving management outcomes? A large number of past RSA research priorities focused on stock assessment improvements. The SSC Economic Working Group found frequent references in the public record criticizing the "quality" of the resulting science, but in fact all but two of the 44 projects passed NOAA scientific peer review. However, there was little basis available to evaluate the marginal improvements in a stock assessment relative to the research funding being spent. The problem was the absence of specific performance metrics: how the research specifically tied into or affected the current assessment or management program. Without performance metrics it has been difficult to compare the relative impacts of past projects.

3) Pros and cons of options the Council could consider:

What fisheries should be given priority in implementing research projects? The Research Steering Committee (RSC) already has stated certain kinds of research it wants the new RSA to focus on (e.g., more applied; management focused; short term outcomes). In addition, the Council has endorsed a new 5-year Research Plan in October 2020 relative to seven strategic research themes, including species-specific priorities. The topic of assessment priorities has also recently been linked to the Research Track Assessments, so there is ample raw material to form a consensus of research criteria to sit alongside the stated management goals (State and federal) for each managed stock. Ultimately a new Council process would endorse such a consensus of criteria for a new RSA program. These are all reasonable objectives.

But how should factors such as uncertainty in stock assessment models (i.e., larger OFL CVs) and the likelihood of a constraining ABC help to identify fisheries where the biggest economic gains from investment in science are expected?

Economists look to the value of a research project to point us in the right direction using benefit-cost analyses, and this is where the past RSA program critics conflated "quality" with "usefulness" of the science. Some of the RSA research may have been statistically well-designed and analytically correct, but did not address a relevant scientific question or timely resolve an assessment dilemma or management impediment, i.e., it lacked value/benefit or relevance. The lesson learned is to ensure a strong linkage/collaboration/partnership between the RSA researcher and the intended consumer of the research results to make sure the research product will be relevant, useful, and, at a minimum, applied directly to fishery science or management, at the right time. For example, at the proposal stage does a research proposal identify a specific client or entity by name and when they will be using or applying the research results? Future proposals lacking such linkages would be down-rated.

Despite the challenges of linking research outcomes with their consequences for management, measures of performance are essential for the Council's investment of RSA funds. RSA funds are a financial asset, and like any financial asset invested by a bank, credit union or mortgage broker, the investor (i.e., the Council for RSAs) has a responsibility to collect sufficient economic and financial data to measure the return on its investment. RSA economic and financial data were not routinely collected in the past so performance and return on this research investment could not be monitored. For example, the Council cannot answer whether the fishery would have been better off leaving the 3-percent quota set aside with the original TAL. The SSC Economic WorkGroup recommends a suite of economic and financial data be collected in association with every RSA project.

The allied performance metrics that research proposals should be asked to address are those related to the impacts of the research products relative to proposed reductions in model uncertainty, potential impacts on ABC, relaxation of gear and other fishing restrictions, etc. Tools and analyses, such as Management Strategy Evaluations, that could be useful to measure such changes, should be incorporated where feasible into the projects such that the Council can begin to adequately evaluate the consequences of its investments.

TOPIC 1. Peer Review and Principal Investigator (PI) Communications: Before, During, and After Completion of RSA projects.

The Issue and Past RSA Experience

There has been much discussion over time about the scientific validity of the research conducted under the RSA Program. Peer review - of proposals and of research results - while not without its problems, is the accepted method for establishing scientific validity. The historical RSA program widely solicited proposals in a competitive process, with each proposal initially reviewed by an internal NOAA subject matter expert, an external subject matter expert, and an industry subject matter expert. These were subject to further technical, administrative and legal analyses and review by NOAA and the Council, before a final selection of grantees was made by NOAA. Progress reports and a final completion report were required of each grant recipient (or Principal Investigator, PI). The final report was certified and approved by NOAA science staff after review and necessary revisions. This was similar in many ways to a peer review of the RSA projects, although unlike most peer-reviews, the PIs of RSA projects were, at least in some cases, unaware that a review was taking place. Contrary to popular belief about projects failing scientific peer review standards in the historic RSA program, all but two of the 44 projects have final reports that were accepted following some level of review by NOAA Fisheries.

However, a revised RSA program presents an opportunity to rethink how proposals are evaluated, how changes to funded proposals are considered, and how project results are reviewed to ensure that they meet the standard of "best scientific information available" (BSIA).

Pros and Cons of Options the Council Should Consider

The selection process for proposals is likely to function best when it is transparent (to PIs), gives appropriate weight to scientific merit and Council programmatic priorities, and engages the broader scientific community in a rigorous peer-review process.

1) What is the structure of the proposal selection process?
    a. Is there a pre-proposal stage? Pre-proposals allow PIs to suggest one or more potential proposal ideas in a shorter format and to receive feedback on whether they are likely to be competitive for funding under the RSA program. Sea Grant (SG) and some National Science Foundation (NSF) programs are among the larger granting organizations that utilize pre-proposals. For the RSA program managers, they can reduce the review burden by limiting the number of full proposals that must be fully evaluated by reviewers to only those ideas that are a good fit for the RSA program. For PIs, pre-proposals are a means to float an idea without committing to writing a full proposal for an idea that might have little chance of success. However, pre-proposals add another step to the selection process, potentially extending an already lengthy process.
    b. How is reviewing structured? Are pre-proposals (if any) reviewed internally, perhaps just to confirm fit to RSA priorities, or externally to evaluate potential scientific merit (may be difficult from the short pre-proposal format)? Are there separate written and panel review stages? Both SG and NSF have this structure where 2-3 external written reviews are solicited for each proposal and then a panel is convened to discuss the

proposals (and their reviews) and potentially rank them. Discussion of proposals at a panel provides a measure of consistency and helps reduce the influence of outliers (unusually positive or negative reviews) in the selection process.

c. What are the review criteria and are these criteria well-matched to reviewer expertise? RSA proposals should be evaluated against at least two broad criteria: their scientific merit and their value to stock assessment, management, or other Council priorities. External scientific review (e.g., by academic fisheries scientists, oceanographers, economists, etc.) can help engage the broader scientific community and extends the base of expertise beyond that available within the community of Council staff and NOAA scientists. However, external reviewers may not be in a position to evaluate this second category. Instead, FMAT and Council Species Committees or NEFSC stock assessment leads may be better positioned to evaluate relevance of proposed research with respect to priorities.
    i. Past performance in grant management and completion, including but not limited to past RSA grants, is used in numerous other granting agencies such as NOAA Sea Grant as a valuable review criterion.

2) How are requests by PIs for changes to proposed research evaluated?
    a. It's not uncommon for field research projects (and, to a lesser extent, lab research) to encounter unanticipated challenges that require changes to the study design. However, some changes may end up invalidating the original design or at least complicating the statistical analysis. Who is empowered to approve or disapprove changes requested by PIs? What criteria should they use when making these decisions? To what extent should they rely on additional outside evaluation of such requests (external review may add rigor but can also slow decision-making)?
    b. Some RFPs include an explicit requirement that the proposal identify *anticipated* challenges and how they will be addressed. If implemented in the RSA program, such a requirement could allow for faster decision-making for such challenges since they are already described in the funded proposal. That is, no additional approval may be necessary if the proposal already specifies changes that will be made to protocols in the event of certain challenges arising.

3) How are project outputs (e.g., final and perhaps interim reports) assessed for their scientific validity and use to guide management?
    a. Leave it to the journal peer-review process? This is typical for SG and NSF and is generally considered the "gold standard," but often quite slow (2-3 years between completion of field/lab work and publication in a journal is not uncommon; <1 yr is rare) and the rigor of the process is beyond the Council's control and generally hard to determine since reviews and reviewer names are rarely published.
    b. Ask the SSC or a subgroup of SSC members to review results? SSC members represent a scientifically well-qualified group that has a great deal of experience with scientific peer-review and is well aware of Council science needs. SSC review would ensure that at least some SSC members were aware of all RSA results, likely increasing uptake of these results in SSC decision-making.

c. Is there an iterative process of peer-review and response by the PI? Is this in-person or written or some combination? Such a process could help hone the quality of the research outputs and provides a mechanism to resolve simple misunderstandings. However, it is potentially time-consuming and would need to be communicated to PIs in advance since it's not a standard part of most granting programs. Nevertheless, this could be a key component of a scientific process in which the end-result is expected to be utilized in a management context.

4) What is the role of the SSC in reviewing (pre)proposals and RSA project reports?
   a. The SSC members represent a community of scientists already engaged with the Council and (collectively) experienced in all aspects of grant writing, grant reviewing, and scientific peer-review. The SSC is also familiar with research priorities for Council-managed species as the SSC helps develop these research priorities.
   b. Many SSC members will also be PIs or Co-PIs on RSA proposals and colleagues from their home institutions will submit proposals. This represents a conflict of interest (COI) that will need to be managed. While this presents no insurmountable obstacle to SSC involvement in RSA review, it may limit the number of SSC members without COIs available to participate.

RESEARCH STEERING COMMITTEE WORKSHOP 1
SSC Economics Workgroup Assessment
June 28, 2021

TOPIC 3. RSA Program Transparency and Conflicts of Interest

1) THE ISSUE

The historic RSA program was a federal financial assistance program in the form of a grant, not a contract, governed by a large body of rules and regulations that acknowledged past performance in the proposal's evaluation and ensured future accountability via "best effort." One of the main objectives of the historical RSA program was to regain public trust in the science and management of fisheries. The RSA review made clear that the historical program eroded, instead of bolstered, the trust for a multitude of reasons (Seagraves 2014).

Avoiding conflicts of interest throughout the process, from proposal ranking to quota sales through the scientific review of the final report, is a key component of regaining public trust in the RSA program. This transparency is key to ensure the Council, NOAA, and, by extension, all entities involved in the RSA program are viewed as “honest brokers;” i.e., trusted by the public to facilitate the program with the aim of maximizing the benefits to society and not any one individual or party.

For example, transparency in peer review is paramount if the SSC is to become more engaged in the RSA review process, as several members have been recipients of historic RSA awards.

2) PAST RSA EXPERIENCE WITH THE ISSUE

1. As part of the federal grant process, potential conflicts of interest are avoided by disqualifying technical reviewers with existing relationships to proposal teams.
2. Persistent concerns about the “veracity of research” (Seagraves 2014) funded under the RSA program highlights the need for additional safeguards and transparency, including public conflict of interest policies. A recent NEFMC RSA review highlighted stakeholder concerns as follows: “There is potential for conflict of interest to enter in the process of priority setting at various levels (i.e. PDT members, advisory panel members, etc.) since some participants are also applicants and/or recipients of RSA grants.” (Research Set-Aside Review Panel 2019)
3. Conflict of interest in the Management Review Panels utilized by the NEFMC are also a continuing concern for some stakeholders (Research Set-Aside Review Panel 2019).
4. There were perceived inequities regarding the auctions used to sell RSA quota, with the perception that “…the program is only available to a select few…” fishermen (Northeast Fisheries Science Center 2009).

3) DIFFERENT OPTIONS THE COUNCIL COULD CONSIDER FOR THE ISSUE

It is clear that concerns about the financial integrity of the historic RSA program undermined the public's perception of the science/management nexus, working directly against a major objective of the program itself. Full and transparent accountability should be viewed as a non-negotiable pillar of any RSA redesign to ensure that the program leads to credible outcomes. Best practices would suggest extending the Conflict of Interest policy to all aspects of the RSA program, if redeveloped. This would include: (1) the preliminary ranking of RSA research priorities, (2) engagement of the SSC as an additional pool of peer review expertise, and (3) full disclosure in sale of quota, and other decision points in which less than full transparency could reduce public trust in the RSA program.

To a great extent, this extension merely entails codifying practices already used by the MAFMC and other bodies related to RSA administration. For example, both Council members and SSC members routinely recuse themselves from deliberations and decisions in which there is potential for a perceived conflict of interest (see, e.g. May 2021 SSC report https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/60bfc1b8dc98c54b33d1aa63/1623179705235/MAFMC+SSC+Report+May+2021+meeting_final.pdf). However, it would be important to have a formal process by which the conflicts of interest are publically identified and addressed for purposes of transparency.

The extent to which third parties such as clearing houses, auctioneers, or other entities facilitating the buying and selling of quota would be held to a conflict of interest policy depends on the exact manner in which that entity is engaged. Nevertheless, it would be important that any entity engaged in such a manner understand that public perception is a key metric by which the success of the RSA program will ultimately be judged. Public conflict of interest policies, or lack thereof, could play a key role in public perception. Compliance costs should be minimal on this front, given that the mitigation of conflicts of interest are considered best practice across all industries.

Recommendations:

1. Publicize existing Conflict of Interest Policies such as Department of Commerce Form CD-571 for RSA program reviewers.
2. Develop public Conflict of Interest policies for the SSC, MAFMC, APs, and others engaged in RSA program prioritization, technical review, and funding to ensure transparency and increase trust.

Seagraves, Rich. Mid-Atlantic Fishery Management Council, "RSA Program Issues", Dover, DE, July 30, 2014.

Northeast Fisheries Science Center. 2009. *Northeast Research Set-Aside Programmatic Review Report*: Woods Hole, MA June 12, 2009.

Research Set-Aside Review Panel. 2019. Program Review of New England Research Set-Aside Programs: Final Report: New England Fishery Management Council: Newburyport, MA: April 2019.

TOPIC 5. Universal data access and transparency (new # IV)

The purpose of this topic is to

- Identify the major problems of data sharing and transparency for RSA-funded projects,
- Define or redefine the data sharing policy and data management process for all the projects funded by RSA, and
- Create transparent policies and processes.

The topic suggests seeking a policy for RSA that "all data from funded research projects should be made freely available without restriction or prior permission on a public data repository".

The issue

The previous RSA program was a federal financial grant assistance program. Since 2013, a data sharing and management plan is required for all the federal funded projects (OSTP 2013; OMB 2013; NOAA 2013, 2016; EPA 2016). Historically, data access was not a requirement of RSA-funded projects, and data stewardship plans were not weighed in the peer review and evaluation process. Some of the historically funded projects had constraints on data sharing for research and management purposes.

Data sharing and transparency are important for reaching the goals of RSA. The RSA program historically favored projects based heavily on those that would "acquire data for management that fills a data need", and the transparency of the data and repeatability of the research results are important for regaining public trust in the science and management of fisheries. Also, without a good data sharing and management policy, waste of resources can be a problem for the value of the investment.

Past RSA Experience with the Issue

Historically, the RSA program did not have a mandatory data sharing and management policy for all the RSA-funded projects. The RSA projects fell into the following categories of data sharing: fully shared, partially shared, shared with restriction, not shared. Currently, there is no unique data management system (such as sharing with a council or in a public data repository) and the data requests require contacting Principal Investigators (PIs) individually. Such data requisition can be a long and frustrating process when it involves contacting different PIs, for example with the project done many years ago or lack of responses to data inquiries, etc.

Pros and Cons of Options the Council Could Consider

It would be beneficial to 1) identify reasons and types of projects of restricted sharing and not sharing; 2) discuss rationale and potential adaptations for such projects; 3) discuss the potential to have a mandatory data sharing and management policy for all projects; 4) include data sharing policy in the peer-review and evaluation process.

Data sharing is clearly important for ensuring replicability of results, transparency and trust. It is value-added to the economic investment made also, as the data may be useful in research being conducted by other researchers for both Council and non-Council purposes. According to

Whitehouse "*Publicly accessible weather and climate data from the National Oceanic and Atmospheric Administration (NOAA) underlie forecasts that are valued at more than $32 billion per year*.".

The SSC recognizes that not all projects will be able to provide full data access due to potential confidentiality concerns or other issues. For example, information on commercial fishery effort or social-economic data that reveal proprietary business information may be bounded by some other "sharing" limits by "confidentiality" policies governed by statute or regulation. The progress of data sharing has been impeded because of multiple reasons such as: 1) Confidentiality or privacy about business operations, 2) Likelihood of misusing the data (e.g., not considering the survey design), and 3) Professional advancement or publication/dissertation concerns by PIs. It might be worth comparing with the federal requirements for data acquired by agencies such as NOAA to create a data sharing and management policy for RSA project (See Appendix B of Text to be included in NOAA Announcements and Awards).

These issues of data sharing require coordination with the Grants office, Regional attorneys and NOAA staff and most importantly collaborative partnerships with industry participants, the hallmark of the RSA program, to protect their interests while allowing research to proceed that will support more effective stewardship of the living marine resources under the Mid-Atlantic Council's stewardship.

Nevertheless, these caveats should be presented as part of the evaluation of the benefits of research under topic I, and should be assessed through the peer review process. Further, quota sale prices are key to understanding the benefits and costs of any research undertaken, and have proven important in the management of the Northeast Large Mesh Multispecies Fishery Management Plan (see, e.g. FW58 Section 7.4.1.2 of NEFMC 2019). At the same time, the deficiencies in economic data and capacities are widespread and have been identified by SSC many times, the latest in its report to the council meeting in 2019. Therefore, it is important to look into strategies to deal with more effective data sharing of RSA-funded projects for the value of these investments.

At a minimum, a clear council coordination process, ideally linked to a publicly available data server or public data repository requirement would be much more efficient for public access and create added value to the research undertaken. Some of these options may involve the cost of staff time, but should benefit for the long run and the best use of the RSA funding expended to collect the data.

References:

EPA. 2016. Plan to increase access to results of EPA-funded scientific research.
NEFMC. 2019. Framework Adjustment 58 To the Northeast Multispecies Fishery Management Plan.
NOAA. 2013. NOAA Plan for Increasing Public Access to Research Results.
NOAA. 2016. Data and Publication Sharing Directive for NOAA Grants, Cooperative Agreements, and Contracts.
Office of Management and Budget (OMB). 2013. Open Data Policy-Managing Information as an Asset.
Office of Science and Technology Policy (OSTP). 2013. Increasing Access to the Results of Federally Funded Scientific Research.

Appendix B: Text to be included in Announcements and Awards (cited from NOAA 2016)

The following text is for inclusion in FFO Announcements and Contract Solicitations (Appendix B.1, B.2) and Notices of Award and Contracts (Appendix B.3).

B.1. Text to be included in FFO Announcements and Contract Solicitations for projects that may generate environmental data (including Broad Agency Announcements)

1. Environmental data and information collected or created under NOAA grants or cooperative agreements must be made discoverable by and accessible to the general public, in a timely fashion (typically within two years), free of charge or at no more than the cost of reproduction, unless an exemption is granted by the NOAA Program. Data should be available in at least one machine-readable format, preferably a widely-used or open-standard format, and should also be accompanied by machine-readable documentation (metadata), preferably based on widely- used or international standards.
2. Proposals submitted in response to this Announcement must include a Data Management Plan of up to two pages describing how these requirements will be satisfied. The Data Management Plan should be aligned with the Data Management Guidance provided by NOAA in the Announcement. The contents of the Data Management Plan (or absence thereof), and past performance regarding such plans, will be considered as part of proposal review. A typical plan should include descriptions of the types of environmental data and information expected to be created during the course of the project; the tentative date by which data will be shared; the standards to be used for data/metadata format and content; methods for providing data access; approximate total volume of data to be collected; and prior experience in making such data accessible. The costs of data preparation, accessibility, or archiving may be included in the proposal budget unless otherwise stated in the Guidance. Accepted submission of data to the NOAA National Centers for Environmental Information (NCEI) is one way to satisfy data sharing requirements; however, NCEI is not obligated to accept all submissions and may charge a fee, particularly for large or unusual datasets.
3. NOAA may, at its own discretion, make publicly visible the Data Management Plan from funded proposals, or use information from the Data Management Plan to produce a formal metadata record and include that metadata in a Catalog to indicate the pending availability of new data.
4. Proposal submitters are hereby advised that the final pre-publication manuscripts of scholarly articles produced entirely or primarily with NOAA funding will be required to be submitted to NOAA Institutional Repository after acceptance, and no later than upon publication. Such manuscripts shall be made publicly available by NOAA one year after publication by the journal.

DECOUPLING ALLOWANCES AND FORAGE AND ECOSYSTEM SPECIES

1) The Issue

In designing a future RSA program there is a fundamental design decision of whether to require the recipients of RSA quota to also conduct the scientific research, or to "decouple" that decision and allow some fishermen to catch the RSA quota, and allow different fishermen to help conduct the scientific research.

What are the implications of having RSA quota directly tied to the research conducted? This could help in enforcement of the quota, as the fishermen/scientists have an incentive to make sure catch accounting is accurate for their own research. This is how the current scallop RSA program in New England works. However, this would also have an impact on the auction process by changing the types and number of vessels that are likely to bid for the quota, and thereby restricting the types of research that is likely to be conducted.

Moreover, the species under management by the MAFMC are not all high value commercial or recreational species. Thus, there is a need to carefully consider the implications of using landings value for RSA Research prioritization choices. High-valued fisheries may get their projects elevated in priority above lower valued fisheries and forage species fisheries, important for their ecosystem services, would rarely get priority for their research needs because they cannot raise a critical mass of funding. This could also potentially lead to biases in stewardship that create social inequity and environmental injustice for some fishing constituencies and fishing communities. Sustainable fisheries management requires an understanding of the role of forage species in the ecosystem and some of these lower valued species can have large impacts on the sustainability of local fishing communities, regardless of their direct revenue contribution to the total industry.

2) Past RSA Experience with the Issue

The former RSA program decoupled the harvest of the RSA quota from the research and relied on the auctions implemented by the National Fisheries Institute (NFI) to generate revenue. Most of the revenue came from a handful of high value species (e.g., summer flounder, black sea bass, scup). Only up to 25% of the revenue from a given species quota could be used to fund research for a different species.

3) Pros and Cons of Options the Council Could Consider

Decoupling the research data collection from the harvest of the RSA quota has important benefits:

(i) It allows for allocation of the RSA quota through a market mechanism (e.g., an auction), which in turn allows for price discovery (how much is the quota worth?) and maximization of revenues (i.e., competition pushes the prices up).[1] In contrast, requiring that the same boats are engaged in the data collection as in the scallop program (i.e., where research and harvesting of the RSA quota are tied) would not maximize program revenues. The principal investigators (PIs) search for interested parties and the ensuing bargaining process are likely to be inefficient.

[1] See, for example, "Auction Theory" by V. Krishna or "Auctions: Theory and Practice" by P. Klemperer.

(ii) Allocation through a market mechanism, assuming the information is available to the Council, would provide data on willingness to pay for quota from the recreational and commercial sectors. In turn, this information could later be used for decisions on intersectoral quota reallocation.

(iii) The auction data would also provide information on the economic value harvesters attached to the regulatory waivers associated to the RSA quota. This information would give the MAFMC a sense of the cost for the industry of the restrictions imposed to regular vessels.

(iv) Leasing of the RSA quota allocated through the auction facilitates full use of the RSA quota. Indeed, harvesters that realize later in the season that they will not be able to harvest all their RSA quota can easily transfer it to other vessels.

(v) Auctioning off quota for forage species (i.e., low value commercial species) is unlikely to generate enough revenue to fund the research associated with those species. While this issue was not addressed in the former RSA program, there are alternative auction designs that could help generate funds for forage species. This could be done, for example, by bundling the quota of forage species with the quota for high value species. The bundle would then be auctioned off as a single unit.

(vi) Additionally, a properly designed market would allocate the quota efficiently, which means that the RSA quota would end up in the hands of the harvesters that can make the most profit from it. This would not be achieved by an RSA program modeled after the New England scallop RSA.

Decoupling the research data collection from the use of the RSA quota could also have (serious) drawbacks:

(i) All the benefits associated with a competitive market (i.e., auction) rely critically on a transparent process for allocating that quota. Without participants' trust in the process (e.g., due to collusion, unclear rules for awarding winners, etc.) the auctions will not be competitive and will lose their appeal in terms of revenue generation. Likewise, all the information associated with the bidding for the quota that could be used for management is only valuable if it is accurate and readily available to the MAFMC. The market for RSA quota should be run by a third party following clear guidelines specified by the MAFMC.

(ii) Decoupling the data collection from the harvesting of the RSA quota makes enforcement of quota reporting requirements significantly harder. This is so because (a) the number of vessels landing RSA quota is likely to increase (with the concomitant increase in the number of landing ports), and (b) leasing makes keeping track of that quota throughout the season challenging.

(iii) Decoupling the data collection from the harvesting of the RSA quota may prevent researchers from developing long-term relationships with industry counterparts. This is the case because the quota is unlikely to be allocated to same vessels every year. In turn, this may undermine the goal of fostering collaboration between the scientific community and the fishing community.

Research Set Aside Workshop - July 15, 2021
SSC Economic WorkGroup One-Pager Briefing on:

Topic 7. Social equity implications of RSA awards

The purpose of this one-pager is to identify the challenges faced by the previous RSA program in the selection of fisheries and prioritization of research projects with regard to social and economic equity implications of RSA awards.

1. Define the topic:

The Department of Commerce Policy on Environmental Justice states that the National Oceanic and Atmospheric Administration (NOAA) manages the Nation's fisheries and coastal habitats and species ensuring future equal access to these environmental resources for all Americans. Thus, policy decisions associated with future implementation of a RSA program must be mindful of the social and economic consequences of any allocation impacts of RSA quota distributions

2) Briefly summarizes what the past RSA experience with the topic has been.

Previously most of the RSA revenue came from high value species that under past policy could be redistributed up to 25 percent to fund research on different species. In effect, fishermen for high valued species such as summer flounder, black sea bass, and scup were "subsidizing" the research on lower valued species, which on their own could not generate comparable levels of funding to support vigorous research programs.

In addition, access to the benefits of RSA quota in the prior program was not necessarily based on "equal access" via the auction process as those entities with an ability to bid a higher price had preferential access to quota shares. This provided a competitive advantage to holders of RSA quota when quota closures for the non-RSA quota were imposed.

3) Seek to identify the pros, cons, ideas of different options the Council could consider for that issue, with particular emphasis on any economic implications of the different choices.

There is a proposal on the record of the Research Steering Committee to have funds from a species auction only used for research on that species. This resolves the issue of one fishery subsidizing another. However, fisheries with low ex vessel values that have critical research needs may never be able to generate sufficient funds to support an RSA on their own. Without further changes, RSA could only be supported in "wealthy" fisheries and "poorer" fisheries would have to find other sources of research funds. This could have a differential negative impact on fishing communities reliant on low margin bait and forage fisheries where research is already scant on these species, scientific uncertainty high, and management approach usually ultra conservative as a result. These smaller scale fisheries and their communities receive less political attention than the more major fishing ports.

In such a case the Council may need to consider a broader discussion of Council standards/priorities of when to use RSA funds in the larger context of other sources of research funds, i.e., Council programmatic/appropriated funds, State funds, other NOAA/ federal grant funds, etc. to ensure that its complete range of FMP research needs get covered. This could include rotating RSAs across different high-valued fisheries and years, or focus on multispecies/ecosystem research rather than single species research to pool resources and take advantage of economies of scale that benefits the entire Mid-Atlantic.

RSA WORKSHOP #2: FUNDING

1. INTRODUCTION

The primary objective of the Research Set Aside (RSA) program is to generate resources to fund research projects that align with the priorities of the Mid-Atlantic Fishery Management Council so that the findings can be incorporated into the Council's management programs. Under this program the grant recipients are awarded set aside quota rather than money. That RSA quota must then be monetized to pay for the research. The RSA quota value is mainly driven by the financial incentives of industry participants to pay for additional fishing opportunities. Aside from this main objective, there are important secondary and competing objectives that must be met to ensure the success and continuity of the program:

i. Maximize revenues from RSA quota
ii. Ensure fairness in access to RSA quota
iii. Foster collaboration between scientific and fishing communities
iv. Ensure compliance with the reporting and use of the RSA quota

Maximize revenues from RSA quota

The Council's goal under the Magnuson Act's National Standard 1 is to provide the greatest overall benefits to the Nation from the living marine resources under its legal stewardship. In some cases, its management goals and objectives are compromised by uncertainty in the science and subsequent application of policy. RSA research is one way to fill knowledge gaps with the intent to improve management outcomes.

The starting reference point for a well-designed RSA program is to maximize revenues received in the conversion of quota pounds into dollars, thereby conducting the greatest amount of research possible. Attributes of a well-designed program will utilize mechanisms that encourage fishermen to pay the fair-market values for the quota poundage (e.g., no insider or special deals). This is oftentimes achievable through open competitive markets.

Having appropriate data to manage a fishery is one of the underlying findings of Section 2 the Magnuson Act:

"(8) The collection of reliable data is essential to the effective conservation, management, and scientific understanding of the fishery resources of the United States."

Thus, it is imperative that the Council adopts a data collection program that will allow the computation of revenues and willingness to pay for RSA quota. This is the basis for the Council's investment in RSA research, and from which it will measure the return on that investment over time, gauging whether the value of the quota set aside for research produced meaningful results for management of the stocks and the fishermen who seek them. Also, any deviation from the maximum revenue objective to pursue other goals can then be objectively evaluated by conducting a trade-off analysis of what is proposed to be gained for what is proposed to be given up.

Ensure fairness in access to RSA quota

In re-establishing an RSA program, the Council may find its design unintentionally impacts access to the program by different segments or sectors of a fishery. Not all sectors may be economically able to compete on equal terms to obtain RSA quota. Moreover, the Council could also choose to use access to the RSA program as a deliberate policy choice. For example, it could design its RSA program to give preference to a particular gear, sector, or geographic area, such as allowing discounted/subsidized RSA quota shares to black sea bass pot fishermen economically affected by wholesale gear replacement regulations because of entanglement rules.

Magnuson Act National Standards 4 and 5 are relevant here, as the allocation or assignment of shares shall be fair and equitable and shall consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose. NOAA legal counsel will need to provide advice on what is the legal versus policy constraint of "equitable" versus "equal" treatment of different sectors in access to RSA quota.

What is known is that any trade-off in the maximum competitive RSA value, intentional or not, will result in a diminution in the total revenue. It is important for the Council to collect data to evaluate whether what they achieve in return for that diminution is worth it.

Foster collaboration between scientific and fishing communities

The objectives of the Council's original RSA program were not aligned with economic performance, efficiency, or revenue outcomes. Rather, the RSA program was originally established to regain public trust . The Environmental Assessment for the original RSA program states:

"Commercial fishermen seek to maximize the revenue from their harvests and will operate their vessels and deploy their gear in such a way as to best accomplish this end. Scientists, conversely, are bound by the "scientific method," and seek to gain information and verify its accuracy through rigorous experimental procedures. Management programs based on this information may then be questioned by the public and lack credibility in their eyes. The Mid-Atlantic Council has developed the research set-aside program to address these concerns. Without the active cooperation of the fishing public, most management programs are destined to fail, as it is chiefly

through the actions of commercial and recreational user groups that humans interact with and affect fisheries resources."

The Council was not trying to maximize the amount of research for a given dollar; it's objective was to engage fishermen directly in the conduct of research because many had no faith in the science being conducted by NOAA or the states, and this lack of confidence was creating management and enforcement issues. In reviewing the past RSA program, the key element of collaboration was communication; it appeared to be the cause of most success stories (a lot of) and almost all failures (a lack thereof).

Thus, identifying fisheries and/or research priorities based on greatest economic value may run counter to other social, cultural and/or geo-political criteria. From a public policy viewpoint, these other criteria offer valid perspectives. There are also varying degrees of research collaboration possible, starting with NOAA's "white boats" to decoupled commercial RSA vessels, etc. What is critical is being able to evaluate/quantify the benefits and costs of adopting any of these alternative objectives and decisions. Not only does it appear to be a good Council practice for reaching a consensus on RSA direction, but it will also be required by applicable law and regulation for the Magnuson Act and federal rulemaking procedures.

<u>Ensure compliance with the reporting and use of the RSA quota</u>

In addition to maximizing revenues, a well-designed RSA program would also minimize inefficiencies and transaction costs in the sale of quota that would eat into the revenue. This could include minimizing the costs of tracking quota possession/use over time and the overall execution/administration of the RSA program itself to help the Council maximize the net revenue and benefits from its RSA research investment.

There have been significant advances in electronic reporting systems since the original RSA program ended, and the adoption and use of technologies that eliminate duplicative and ineffective reporting systems can hopefully be avoided in any re-designed system. Some of the software used in cooperative research and various catch share systems may be models for consideration to avoid reinvention and duplication of effort that would only decrease net benefits of a new RSA program.

Historically catch reporting and enforcement in NOAA have been handled separately, and while progress continues, there may be opportunities in future for breakthroughs with VMS/satellite GPS/RADAR and next generation communication technology solutions that could benefit RSA perhaps through public private partnerships. In the interim, close collaboration with enforcement at the state and federal level and General Counsel on design and execution can improve compliance rates relative to the original RSA.

2. PROGRAM DESIGN

The two main alternative approaches for implementing the RSA program given the identified objectives above are: (i) bilateral arrangements between research principal investigators (PIs) and industry members (e.g., scallop program); and (ii) competitive markets in the form of different auction formats. Auctions are mechanisms for selling (or buying) items by offering them up for bid and selling the items to the highest bidders. In this case, the item for sale is RSA quota. Auctions foster competition among bidders to increase seller's revenues and allow for price discovery when the value of the items is unknown. There are many alternative types of auction markets, with different settings calling for different designs. Bilateral arrangements, on the other hand, are agreements between PIs and vessel owners whereby grant recipients and industry partners share the proceeds generated from harvesting the RSA quota.

The two approaches mentioned above are not equally equipped to address the secondary objectives (i) -(iv) listed above. Auctions, if properly designed and implemented, will maximize RSA quota revenue through thick markets and competition.

However, if fairness is understood as equal access to the quota, competitive markets will not achieve that objective. On the other hand, if fairness is conceptualized as access to the quota according to willingness-to-pay, then auctions will meet the objective. (ii) In the case of the bilateral arrangements, it is entirely up to the recipients of RSA grant awards to decide who they partner with to use compensation fishing opportunities. To the extent that revenue is not their unique consideration when selecting industry partners, bilateral agreements may offer access to quota to harvesters that would not be awarded RSA quota at the auctions. Alternatively, if PI or fishermen's transaction costs are high, a much smaller group of fishermen might ultimately have an opportunity to access the quota when compared to auctions. Regarding objective (iii), markets for quota are not guaranteed to ensure collaboration between the scientific and fishing communities since auctions decouple the research from the harvest of the RSA quota. In contrast, in programs such as the scallop RSA, researchers often work with a relatively small group of vessels with whom they are familiar due to geographic proximity or some other reason. This type of interaction is more conducive to continued collaboration between industry and PIs. Finally, (iv) allocating the quota to many vessels and then allowing leasing, as the auctions do, makes enforcement more challenging and presumably more expensive. For example, it increases the number of landing ports for the RSA quota. Oversight entails substantial investment from NMFS across several line offices, including the Sustainable Fisheries Division, Analysis and Program Support Division, and Office of Law Enforcement. Table 1 below summarizes these points.

Table 1: Comparison in Ability to Achieve Secondary Objectives

(COMPETING) OBJECTIVES	BILATERAL AGREEMENTS	MARKETS (AUCTIONS)
REVENUE MAXIMIZATION		✓
FAIRNESS OF ACCESS (IF UNDERSTOOD AS EQUAL ACCESS TO QUOTA)	✓	
LONG-TERM COOPERATION BETWEEN RESEARCHERS & INDUSTRY	✓	
ENFORCEMENT & COMPLIANCE	✓	

3. SCENARIO ANALYSIS

The SSC Economic Workgroup (WG) has conducted a scenario analysis to compare revenue generation between competitive markets (auctions) and bilateral agreements, the two main approaches for implementing the RSA Program.

There was no granular data (i.e., data on individual bids) made available on the auctions from the former RSA Program. Without information on the individual bids, it was not possible to estimate the distribution of harvester's willingness to pay for RSA quota. Unfortunately, the distribution of willingness-to-pay for quota is critical for studying the revenue advantage of the auctions, one of the initial planned analyses for the project. Barring these detailed data, the Economic WG relied on the summary data that was provided by the National Fisheries Institute (NFI) who oversaw the Mid-Atlantic auction program. The summary data utilized included the average winning bid per year and species, coupled with average number of participants per year and species. Specifically, the simulations that support the scenario analysis use a calibrated model based on summary statistics on bids and # of bidders for summer flounder quota. The distribution of willingness to pay used in the simulations is assumed and not estimated from data. Importantly, the simulated scenarios are hypothetical and only intended to illustrate relative performance on revenue generation rather than to estimate dollar amounts raised under each approach. The simulations only explore a few plausible scenarios and do not represent an exhaustive list. Each scenario is replicated 1,000 times.

Table 2 below summarizes the findings of the simulations. The right column shows how much higher the revenue from the auctions is compared to the revenue from the bilateral agreements. For example, the baseline case generates (on average) 28% higher revenue than the bilateral arrangements. This baseline scenario assumes supply of 400,000 lbs. of summer flounder RSA quota in lots of 10,000 lbs. each, sequential English auctions (species-lot level) in which recreational and commercial bidders can participate, 150 bidders, a minimum (reserve) price of $1.50/lb., $100 per vessel in entry costs and 4% of proceeds in administrative costs.

The revenue advantage observed in the baseline case, however, decreases in the other scenarios. When separate auctions are conducted for recreational and commercial vessels, as opposed to auctions in which anybody can bid regardless of sector, the auctions generate 15% more revenue than the bilateral agreements. Likewise, high entry costs and administrative fees of the scale observed in the former RSA program would reduce the revenue advantage of the auctions to 17% of the revenue from bilateral arrangements. The possibility of collusion by a small number of bidders has a smaller impact but also reduces the revenue advantage of the auctions (to 20%). Lastly, separate auctions combined with high entry and administration costs, would significantly reduce the advantage of competitive markets over bilateral agreements in generating revenue (5%). Note that these results do not account for the additional enforcement costs that may be needed to monitor the RSA quota under the auctions.

The main conclusion from these simulations is that the performance of the preferred mechanism will critically depend on the design and implementation. Moreover, transparency and bidders' trust in the rules of the auctions will be critical in determining the success of these markets in raising revenue.

Table 2: Summary of Revenue Comparison between Auctions and Bilateral Agreements

SCENARIO	COMPARISON (EXCESS REVENUE IN THE AUCTION)
BASELINE CASE	28%
SEPARATE COM. & REC. RSA AUCTIONS	15%
AUCTION WITH HIGH ADMIN. AND ENTRY COSTS	17%
AUCTION WITH COLLUSION	20%
SEPARATE COM. & REC. AUCTIONS WITH HIGH ADMIN. AND ENTRY COSTS	5%

4. ANCILLARY BENEFITS

Beyond their ability to foster competition to generate revenue for the program, auction markets for RSA quota may generate ancillary benefits and information valuable for management, as indicated in Table 3.

Information on the bids submitted by recreational and commercial vessels would provide data on willingness-to-pay for RSA quota from each sector. In turn, this granular information, if available to the Council, could inform future intersectoral quota reallocation decisions.

Additionally, bidding behavior regarding RSA quota for different species may also provide information on technical complementarities (i.e., jointness) in the harvest of different species. Since the RSA quota is only valuable to harvesters to the extent it provides them with fishing opportunities they would not otherwise have (e.g., fishing after the season has ended, increasing bag limits for charter boat anglers, etc.), bidding in the auctions provides information on the value that industry attaches to relaxing some of the regulations. A competitive market also ensures the RSA quota is allocated according to willingness-to-pay, increasing allocative efficiency, and makes it easier for vessels that mid-season find themselves unable to fish their quota to transfer that quota to other boats.

Table 3: Ancillary Benefits of Auctions

ANCILLARY BENEFITS (AUCTIONS)
INFORMATION ON QUOTA DEMAND FROM REC. AND COMMERCIAL SECTOR
INFORMATION ON SPECIES' HARVEST COMPLEMENTARITIES
WILLINGNESS TO PAY FOR ALTERNATIVE REGULATORY WAIVERS
HIGHER LIKELIHOOD RSA QUOTA GETS USED EACH SEASON
INCREASED EFFICIENCY

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 26, 2022

To: Michael P. Luisi, Chairman, MAFMC

From: Paul J. Rago, Ph.D., Chair, MAFMC Scientific and Statistical Committee (SSC)

Subject: Report of the May 2022 SSC Meeting

Executive Summary

Harvest Control Rule

- The SSC responded to the Council's request to review and rank the five options under the Council's HCR Amendment and Commission Addendum by forming a work group and holding three public meetings.
- The SSC determined that the HCR will not have any effects on ABC determination in the first year of application, but could influence future ABCs in subsequent years if uncertainty of catch data increases.
- The SSC noted that the HCR could not be considered to be a formal control rule because it does not consider specific outcomes for harvest. Instead, it specifies directional changes in potential harvest rates. The absence of specific details on the measures that might be undertaken prevented the SSC from ranking the alternatives as requested by the Council.
- The SSC evaluated the pros and cons of each option. Key concerns included the binning of responses within defined ranges of stock status, the introduction of potential time lags, and the possibility of feedback loops that might induce wide swings in population status or regulatory measures across years.
- Even when management measures are appropriate, lack of compliance or understanding of regulations can reduce their efficacy. Some of the measures replicate the approaches used by the SSC to derive the ABC in the first place. This circumstance has the potential to induce additional variability in fishery performance and increase future uncertainty for determination of ABCs. Overages by recreational harvesters may cause problems of equitability of allocation with the commercial sector.

- The expected two-year frequency of updated stock assessments and associated management adjustments for the Amendment species, will offset to some extent, the concerns highlighted for the various measures
- The SSC cautions that stability of regulations is not the same as stability of catch. If regulations are properly set to achieve a target F, then catches and CPUE will be expected to fluctuate with stock biomass. It is possible to set a constant catch policy, but harvest limits under such a policy would likely have to be substantially lower than the ABC (and its attendant RHL) to account for interannual variability in population processes and angler avidity.

Illex Squid-Scientific Advances from Research Track Assessment

New information on ageing, statolith microchemistry, oceanographic drivers, generalized depletion models. The SSC appreciated learning about these promising research results and looked forward to their incorporation into future stock assessments.

Butterfish update Scientific Advances from Research Track Assessment

A wide variety of ecosystem topics were considered for inclusion in the butterfish assessment. These included predictive models for spatial distribution patterns over time, the influence of environmental drivers, the potential magnitude of natural mortality by marine mammal, bird and fish populations, and comparative analyses of trends in recruitment and condition factor for a broad range of fish species.

A new state space model was developed and applied to Butterfish to estimate current stock size, rates of removal and biological reference points. Using data through 2019, the stock is not overfished and overfishing is not occurring.   The new biological reference point for fishing mortality is much higher than earlier values but this is due in part to updated information on maturity at age, and revised selectivity patterns from 2014 onward. The realism of the high reference point will be considered by the SSC when it receives results of the upcoming Management Track Assessment for Butterfish.

Ecosystem and Socio-Economic Profiles

The SSC received a basic overview of methods for linking oceanographic drivers to stock assessments. The hypothesis-driven age-structured approach was viewed as promising by the SSC.

Atlantic Surfclam and Ocean Quahogs

Catches for Surfclams and Ocean Quahogs were updated but no new fishery independent data were available for either species.   Catches continued to be below existing quotas. **The SSC recommended continuation of previously approved quotas for 2023. These are 42,237 mt for Surfclams and 44,082 for Ocean Quahogs.**

Longfin Squid

Catches of Longfin Squid for 2021 were updated along with NEFSC bottom trawl survey indices. **The SSC recommended continuation of previously approved quota of 23,400 mt for 2023.**

Chub Mackerel

No new information was available to inform specification of a multiyear ABC for Chub Mackerel. The current ABC is based on recent catch history and expert judgment. A research project relying on age samples from commercial landings is underway. Little is known about Chub Mackerel dynamics in the Mid-Atlantic but large fisheries for this widely distributed species and similar species exist elsewhere in the world. Detailed research recommendations for future assessments are provided, however prospects for conventional stock assessment approaches are limited for the foreseeable future. **The SSC recommends continuation of the existing quota ABC = 2,300 mt for the period 2023-2025.**

Multi-year ABCs

Averages of ABCs defined by the P* approach can be problematic when the stock is above Bmsy or when strong trends in biomass are expected. Under these conditions, the average of consecutive ABCs may exceed the target overfishing limit in one or more years. The SSC reviewed initial work from a subcommittee to review alternative methods for computing a constant catch that meets the requirements of the Council's Risk Policy. The SSC will continue collaboration with the NEFSC to develop software that interfaces with the existing AgePro software and new methods under development using the Woods Hole Assessment Model (WHAM).

Background

The SSC met via webinar from 10th-11th May 2022, addressing the following topics:

- Review of Harvest Control Rule per the Council's request
- Overview of key scientific advances from the Research Track Assessments for *Illex* squid and Butterfish.
- Overview of Ecosystem and Socio-Economic Profiles
- Review of previously approved ABCs for 2023 for Atlantic Surfclams, Ocean Quahogs, and Longfin squid.
- Setting ABCs for Chub Mackerel for 2023-2025
- Review guidance and approaches for multi-year average ABC calculations

See Attachment 1 for the meeting's agenda. An Executive Summary provides a quick summary of the primary conclusions of the SSC.

All SSC members were able to participate for all or part of the meeting (Attachment 2). Other participants included Council members, Council staff, NEFSC and GARFO staff, and representatives of industry, stakeholder groups, and the general public. Council staff provided outstanding technical support throughout the process. A special thanks to Brandon Muffley who guided the SSC's work before, during, and after the meeting. Within the SSC, Thomas Miller's leadership on the Harvest Control Rule was a significant factor in the success of the working group's review. I thank SSC members and Council staff for their comments on an earlier draft of this report.

All documents referenced in this report can be accessed via the SSC's meeting website https://www.mafmc.org/ssc-meetings/2022/may 10-11. A comprehensive guide to the acronyms in this report may be found in Attachment 3.

Harvest Control Rule

As noted in the March 2022 SSC meeting report:

"The HCR amendment is a complex set of measures designed to regulate recreational harvest of summer flounder, scup, black sea bass, and bluefish. The overall objective is to prevent overfishing by employing controls that account for stock status and its uncertainty. To the extent possible the measures are to be governed by angler preferences and a desire for stability of measures across jurisdictions and over time."

The Council's request to the SSC is stated below:

> *Request that the SSC provide a qualitative evaluation, in time for final action at the June 2022 Council/Policy Board meeting, regarding the potential effect of each of the five primary alternatives in the Harvest Control Rule Addendum/Framework on the SSC's assessment and application of risk and uncertainty in determining ABCs. The intent is to provide the Council and Policy Board with information to consider the tradeoffs among*

the different alternatives with respect to the relative risk of overfishing, increasing uncertainty, fishery stability, and the likelihood of reaching/remaining at Bmsy for each approach at different biomass levels (e.g., for ½ Bmsy < B < Bmsy, the relative risk among alternatives is (highest to lowest) E > C > B > A>D).

A subcommittee consisting of Tom Miller (chair), Lee Anderson, Cynthia Jones, Paul Rago, Brian Rothschild, and Alexei Sharov met three times to discuss the SSC response and draft a summary report. All meetings were open to the public. This report was made available to all SSC members prior to the meeting.

The report is structured to address four key questions:

- What is the impact of the proposed Addendum / Framework on the SSC's assessment and application of risk and uncertainty in determining ABCs?
- Does the proposed Addendum / Framework represent a Harvest Control Rule?
- What are some of the implications of the proposed Addendum / Framework?
- What are the benefits and challenges of each proposed action within the proposed Addendum / Framework?

During the meeting this draft served as a template for discussions. Changes to the document were made by Tom Miller as the topics were discussed. As such, the subcommittee's final report captures all of the comments made by the committee and will not be repeated here. The Executive Summary provides an overview of the primary conclusions of the SSC.

Overview of *Illex* Research Track Stock Assessment

The recently completed Research Track Assessment for *Illex* included a number of scientific advances that could improve future management of *Illex*. The SSC received an overview of these advances via presentations from Lisa Hendrickson, NEFSC, Sarah Salois, NEFSC, and John Manderson, Open Ocean Research. The purpose of these presentations was to introduce the SSC to these improvements before Management Track Assessments later this year and to lay the basis for potential changes in future *Illex* assessments.

Lisa Hendrickson reported on various analyses of biological samples collected by industry. Analyses included age estimation, sex and maturity status, and micro-element analysis of transects along statoliths. Samples were collected between May to October in 2019 and 2020. Samples were aged using funding from both NEFSC and the Council. A total of 725 squid were aged; although total numbers are modest by finfish standards, these data represent one of the largest samples of *Illex* aging in the world. The spring-summer fishery is primarily supported by recruits born between November and April. Post fishery samples from October indicated these squid were born between May and July of the same year. A post-doctoral fellow, Jessica Jones analyzed strontium, calcium, and other elements along statolith transects. The ultimate aim of this research is to help distinguish among seasonal cohorts and possibly identify spawning areas and times. Results of these research efforts will be prepared for publication in the scientific literature.

Sarah Salois summarized work conducted by the "Squid Squad", a group of oceanographers, biologists, commercial fishers and processors who met weekly during 2021 and 2022 to highlight potential oceanographic features influencing availability of *Illex* to fishing areas on the shelf break. The group developed a useful general framework for testing hypotheses about oceanographic processes and squid availability. Ultimately it is hoped that these insights will support real-time forecasts of *Illex* availability for management. Key factors include the dynamics of ocean fronts, the frequency and attributes of warm core rings, bottom temperatures and composition of slope water. This hypothesis framework aids in development of Generalized Additive Models (GAM).

One of the factors hampering application of assessment models is the dynamic nature of seasonal migration patterns into and out of the fishing area. John Manderson highlighted his recent work to apply a Generalized Depletion Model (GDM) to *Illex*. The GDM was developed and first applied to squid fisheries in the Falkland Islands (Roa-Ureta 2012)[1]. An important feature of the GDM is that it allows for differences among fleets and migrations. Migrations are characterized by pulses of recruits to and from the fishing area during the fishing season. Pulses are currently identified based on abrupt changes in catch per unit effort (CPUE). Future refinements of the model could ultimately allow inclusion of other information, such as seasonal length and weight frequencies.

The SSC appreciated the information provided by the assessment team and looks forward to the final reports from the RTA.

Overview of Butterfish Research Track Stock Assessment

Scientific advances in the Research Track Assessment for Butterfish included extensive consideration of the influence of environmental and ecosystem factors on population dynamics, and the application of a state space modeling approach. Laurel Smith and Charles Adams, both NEFSC, provided detailed summaries of these advances.

Laurel Smith provided an overview of a number of working papers on ecosystem factors. Changes in decadal patterns of spatial distribution were explained in part by bottom and surface temperatures and bottom type. Sources of natural mortality include marine mammals, birds, and fish were low relative to overall Butterfish catch rates. Estimated total consumption by seals was less than 9% of total commercial catch. Consumption of Butterfish by seabirds is negligible based on available data. Average consumption of butterfish by other fish species was about 3,300 mt but ranged up to 30,000 mt.

Condition factor of Butterfish and many other species dropped markedly around 2000 and

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[1] Roa-Ureta, R.H. 2012 Modelling in-season pulses of recruitment and hyperstability-hyperdepletion in the *Loligo gahi* fishery around the Falkland Islands with generalized depletion models. ICES Journal of Mar. Sci. 69:1403-1415.

remained low for about a decade. Changes in the relative abundance of small vs large copepods showed a similar pattern and may be responsible for the temporal changes in condition.

In the Mid-Atlantic, the Butterfish assessment will be the first to use a state-space model to characterize stock status. Butterfish have a very high natural mortality rate (M~1.0) State-space models use the same basic equations as age-structured models but treat parameters as unobserved states with variance over time. This allows parameters to vary over time while simultaneously estimating fewer parameters. The new Woods Hole Assessment Model (WHAM) can implement random effects for interannual transitions in numbers at age, natural mortality and selectivity. These changes result in realistic increases in uncertainty; state space models often have reduced retrospective patterns.

SSC members commented on the very high Fmsy proxy (>6/yr) estimated by the WHAM model. Dr. Adams explained that this was due to the very young age at maturity (~0.7 years) and the selectivity pattern of the fishery. The force of mortality on an age group is the product of the maximum F and the selectivity at age. The WHAM model uses two selectivity stanzas that begin in 1989 and 2014, respectively. Selectivity estimates may vary as additional years of data are added to the relatively short second stanza. The SSC commented that the so-called 2/3 M rule developed via a meta analysis by Patterson did consider a number of small pelagic fishes that had collapsed. The realism of the high reference point in the WHAM model will be considered by the SSC when it receives results of the upcoming Management Track Assessment for Butterfish.

The SSC sought clarification about differences between WHAM and ASAP model runs. One of the notable features of WHAM is the ability to use autoregressive models for recruitment. This is a commonly observed property of historic recruitment estimates for Mid-Atlantic stocks. The SSC will revisit the comparisons between WHAM and ASAP models when it reviews the results of the Management Track Assessment for Butterfish later this year.

Ecosystem and Socio-Economic Profiles for Stock Assessments

NEFSC scientists Scott Large, Abby Tyrell, Ricky Tabandera led a discussion on Ecosystem and Socio-Economic Profiles (ESP) for Stock Assessments. ESPs are viewed as a way of operationalizing the results of the State of the Ecosystem (SOE) report and stock assessments. Key features of ESP include leveraging of knowledge pathways, inclusion of a broad range of factors, standardized reporting of results and transparency (data, algorithms, availability). The ESP development begins with a problem statement followed by a conceptual model. Suitable indicators are identified and analyzed to develop summary recommendations. An example application of ESPs to Sablefish in the Pacific was presented.

The SSC inquired about specific examples of problem statements. Reference point selection for Atlantic mackerel was considered as an example. Analyses of the utility of using patterns for multiple species to strengthen inferences about single species was also suggested by the SSC.

SSC encouraged future work on ESP and looked forward to receiving applications to Mid-Atlantic stock assessments currently being developed for Bluefish, Black Sea Bass, and Atlantic Mackerel.

Atlantic Surfclam and Ocean Quahog

Jessica Coakley, MAFMC, provided an overview of current landings patterns and issues of concern from the Advisory Panel for each species. Catches of both Atlantic Surfclam and Ocean Quahog continue to be well below the current quotas and both fisheries' footprints have been moving to the north and east over the past decades. LPUE trends for Ocean Quahog have been relatively stable, but Atlantic Surfclam LPUEs have shown steady declines as the overall stock approaches Bmsy levels. Catches of Surfclams on Georges Bank and in Southern New England constitute an increasing fraction of landings since 2011. The Advisory Panel noted the need for updated regulations on Georges Bank consistent with new FDA guidelines. The Advisory Panel also requested Council action and research on access to Nantucket Shoals and Great South Channel. Joint action with the New England Fishery Management Council would be desirable.

Previous model results for Ocean Quahog suggest stable abundance trends at about two times Bmsy since 1980. Overall LPUE trend supports this result although like Atlantic Surfclams, fishing patterns have shifted northward and eastward over time.

The SSC commented on increased Surfclam catches in the Southern Virginia area. Dan Hennen, NEFSC, noted that this trend is likely to be short-lived, owing to increased temperature in recent decades. Concerns about future effects of wind energy development were also expressed. Continued patterns of landings below the ABCs sparked a discussion on the definition of "optimum yield" but no conclusions were drawn.

Catches for Atlantic Surfclams and Ocean Quahogs were updated but no new fishery independent data were available for either species. Per the most recent benchmark assessment neither stock is overfished and overfishing is not occurring. Catches continued to be below existing quotas. Council staff recommended no changes to the existing ABCs. **The SSC recommended continuation of previously approved quotas for 2023. These are 42,237 mt for Atlantic Surfclams and 44,082 for Ocean Quahogs.**

Longfin Squid

Jason Didden, MAFMC, summarized 2021 landings and bottom trawl survey indices from NEFSC. Both fall and spring bottom trawl survey indices for Longfin Squid were above averages for the last 10 years. Catches have been well below the TAC since 2000. Prices dropped sharply in 2020 due to lower demand, rebounded in 2021 but remained well below peak prices in 2019. Landings in 2022 thus far are above comparable estimates in 2021 but remain well below the first trimester cap. Harvesters reported high fuel prices are likely to reduce effort. Concerns about pending turtle bycatch measures, exclusion from future wind energy areas, and potential changes in stock assessment methodology were expressed by the Advisory Panel.

SSC members inquired about the status of the next Research Track Assessment for Longfin Squid (Spring 2026). A representative from the public noted that examination of new assessment methods prior to that would be desirable. The SSC noted that improved, higher frequency data collections and processing of biological samples should begin now to lay the basis for the next RTA.

No compelling evidence was provided to adjust the previously approved ABC. **The SSC recommended continuation of previously approved Longfin Squid quota of 23,400 mt for 2023.**

Chub Mackerel

Julia Beaty, MAFMC, opened with a summary of recent recreational and commercial catches. Total catches were well below the current ABC of 2,300 mt, but recreational catches have been increasing. This may be due to ongoing efforts to improve identification of the Chub Mackerel by APAIS staff. Chub Mackerel remain a relatively rare species in angler intercept surveys and precision of estimates is low.

There are no quantitative assessments of Chub Mackerel in the Mid-Atlantic or adjacent regions. Stock status is unknown, but since 2018 the SSC has assumed that this relatively unfished stock is at or above Bmsy. Monitoring of commercial landings for length and age composition is ongoing but there are no fishery-independent indices of relative abundance. Commercial landings come primarily from vessels targeting *Illex* squid near the shelf break. Chub Mackerel are occasionally targeted when economic factors are favorable (e.g., low *Illex* availability, high Chub Mackerel prices). No unusual patterns were reported for 2021. Advisory Panel members reported increasing prevalence, perhaps due to climate change. Council staff recommended a continuation of the current ABC for 2023 to 2025.

The SSC noted that despite the paucity of data and lack of assessment methodology, reviews of assessments and basic biological data for other Chub Mackerel stocks and similar species stocks could lay a basis for future assessments. Continuation of research programs to monitor commercial landings was encouraged. A member of the public also commented on the utility of fishery dependent data collection programs.

Following the presentation and general discussion, the SSC addressed the Terms of Reference (standard font) for Chub Mackerel Responses by the SSC (*italics*) to the Terms of Reference provided by the MAFMC are as follows:

Terms of Reference

For Chub Mackerel, the SSC will provide a written report that identifies the following for the 2023-2025 fishing years:

1) The level of catch, in weight, associated with the acceptable biological catch (ABC) for the stock. Provide any rationale for the specified ABC and, if possible, identify any interim metrics that can be examined to determine if multi-year specifications need reconsideration prior to their expiration;

   The SSC recommends 2,300 mt (= 5.07 million pounds) as ABC be continued for fishing years 2023-2025. This value reflects limited new information available to the SSC to justify any change in ABC, and the low landings in both commercial and recreational sectors since 2017. This value does not exceed the observed highest catch in the fishery (2013). The expert judgment of the SSC is that this level of catch is unlikely to result in overfishing given the general productivity of this species in fisheries throughout the world, combined with the relatively low fishery capacity in our region.

2) The most significant sources of scientific uncertainty associated with determination of the ABC;
   - *Stock size and productivity cannot be determined, there is no information to determine reference points for stock biomass levels, and little information exists to determine reference points for fishing mortality rates.*
   - *Low levels of landings curtails the quantity and quality of fishery-dependent data.*
   - *Public outreach efforts may have led to improved identification of scombrids in recreational catches, possibly altering catch estimates.*
   - *There is a perception that climate change may be altering patterns of availability of Chub Mackerel.*
   - *There is no information about the source of recruits; it is unknown whether Chub Mackerel are episodic in the Mid-Atlantic, whether this is a range expansion with localized spawning, or neither. Early life stages of this species are found in the Gulf of Mexico, South Atlantic and Mid-Atlantic, suggesting a broad distribution. However, stock structure is poorly described.*
   - *There is no information on predation mortality, and limited information on the role of Chub Mackerel in predator diets.*
     - Council-funded study on predator diets: chub mackerel were determined to be an exceptionally small component of the diets of tunas and marlins (Golet work)
   - *There is very high uncertainty in recreational landings and discards.*
   - *Observer coverage on fisheries likely to catch Chub Mackerel may be low (Illex fleet, Mid-Atlantic small mesh bottom trawl).*

3) Research or monitoring recommendations that would reduce the scientific uncertainty in the ABC recommendation;

- *The SSC requests specific data collection in association with this species to support future ABC specification. Limited fishery-dependent data on age and size distributions are available. However, the limited commercial harvests since 2017 have reduced sampling. The SSC would benefit from improved data on catch, age and length composition and effort in the directed Chub Mackerel fishery. An expanded fishery would allow for the collection of more information on how this stock responds to fishing in our region – but the data do not suggest the fishery is currently constrained by the ABC.*
- *Comprehensive analysis of spatial (and temporal) patterns in catch from all sources – commercial and recreational catches, observer data – could lead to improved understanding of population variability.*
- *We lack a fishery independent survey. The feasibility of acoustic surveys for Chub Mackerel (and other pelagic species) should be explored.*
- *Aging precision and validation.*
- *Consider a synthesis of survey data in the Mid-Atlantic, South Atlantic and Gulf of Mexico (such as EcoMon) on early life history stages to assess density and distribution of Chub Mackerel as a first step in an evaluation of whether egg production methodologies could provide a foundation for reference point determination.*
- *Synthesis of stock structure and dynamics of other Chub Mackerel stocks and stocks of related scombrid species, such as listed in the supplemental documents, to evaluate feasible assessment approaches and evaluate fished stock dynamics. Explore whether existing ecosystem models (e.g., Buchheister et al. 2017) may provide indications of potential ranges of population biomass and mortality rates.*
- *Information on Chub Mackerel diet that may help establish links to ecosystem productivity to assess potential stock productivity.*

4) The materials considered by the SSC in reaching its recommendations;

- *Staff memo: 2023-2025 ABC Recommendations and Considerations*
- *2022 Chub Mackerel Advisory Panel Fishery Performance Report*
- *2022 Chub Mackerel Fishery Information Document*
- *Supplementary materials from SSC meeting web site*
    - *Stock Assessment and Fishery Evaluation (SAFE) Document for Pacific Council Coastal Pelagic Species FMP*
    - *Pacific mackerel stock assessment June 2019*
    - *ICES Workshops on Chub Mackerel: Workshop 1 (2020), Workshop 2 (2021)*
    - *FAO Summary of Atlantic Chub Mackerel Landings by Region, 2010-2019 (see Table B-37, page 324; Source: FAO 2019 Yearbook of Fishery and Aquaculture Statistics)*
    - *Characterization of the Atlantic Chub Mackerel Fishery and Stock, Robert Leaf, University of Southern Mississippi (2020)*
    - *Age and Growth of Atlantic Chub Mackerel (Scomber colias) in the Northwest Atlantic (Daley and Leaf, 2019)*
    - *Chub Mackerel Literature Review (2017)*
    - *NEFSC survey data on chub mackerel (2017)*

5) A conclusion that the recommendations provided by the SSC are based on scientific information the SSC believes meets the applicable National Standard guidelines for best scientific information available.

The SSC believes that the recommendations provided are based on scientific information that meets the applicable National Standard guidelines for best scientific information available.

Guidance and Approaches for Constant/Average ABC Calculations

Multi-year catch limits based on constant catches are often considered desirable by both managers and industry. The Mid-Atlantic Fishery Management Council has requested consideration of multi-year specifications based on average catches for a number of stocks. At the July 21-23, 2021 meeting of the SSC, two Council members proposed average catch options could not be considered because the average ABC catch policy resulted in P* values above 0.5 over the specification period. P* is the probability of a given quota exceeding the overfishing threshold. The Council requested that the SSC develop an alternative process to apply during these situations that would allow the SSC to still provide constant ABC recommendations.

The SSC formed a small team to address the technical basis of this impediment and to seek clarification of applicable policy constraints related to the Council's Risk Policy. Michael Wilberg presented an overview of recommendations from a subgroup that also included Brandon Muffley and Paul Rago.

Potential options for addressing the Council's request include continuation of the status quo, developing a new optimization approach, or using a single year projection to set catches for a multiyear specification procedure. Continuation of the status quo approach would result in rejection of any policy that resulted in a P* greater than 0.5. The optimization approach would build on a method outlined in a white paper prepared by Paul Rago. The method entails using a constrained nonlinear optimization that maximizes average ABC over the specification period, subject to constraints imposed by the Council's Risk Policy. Unpublished simulation studies by Wilberg in support of the Wiedenmann et al (2017) paper have shown that the use of single year projection to characterize a multiyear quota yield results comparable to quotas based on multi-year projections.

Irrespective of the approach selected, a common set of code was recommended for use by analysts. The current approach is time consuming and can be error prone when multiple scenarios are under consideration. The SSC encouraged the development of common code for application all P* calculations for both AgePro and WHAM applications. Work with the NEFSC to link existing software with new R code "wrappers" was suggested as a way forward.

The SSC noted that multi-year projections are often overly optimistic because recruitment tends to be overly estimated, especially when contemporary levels are low. For short term projections, the implications of future recruitment are less important. Instead, current stock structure, particularly when strong year classes are present, should be factored into multi-year projections. Hence multi-year projections based on single year projection were considered less useful and not recommended for general application.

The SSC recommended consultation with other Councils' SSCs for their multi-year forecast practices, a review of previous applications by the SSC, development of new software in collaboration with the NEFSC to automate the process, and obtaining additional policy guidance from the Council and GARFO on admissible risk constraints.

Other Business

The Scientific Coordination Subcommittee will be hosting a workshop of the Fishery Management Council's Scientific and Statistical Committees August 15th-17th in Sitka, Alaska. Sarah Gaichas will be presenting a keynote address. The focus of the meeting will be inclusion of ecosystem information in stock assessments. In addition to Brandon Muffley, the following SSC members will be attending: Olaf Jensen, Yan Jiao, and Alexei Sharov.

The July 25-26 meeting of the SSC will be a hybrid meeting in Baltimore.

Attachment 1

Mid-Atlantic Fishery Management Council

Scientific and Statistical Committee Meeting

May 10 – 11, 2022

UPDATE: Due to recent Covid developments, the meeting will now be 100% virtual with no in-person participation

Hybrid Meeting:
Royal Sonesta Harbor Court Baltimore (550 Light Street, Baltimore, MD 21202)
or via Webex webinar

This meeting will be conducted as a hybrid meeting. SSC members, other invited meeting participants, and members of the public will have the option to participate in person at the Royal Sonesta Baltimore or virtually via Webex webinar. Webinar connection instructions and briefing materials will be available at Council's website: https://www.mafmc.org/council-events/2022/may-2022-ssc-meeting

AGENDA

Tuesday, May 10, 2022

12:30 Welcome/Overview of meeting agenda (P. Rago)

12:35 SSC guidance on the Recreational Harvest Control Rule Framework/Addenda
- Review draft response document developed by SSC HCR sub-group (T. Miller)
- SSC feedback and input on document for consideration by Council

2:00 Break

2:15 Introductory overview of *Illex* Research Track stock assessment information
- Age, length, intra-annual cohort identification and preliminary trace elemental analysis results (L. Hendrickson)
- Oceanographic indictors for *Illex* in Northwest Atlantic (S. Salois)
- Generalized depletion modeling of *Illex* fishery (J. Manderson)

3:15 Introductory overview of Butterfish Research Track assessment information

- Butterfish condition, environmental drivers, and consumptive removals (L. Smith)
- Introduction to WHAM – application to Butterfish, comparison to ASAP, and other considerations (C. Adams)

4:15 Break

4:30 Ecosystem and Socio-Economic Profiles (ESP) for stock assessments (S. Large)

- Overview of ESPs – process, content, application
- Draft examples for bluefish and black sea bass

5:30 Adjourn

<u>Wednesday, May 11, 2022</u>

8:30 Atlantic Surfclam and Ocean Quahog data and fishery update: review of previously recommended 2023 ABC (J. Coakley)

9:30 Longfin squid data and fishery update: review of previously recommended 2023 ABC (J. Didden)

10:15 Break

10:30 Chub Mackerel ABC specifications for 2023-2025 fishing years

- Review of staff memo and 2023-2025 ABC recommendations (J. Beaty)
- 2023-2025 SSC ABC recommendations (G. Fay)

12:00 Guidance and approaches for constant/average ABC calculations

- Review draft approach developed by SSC sub-group
- SSC input and feedback for Council consideration

12:45 Other Business

1:00 Adjourn

Note: agenda topic times are approximate and subject to change

Attachment 2

MAFMC Scientific and Statistical Committee

May 10-11, 2022

Meeting Attendance via Webinar

Name	Affiliation
SSC Members in Attendance:	
Paul Rago (SSC Chairman)	NOAA Fisheries (retired)
Tom Miller	University of Maryland – CBL
Ed Houde	University of Maryland – CBL (emeritus)
Dave Secor	University of Maryland – CBL
John Boreman	NOAA Fisheries (retired)
Lee Anderson	University of Delaware (emeritus)
Jorge Holzer (May 10th only)	University of Maryland
Yan Jiao	Virginia Tech University
Rob Latour	Virginia Institute of Marine Science
Brian Rothschild	Univ. of Massachusetts-Dartmouth (emeritus)
Olaf Jensen	U. of Wisconsin-Madison
Sarah Gaichas	NOAA Fisheries NEFSC
Wendy Gabriel	NOAA Fisheries (retired)
Mike Wilberg (Vice-Chairman)	University of Maryland – CBL
Cynthia Jones	Old Dominion University
Gavin Fay	U. Massachusetts-Dartmouth
Alexei Sharov	Maryland Dept. of Natural Resources
Geret DePiper	NOAA Fisheries NEFSC
Mike Frisk	Stony Brook University
Mark Holliday	NOAA Fisheries (retired)
Others in attendance (only includes presenters and members of public who spoke):	
Kiersten Curti (May 10th only)	NEFSC
Jason Didden	MAFMC staff
Brandon Muffley	MAFMC staff
Julia Beaty	MAFMC staff
Jeff Kaelin	Lund's Fisheries
Jessica Coakley	MAFMC staff
Chuck Adams	NEFSC
Lisa Hendrickson (May 10th only)	NEFSC
John Manderson (May10th only)	Open Ocean Research
Michelle Duval	MAFMC
Abby Tyrell (May 10th only)	NEFSC
Scott Large (May 10th only)	NEFSC
Dan Hennen (May 11th only)	NEFSC
Sarah Salois (May 10th only)	NEFSC
Ricky Tabandera (May 10th only)	NEFSC
Laurel Smith (May 10th only)	NEFSC

Attachment 3. Glossary

ABC—Acceptable Biological Catch
AIC—Akaike's Information Criterion
Bmsy—Biomass at maximum sustainable yield
CV—Coefficient of Variation
DFO—Department of Fisheries and Oceans, Canada
ESP—Ecosystem and Socio-economic Profiles
EAFM—Ecosystem Approach to Fisheries Management
F—Instantaneous rate of fishing mortality
FDA—Food and Drug Administration
GARFO—Greater Atlantic Region Fisheries Office
HCR—Harvest Control Rule
MRIP—Marine Recreational Information Program
MTA—Management Track Assessment
MSC—Marine Stewardship Council
MSE—Management Strategy Evaluation
OFL—Overfishing Limit
P*—Probability of overfishing
RHL—Recreational Harvest Limit
RSA—Research Set Aside
RSC—Research Steering Committee
RTA—Research Track Assessment
R/V—Research Vessel
SSBmsy—Spawning stock biomass at maximum sustainable yield
SSC—Scientific and Statistical Committee

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 27, 2022

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 June 2022 Council Meeting:

1. 2022 Planned Meeting Topics
2. May 2022 CCC Meeting Agenda
3. May 2022 CCC Meeting Motions
4. May 2022 CCC Meeting Report
5. Email to Paul Doremus (NMFS): USFWS Squid Export Issue
6. Spring 2022 NRCC Meeting Agenda
7. Staff Memo: Sea Turtle Bycatch in Trawl Fisheries
8. Comments from Seafreeze, Ltd: Sea Turtle Bycatch Reduction in Trawl Fisheries
9. Excerpt from NRCC Port Biological Sampling Presentation (full presentation available here)
10. GARFO Habitat and Ecosystem Services Division Update
11. Fact Sheet: Revised Commercial and Recreational Allocations of Summer Flounder, Scup, and Black Sea Bass
12. Staff Memo: Offshore Wind Updates
13. NEFMC and MAFMC Letter to BOEM Re: Survey Mitigation Strategy (5/6/22)
14. NEFMC and MAFMC Letter to USFWS Re: Dogfish Proposed CITES Listing (5/9/22)
15. Staff Memo: NMFS Draft Climate Regional Action Plan

2022 Planned Council Meeting Topics

Updated: 5/24/22

June 7-9, 2022 Council Meeting - Riverhead, NY

- Recreational Harvest Control Rule Framework/Addenda: Final Action (with ASMFC Policy Board)
- 2023-2025 Chub Mackerel Specifications: Approve
- Mackerel Rebuilding 2.0 Amendment (includes RH/S cap and 2023-2025 Mackerel Specifications): Final Action
- 2023 Longfin Squid Specifications: Review
- 2023 Atlantic Surfclam and Ocean Quahog Specifications: Review
- Aquaculture Policy: Review and Approve
- Research Set-Aside Program Redevelopment: Review Committee Recommendations and Consider Council Action
- Habitat Activities Update (including aquaculture and a preview of Northeast Regional Habitat Assessment products)
- Unmanaged Commercial Landings Report
- Atlantic Large Whale Take Reduction Plan Phase II: Update and Feedback
- EAFM Summer Flounder Management Strategy Evaluation: Model Development and Outputs
- Review spatial revenue analyses from NEFSC related to river herring and shad bycatch
- Atlantic Sturgeon Bycatch Draft Action Plan
- NOAA Fisheries Equity and Environmental Justice Strategy Presentation
- New Jersey Ocean Acidification Monitoring Network Presentation

August 8-11, 2022 Council Meeting - Philadelphia, PA

- 2023 Summer Flounder, Scup, and Black Sea Bass Specifications and Commercial Measures: Review (Joint with ASMFC SFSBSB Board)
- 2023 Bluefish Specifications and Recreational Management Measures: Review (Joint with ASMFC Bluefish Board)
- EAFM Summer Flounder Management Strategy Evaluation: Final Results and Recommendations (Joint with ASMFC SFSBSB Board)
- Evaluation of Commercial Scup Discards and Gear Restricted Areas: Review
- Recreational Reform Initiative Technical Guidance Document: Discuss Next Steps (Joint with ASMFC Policy Board)
- Recreational Sector Separation and Catch Accounting Amendment: Discuss Next Steps (Joint with ASMFC Policy Board)
- 2023 Illex Specifications: Approve
- 2023-2024 Butterfish Specifications: Approve
- Offshore Wind Updates
- Climate Change Scenario Planning: Review Scenario Creation Workshop Outcomes and Draft Scenarios

October 4-6, 2022 Council Meeting - Dewey Beach, DE

- 2023 Implementation Plan: Review Draft (Executive Committee)
- Atlantic Surfclam and Ocean Quahog Species Separation Requirements Amendment: Approve Alternatives for Public Hearing Document
- Ocean City Video Project: Review Results
- Private Recreational Tilefish Permitting and Reporting: Review Performance
- Joint Council-SSC Meeting
- Essential Fish Habitat Redo: Initiate Amendment
- Climate Change Scenario Planning: Review Final Scenarios and Discuss Applications~~Generate Recommendations~~
- Robert's Rules of Order Training

December 12-15, 2022 Council Meeting - Annapolis, MD

- 2023 Implementation Plan: Approve
- 2023~~-2026~~ Spiny Dogfish Specifications: Approve
- 2023 Recreational Management Measures for Summer Flounder, Scup, and Black Sea Bass: Approve (Joint with ASMFC SFSBSB Board)
- Recreational Reform Initiative Technical Guidance Document: Review Draft (Joint with ASMFC Policy Board)
- Recreational Sector Separation and Catch Accounting Amendment: Approve Scoping Document (Joint with ASMFC Policy Board)
- Atlantic Surfclam and Ocean Quahog Species Separation Requirements Amendment: Final Action
- EAFM Risk Assessment Comprehensive Review: Update
- Habitat Activities Update (Including Aquaculture)
- Offshore Wind Updates

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

2022 Council Meeting Topics At-a-Glance

	June	August	October	December
Mackerel, Squid, Butterfish *and* **River Herring and Shad (RH/S)**	• 2023-2025 Chub Mackerel Specs • 2023 Longfin Squid Specs – Review • RH/S Spatial/ Temporal Analyses • Mackerel Rebuilding 2.0 Amd: Final Action	• 2023 Illex Specs Review • 2023-2024 Butterfish Specs		
Recreational Reform	• Rec HCR FW/ Addenda: Final Action	• Rec Reform Technical Guidance Doc: Discuss • Rec Sector Separation and Catch Accounting Amd: Discuss		• Rec Reform Technical Guidance Doc: Review Draft • Rec Sector Separation and Catch Accounting Amd: Approve Scoping Doc
Summer Flounder, Scup, Black Sea Bass (SF/S/BSB)		• SF/S/BSB 2023 Specs Review • Commercial Scup Discards and GRAs: Review		• SF/S/BSB 2023 Rec Mgmt Measures
Bluefish		• Bluefish 2023 Specs and Rec Mgmt Measures Review		
Tilefish			• Private Tilefish Permitting/ Reporting Update	
Atlantic Surfclam and Ocean Quahog (SC/OQ)	• SC/OQ 2023 Specs Review		• SC/OQ Species Separation Amd: Approve Public Hearing Doc	• SC/OQ Species Separation Amd: Final Action
Spiny Dogfish				• 2023 Dogfish Specs
Science Issues	• RSA Redevelopment: Final Action		• Joint Council-SSC Meeting • Ocean City Video Project: Review Results	
EAFM	EAFM Summer Flounder MSE: Model Development and Outputs	• EAFM Summer Flounder MSE: Review Final Results		• EAFM Risk Assessment Comprehensive Review: Update
Habitat, Aquaculture, Wind	• Habitat Update • Aquaculture Policy: Approve	• Offshore Wind Update	• EFH Redo Amd: Initiate	• Habitat Update • Offshore Wind Update
Protected Resources	• Atlantic Large Whale Take Reduction Plan Phase II • Atlantic Sturgeon Bycatch Draft Action Plan			
Other	• Unmanaged Commercial Landings Report • NOAA Fisheries Equity and Environmental Justice Strategy Presentation	• Climate Change Scenario Planning: Review Draft Scenarios	• 2023 Implementation Plan: Draft Deliverables • Climate Change Scenario Planning: Final Scenarios and Recommendations	• 2023 Implementation Plan: Approve

	June	August	October	December
	• New Jersey Ocean Acidification Monitoring Network Presentation			

Acronyms/Abbreviations

Amd	Amendment	MSE	Management Strategy Evaluation
EAFM	Ecosystem Approach to Fisheries Management	Rec	Recreational
FW	Framework	RH/S	River Herring and Shad
GRAs	Gear Restricted Areas	SC/OQ	Atlantic Surfclam and Ocean Quahog
HCR	Harvest Control Rule	SF/S/BSB	Summer Flounder, Scup, Black Sea Bass
Mgmt	Management	Specs	Specifications
MSB	Mackerel, Squid, Butterfish	SSC	Scientific and Statistical Committee

Actions Referenced in this Document

- **Mackerel Rebuilding 2.0 Amd:** Atlantic Mackerel Rebuilding 2.0 Amendment
- **Rec HCR FW/ Addenda:** Recreational Harvest Control Rule Framework/Addenda
- **Rec Reform Technical Guidance Doc**: Recreational Reform Initiative Technical Guidance Document
- **Rec Sector Separation and Catch Accounting Amd:** Recreational Sector Separation and Catch Accounting Amendment
- **SC/OQ Species Separation Amendment:** Atlantic Surfclam and Ocean Quahog Species Separation Requirements Amendment

5/11/22

Council Coordination Committee Meeting
May 17-19, 2022

The Annapolis Waterfront Hotel
80 Compromise Street, Annapolis, MD 21401

AGENDA

Tuesday, May 17, 2022 • Webinar: Register for Day 1	
1:00 – 1:30	Opening of Meeting • Welcome and Introduction (Mike Luisi/Janet Coit) • Approval of Agenda • Mid-Atlantic Fisheries Highlight (Mike Luisi)
1:30 – 2:45	NOAA Fisheries Update and FY 22/23 Priorities (Janet Coit/Kelly Denit) • Electronic Monitoring Information Law Procedural Directive • Update on National Standard 1 (NS1) Technical Guidance Workgroups • Follow up on Council EO 13921 Recommendations • BSIA Regional Framework Update • Status of Regional Recusal Determination Handbooks and Webpages • Other
2:45 – 3:00	**Break**
3:00 – 3:30	Budget and Council Funding Update (Paul Doremus)
3:30 – 4:30	NOAA Fisheries Science Updates (Jon Hare) • Next Generation Data Acquisition Plan • Other
4:30 – 5:00	Legislative Outlook • Legislative Update (Dave Whaley) • Legislative Work Group Report (Tom Nies)
5:00 – 5:15	Public Comment
5:15	**Adjourn for the day**

Wednesday, May 18, 2022 • Webinar: Register for Day 2	
9:00 – 10:45	Climate Change and Fisheries • East Coast Scenario Planning Initiative – Update (Kiley Dancy) • Pacific Council Scenario Planning – Lessons Learned (Merrick Burden) • North Pacific Council Climate Change Taskforce – Update (Bill Tweit) • NOAA Fisheries Climate Change Initiatives (Kelly Denit)
10:45 – 11:00	**Break**
11:00 – 12:00	America the Beautiful/Area-Based Management • CCC Area Based Management Subcommittee Update (Eric Reid) - Draft report and maps of existing fishery conservation areas • NOAA Fisheries Update (Samuel Rauch)

12:00 – 1:30	**Lunch on your own**
1:30 – 2:30	Recreational Fisheries Management • Report from 2022 National Saltwater Recreational Fisheries Summit (Russel Dunn) • Brief presentations on recreational-related Council actions and projects of interest - MAFMC Recreational Reform Initiative (Julia Beaty) - North Pacific Council halibut allocation update (Bill Tweit)
2:30 – 3:30	Management Strategy Evaluations • Use of MSEs by the Councils and NOAA Fisheries (Brandon Muffley, Jon Hare) • Discussion: How were the outcomes of MSEs used in management? What lessons were learned, from a process or fisheries management perspective?
3:30 – 3:45	**Break**
3:45 – 4:45	National Seafood Strategy (Paul Doremus) • Update on NOAA Fisheries National Seafood Strategy Other Issues (Kitty Simonds) • Responding to misinformation or mischaracterizations of U.S. fisheries by third-party certification programs or other organizations
4:45 – 5:00	Public Comment
5:00	**Adjourn for the Day**

Thursday, May 19, 2022 • Webinar: Register for Day 3	
9:00 – 10:00	Environmental Justice • CCC Environmental Justice Work Group Report (Jose Montanez/Maria Carnevale) • Update on NOAA Fisheries environmental justice initiatives (Samuel Rauch)
10:00 – 10:30	International Affairs (Alexa Cole) • Report on NOAA Fisheries involvement in international fisheries issues
10:30 – 10:45	**Break**
10:45 – 11:15	Integration of ESA Section 7 with MSA (Sam Rauch) • Follow up from January meeting regarding implementation of Policy Directive 01-117 and opportunities to improve coordination between Councils and NOAA Fisheries
11:15 – 11:45	CCC Committees/Work Group Reports • Council Member Ongoing Development Work Group (Tom Nies) • Scientific Coordination Subcommittee (David Witherell) • Habitat Work Group (Jessica Coakley) • Communications Work Group (Mary Sabo)
11:45 – 12:00	Public Comment
12:00 – 1:00	Wrap up and Other Business • CCC Outcomes and Recommendations • Future Meeting Planning
1:00	**Adjourn Meeting**

May 2022 CCC Meeting Motions

Legislative Work Group

The CCC approves the updated Forage Fish consensus statement prepared by the Legislative Work Group.
Reid/Tweit
Motion carries by consent

Climate Change

Move to recommend that NOAA Fisheries postpone further development of the Council Governance Policy until after completion of the East Coast Climate Change Scenario Planning Initiative.
Moore/Nies
Motion carries unanimously with no abstentions

America the Beautiful/Area-Based Management

I move that the CCC request that NOAA Fisheries provide special funding, as soon as possible, to contract GIS work needed to consolidate and complete the work of the ABM/ATB Subcommittee.
Tweit/Gorelnik
Motion carries by unanimous consent

I move that NOAA convene a meeting with CEQ and the CCC Subcommittee representatives (Eric Reid, David Witherell, Mike Luisi) to discuss the draft report in time to be used in development and deliberation of the definition of 'conservation'.
Reid/Hanke
Motion carries by unanimous consent

Environmental Justice

I move the CCC establish an EEJ workgroup to share information about different approaches to meet EEJ objectives, taking into account the draft EEJ strategy. The Workgroup should consider developing a terms of reference, holding an EEJ workshop, and publishing a peer reviewed journal article on their work.
Simonds/Nies
Motion carries by consent

ESA/MSA Coordination

Move to form a working group to consider potential changes to the ESA Policy Directive addressing issues identified by the CCC through the May 2021 and January 2022 meetings.
Simonds/Nies
Motion carries by unanimous consent

MEETING REPORT
COUNCIL COORDINATION COMMITTEE

May 17-19, 2022
Annapolis, Maryland

The Council Coordination Committee (CCC) met May 17-19, 2022, in Annapolis, Maryland. The following is a summary of presentations, discussions, and outcomes from the meeting. Briefing materials and presentations are available at http://www.fisherycouncils.org/ccc-meetings/may-2022.

DAY 1 – TUESDAY, MAY 17, 2022

Mid-Atlantic Highlight and Updates

The meeting began with an opening presentation by Mr. Mike Luisi, Chair of the Mid-Atlantic Fishery Management Council (MAFMC) and current Chair of the CCC. Mr. Luisi provided an overview of MAFMC-managed fisheries and highlighted several recent Council actions and initiatives.

NMFS Updates and FY 2022/2023 priorities

Ms. Janet Coit, Assistant Administrator for NOAA Fisheries, provided an overview of NMFS priorities for the upcoming year, which include climate change, seafood promotion and marketing, and equity and environmental justice, among others. She noted that fisheries are an important part of our economy, providing food security, jobs, recreation, and other benefits. Ms. Coit gave a brief overview of the recently released "Status of the Stocks" and "Fisheries of the United States" reports, highlighting that 90 percent of U.S. stocks are not subject to overfishing and 80 percent are not overfished. Ms. Coit commended the regional fishery management councils (RFMCs or Councils) for their hard work on tackling challenging issues. She emphasized the importance of continued collaboration and partnership between NMFS and the Councils.

Ms. Kelly Denit, Director of NOAA Office of Sustainable Fisheries, provided an overview of NMFS activities and gave updates on several topics as requested by the Council Executive Directors.

<u>Applying Information Law to Electronic Monitoring Data & Supporting Guidance in U.S Fisheries</u>: Ms. Denit gave an overview of key feedback on the draft directive for electronic monitoring and applying information law to electronic monitoring data and supporting guidance in U.S. Fisheries Final Procedural Directive. She stated there were a number of comments regarding concerns with personally identifiable information (PII), when a particular piece of information collected during EM becomes a Federal record. She stated this directive does not apply to scientific research and pilot projects. Ms. Denit provided a table of the three laws and when and how the laws apply. She stated that EM data are considered confidential, including for a contractor or another party that NOAA is using to process the files. Ms. Denit summarized when data become a federal record and anticipated requirements for access and use of the EM information. Any of the records that are obtained from EM can be used by the agency to

determine if there is a violation of any of the statues. Non-disclosure agreements would need to be signed in order to have any access to these data. Mr. Bill Tweit (Vice-Chair, North Pacific Fishery Management Council (NPFMC)) asked if the agency was planning to conduct a review of this procedure directive after a couple of years to evaluate costs to the fishery and buy-in of the program. Ms. Denit responded that the agency would be at the ready to make changes should they be needed to the program.

National Standard 1 Workgroups Update: Ms. Denit provided updates on the National Standard 1 Workgroup subgroups. Subgroup 1 is continuing to work on development of technical guidelines for estimation of MSY or its proxy. Subgroup 3 is expected to finish its work on data-limited ACLs this fall. Mr. Tom Nies (Executive Director, New England Fishery Management Council (NEFMC)) expressed concerns regarding the length of time that this procedural directive is taking, particularly as it relates to changing climate conditions and ongoing litigation in his region.

Best Scientific Information Available Regional Frameworks: NMFS Procedure 01-101-10 requires the development of regional frameworks for determination of the best scientific information available (BSIA) by May 7, 2022. Ms. Denit reported that four regional frameworks have been completed and two are currently under review. The CCC requested information about where the completed regional frameworks are (or will be) posted on the NMFS website.

E.O. 13921 – SEAFOOD Competitiveness and Marketing Strategies: Ms. Denit provided a brief overview of how the RFMC's comments and priorities provided in May 2020 were processed and provided to supporting federal agencies and federal agencies outside the NMFS purview. Ms. Denit stated Dr. Paul Doremus will provide information about how the Council's recommendations have been rolled into the draft National Seafood Strategy that will be discussed later in the agenda.

Regional Recusal Determination Procedure Handbooks: NMFS finalized updated Policy and Procedural Directives on Financial Disclosures and Recusal Determination in November 2021. Handbooks are being developed by NOAA GC with draft expected for Council review by November 2023. John Carmichael (Executive Director, South Atlantic Fishery Management Council (SAFMC)) requested that the regions work closely, early on to develop these handbooks instead of waiting to the end, which was what had occurred with the Southeast Regional Framework for BSIA.

Budget Updates

Dr. Paul Doremus, NMFS Deputy Assistant Administrator for Operations, briefed the CCC on the FY 2022 enacted budget and the administration's FY 2023 budget proposal. The total NMFS budget (ORF) for FY 2022 is $1.02 billion. The budget includes marginal support for two administration priorities, climate research and offshore wind, but did not include funds for Environmental Justice and Equity (EEJ) or Restoration and Resilience. The Council/Commissions PPA total is $42.9 million, an increase of 3.3% from the FY 2021 enacted amount. The FY 2022 spend plan amount should be announced soon. It is unlikely the Councils will see an increase in the funding provided under other PPAs.

The FY 2023 request (ORF) is $1.106 billion. It includes significant increases requested for the three priorities of climate research, economic development/offshore wind, and EEJ, as well as a significant investment for consolidation of the Northwest Fisheries Science Center. The proposed Council/Commission PPA is $44.3 million, an increase of 3.2% from the FY 2022 enacted amount. CCC members noted that the proposed Council/Commission PPA does not include any amounts for new program activities in support of the administration's three priority areas. In response to a question, Dr. Doremus replied that the agency was not planning to provide additional funds to the Councils for these activities.

Dr. Doremus noted that the agency had not yet completed its planning for implementation of the American Fisheries Advisory Committee Act, which modifies administration of the Saltonstall-Kennedy program.

NMFS Science Updates

Dr. Jon Hare, NMFS Acting Director of Scientific Programs and Chief Science Advisor, provided an update on recent science activities. The presentation focused on three main issues: climate change, offshore wind, and adapting the survey and data collection enterprise.

Dr. Hare highlighted several recent initiatives and accomplishments related to climate change.

- NMFS recently released a five-year progress report on implementation of the Climate Science Strategy (2015). This report describes specific activities NMFS has undertaken, including efforts to track change, assess vulnerability, understand and project climate impacts, build capacity to use climate information, and identify climate-ready management strategies.
- Launched on April 19, the new Distribution Mapping and Analysis Portal (DisMAP) consolidates trawl survey data from around the country and allows a user to interact with the data to look at changes in species distributions.
- Researchers at the Southwest Fisheries Science Center have developed an approach for predicting marine heat waves and they are now producing global forecasts that can provide up to a year's advanced notice of marine heat waves.
- NMFS is currently seeking public comments on Draft 2022-2024 Climate Science Regional Action Plans (RAPs). The plans identify actions that each region intends to take over the next 3 years to address regional climate-science needs and the objectives of the NOAA Fisheries Climate Science Strategy. The deadline for comments on the RAPs has been extended until **July 29, 2022**. On Day 3 of the meeting, Ms. Carrie Simmons (Executive Director, Gulf of Mexico Fishery Management Council (GFMC)) requested a further extension until the end of August for the Southeast RAP to allow for review by the Council at their August meeting. Dr. Hare said he would look into it and follow up.

In addition, Dr. Hare noted that offshore wind energy development intersects with nearly everything that NMFS and the Councils are engaged in. Planning for the future is critical. NMFS recently released a draft Federal Survey Mitigation Strategy that identifies essential components of mitigating the impacts of offshore wind energy development on the surveys, as well as actions to accomplish the goals and objectives of mitigation. The goal is to address mitigation early in the process and not wait until areas have already been leased and construction and operation plans have been approved.

Dr. Hare acknowledged that NMFS fisheries surveys have faced significant challenges recently, including cancelled surveys and reduced days at sea. Specific challenges include increasing fuel prices, COVID issues, and staffing shortages. Declining days at sea by fishery independent surveys provided an illustration of the challenges to maintaining capabilities and the need to actually restore capabilities of some important science products. There was discussion from the CCC on how NMFS intends to address ongoing, basic science needs with the growing future demands for scientific products. The CCC is concerned with declining scientific capabilities as funding fails to keep pace with increasing expenses and new initiatives increase demands on the NMFS science enterprise. It was noted that under MSA provisions, reduced scientific information and analyses results in greater uncertainty that translates into lower catch levels. Put another way, the fisheries managed by the Councils ultimately pay the cost for scientific deficiencies. Dr. Hare provided an overview of ongoing and planned efforts to sustain core strengths while building additional capacity through modernization and implementation of new technologies and through better survey planning, prioritization, and management of survey resources. He also noted the agency is pursuing 3 approaches for meeting management's science demands: 1) making best use of available resources; 2) continuing to articulate the need for and benefits of new resources; and 3) building partnerships built on shared interests to expand scientific capabilities.

Legislative Outlook

The CCC recognized the passing of Congressman Don Young (1933-2022) and his contributions to sustainable fisheries. As one of the authors of the Magnuson-Steven Fishery Conservation and Management Act, Congressman Young was a lifelong supporter of the U.S. fishing industry and the Regional Fishery Management Councils.

Mr. Dave Whaley, a contractor to the Councils and ad hoc member of the Legislative Work Group, provided an update on current legislative activities and an estimate of the remaining days of legislative session for the 117th Congress. He noted that elections will be held this fall for all members of the U.S. House of Representatives, and roughly one-third of U.S. Senators. It is possible that control of the House and/or Senate could flip. If this occurs, it will affect control of committees, which may lead to changes in committee priorities.

Due to the passing of Congressman Young, Congressman Huffman (D-California) - Chair of the Water, Oceans, and Wildlife Subcommittee - announced that he would suspend work on MSA reauthorization until a new Alaska representative is seated in the House of Representatives. This will not happen before mid-September. With the approach of the elections in the fall and this pause, MSA reauthorization efforts may not make significant progress this year. While two bills to reauthorize the Act have been introduced in the House, no reauthorization bill has been filed in the Senate.

While the MSA reauthorization has slowed, other bills dealing with fisheries management and ocean governance are still moving. In particular, the "America Creating Opportunities for Manufacturing, Pre-Eminence in Technology, and Economic Strength Act of 2022" or the "America COMPETES Act of 2022" contains a number of fishery, ocean, coral reef, and marine mammal provisions and is currently in a House/Senate conference. The outcome of the conference and whether these provisions will remain in the final conference report are not known at this time.

Outcomes/Action Items:

1. The CCC approved revisions to the Forage Fish Consensus in the CCC's MSA Reauthorization Working Paper, as recommended by the Legislative Work Group.

DAY 2 – Wednesday, May 18, 2022

Climate Change and Fisheries

Council Initiatives

The CCC received several presentations on recent and ongoing climate change initiatives.

Ms. Kiley Dancy (Council Staff, MAFMC) provided an update on the East Coast Scenario Planning Initiative. This project is being conducted by East Coast fishery management organizations and is exploring governance and management issues related to climate change and fishery stock distributions. Ms. Dancy provided an overview of the work completed so far, much of which has focused on gathering input from stakeholders which will inform an upcoming scenario creation workshop to be held in June 2022. Several CCC members were impressed by the turnout in the scoping and exploration webinars and felt it was clear that stakeholders are invested in this process. The expected outcomes from the initiative will include policy recommendations related to governance and management, a list of data gaps and monitoring needs, and near- and long-term priorities.

Mr. Merrick Burden (Executive Director, Pacific Fishery Management Council (PFMC)) presented on the Pacific Council's Scenario Planning Initiative and shared several lessons learned. This project was an outgrowth of the PFMC's Climate and Communities initiative. The resulting work product was the creation of four high-level scenarios describing the future of west coast fisheries under climate change. Mr. Burden noted that more work is needed to translate the outcomes of their scenario planning process into something that is "actionable" by the PFMC, as the scenarios were broad and relatively theoretical.

Mr. Bill Tweit (Vice-Chair, NPFMC) presented on the North Pacific Council's Climate Change Taskforce (CCTF). The CCTF was formed to evaluate the vulnerability of key species and fisheries to climate change in the North Pacific and strengthen resilience in regional fisheries management. As a first step, the CCTF is currently preparing a Climate Readiness Synthesis, which will provide a snapshot of the NPFMC management program's current climate readiness.

NMFS Climate Initiatives

Ms. Kelly Denit (Director of NOAA Office of Sustainable Fisheries) presented a NMFS proposal to develop a Council Governance Policy which would address when and how the Secretary will review and assign authority over Federally managed domestic stocks found across more than one jurisdiction (under MSA Section 304(f)). This initiative is intended to bring transparency to how this authority can be used. The Councils were encouraged to provide input on the scope of this initiative by July 2022 with NMFS targeting completion of a draft policy by spring 2023.

Several CCC members noted that the proposed timeline would not allow adequate time for the Councils or stakeholders to provide input on the scope of the policy. The CCC noted that, as a general rule, NMFS should take Council meeting schedules into account when soliciting Council input. CCC members expressed serious concerns about how this policy would incorporate the work that is already being done by the Councils, NMFS, and the ASMFC through scenario planning and related initiatives. Specifically, the proposed timeline would not allow for the outcomes of the East Coast Climate Change Scenario Planning Initiative to be meaningfully incorporated into NMFS' Council Governance Policy. It was also noted that the lack of clear baselines for some data-poor species will make it difficult to identify or measure climate-related species shifts. At the end of this discussion, the CCC voted unanimously to recommend that NMFS postpone further development of the Council Governance Policy until after completion of the East Coast Climate Change Scenario Planning Initiative, planned for spring 2023.

Outcomes/Action Items:

1. The CCC approved a motion recommending that NOAA Fisheries postpone further development of the Council Governance Policy until after completion of the East Coast Climate Change Scenario Planning Initiative.

Area-Based Management/America the Beautiful

<u>Area-Based Management Subcommittee Report</u>

Mr. Eric Reid, Chair of the Area-based Management Subcommittee, provided a summary of the group's work to date, including a proposed definition of "conservation area" and a summary of the draft report that evaluates all conservation areas in the U.S. EEZ that can be used for the American Conservation and Stewardship Atlas (Atlas). The Subcommittee defined conservation area (with respect to fisheries) as: 1) an established, geographically defined area, with 2) planned management or regulation of environmentally adverse fishing activities, that 3) provides for the maintenance of biological productivity and biodiversity, ecosystem function and services (including providing recreational opportunities and healthy, sustainable seafood to a diverse range of consumers). There are 615 areas in the U.S. EEZ that meet this definition, including 491 areas classified as ecosystem conservation areas established to conserve habitat, biodiversity, special ecosystems, or vulnerable species. Over 54% of the EEZ is covered by these ecosystem conservation areas. The subcommittee intends to finalize the report once GIS information is fully available to create maps of the different areas for the Fall CCC Meeting.

CCC members appreciated the work of the Subcommittee and encouraged the group to complete a peer reviewed journal article. CCC members recommended that the MAFMC issue a news release on the report and its findings. Additionally, one CCC member requested that the Subcommittee include a discussion of the endurance of areas established by the Councils in the final report. In response to a question from Mr. Sam Rauch on how the group's definition of conservation area could be broadened to include areas on land, Mr. Reid noted that the word 'fishing' could be deleted from part 2 and the parenthetical phrase could be deleted from part 3. The CCC expressed special appreciation to Jessica Coakley for her extraordinary efforts to assemble the report.

<u>NMFS Update on Area-Based Management</u>

Mr. Sam Rauch (NMFS Deputy Assistant Administrator for Regulatory Programs) provided an update on NOAA activities relative to the 30 by 30 initiative. He noted that under the President's Executive Order 14008, the purpose of 30 by 30 initiative (i.e., conserve 30% of the land and sea by 2030) is to use this tool to address the disappearance of nature, climate change, and inequality. Mr. Rauch noted the thousands of written and oral comments on the Atlas. The agencies are still working through these comments, and the Atlas beta version is scheduled for completion in December. The Atlas group may also include a definition or elements of conservation area and may provide examples of the types of conservation areas that would be included.

Mr. Rauch also alerted the CCC that NOAA is establishing a Marine and Coastal Area-based Management Federal Advisory Committee. An announcement for nominations is forthcoming. Mr. Rauch thought the CCC Subcommittee report will be influential to the work of this FAC. In response to a question on the inclusion of Council members on this committee, Mr. Rauch noted that there is a need for a diversity of viewpoints including perspectives from Councils and the fishing industry, and others.

***Outcomes/Action Items**:*

1. The CCC recommended that the MAFMC issue a press release on the report and its findings.
2. The CCC approved a motion requesting that NOAA Fisheries provide special funding, as soon as possible, to contract GIS work needed to consolidate and complete the work of the Area-Based Management Subcommittee. Bill Tweit noted his rationale for the motion and detailed that the request was for $50K to the NPFMC or PFMC to contract with Pacific States Marine Fisheries Commission.
3. The CCC approved a motion requesting that NOAA convene a meeting with CEQ and the CCC Subcommittee representatives to discuss the draft report in time to be used in development and deliberation of the definition of 'conservation'. The subcommittee representatives at this meeting will be Eric Reid, David Witherell, and Mike Luisi.

Recreational Fisheries

NMFS Updates

Mr. Russ Dunn (NMFS Policy Advisor for Recreational Fisheries) presented an overview of the 2022 National Saltwater Recreational Fisheries Summit, highlighting discussion points and next steps. The summit report is expected to be available June 30, 2022. CCC members expressed appreciation to NMFS and the summit organizers for providing an opportunity for anglers from across the nation to meet and share their concerns and experiences. Summit presentations were informative, and the breakout groups proved to be a successful approach for gathering input from the many attendees. Russ Dunn also presented on efforts to engage the recreational community in habitat plans through conservation and restoration activities.

Council Presentations

Ms. Julia Beaty (Council Staff, MAFMC) presented on the MAFMC Recreational Harvest Control Rule framework action, which is being developed with the Atlantic States Marine Fisheries Commission. The CCC discussed tradeoffs of regulatory stability and the potential magnitude of change in recreational measures that could occur if a stock classification changed. The extent of regulatory change varies across the several options in the framework, and in some cases could be substantial. However, it was noted that annual changes can be significant under the current approach, and this framework is being prepared to improve stability by avoiding 'chasing' the recreational harvest limit from year to year. Mr. Bill Tweit (Vice-Chair, NPFMC) also presented an overview of the NPFMC Halibut Allocation review.

Management Strategy Evaluations

Mr. Brandon Muffley (Council Staff, MAFMC) gave a presentation titled "The use of MSE in the council process: lessons learned and future direction." This talk included several topics that covered: a general overview of MSE, outcomes from SCS workshop 6, Mid-Atlantic experiences, regional examples, and NOAA perspectives and direction.

Mr. Tom Nies (Executive Director, NEFMC) summarized the use of MSE in the New England region and focused particularly on the Atlantic Herring ABC control rule that was established via a MSE process. He stressed the large time commitment involved in producing the MSE. After four years and use of two dedicated science center staff the MSE effort led to the development of the control rule. The New England region had several lessons learned from this experience that he summarized in his presentation. He summarized how a MSE is being developed for an EBFM approach, and how they intend to use it to compare EBFM vs single species management strategies.

Mr. David Witherell (Executive Director, NPFMC) summarized the history of MSE in the North Pacific, beginning with an early history of MSEs being developed by the science community but with very little awareness of these efforts by the Council and stakeholders, and other examples where difficulties arose in building the model which led to a lengthy multi-year process.

Dr. Jon Hare (NMFS Acting Director of Scientific Programs and Chief Science Advisor) summarized NOAA's involvement with MSEs. He described two types of MSEs that include 1) those requested by Councils and 2) research based MSEs to start conversations. He described challenges with developing MSEs that ranged from resource constraints to planning difficulties and more. This was followed with a series of suggestions for strengthening collaborations among Councils, regional offices, and science centers.

The session concluded with the suggestion that each of the Councils be prepared to discuss MSEs at the October 2022 meeting.

National Seafood Strategy

Dr. Paul Doremus (NMFS Deputy Assistant Administrator for Operations) presented NMFS' Draft National Seafood Strategy. The overall purpose of the strategy is to support resilience and competitiveness via four goals – optimize wild capture production, increase aquaculture (production, regulation, and global leadership), facilitate fair and reciprocal trade, and address infrastructure issues. Each goal has several supporting objectives. The draft strategy was informed by initial input from several industry roundtables and the Marine Fisheries Advisory Committee (MAFAC). Initial insights from industry roundtables highlighted the importance of making fisheries a more prominent part of, and better integrated into the vision for, the blue economy.

Other themes from the industry roundtables included climate change; climate and general science needs; the need for NOAA Fisheries to better understand supply chain and business operations (with weaknesses exposed by Covid); needs of rural and tribal communities; disappearance of working waterfronts; recreational/subsistence fishing, the need for marketing of U.S. sustainability; fishing labor shortages; and trade barriers. CCC members provided initial feedback and recommendations on the draft strategy. Dr. Doremus invited additional input as the draft strategy is being developed. Comments can be sent to Sarah.Shoffler@noaa.gov.

Ms. Kitty Simonds (Executive Director, Western Pacific Fishery Management Council (WPFMC)) highlighted several issues related to third-party certifications and ratings. Third party certifications (e.g., Marine Stewardship Council (MSC)) impact marketing, consumer choice, and supply chains while being costly and redundant for most U.S. catch. Ratings are often based on outdated or incorrect information. Acknowledging that NMFS is prohibited from adopting, using, or promoting any third-party certification scheme, Ms. Simonds encouraged NMFS to highlight the efficacy of the Magnuson-Stevens Act and Council-managed fisheries. Ms. Simonds suggested that this could be incorporated into the seafood strategy, such as through development of a labeling alternative for U.S.-managed seafood. Ms. Simonds also expressed concern that U.S. fisheries are threatened by misinformation spread by third-party organizations, such as the Minderoo Foundation, and encouraged NMFS to consider ways to address these mischaracterizations of U.S. fisheries.

A number of other issues were raised during the discussion following the presentations. Dr. Chris Moore (Executive Director, MAFMC) noted that recently-proposed changes to the MSC standards could threaten the spiny dogfish fishery's certification which could have major impacts on the fishery's export markets in Europe. Mr. Tom Nies (Executive Director, NEFMC) raised concern about petitions to list winter and thorny skates under CITES and asked whether NMFS ever weighs in on such petitions. Mr. Rauch responded that the agency works closely with the U.S. Fish and Wildlife Service to develop positions on potential CITES listings but that he was not at liberty to say what the U.S. position will ultimately be.

DAY 3 – Thursday, May 19, 2022

Equity and Environmental Justice

Mr. Archie Soliai (Chair, WPFMC) provided a presentation on equity and environmental justice (EEJ) planning and activities recently undertaken by the Western Pacific Council. He listed some major issues that affect generational equity in the Western Pacific region. The WPFMC recently held an EEJ strategy workshop that brought together indigenous council members, advisory panel members, NOAA regional staff and leaders working on environmental justice issues. Workshop participants discussed how EEJ integrates with WP Council work and how to best use organizational tools for change. Soliai shared the graphic outputs from the workshop's live scribe that detailed the dialogue high points alongside imagery. CCC members commented that the Councils provide voice for communities within federal processes. They also said that the workshop scribe imagery is innovative and makes the workshop dialogue accessible. The next steps are to develop a draft strategy to incorporate EEJ values in decision making. The WPRMC looks forward to working with NOAA to develop and implement the strategies.

Ms. Maria Carnevale (Council Staff, WPFMC) provided a report on progress of the CCC Environmental Justice Working Group. The group met 8 times to develop a workshop plan and a draft report for CCC review. The report provides an overview of federal directives and policies relative to EEJ and discusses the linkages of EEJ features to objectives and requirements of the MSA. The report highlights the diversity of needs and initiatives across different regions, and it describes relevant efforts, activities and perspectives of each council. Numerous approaches and ideas were presented and discussed, and challenges were identified. The workgroup also identified potential next steps to continue a sustained dialog and coordination with NMFS, continue to synthesize information and identifying a subset of related EEJ actions, and establish a formal workgroup. CCC members commented on how the report advances EEJ and how nicely the CCC report and NMFS EEJ efforts dovetail.

Mr. Sam Rauch provided an update on NMFS environmental justice initiatives. The agency has developed a draft equity and environmental justice strategy which is currently out for public comment. The report includes definitions for the terms *Equity* and *Environmental Justice*, which are very similar to the CCC working group definitions. This is a national strategy for NOAA and is broader than MSA issues (e.g., ESA issues). The strategy identifies several barriers to equity and environmental justice and provides a framework to incorporate EEJ into NOAA Fisheries' daily activities. NOAA intends to finalize the EEJ strategy in November, with development of regional implementation plans in the spring of 2023. A series of outreach webinars to receive public comment have been scheduled.

Following the presentations, members discussed engagement strategies, how to move the research needs identified in the CCC EEJ report forward, WP underserved and disadvantaged fisheries, how to identify underserved communities, Council representation, and the importance of National Standard 8 and funding territorial science. One member commented that EEJ is a through line for much of the CCC topics and dialogue over the last three days. The CCC views workgroups as a good way for staff to share information. They also allow Councils to each participate and contribute to the discussions relative to their interest and impacts on their region. An EEJ workshop would help to coordinate efforts and resources among the Councils and NOAA, promote and identify management approaches that support EEJ, and data collection and research aimed at advancing EEJ for U.S. fisheries management. The EEJ workshop could include Regional Fishery Management Council staff, leadership, and NOAA Fisheries staff. Ideally, this workshop would occur before the next CCC meeting (October) and prior to NOAA finalizing their EEJ strategy. Lastly, a peer reviewed publication will provide a snapshot in time as to the current situation with respect to EEJ, and discuss possible future approaches.

Outcomes/Action Items:

1. The CCC approved a motion to establish an EEJ workgroup to share information about different approaches to meet EEJ objectives, taking into account the draft EEJ strategy. The Workgroup should consider developing a terms of reference, holding an EEJ workshop, and publishing a peer reviewed journal article on their work.

Integration of ESA Section 7 with MSA

Ms. Kitty Simonds (Executive Director, WPFMC) presented an overview of the CCC's discussion to date to improve the ESA Policy Directive to integrate ESA Section 7 with MSA. The CCC reviewed the implementation status at the May 2021 meeting and recommended strengthening the relationship between NMFS and Councils on ESA consultations for fisheries by updating the policy directive to improve the process and timing for Council involvement. During the January 2022 CCC call, the Councils highlighted issues such as persistent delays in completing BiOps; lack of coordination with fishery management action timelines as well as with development of RPMs; Policy Directive not followed and Councils not provided the opportunity to develop RPMs or RPAs when consultation was triggered external to the Council process; Council staff not being included in working groups resulting from BiOp RPMs; FOIA and FACA impeding Council involvement; coordination issues when NMFS develops RPMs external to the Council; and a general need to coordinate on deadlines. Successful examples stem from early coordination through the Council process.

Potential changes to the policy directive to address issues raised by the CCC include: adding language to encourage and incentivize early coordination with the Councils for RPMs in addition to RPAs; adding language for Council-NMFS to agree on coordinated schedule for Council involvement, input, development of RPMs/RPAs, and draft BiOp sharing; NOAA GC to facilitate sharing of draft BiOp with Council staff to facilitate early NMFS-Council coordination; and adding an overarching policy statement that NMFS will work in close coordination with the Councils through the MSA Council process. These potential changes point to the need to address fishery impacts to ESA-listed through the Council process. Simonds conveyed the CCC's interest to work with NMFS to refine these improvements to integrating ESA and MSA processes.

Mr. Sam Rauch presented on NMFS' initial review of the CCC comments on the Policy Directive. Rauch concurred with Simonds' characterization that the Policy Directive recognizes the Council's critical role in ESA consultations, and noted that it also allowed for variations in the coordination approach for each Council. Initial internal discussions indicate that there are clear regional and case-by-case variations, but with the Policy Directive's existing focus on early and frequent coordination, NMFS found that a major update was not needed at this time. One issue that NMFS has identified with the Policy Directive is that it has not worked as well for consultations that were initiated through external triggers. NMFS is struggling with how to handle situations in which consultations occur outside of the Council action process, specifically in terms of how to involve Councils in those situations and when NMFS may be on an accelerated timeline. Rauch reviewed existing policies that address frontloading and coordination, including the Operational Guideline, Regional Operating Agreements, ESA-MSA Integration Agreements, and NEPA Guidance. NMFS would like to continue working on these issues with the Council, and plans to work with each Region/Council pair to share best practices.

***Outcomes/Action Items*:**

1. The CCC approved a motion to form a working group to consider potential changes to the ESA Policy Directive addressing issues identified by the CCC through the May 2021 and January 2022 meetings.

International Issues

Ms. Alexa Cole (Director of NMFS Office of International Affairs, Trade, and Commerce) provided a briefing on U.S. involvement in international fisheries issues. The office was recently renamed to incorporate a newly-established Trade and Commerce Division. This change aligns trade monitoring functions of NOAA Fisheries under one office and is intended to strengthen the office's ability to prioritize and manage resources to address seafood competitiveness, support the U.S. seafood industry, advance trade policy priorities, and combat IUU fishing.

Ms. Cole gave an overview of U.S. involvement in regional fishery management organizations (RFMOs). She noted that the Councils play a significant role in certain RFMOs, either through advisory councils or as commissioners. The Western Central Atlantic Fishery Commission (WECAFC) is a newly developed organization which will be focusing on fisheries in the wider

Caribbean area. NMFS staff are planning to attend at least one meeting of each Southeast Council this summer to discuss WECAFC working groups and management efforts. The CCC was asked to assist with distributing a forthcoming federal register notice soliciting nominations for U.S. Commissioners to fill non-federal and non-Council seats on certain RFMOs. This is part of an effort to engage a diverse pool of candidates representing a range of stakeholder perspectives.

The fourth session of the UN Intergovernmental Conference on Marine Biodiversity of Areas Beyond National Jurisdiction (BBNJ) was held in March 2022. There were four main thematic areas: (1) marine genetic resources, (2) area-based management tools, (3) environmental impact assessments, and (4) capacity-building and the transfer of marine technology. One area of continued negotiations relates to the use of area-based management tools on the high seas. Some delegations have supported a centralized global process, while the U.S. and a number of other delegations support a two-fold process that delegates final decision-making authority to RFMOs and other global and regional management bodies. The State Department will conduct outreach and hold stakeholder webinars and discussions before the fifth session of negotiations is held later this year.

NMFS is continuing to work on implementation of the Marine Mammal Protection Act (MMPA) import provisions, which prohibit importation of fish and fish products from nations with unsustainable levels of marine mammal bycatch. The deadline for nations to apply for Comparability Findings was November 30, 2021. The results of Comparability Finding application reviews will publish by November 30, 2022. All seafood entering the U.S. after January 1, 2023 must have a Comparability Finding for its harvesting fishery or there will be import prohibitions on fish and fish products from that fishery.

Finally, Ms. Cole gave an overview of the findings of the 2021 Biennial Report to Congress on Improving International Fisheries Management, which is issued every two years under the High Seas Driftnet Fishing Moratorium Protection Act.

Mr. Archie Soliai (Chair, WPFMC) asked about what progress the U.S. is making with respect to strengthening U.S. negotiations, particularly in the Pacific. Ms. Cole responded that it continues to be a priority but that the pandemic has been a setback. Mr. Soleil noted that the continuing decline in the number of fishing vessels in American Samoa is not sustainable for the cannery that supports the American Samoa economy.

***Outcomes/Action Items*:**

1. NMFS requested Council assistance with publicizing an upcoming federal register notice soliciting nominations for U.S. Commissioners to fill non-federal and non-Council seats on certain RFMOs.

Committee and Working Group Updates

Council Member Ongoing Development (CMOD): Mr. Tom Nies (Executive Director, NEFMC) provided an overview of the upcoming CMOD meeting scheduled for November 15-16th, 2022 in Denver, Colorado. The Councils are requested identify participants by Friday, July 1, 2022. The meeting is scheduled for 50 participants across the nation. Each RMC should identify 3

Council members and 1 staff member to attend. Participants may be asked to provide presentations or regional overviews.

Scientific Coordination Subcommittee: Mr. David Witherell (Executive Director, NPFMC) provided an update on the plan for the upcoming Scientific Coordination Subcommittee. The North Pacific Fishery Management Council will host this meeting August 15-17, 2022, in Sitka Alaska, in the Harrigan Centennial Hall. The meeting is focused upon various aspects of addressing Ecosystem-Based Fishery Management (EBFM), including ecosystem indicators, multi-species modeling and addressing distributional shifts in managed stocks. The three primary themes of this meeting are: 1. How to incorporate ecosystem indicators into the stock assessment process. 2. Developing information to support management of interacting species in consideration of EBFM. 3. How to assess and develop fishing level recommendations for species exhibiting distributional changes. Each Council will send 2 official SSC delegates plus a staff member (or 3 SSC members).

Habitat: Jessica Coakley (Council Staff, MAFMC) provided an overview presentation of the Habitat Working Group. She discussed the past and present accomplishments of the working group. Presently, the working group is taking a "deeper dive" into regional habitat work through a series of presentations on habitat and EFH efforts from each of the Councils. The group is scheduled to hear presentations on fish and habitat climate vulnerability and would like to focus on the incorporation of climate resilience in Council EFH designations. The CCC voiced support of this shared area of common interest. The CCC also supported the working group meeting in-person in 2023 as they last met in-person in 2019.

Communications: Mary Sabo (Council Staff, MAFMC) provided an update on efforts by the Council Communications Group to develop a cross-Council calendar tool, as requested by the CCC during the October 2021 meeting. The group is aiming to have this project completed in time for review by the CCC during its October 2022 meeting. Mr. Witherell asked if it would be helpful for the communications group to have an in-person meeting. Mr. Nies recommended that the group first draft a proposal, including proposed meeting topics and objectives, for review and approval by the CCC. The CCC agreed that NMFS communications staff should also be included in a future in-person meeting.

***Outcomes/Action Items*:**

1. The CCC endorsed the Habitat Work Group's proposal to meet in person in 2023 or 2024 with a focus on incorporating climate and climate resilience in our EFH designations.
2. The Council Communications Group will consider developing a proposal for an in-person meeting for future review by the CCC.

From: Moore, Christopher <cmoore@mafmc.org>
Sent: Friday, May 20, 2022 2:24 PM
To: Paul Doremus - NOAA Federal <paul.n.doremus@noaa.gov>
Cc: Samuel Rauch (Samuel.Rauch@noaa.gov) <samuel.rauch@noaa.gov>; Burden, Merrick <merrick.j.burden@noaa.gov>; Mary Sabo <msabo@mafmc.org>
Subject: USFWS Squid Export Issue

Paul – It was good to see you this week! At the meeting, we briefly discussed the Mid-Atlantic Council's concerns regarding the inclusion of U.S. squid fishery products in the U.S. Fish and Wildlife Service (USFWS) inspection and user fee system for monitoring wildlife imports and exports. This was identified in both the MAFMC and PFMC responses to EO 13921 several years ago. The attached letter from the Council to Secretary Bernhardt (12/21/20) provides a detailed overview of the issue and suggested remedies.

Under the authority of the Endangered Species Act, USFWS is responsible for regulating the import and export of wildlife through the licensing of importers and exporters, inspection of shipments, and charging fees for processing applications and performing inspections. The ESA provides an exemption from these requirements for "shellfish and fishery products" if they are intended for human or animal consumption, not listed as injurious under the Lacey Act, and not listed under the ESA or CITES. This exemption currently applies to the vast majority of domestic fisheries, but it does not apply to the three commercially harvested U.S. squid fisheries. While squid meet all of the criteria described above, **the USFWS has concluded that squid are neither shellfish nor fishery products**. As noted in a 2008 letter from Sam, the USFWS definition of shellfish is inconsistent with the NMFS definition, which includes all aquatic mollusks and crustaceans.

These licensing requirements are redundant, time-consuming, and costly for U.S. squid producers. Squid are generally considered to be a higher volume, lower value product so any fees associated with USFWS policies and regulations add layers of costs that make U.S. products more expensive to produce and thus less competitive in the international market.

We recommend that squid be reclassified as either "shellfish" or "fishery products" and therefore exempt from the USFWS inspection and user fee system. The attached letter describes several ways this could be accomplished. We appreciate any assistance you can offer to address this issue – talk to you soon. Thanks! C

Christopher M. Moore, Ph.D.
Executive Director
Mid-Atlantic Fishery Management Council
800 N. State St, Suite 201
Dover, DE 19901

302-526-5255
mafmc.org

2022 SPRING NRCC MEETING AGENDA

Venue at Portwalk Place – 22 Portwalk Place, Portsmouth, NH
All times are approximate

Monday, May 9

9:00 a.m. – 9:15 a.m.

1. Welcome, Introductions, Announcements
   (Reid, Sullivan)

9:15 a.m. – 3:00 p.m. (Break as needed, lunch at noon)

2. Stock Assessments
   Discussion leader: Beal, Moore, Nies
   - Overarching assessment process review

   Discussion leader: Simpkins
   - Discussion of recent research track assessments and process
   - NRCC Assessment Working Group update
   - Update on Research Track steering committee status
   - Discuss Research Track schedule and select topics for 2027

3:00 p.m. – 3:30 p.m.

3. Did Not Fish Reports
   Discussion leader: Moore/Nies
   - Updates from MAFMC and NEFMC on discussions at recent Council meetings

3:30 p.m. – 4:00 p.m.

4. COVID data gaps
   Discussion leader: Simpkins
   - Summary of progress made in developing standardized approaches to address data missing as a result of COVID

4:00 p.m. Adjourn Day 1

6:45 p.m. – Dinner at Jumpin' Jays Fish Café *https://www.jumpinjays.com/*

Tuesday, May 10

9:00 a.m. – 9:30 a.m.

5. Scenario Planning
   Discussion leader: Core Team
   - Update regarding Climate Change Scenario Planning meeting

9:30 a.m. – 10 a.m.

6. Aquaculture
   Discussion leader: Schillaci
   - Update regarding aquaculture, including the national strategic plan, recent guide on federal permitting, MAFMC development of an aquaculture policy

10:00 a.m. – 10:30 a.m.
7. Offshore Wind
   Discussion leader: Pentony/Simpkins
   - Update on offshore wind activities

10:30 a.m. – 10:45 a.m. Break

10:45 a.m. – 11:00 a.m.
8. SAFE Reports
   Discussion leader: Fenton
   - Update on Stock Assessment and Fishery Evaluation (SAFE) reports

11:00 a.m. – 11:30 p.m.
9. Port Sampling
   Discussion leader: Simpkins
   - Update on efforts to assess impacts of reduced sampling and/or approaches for sampling prioritization.

11:30 a.m. – 12:00 p.m.
10. Protected Resources – Sturgeon and Sea Turtle Bycatch
   Discussion leader: Moore
   - Discussion regarding the bycatch issues for sea turtles and sturgeon, which are being addressed through difference processes, but may result in intersecting mitigation measures.

12:00 p.m. – 1:00 p.m. Lunch

1:00 p.m. – 2:00 p.m.
11. FDDI and CAMS Updates
   Discussion leader: Gouveia

2:00 p.m. – 2:30 p.m.
12. Future NRCC Meeting Procedures
   Discussion leader: Nies
   - Discuss format of future NRCC meetings (e.g., in-person meeting procedures, remote access, etc.).

2:30 p.m. – 3:00 p.m.
13. Meeting wrap-up and Other Business
   - Complete any unfinished discussions or unresolved new business
   - Review action items and assignments
   - Identify Fall 2022 meeting date (NEFMC chair)
   - Adjourn meeting

3:00 p.m. Meeting adjourns

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 24, 2022

To: Chris Moore, Executive Director

From: Karson Coutre, Staff

Subject: Sea Turtle Bycatch in Trawl Fisheries

At the April Meeting, the Council received an update from NOAA Fisheries staff on their public outreach efforts related to sea turtle bycatch, gear research, and potential mitigation measures in trawl fisheries in the Greater Atlantic Region. NOAA conducted virtual stakeholder webinars and call-in days throughout February and March to gather information from the fishing industry and other stakeholder groups to inform any future bycatch mitigation measures. NMFS had indicated that written comments may be submitted to nmfs.gar.turtletrawl@noaa.gov by May 31, 2022, however additional input will be accepted at the same email address as they move forward. Background information, descriptions of gear designs, research results, type of information needed, and recordings from informational webinars can be found on their website.

Stakeholder feedback throughout the outreach consisted of clarifying questions and concerns about the sea turtle bycatch estimates, data used, and research results. Comments were also received on the geographical range of the measures, tow duration issues, fishery definitions, and economic impacts. Protected Resources staff indicated in April that there is more research to be done and they are approximately a year away from the proposed rule stage.

Seafreeze Ltd.

100 Davisville Pier
North Kingstown, R.I. 02852 U.S.A.
Tel: (401)295-2585

May 31, 2022

RE: Sea Turtle Bycatch Reduction in Trawl Fisheries

The 2021 Biological Opinion, page 1, opens with: "Section 7(a)(2) of the Endangered Species Act (ESA) (16 U.S.C. 1531 *et seq*.) requires that each federal agency shall ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species.." It is unclear why the agency is undertaking a targeted action against the squid trawl fishery while other fisheries and entities are responsible for significantly higher turtle takes than trawl fisheries. The highest sources of mortality of course should be addressed first, as those sources are the most likely to jeopardize the protected species in question.

One of the fisheries for example included in review in this BiOp is "Summer Flounder/Scup/Black Sea Bass". The current allocation of black sea bass quota is 45% commercial, 55% recreational; therefore the recreational sector has the most activity in this fishery, as authorized by NMFS once that allocation is made final.[1] For fluke, one of the species highlighted by NMFS in its recent presentations to the Mid Atlantic Council regarding "Sea Turtle Bycatch in Trawl Fisheries"[2], 45% of the fishery is allocated to the recreational sector.[3] Furthermore, HMS- which although not a part of this Biological Opinion holds tournaments in the Greater Atlantic region during the summer months and is managed directly by NMFS- authorizes vessels traveling at high speeds to harvest HMS species within the tournament frameworks. All harvest of these tournament species is recreational. Pages 13-14 of the BioOp acknowledge hook and line fisheries which would encompass recreational harvest. It is questionable why these sectors of the fisheries examined are not analyzed by the agency in detail.

One aspect of these recreational fisheries that is analyzed, however, is that of turtle interactions via vessel strike. The BiOp states, "Vessels participating in the fisheries listed in the Opinion pose a potential threat to sea turtles when transitioning to and from fishing areas and when moving during fishing activity….In fact, the most commonly recognized injuries are from propellers…Records from the

[1] https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/61c332f896f5e31a8b79afb3/1640182520998/2021-12_MAFMC-Motions.pdf.

[2] See https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/61c358c78fbd5708c771283a/1640192202042/15_sea+turtle_Upite+MAFMC+presentation+Dec+2021+public2.pdf and https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/624ef2a994e1fb046b245136/1649341099248/7_Sea+Turtles+MAFMC+April+ppt+2022.pdf.

[3] https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/61c332f896f5e31a8b79afb3/1640182520998/2021-12_MAFMC-Motions.pdf.

Sea Turtle Stranding and Salvage Network (STSSN) show that both juvenile and adult sea turtles are subject to vessel strikes (NMFS STSSN database, unpublished data)…Based on data from off the coast of Florida, there is good evidence that when vessel strike injuries are observed as the principle finding for a stranded turtle, the injuries were both ante-mortem and the cause of death…Foley et al. (2019) found that the cause of death was vessel strike in approximately 93 percent of stranded turtles with vessel strike injuries."[4]

According to page 260 of the BioOp, "This results in an estimate of 476 sea turtles stranding due to vessel strikes from Maine through Virginia from May through November each year (2012 and 2013)." Compared with an annual average of 108 turtle mortalities estimated due to all trawl fisheries combined, [5] it is questionable that targeted agency action only encompasses trawl fisheries. This also is in stark contrast to only 50 observed interactions with the longfin squid fishery for a 20-year period from 2000-2019, according to the documents relied upon for this proposed action.[6] Using the numbers provided by the agency, of the total trawl interactions with turtles for a 20 year period, less than 20% can be attributed to the longfin squid fishery.[7] There is a miniscule number of annual sea turtle interactions with longfin squid trawl gear compared to annual sea turtle mortalities due to the 476 annual vessel strikes in the Greater Atlantic Region.

As vessel strike mortality, which are primarily due to vessels traveling at high speeds, which occurs in recreational fisheries and not the trawl fisheries being targeted by the agency for regulatory action, it begs the question why the focus of agency action is not vessel speed restrictions in the Greater Atlantic Region from May through November, rather than proposals for requirements on squid trawl vessels. The numbers of turtle mortalities due to vessel strikes in the region dwarf those of all trawl fisheries combined. If the agency is to comply with Section 7(a)(2) of the Endangered Species Act to ensure protection for endangered species from all actions that it authorizes, recreational fishing must also be included. The agency routinely implements Right Whale Speed Restriction Zones for that species; there is no reason that it cannot do so for turtle species.

When it comes to commercial fisheries alone, combined trawl fisheries are not the primary source of mortality for the turtle species in question. On page 255 of the BioOp, rolling 5 year mortality percentages by gear type indicate that out of trawl, gillnet, and vertical line fisheries, trawl fisheries have the lowest turtle mortality percentage by gear type (43-48% versus 64-78% for gillnet and 53-64%

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[4] See 2021 Biological Opinion, p. 259.

[5] See 2021 Biological Opinion, p. 256. , NMFS estimates on page 255 that trawl fishery interactions with turtles for a 5 year period will result in mortality for 477 loggerhead, 27 Kemp's Ridley, 20 leatherback and 16 green sea turtles, a total of 540 turtles, which is an average of 108 total turtles per year. We do note that this number is contradicted by two Protected Species Division presentations to the Mid Atlantic Fishery Management Council, which were also in contradiction to themselves. The December presentation gave the numbers as a total trawl bycatch from 2014-2018 as 571 total turtles with 54 interactions in the longfin squid fishery; the April presentation changed this to 583 total trawl interactions, with 50 from the longfin squid fishery. The April presentation would result in an average of 116 turtle trawl interactions a year.

[6] See https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/624ef2a994e1fb046b245136/1649341099248/7_Sea+Turtles+MAFMC+April+ppt+2022.pdf.

[7] See https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/624ef2a994e1fb046b245136/1649341099248/7_Sea+Turtles+MAFMC+April+ppt+2022.pdf, slide 2. See also https://www.fisheries.noaa.gov/sea-turtle-bycatch-reduction-trawl-fisheries.

for vertical line). Furthermore, on page 256, NMFS estimates that gillnet fishery interactions with turtles for a 5 year period will result in mortality for 808 loggerhead, 187 Kemp's Ridley, and 41 leatherback sea turtles, a total of 1,036 turtles. In contrast, NMFS estimates on page 255 that all trawl fishery interactions with turtles for a 5-year period will result in mortality for 477 loggerhead, 27 Kemp's Ridley, 20 leatherback and 16 green sea turtles, a total of 540 turtles. This begs the question why NMFS has chosen to take action on trawl fishery interactions and presented to the Mid Atlantic Fishery Management Council twice- once in December 2021 and once in April 2022- about the need to enact trawl fishery restrictions to reduce turtle interactions without once mentioning gillnet fishery interactions which are almost double in number. This is nonsensical and misleading to Council members and the public.

The materials presented to the public at the Mid Atlantic Council's December 2021 meeting begins with: "Fisheries bycatch is the primary threat to sea turtles in the Greater Atlantic Region and occurs at high levels in several regional trawl fisheries."[8] However, NOAA's own BiOp details that this is not the case; annual vessel strikes dwarf the annual interactions in all trawl fisheries combined, never mind those of the other fisheries in question.

NOAA's informational page on "Sea Turtle Bycatch Reduction in Trawl Fisheries", the subject of this comment letter, is equally as misleading. This webpage makes the statement: "Sea turtle interactions documented by the Northeast Fisheries Observer Program most commonly occur from Massachusetts south. Seventy-two percent of observed fishery interactions from 2000-2019 were on trips where croaker (36%), longfin squid (19%), or summer flounder (17%) was the top landed species by hail weight." The statement should be corrected to read that 72% of observed *trawl* fisheries interactions were by the listed fisheries. The listed trawl fisheries were not responsible for 72% of *all* "observed fishery interactions." As established by the BiOp itself, the most turtle interactions occur in gillnet fisheries, not trawl fisheries, with gillnet fisheries responsible for nearly double the annual interactions of all trawl fisheries combined.

Using purely the term "interactions" is also misleading and would lead the public and the Council to believe that an interaction is equivalent to mortality. While that may be largely the case with vessel strikes, it is not the case with trawl fishery interactions. According to raw observer data from 2010-2019 detailing trawl fishery interactions in the Greater Atlantic Region, out of 145 total turtle interactions with all trawl fisheries, only 16 of that 145 resulted in mortality. This is merely an 11% mortality rate for fisheries with low interaction numbers. For the longfin squid fishery, the raw observer data showed only 47 interactions with 8 turtle mortalities for this 20-year period. Statistically, that is less than a half a turtle per year for mortality. Omitting the difference between interaction vs mortality is inappropriate, as very low actual mortality is occurring from these fisheries. Proposed agency actions would result in enormous economic burdens on the fleet for very little impact of benefit on turtle populations. Yet this distinction is not made.

These claims by the agency regarding the urgency of reducing trawl interactions also omit the context of overall turtle mortality. For example, according to NOAA's own website, "In recent years, an average of 600 sea turtles have been found cold stunned along the Cape Cod Coast in Massachusetts from late October through December each year. In the winter of 2014-2015, 1243 sea turtles washed up

[8] See https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/61aa78b94607ca266be901af/1638561977275/Tab15_Sea-turtle-bycatch_2021-12.pdf.

on Cape beaches, of which 746 were alive."[9] That is one winter alone responsible for 497 dead turtles, and with an average of 600 cold stun interactions a year. These numbers far exceed any trawl interaction numbers. It is understood that NOAA does not control the weather; however, omitting the context does not present managers or the public with a clear understanding of turtle mortality through which to view trawl interaction and mortality numbers and the urgency of action on the fisheries in question. Another example, while outside of NOAA control but still useful for context, is the fact that over 10 years, 279 turtles were incidentally captured by one power plant in Florida, 65 in North Carolina, and 84 in New Jersey.[10]

Consider also this context. According to STSSN incidental capture records from 2008-2019, Virginia alone had 309 observed/reported hook and line incidental captures, with North Carolina at 260. That is 569 total hook and line interactions in just two states alone. This is considerably more than the 264 total observed trawl fishery interactions in the entire Greater Atlantic Region from 2000-2019.[11] In fact, for the 2008-2019 period, all trawl fisheries, excluding shrimp, in the Greater Atlantic Region were responsible for only 113 total incidental captures coastwide, with 111 of those attributed to North Carolina alone, as opposed to 569 for hook and line fisheries in just two states for the same time period![12] As the BiOp estimates mortality per sector based on number of turtle interactions scaled up by number of trips per sector,[13] and if the BiOp data estimates 13,082,108 annual recreational trips (which would be primarily using hook and line gear) versus 240,365 total commercial trips from all commercial gear types in the Greater Atlantic Region,[14] what would be the scaled-up number for recreational hook and line interactions in the region? They would be far greater than the numbers for the squid or fluke trawl fisheries. Yet, no mention is made of this issue, despite the requirements of Section 7. Does the agency plan to address hook and line fishery restrictions in light of these facts?

We do not believe that the agency is fulfilling its Section 7 requirements by selectively enforcing policy against fisheries with low interaction while ignoring fisheries with much high interaction. This is particularly the case when considering the substantial reductions in catch and revenue that would occur from the measures being considered by the agency for the squid fishery. NOAA is asking for feedback on how fishermen subjected to these types of proposed measures would compensate for the associated economic impacts. There are no options other than economic loss. To knowingly target a fishery with low turtle interaction with awareness that doing so will cause economic harm to that fishery, while ignoring other fisheries with much higher interaction and mortality rates, whether hook and line, gillnet, or via vessel strike, is unethical and does not provide the best protection to turtles by addressing activities authorized by the agency.

Sincerely,
Meghan Lapp
Fisheries Liaison, Seafreeze Shoreside and Seafreeze Ltd.

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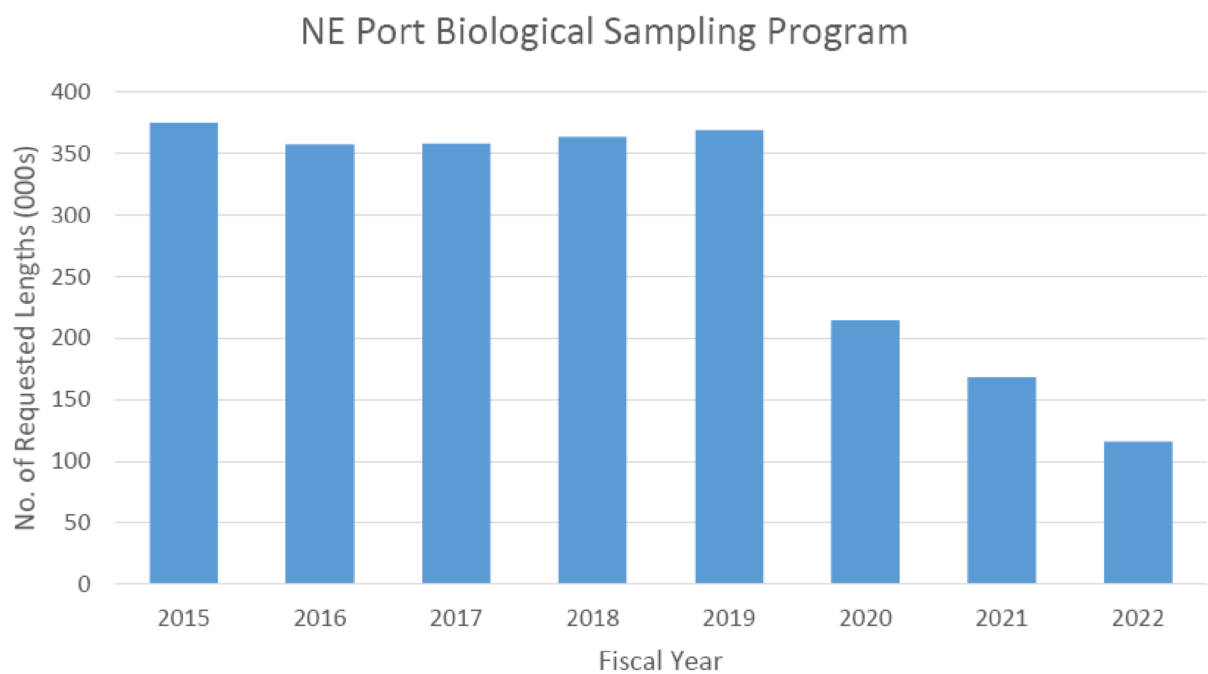
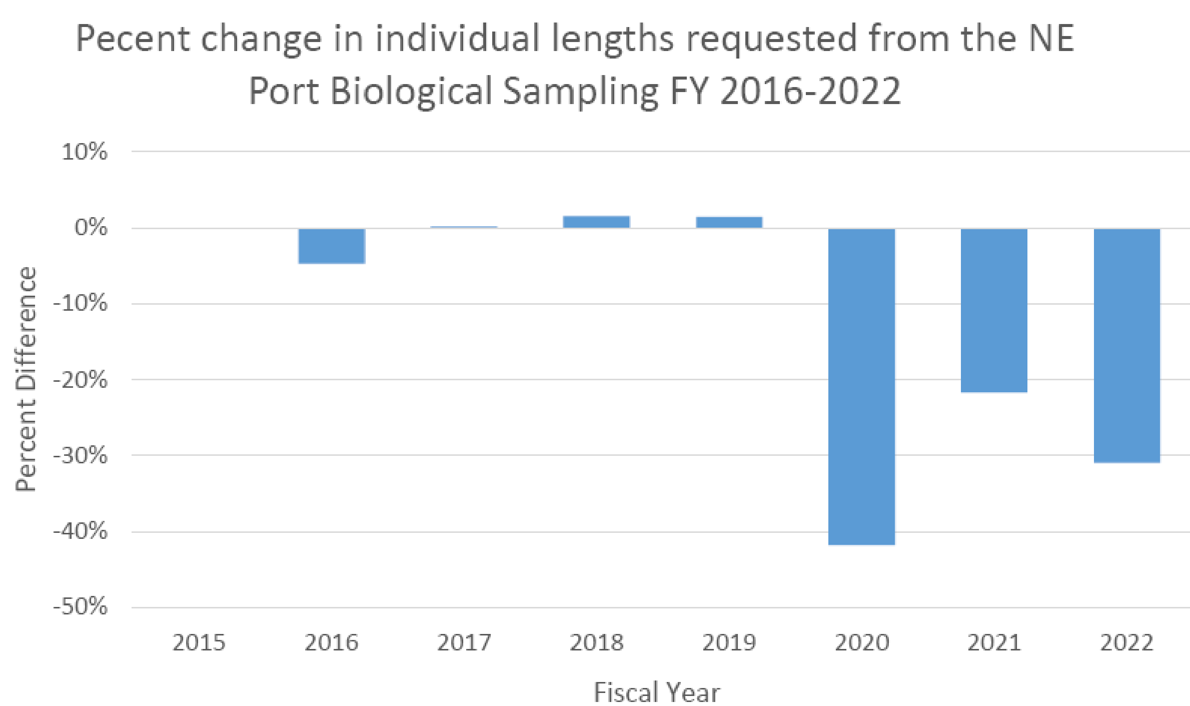
[9] See https://www.fisheries.noaa.gov/feature-story/cold-snaps-and-stunned-sea-turtles.
[10] 2008-2019 Incidental Capture Records Reported to the STSSN.
[11] See https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/623dfd9f48971c21e92d81a2/1648229792595/Tab07_Sea-Turtle-Bycatch_2022-04.pdf.
[12] 2008-2019 Incidental Capture Records Reported to the STSSN.
[13] See for example, p. 255-256.
[14] See p. 259.

Total number of Individual lengths requested FY 2015 - 2022





GARFO Habitat and Ecosystem Services Division Update
MAFMC MEETING June 2022

AQUACULTURE

GARFO staff continue to coordinate with EPA, the US Army Corps of Engineers (USACE), the US Fish and Wildlife Service (USFWS), and other state and federal agencies related to NOAA Fisheries' role as lead federal agency under the National Environmental Policy Act (NEPA) for specific federal waters aquaculture projects per E.O. 13921. We were designated as lead federal agency for the development of an EIS for the Blue Water Fisheries net-pen aquaculture project proposed for federal waters off of MA/NH in 2021. We are in the process of working internally, and with partner federal agencies, to develop a framework that will allow us to move forward with the NEPA analysis for the project. Currently there is no expected timeframe for the publication of a Notice of Intent (NOI) in the *Federal Register* for the project.

Manna Fish Farms recently submitted applications to EPA and USACE to construct a commercial scale net-pen aquaculture operation in federal waters of the Gulf of Mexico. They also recently notified us that they plan to continue the development of application materials and survey work associated with their proposed net-pen aquaculture project in federal waters off Shinnecock Inlet in NY.

NOAA Fisheries' Office of Aquaculture is hosting a series of public listening sessions on their draft aquaculture strategic plan. During each listening session, NOAA staff will provide an overview of the contents of the draft strategic plan, discuss next steps, and answer related questions. These meetings are intended to ensure an inclusive and transparent process as NOAA works to expand sustainable aquaculture in the United States. The sessions will be recorded. A copy of the draft aquaculture strategic plan can be found here.

Public Listening Session Registration Links:

- Session 1: Wednesday, June 8, 11:00 a.m. ET
- Session 2: Wednesday, June 8, 6:30 p.m. ET
- Session 3: Thursday, June 9, 5:00 p.m. ET

NOAA recently published Notices of Intent to prepare Programmatic Environmental Impact Statements for the proposed Southern California and Gulf of Mexico Aquaculture Opportunity Areas. Additional information can be found on the NOAA Fisheries West Coast Region AOA Public Scoping Meetings page and NOAA Fisheries Gulf of Mexico AOA Public Scoping Meetings page.

NOAA Fisheries recently published the Guide to Permitting Marine Aquaculture in the United States (2022). The primary purpose of this guide is to assist individuals with navigating the federal permitting process for marine aquaculture (finfish, shellfish, invertebrates, seaweed). The guide was prepared by NOAA in consultation with the Subcommittee on Aquaculture under the National Science and Technology Council. It outlines the key requirements necessary to obtain federal permits to conduct commercial aquaculture activities and provides an overview of the federal statutes and regulations governing aquaculture in the United States. The permitting complements a series of outreach, education, science, and policy resources recently published by NOAA Fisheries and available on our website.

OFFSHORE ENERGY - Wind

GARFO staff are busy with the environmental reviews and consultations for numerous offshore wind projects. With nine projects entering the NEPA process in 2021, we are expecting back-to-back and overlapping EIS reviews and consultations through the remainder of the calendar year. This is a challenge for us as we have limited resources to handle the workload. We expect this pace to continue into 2023, as BOEM is expected to publish more NOIs later this year, and continue with the process for wind development in the NY Bight and Central Atlantic. The next formal public comment opportunity is on the Ocean Wind DEIS, expected in late June.

GARFO, working with the Northeast Fisheries Science Center (NEFSC) and NOAA Fisheries Headquarters, are working closely with BOEM and other agencies to provide input on project alternatives for consideration in the EISs, including habitat minimization alternatives aimed at avoiding and minimizing impact to complex habitat during construction and operations. We are also working closely with BOEM to update timelines and milestones for projects, as required under FAST-41, as project schedules often change. We also engage regularly with BOEM, the USACE, and other agencies and provide technical assistance at various stages of the environmental review process.

We have also been involved in BOEM's effort to develop guidance for offshore wind developers for fishery mitigation due to offshore wind development. GARFO and NEFSC staff participated in BOEM's Technical Working Group to provide guidance and recommendations to help improve BOEM's fishery compensation mitigation guidance.

We are continually working internally, with BOEM, and other partners to find ways to streamline the environmental review and consultation processes. We've developed information needs checklists for EFH assessments, biological assessments for ESA, and socioeconomic impact analyses to guide BOEM in the development of these documents.

In cooperation with the NEFSC and New England Fishery Management Council, we are developing benthic habitat monitoring recommendations guidance similar to our Benthic Habitat Mapping Guidance to provide BOEM and developers with recommendations on the preferred survey methodologies to help guide their survey plans. We are also working with BOEM to develop templates for the EFH assessments and biological assessments they provide and are working on programmatic consultations.

In addition, we are routinely engaging with developers, contractors, and BOEM staff to discuss the data and analysis necessary to evaluate fishing operations and community impacts as a way to improve industry outreach and the content of project Construction and Operation Plan's (COP) and EISs.

GARFO has also been participating in Task Force meetings and providing comments on several offshore wind planning and call areas. Andy Lipsky from the NEFSC represented NMFS and other NOAA line offices at the Gulf of ME task force meeting on May 19th, and provided our comments related to resources of concern and impacts to NOAA scientific surveys in the Gulf of Maine, and feedback on the State of Maine's proposed research array. The Task Force meeting focused on the commercial planning process for wind energy leasing in the GOM and a framework approach for the first step in the commercial lease planning process, which is a request for interest (RFI). We expect BOEM to publish requests for input soon on the commercial lease planning process and the proposed research array. To date, GARFO and NEFSC staff have participated in the ongoing fisheries and wildlife working groups.

NOAA participated in and presented our comments during the February 2022 Central Atlantic Task Force meeting regarding potential impacts on our trust resources due to offshore wind development in the Central Atlantic Planning areas. We suggested that BOEM consider the cumulative impacts of existing areas when determining future lease areas and recommended the removal of existing coral protection areas, canyons, and other areas important to fisheries and marine resources from further consideration. Some areas were removed from consideration, but the coral protection areas were still included in the recently published call for information on April 29th. Working with our Southeast Regional Office and NEFSC, we plan to provide comments on the Central Atlantic Call Areas by the June 28 deadline.

BOEM held an auction this past February for offshore wind leases in the NY Bight. The auction resulted in winning bids on six leases from six different companies, totaling $4.37 billion in revenue. BOEM is considering the development of a programmatic environmental impact statement to assess the impacts across the lease areas with scoping expected as early as this summer.

Coastal Storm Risk Management

As has been reported to the Council in the past, there are a number of U.S Army Corps of Engineers (USACE) Coastal Storm Risk Management Feasibility Studies underway in the Mid-Atlantic. Two studies had been paused, but have received funding and are now active.

1. New York and New Jersey Harbor and Tributaries Focus Area Feasibility Study. A new Notice of Intent is planned to be published in the *Federal Register* in the coming weeks. The Draft Integrated Feasibility Report and Tier 1 Environmental Impact Statement (EIS) is expected to be released in September 2022. The plan still considers five storm surge barriers across several major waterways (Throgs Neck, Verrazano, Arthur Kill, Jamaica Bay, and Kill Van Kull), as well as beach nourishment, levees, flood walls, elevation and flood proofing structures, and nature based features.
2. New Jersey Back Bay Coastal Risk Management Study GARFO provided the USACE with extensive comments on the Draft Integrated Feasibility Report and Tier 1 (EIS) in Nov 2021. The USACE is still reviewing and developing responses to all of the comments on the draft EIS. They have also made some minor modifications to the design of two of the proposed storm surge barriers although the plan continues to include barriers across Manasquan, Barengat and Great Egg inlets and cross bay barriers in Ocean City and Absecon. A supplemental EIS is anticipated to be released in June 2023.

NOAA Fisheries is a cooperating agency for both of these projects and we have expressed significant concerns about the effects of the barrier and gates on aquatic resources including fisheries, wetlands and submerged aquatic vegetation..

Port Activities:

As with our last update, there are a number of port development projects in various stages of development within the Mid-Atlantic. One such project is the Diamond State Port Corporation/Edgemoor container terminal project. Permits are expected this summer. Fish passage (full width rock ramp), habitat enhancement and eDNA are part of the mitigation package.

We are also beginning to see a number of offshore wind related port projects. We previously reported on the NJ Windport located on the Delaware River adjacent to the Salem Nuclear Generating Station, and the Port of Paulsboro farther upstream. Additional facilities have been proposed or are planned in Norfolk, VA, as well as South Brooklyn, Albany and Coeymans, NY. Other projects are likely in the future.

Other Activities:

Essential Fish Habitat Innovation and Enhancement Funding: Every year, NOAA Fisheries Office of Habitat Conservation has $150,000 to $200,000 available to the regions for research or other activities that advance or inform EFH designations and EFH consultations. The regions work with the Councils and NOAA Fisheries Science Centers to develop projects that compete for this funding. The regional EFH coordinators review all the proposed projects and make recommendations to the Habitat leadership on which ones to fund. It is a collaborative and consensus based process. Last year, GARFO and the Mid-Atlantic and New England Councils received $88,00 to develop a matrix that synthesizes information about species and habitat vulnerability to climate change and identifies the dependence or occurrence of species on specific habitat types.

This year, GARFO and the Councils received $66,000 to develop a National Fishing Effects Database that will include a detailed, searchable fishing effects library (with direct access to literature where available) for internal Council and NOAA Fisheries users, and a publicly accessible and searchable viewer that can be used by interested parties (Council stakeholders, academics, others) to understand the body of information used by the Councils for fishing gear effects analyses. The database will be available to all regions to support their own fishing effects literature reviews. This work will support the up-coming MAFMC EFH Review.

These two projects highlight the collaboration between the two Councils and GARFO HESD. Many thanks to the Council staff working with us on these and we look forward to working together on future EFH Innovation and Advancement funding opportunities.

NOAA Mitigation Policy: In our June 2021 update, we presented information on NOAA's draft Mitigation Policy. Over the past year, NOAA staff have been working to address comments received on the draft document. It is hopefully undergoing the last round of review with the Council on Environmental Quality and the Office of Management and Budget. We are hopeful that it will be released this summer.

Fact Sheet: Revised Commercial and Recreational Allocations of Summer Flounder, Scup, and Black Sea Bass

Summary of Proposed Changes

In December 2021, the Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission (Commission) approved a joint amendment to revise the allocations of summer flounder, scup, and black sea bass to the commercial and recreational sectors. These changes are intended to better reflect current information about the historic proportions of catch and landings from the commercial and recreational sectors. The revised allocations are summarized in the table below. For all three species, these changes shift allocation from the commercial to the recreational sector.

	Original Allocations	Revised Allocations
Summer Flounder*	**60%** Commercial; **40%** Recreational Landings-based	**55%** Commercial; **45%** Recreational Catch-based
Scup	**78%** Commercial; **22%** Recreational Catch-based	**65%** Commercial; **35%** Recreational Catch-based
Black Sea Bass*	**49%** Commercial; **51%** Recreational Landings-based	**45%** Commercial; **55%** Recreational Catch-based

* The current and revised allocations for summer flounder and black sea bass are not directly comparable due to the transition from landings-based to catch-based allocations (see Additional Information on p. 3 for details).

The amendment has been submitted to NOAA Fisheries for approval and rulemaking. If approved, the revised allocations are expected to take effect on January 1, 2023.

Rationale for Revised Allocations

Why are changes to the commercial and recreational allocations needed?

The original allocations were set in the mid-1990s and have not been revised since that time. These allocations were based on historical proportions of catch or landings from each sector. Recent changes in the methodology used to collect recreational fishing data have resulted in much higher recreational catch estimates throughout the time series compared to previous estimates. Some changes have also been made to commercial catch data since the allocations were established. As a result of these changes, the original allocation percentages no longer reflect the current understanding of the recent and historic proportions of catch and landings from the two sectors. In addition, the Council's allocation review policy requires that allocations be reviewed at least every 10 years.

How were the revised allocations determined?

The revised commercial and recreational allocations are based on updated data from the same base years used to set the original allocations (summer flounder: 1981-1989; scup: 1988-1992; black sea bass: 1983-1992). This approach uses the best scientific information currently available while accounting for fishery characteristics in years prior to influence by the commercial/recreational allocations. The allocations for all three species will now be catch-based. Previously, scup had a catch-based allocation and summer flounder and black sea bass had landings-based allocations (see p. 3 for details).

Why weren't the revised allocations based on more recent timeframes?

When the original allocations for these species were developed, the base years were selected because they represented periods of relatively unrestricted fishing effort and, therefore, could serve as a proxy for each sector's level of effort and interest in the fishery prior to implementation of management controls. The Council and Commission considered allocation options based on more recent timeframes, but these options raised concerns about fairness due to differences in how well the commercial and recreational sectors have been held to their respective limits in past years.

Potential Impacts

How will the revised allocations affect each sector's future limits?

For all three species, these changes result in a shift in allocation from the commercial to the recreational sector. The tables below show how each sector's recent landings compare to the actual limits for 2022 and examples of limits which may have been implemented if the revised allocations had been in place in 2022. These are provided for comparison purposes only. Revised allocations are not expected to be implemented until 2023. The commercial quota and recreational harvest limit (RHL) for 2023 will not be determined until later in 2022.

Table 1: Recent commercial landings compared to the actual 2022 commercial quotas and example commercial quotas under the revised allocations. All values are in millions of pounds.

Species	Avg. 2019-2021 Commercial Landings	Actual 2022 Commercial Quota (Original Allocations)	Example 2022 Quota (Revised Allocations)
Summer Flounder	9.51	15.53	15.14
Scup	13.43	20.38	15.18
Black Sea Bass	4.09	6.47	5.05

Table 2: Recent recreational landings compared to the actual 2022 RHLs and example RHLs under the revised allocations. All values are in millions of pounds.

Species	Avg. 2019-2021 Recreational Landings	Actual 2022 RHL (Original Allocations)	Example 2022 RHL (Revised Allocations)
Summer Flounder	8.93	10.36	11.12
Scup	14.44	6.08	9.86
Black Sea Bass	9.74	6.74	8.19

It is not possible to precisely predict future commercial quotas and RHLs, as these limits are derived from the overall Acceptable Biological Catch limit (ABC) for each species and will vary depending on stock size, expected dead discards from each sector, and other factors. The following questions provide an approximation of likely near-term impacts, assuming future ABCs remain similar to recent years.

Will the revised allocations require a reduction in commercial landings?

Not necessarily. Commercial landings of all three species have been below the commercial quotas in recent years. The commercial quota has not been fully harvested for scup since 2007, for summer flounder since 2018, or for black sea bass since 2019. While the revised allocations will result in lower commercial quotas than would have been set under the original allocations, recent landings suggest that, in the near term, commercial landings may not need to be reduced below recent levels.

Will these changes allow for increased recreational harvest or less restrictive management measures?

The revised allocations will result in higher RHLs than would have been set under the original allocations, but the impact of these increases on management measures will vary by species. Under the current management process, the Council and Commission compare recent recreational landings to the RHL for the upcoming year to determine whether changes to the recreational management measures (bag limit, size limit, season) are warranted. The goal is to set measures that will achieve, without exceeding, the RHL.

For **summer flounder**, recreational landings have been close to or below the RHL for three of the last four years. The RHL for 2022 is a 25% increase compared to 2021 and is the highest RHL in over a decade. This increase allowed for less restrictive management measures to be implemented for 2022. It is possible that higher RHLs resulting from the revised allocations could allow for management measures to remain similar to 2022 or be further relaxed.

For **scup** and **black sea bass**, the recreational sector has significantly exceeded the RHLs in recent years, meaning that recreational harvest of these species may not be allowed to increase in the near term, even with higher RHLs. This will depend, in part, on the effectiveness of the more restrictive management measures that were implemented in 2022 for scup and black sea bass.

Additional Information

Why are summer flounder and black sea bass changing from landings-based to catch-based allocations?

This change is intended to simplify the specifications process and decrease the influence of dead discards from one sector on the other sector's catch and landings limits. The main difference between catch- and landings-based allocations is the step in the process at which dead discards are accounted for. With a landings-based allocation, projected dead discards from both sectors are combined and subtracted from the entire ABC before the allocation percentages are applied. With a catch-based allocation, the ABC is divided between the sectors based on the allocation percentages, and then each sector's projected dead discards are subtracted to produce commercial quotas and RHLs. A catch-based allocation does not change the way the fisheries are managed aside from the process of setting annual catch and landings limits for each sector.

Why has recreational data changed so much in recent years?

Recreational catch and harvest data are estimated by NOAA Fisheries' Marine Recreational Information Program (MRIP). In July 2018, MRIP released revised time series of catch and harvest estimates based on adjustments for a revised angler intercept methodology and a new effort estimation methodology, including a transition from a telephone-based effort survey to a mail-based effort survey. These changes affected the entire time series of recreational data going back to 1981. In general, the revised recreational fishing effort estimates are higher — and in some cases substantially higher — than the previous estimates because the new methodology is designed to more accurately measure fishing activity, not because there was a sudden rise in fishing effort.

For additional information, visit the Council's Recreational Fishing Data web page.

What are the next steps for this action?

The Council has submitted the amendment for review by NOAA Fisheries. As part of the rulemaking process, NOAA Fisheries will publish a proposed rule with a public comment period. Once a final rule has published, NOAA Fisheries will issue a fishery bulletin alerting constituents to any regulatory changes being implemented.

Additional information and updates related to this action can be found on the Council's website at https://www.mafmc.org/actions/sfsbsb-allocation-amendment.

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 27, 2022

To: Chris Moore, Executive Director

From: Julia Beaty, staff

Subject: Updates on Offshore Wind Energy Development

The following major updates in offshore wind energy development occurred since the April 2022 Council meeting. This is not intended to be an exhaustive list.

- The Bureau of Ocean Energy Management (BOEM) published a Call for Information and Nominations to assess commercial interest in, and obtain public input on, potential wind energy leasing activities in the Central Atlantic. The Call Areas were not modified to remove the Frank R. Lautenberg Deep Sea Coral Protection Areas, as requested by the Council. Staff plan to submit a letter through the associated comment period, which ends June 28, to again request that these areas be removed from further consideration for wind energy development.
- On May 6, 2022, the Mid-Atlantic and New England Councils submitted a comment letter on the NOAA Fisheries and BOEM Federal Survey Mitigation Implementation Strategy for the Northeast U.S. Region.
- On May 11, 2022, BOEM held an offshore wind auction for two lease areas two areas off North and South Carolina.
- BOEM held a Gulf of Maine Task Force meeting on May 19, 2022.
- On May 19, 2022, Sea Grant, the Department of Energy, and NOAA Fisheries announced funding of six projects for the coexistence of offshore energy with northeast fishing and coastal communities.
- Council staff participated in a Department of Energy offshore wind strategy external stakeholder workshop on May 24–25, 2022.

New England Fishery Management Council

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

May 6, 2022

Jonathan Hare
Science and Research Director
National Oceanic and Atmospheric Administration
Northeast Fisheries Science Center
166 Water Street
Woods Hole, Massachusetts 02543

Brad Blythe
Chief, Branch of Biological and Social Sciences & BOEM Scientific Integrity Officer
Bureau of Ocean Energy Management
Office of Renewable Energy Programs
45600 Woodland Road (VAM-OREP)
Sterling, Virginia 20166

Dear Dr. Hare and Dr. Blythe,

Please accept these comments from the New England Fishery Management Council (New England Council) and the Mid-Atlantic Fishery Management Council (Mid-Atlantic Council) regarding the NOAA Fisheries and BOEM Federal Survey Mitigation Implementation Strategy for the Northeast U.S. Region. The Councils rely heavily on NOAA's scientific surveys for development of key management measures, including measures required by law such as annual catch limits. We strongly support efforts to understand and mitigate the negative impacts of offshore wind development on these surveys.

The New England Council has primary management jurisdiction over 28 marine fishery species in federal waters and is composed of members from Maine to Connecticut. The Mid-Atlantic Council manages more than 65 marine species[1] in federal waters and is composed of members from the coastal states of New York to North Carolina (including Pennsylvania). In addition to managing these fisheries, both Councils have enacted measures to identify and conserve essential fish habitats (EFH), protect deep sea corals, and sustainably manage forage fisheries. The Councils support efforts to mitigate the effects of climate change, including the development of renewable energy projects, provided risks to the health of marine ecosystems, ecologically and economically sustainable fisheries, and ocean habitats are avoided.

While the Councils recognize the importance of domestic energy development to U.S. economic security, it is important to note that marine fisheries throughout New England and the Mid-Atlantic are profoundly important to the social and economic well-being of communities in the Northeast U.S. and provide numerous benefits to the nation, including domestic food security.

[1] Fifteen species are managed with specific Fishery Management Plans, and over 50 forage species are managed as "ecosystem components" within the Mid-Atlantic Council's FMPs.

Both Councils updated their policy on wind energy development in December 2021, working together on policy development and adopting the same language. Our comments in this letter build upon this policy.

Summary of Recommendations

- As time and resources allow, consider impacts to the Northeast Area Monitoring and Assessment Program (NEAMAP) and other partner surveys as part of the mitigation strategy.
- Provide additional detail on the intent and differences between certain objectives.
- Clarify the feasibility of implementing mitigation program and survey-specific plans given resource and funding constraints.
- Recommend data sharing strategies.
- Establish new, long-term monitoring surveys.
- Analyze cumulative effects on NOAA surveys from all wind projects.
- Streamline and facilitate process for obtaining the necessary incidental take authorizations for endangered and protected species for surveys completed by wind developers.
- Bring in the Northeastern Regional Association of Coastal Ocean Observing Systems (NERACOOS) and Mid-Atlantic Coastal Ocean Observing System (MARACOOS) as partners.
- Seek Council participation on work groups and consult with Councils on effectiveness of monitoring efforts.
- Develop a NOAA website to host updated implementation strategy materials, announcements of public meetings and comment opportunities, and a tracking dashboard measuring progress and effectiveness of mitigation measures.

Completeness of Strategy, Impacts, and Components

This strategy should more explicitly consider implications for other partner surveys such as the Northeast Area Monitoring and Assessment Program (NEAMAP). Such evaluations might be more limited than those completed for core NOAA Fisheries surveys, but it would be useful to estimate the extent to which these surveys may be impacted by development and what the effects might be on fisheries management.

The draft mitigation strategy states it is too late to avoid impacts to NOAA Fisheries surveys from offshore wind projects with approved Construction and Operations Plans (i.e., Vineyard Wind 1 and South Fork Wind). The magnitude of survey impacts from these projects is unclear and should be clarified. To avoid loss of data quantity, accuracy, and precision, with associated downstream impacts, the impacts of these projects will need to be mitigated through this implementation strategy. Clarity should be provided on the feasibility of redesigning surveys or deploying new types of surveys at sites where projects have already been permitted.

Goals, Objectives, and Actions

We agree that a “workflow for identifying federal survey mitigation needs in a timely manner as part of the permitting and leasing framework” (Action 1.1.2) is important. However, we would appreciate more detail on what this means. Is this action envisioned as part of the EIS development process, where impacts of specific projects on surveys are identified? Action 3.1.1 under Goal 3 is to "Document and analyze impacts of offshore wind energy development on NOAA Fisheries surveys during the environmental review process for individual projects", so we assume something different is envisioned here. Or is this action intended to be a broader effort, thinking across multiple projects and timelines? The reference to the leasing framework suggests that the idea is to begin considering survey mitigation needs early in the process, as lease areas are being developed. We would agree with this. This might be especially important in the Gulf of Maine or in other deep-water areas if vessel access for alternative surveys is challenging due to floating arrays (this relates to Action 3.2.3).

Given the complexity and importance of mitigating impacts to NOAA Fisheries surveys, it will be important to obtain all necessary resources, including funding, to achieve all the outlined goals and objectives (objectives 1.2 and 1.3 in the draft strategy). Section 8 in the draft strategy includes a list of potential funding sources, which are not guaranteed. Table 2 includes numerous actions with completion dates beginning this fall that are not yet funded. If all the outlined goals, objectives, and actions cannot be achieved using federal funds or other grants, we recommend any applicable survey mitigation measures be required as part of lease and permit conditions for wind projects (Action 1.3.2). Alternatively, NOAA and BOEM could prioritize and complete a focused subset of the actions versus partially addressing all actions.

As part of either Objective 2.2 or Goal 4, we suggest considering new, long-term monitoring surveys to be conducted by NOAA Fisheries. Long-term monitoring is important to adequately sample new habitats created by offshore wind energy development, species regime shifts because of climate change, etc.

Cumulative effects on NOAA Fisheries surveys from all offshore wind energy projects should be analyzed as part of Objective 3.1, Action 3.1.1. Documenting and analyzing impacts for individual projects is important; however, the aggregate effects are critical to understanding regional impacts.

Objectives 4.1 and 4.2 are similar. It would be helpful to outline specific review tasks to be completed quarterly (strategy review) vs. annually (program and survey-specific plan reviews). We assume that survey-specific plan reviews will be done after the survey is conducted each year, but in time to adapt the mitigation plan for the following year. Since surveys are done on different schedules, this could argue for a rolling review survey by survey, rather than a larger annual evaluation.

Consideration of new survey technologies will be important but issuing and evaluating responses to an annual request for information for survey technologies (Action 4.4.1) could be quite time-consuming. It would be useful to know more about what this process might entail, and how alternative survey technologies would be evaluated by NOAA Fisheries. This seems like an area of work where identifying partners who are also exploring or using these technologies would be worthwhile.

We are encouraged that Objective 4.5 includes monthly tracking and reporting on wind energy development in the U.S. This product will be useful beyond survey mitigation. As part of Action

4.5.1, we strongly urge BOEM to include downloadable GIS layers with proposed project layouts including cable routes as part of the dashboard for stakeholders to understand the regional cumulative effects of all proposed projects more easily.

Additional detail and specificity should be provided for Objective 4.6 as it is not clear if the intention is to adapt surveys to reflect ecosystem changes. If survey adaptation due to climate change is already planned for, this should be integrated with offshore wind survey mitigation work.

Goal 5 (coordinated execution and sharing knowledge) is essential. Ideally NOAA and BOEM staff and other partners from outside the region will be integrated into the process at the outset so knowledge sharing can occur on an ongoing basis.

Developer Monitoring Surveys

We strongly support evaluation and integration of developer monitoring surveys with NOAA Fisheries surveys (Goal 2), regional standards (Objective 2.1), and compatibility with NOAA surveys (Objective 2.2). Data sharing strategies, including plans for distributing developer-collected data, should be further elucidated. The strategy should clarify whether and how developer-collected monitoring data will be combined with or aligned with data from the NOAA Fisheries surveys. We recommend that all project-specific monitoring studies be shared with NOAA Fisheries, made publicly available, and integrated with the existing survey data where possible. When these studies cannot be integrated with NOAA Fisheries survey data to support fisheries management, an explanation for why should be provided for future data users.

We understand that surveys conducted by developers may require authorizations under the Marine Mammal Protection Act and the Endangered Species Act. Especially as these surveys can represent continuous time series, timely issuance of any required authorization is important to avoid temporal gaps in coverage. The mitigation strategy should consider ways to facilitate and streamline this process.

Working with Partners

We appreciate that the draft strategy identifies the Councils as partners in the survey mitigation process. We understand that the strategy was intentionally left open-ended as to how stakeholders including the Councils might be involved. Suggested paths for Council involvement include:

- Council member and/or staff participation in work groups addressing specific issues (e.g., the Scallop Survey Working Group), based on resource availability and expertise.
- Consultation on the effectiveness of long-term monitoring efforts to adequately measure impacts of offshore wind development on Council-managed species.

NERACOOS and MARACOOS (Northeast and Mid-Atlantic Regional Association Coastal Ocean Observing Systems) would also be useful partners in this work.

Communication and outreach recommendations

Survey mitigation is a complex, long-term issue that will involve multiple teams working across NOAA, BOEM, and partner organizations. Offshore wind development is complex and fast-moving. We suggest the following ways to improve communication on these issues:

- We agree that a NOAA website (Action 5.3.3) is essential. This site should host the final strategy, a routinely updated copy of the Goals, Objectives, and Actions table, announcements of public meetings and comment opportunities, and other related reports and information. The website should also include Objective 4.3's dashboard for tracking how the mitigation measures are being implemented and adapted, and whether the measures have been effective at achieving the stated goals and objectives.
- NOAA should identify a staff member to liaise with the Councils and serve as a point of contact on survey mitigation issues (perhaps the program coordinator noted in Action 5.1.2). This individual should provide periodic updates to the Councils during their meetings at appropriate intervals, perhaps twice per year.
- Communications and outreach should not focus just on scientific publications and scientific presentations. The strategy should more explicitly acknowledge that communications and outreach to non-technical audiences will be prioritized. For example, BOEM and NOAA should provide easily digestible information on the likely impacts survey changes will have on stock assessments and scientific uncertainty levels used in management, where possible. Impacts on assessments will be important for Councils (including their Scientific and Statistical Committees) to understand. The issue of survey mitigation is complex, and detailed materials will be important for scientific stakeholders; however, other users will appreciate higher-level summaries of changes made and their implications.

Minor errors noted in the draft strategy

The following errors in the document are not substantive to the overall conclusions drawn but should be corrected in the final strategy document.

- Councils should be referred to as Fishery (not Fisheries) Management Councils on page 18 and throughout the document.
- The document refers to the Management and Conservation Act on page 18; this should be corrected to Magnuson-Stevens Fishery Conservation and Management Act.
- Page 18 and page 25 refer to the Atlantic States Marine Fisheries Commission as "the Interstate Fisheries Commission" and the "Marine Fisheries Commission", respectively. The phrase Atlantic States Marine Fisheries Commission would be clearer.
- The role of states in fisheries management is downplayed on page 19. The Atlantic States Marine Fisheries Commission (ASMFC) is composed of "member states", not "representatives from coastal states." The states' role in ASMFC should also be noted under the state bullet on page 19 given that the states manage fisheries.

Conclusion

We look forward to working with NOAA and BOEM on these important issues. Please contact us if you have any questions.

Sincerely,

Thomas A. Nies
Executive Director, New England Fishery Management Council

Dr. Christopher M. Moore
Executive Director, Mid-Atlantic Fishery Management Council

cc: J. Beaty, M. Luisi, W. Townsend

New England Fishery Management Council

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

May 4, 2022

Rosemarie Gnam
Chief, Division of Scientific Authority
U.S. Fish and Wildlife Service

RE: Proposed Amendments to the CITES Appendices

Ms Gnam:

The Mid-Atlantic and New England Fishery Management Councils (Councils) support the tentative U.S. position that spiny dogfish should not be added to any CITES Appendices at this time. The Northwest Atlantic stock is managed jointly by the Mid-Atlantic and New England Councils under a federal fishery management plan, which meets all requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Although the stock was previously overfished in the decades prior to Council management, the stock was declared rebuilt in 2010 and has been maintained at sustainable levels ever since.

As required under the MSA, the Councils set science-based catch limits and other management measures intended to ensure the sustainability of the spiny dogfish stock. Annual quotas are set based on regular stock assessments. These stock assessments utilize comprehensive monitoring of U.S. catch, catch reports from Canada, and fishery independent indices. There is also a research track assessment underway in 2022 to evaluate additional data and/or models for assessing stock trends. Stock size is expected to vary over time, and management/quotas will be adjusted accordingly to ensure sustainability. Please contact the Mid-Atlantic Fishery Management Council (302-526-5255 or cmoore@mafmc.org) if you have any questions or need any additional information.

Sincerely,

Dr. Christopher M. Moore

Executive Director, Mid-Atlantic Fishery Management Council

Thomas A. Nies

Executive Director, New England Fishery Management Council

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
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: May 24, 2022

To: Council

From: Chris Moore, Executive Director

Subject: 2022-2024 Climate Regional Action Plans

NOAA Fisheries is soliciting public comments on Draft 2022-2024 Climate Science Regional Action Plans. The plans identify actions that each region intends to take over the next 3 years to address regional climate-science needs and the objectives of the NOAA Fisheries Climate Science Strategy. NOAA Fisheries is interested in input on the clarity of the goals and activities, ways to strengthen the plans, and what additional goals and activities need to be addressed. The deadline for comments has been extended **July 29, 2022**.

The Draft Northeast Regional Action Plan is linked below. The Council will briefly review the draft plan during the Executive Director's Report at the June 2022 Council Meeting. If the Council wishes to formally submit comments, staff will draft a letter for Council review following the meeting. Council members may send comments to Mary Sabo at msabo@mafmc.org.

- NOAA Fisheries Draft Northeast Regional Action Plan 2022-2024

Climate Regional Action Plans Overview
Climate Science Regional Action Plans (RAPs) guide the implementation of the NOAA Fisheries Climate Science Strategy in each region. Launched in 2016, these plans are designed to increase the production, delivery, and use of scientific information needed to fulfill NOAA Fisheries' mission in a changing climate. Specifically, the RAPs identify actions to address key information needs for climate-informed decision-making including what's changing, expected future conditions, and how to increase resilience and adaptation of living marine resources and the many people who depend on them. These actions will help track changes, assess risks, provide early warnings and forecasts, and evaluate the best management strategies for changing conditions in each region. Additional information is available on the Climate Science Strategy Regional Action Plan page.