August 2022 Council Meeting

Monday, August 8, 2022 – Thursday, August 11, 2022

Hybrid Meeting:
The Notary Hotel
(21 N. Juniper Street, Philadelphia, PA 19107, 215-496-3200)
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 The Notary Hotel or virtually via Webex webinar. Webinar connection instructions and briefing materials will be available at: https://www.mafmc.org/briefing/august-2022.

Agenda

Monday, August 8th

3:00 p.m.	***Council Convenes with the Atlantic States Marine Fisheries Commission's (ASMFC) Bluefish Management Board***
3:00 p.m. – 4:30 p.m.	**Bluefish 2023 Specifications (Tab 1)** - Review recommendations from the Scientific and Statistical Committee (SSC), Monitoring Committee, Advisory Panel, and staff - Review previously adopted commercial and recreational catch and landings limits for 2023 and revise as necessary - Review and revise 2023 commercial and recreational measures if needed
4:30 p.m.	***Council Adjourns***
4:30 p.m. – 5:00 p.m.	**ASMFC Bluefish Board Only** - ASMFC Bluefish Fishery Management Plan Review

Tuesday, August 9th

9:00 a.m.	***Council Convenes with the ASMFC Summer Flounder, Scup, and Black Sea Bass Management Board***
9:00 a.m. – 11:00 a.m.	**EAFM Recreational Summer Flounder Management Strategy Evaluation (Tab 2)** - Review MSE model results and work group recommendations - Provide feedback and direction for potential application of MSE results

11:00 a.m. – 12:30 p.m. **Summer Flounder 2023 Specifications (Tab 3)**

- Review recommendations from the SSC, Monitoring Committee, Advisory Panel, and staff
- Review previously adopted commercial and recreational catch and landings limits for 2023 and revise as necessary
- Review and revise 2023 commercial measures if needed

-------- Lunch 12:30 p.m. – 1:30 p.m. --------

1:30 p.m. – 2:30 p.m. **Scup 2023 Specifications (Tab 4)**

- Review recommendations from the SSC, Monitoring Committee, Advisory Panel, and staff
- Review previously adopted commercial and recreational catch and landings limits for 2023 and revise as necessary
- Review and revise 2023 commercial measures if needed

2:30 p.m. – 4:00 p.m. **Black Sea Bass 2023 Specifications (Tab 5)**

- Review recommendations from the SSC, Monitoring Committee, Advisory Panel, and staff
- Review previously adopted commercial and recreational catch and landings limits for 2023 and revise as necessary
- Review and revise 2023 commercial measures if needed

4:00 p.m. ***Council Adjourns***

4:00 p.m. – 4:30 p.m. **ASMFC Summer Flounder, Scup, Black Sea Bass Board Only**

- ASMFC Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan Review

Wednesday, August 10th

9:00 a.m. – 10:00 a.m. **BOEM Guidance for Mitigating Impacts of Offshore Wind Energy Projects on Commercial and Recreational Fisheries (Tab 6)**

- Review draft guidance and discuss Council comments

10:00 a.m. – 10:30 a.m. **Community Offshore Wind Project (lease OCS-A-0539 off New Jersey) (Tab 7)**

- Presentation by RWE representatives

10:30 a.m. – 11:00 a.m. **East Coast Climate Change Scenario Planning (Tab 8)**

- Update on draft scenarios and next steps

11:00 a.m. – 11:30 a.m. **Ecosystem and Ocean Planning (EOP) Committee Report (Tab 9)**

- Report on EOP Committee / Advisory Panel meeting on potential designation of Hudson Canyon National Marine Sanctuary

11:30 a.m. – 12:30 p.m. **Update on New England Fishery Management Council Activities Affecting Mid-Atlantic (Tab 10)**

- Monkfish specifications update
- Potential winter flounder accountability measures for squid fishery
- New England response to Sturgeon Draft Action Plan

- Next steps regarding SCOQ Nantucket Shoals Habitat Management Area

-------- Lunch 12:30 p.m. – 1:30 p.m. --------

1:30 p.m. – 2:30 p.m. **Butterfish 2023 – 2024 Specifications (Tab 11)**
- Review recommendations from the Advisory Panel, SSC, and staff
- Approve 2023-2024 specifications

2:30 p.m. – 3:30 p.m. **Report on *Illex* Squid Research Track Assessment Process (Tab 12)**
- Review report from Consensus Building Institute (CBI)
- Discussion and recommendations on next steps

3:30 p.m. – 4:00 p.m. ***Illex Preliminary* 2023 Specifications (Tab 13)**
- Review recommendations from the Advisory Panel, SSC, and staff
- Approve preliminary 2023 specifications

4:00 p.m. – 4:30 p.m. **Update on *Illex* Permit Amendment (Amendment 22 to the Mackerel, Squid, Butterfish FMP) (Tab 14)**
- Overview of alternatives that were selected as preferred at final action
- Update on current status of NMFS rulemaking

4:30 p.m. **Acknowledgement of Outgoing Council Members**

Thursday, August 11th

9:00 a.m. – 9:15 a.m. **Swearing In of New and Reappointed Council Members**

9:15 a.m. – 9:30 a.m. **Election of Officers**

9:30 a.m. – 1:00 p.m. **Business Session**

Committee Reports (Tab 15) – SSC, NTAP

Executive Director's Report (Tab 16) (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 (Tab 17) – New England Council, South Atlantic Council

Other Business and General Public Comment

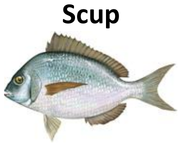
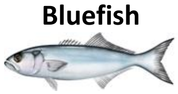
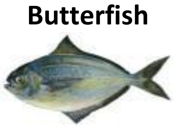
This meeting will be recorded. Consistent with 16 USC 1852, a copy of the recording is available upon request.

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.

MID-ATLANTIC
FISHERY MANAGEMENT COUNCIL

Stock Status of MAFMC-Managed Species

(as of 7/26/22)

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	2022 research track assessment failed, but peer review agreed likely "lightly fished in 2019," though with cautious caveats
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	43.5 million lbs	No overfishing Not overfished	Most recent management track assessment was 2022.
Chub Mackerel 	At least 3,026 MT of catch per year	At least 3,026 MT of catch three years in a row	No overfishing Not overfished	No stock assessment.

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

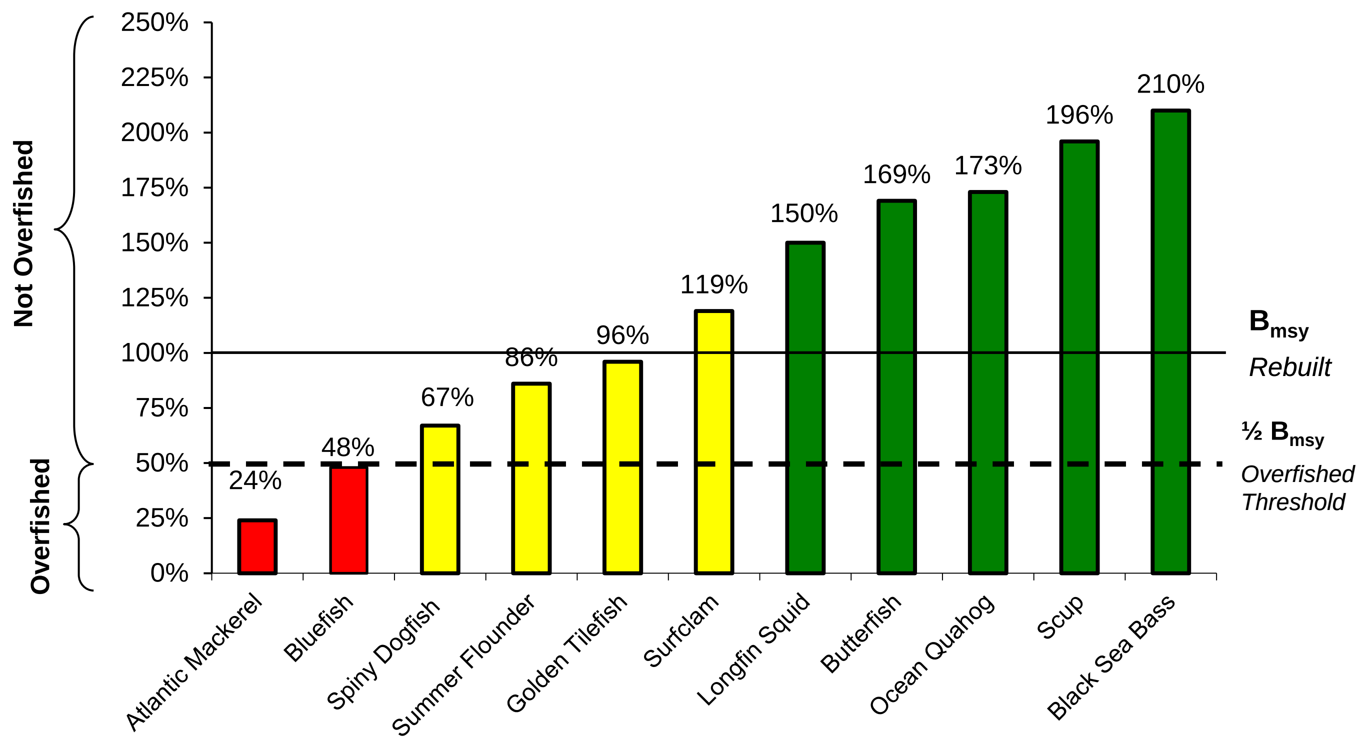
SOURCES: Office of Sustainable Fisheries - Status Report of U.S. Fisheries; SAW/SARC, SEDAR, and TRAC Assessment Reports.

[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 $0.4*SSB_0$.

MID-ATLANTIC
FISHERY MANAGEMENT COUNCIL

Stock Size Relative to Biological Reference Points

(as of 7/26/22)



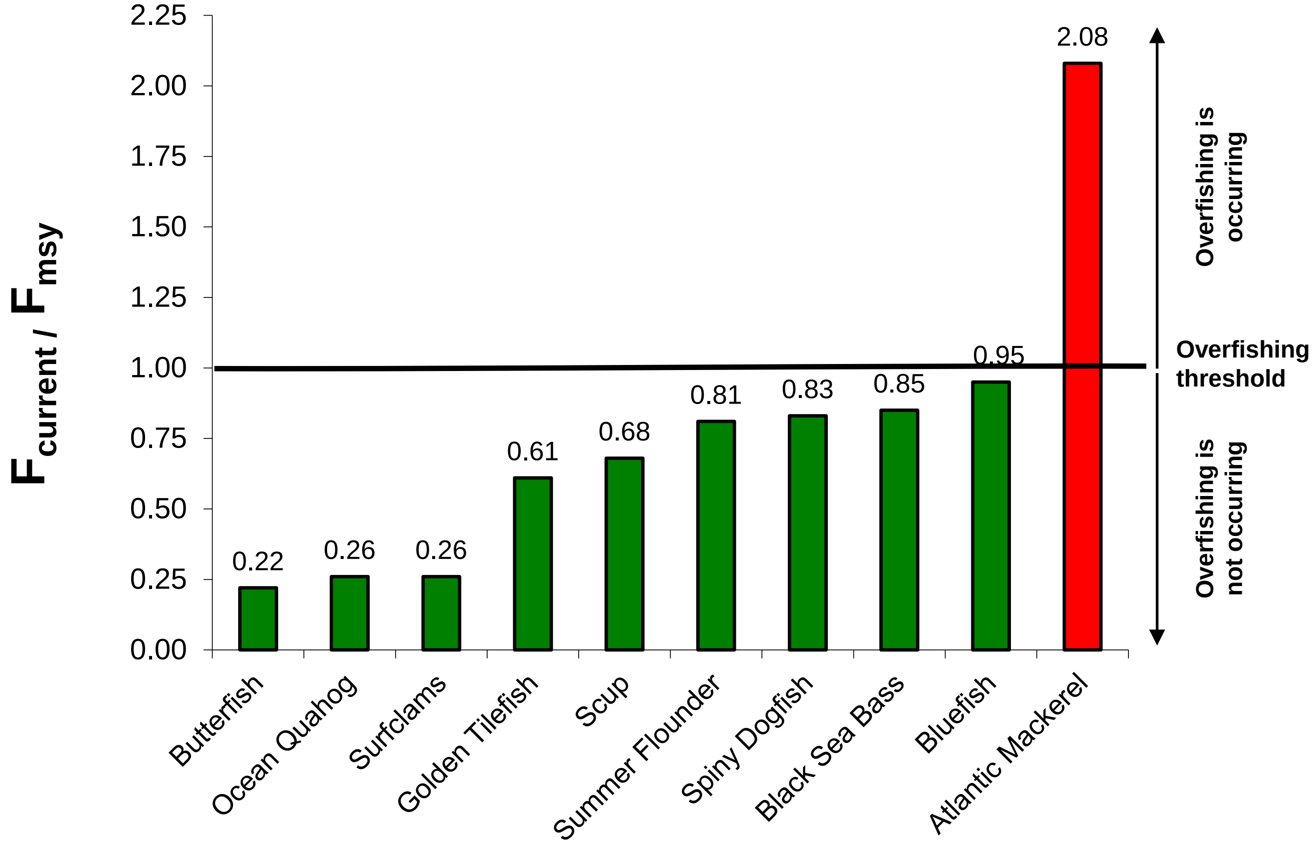
Notes:

- 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	2021
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 7/26/22)



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.

Year of data used to determine fishing mortality	
Atlantic Mackerel	2019
Black Sea Bass	2019
Bluefish	2019
Butterfish	2021
Golden Tilefish	2020
Ocean Quahog	2019
Spiny Dogfish	2017
Surfclam	2019
Scup	2019
Summer Flounder	2019

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: July 27, 2022

To: Council and Board

From: Karson Cisneros, Council staff

Subject: 2023 Bluefish Specifications

On Monday, August 8, the Council and Board will review previously adopted bluefish 2023 specifications and recreational management measures and recommend revisions as needed. Materials listed below are provided for the Council and Board's consideration of this agenda item.

As noted below, one material is behind another tab, and some will be available on the August 2022 Meeting Page at a later date.

1) Advisory Panel meeting summary from August 1, 2022
2) Monitoring Committee meeting summary from July 27, 2022
3) July 2022 Scientific and Statistical Committee meeting report *(behind Tab 15)*
4) Staff memo on 2023 bluefish recreational measures dated July 20, 2022
5) Staff memo on 2023 bluefish specifications dated July 12, 2022
6) June 2022 Advisory Panel Fishery Performance Report
7) 2022 Bluefish Data Update
8) 2022 Bluefish Fishery Information Document
9) Public comments received through July 29, 2022

Bluefish Joint Advisory Panel Webinar Meeting
Monday, August 1, 2022

MAFMC Advisors in attendance: Steve Heins (NC), Willy Goldsmith (DC), Phil Simon (NJ), Mike Waine (NC), Paul Lane (NC), Eric Burnley (DE), William Mandulak (NC)

ASMFC Advisors in attendance: Peter Fallon (ME), Charlie Locke (NC)

Other attendees: Karson Cisneros (MAFMC Staff), Dustin Colson Leaning (ASMFC Staff), Alan Bianchi (NC DMF), Chris Batsavage (Council and Board Member), Michael Celestino (NJ DEEP), Thomas Newman, Cynthia Ferrio (GARFO), Michelle Duval (Council Member)

The Advisory Panel (AP) met via webinar on August 1st, 2022, to provide comments on bluefish recreational management measures for 2023. AP feedback at this meeting will inform the Council and Board's August 8th bluefish recreational management measures discussions.

Summary

Four advisors voiced support for status quo recreational management measures in 2023. The rationale for supporting status quo measures included stability, recent overages, the disparate discard estimates, and the unknowns related to the upcoming research track stock assessment.

An advisor asked what percent of for-hire trips landed the full 5 fish bag limit and whether trips had increased in recent years. Staff responded that they can follow up with that information. This advisor added that they had heard mixed feedback from the AP in the past on whether the for-hire sector should have an increased bag limit. They felt that any liberalization considered by the Council and Board should make the private and for hire bag limits equal, not further divergent between the modes. They added that they did not understand the justification for further discrepancies between the bag limits and do not feel that the argument that the for-hire fleet is such a small component of the fishery justifies giving a conservation pass on a resource that's in rebuilding. Furthermore, they would like to see divergent measures by mode explored further through the sector separation amendment as part of the recreational reform initiative. Another advisor added that they agreed with these comments.

Advisors asked clarifying questions related to the variable recreational dead discard estimation methodologies, the monitoring committee (MC) discussion, and whether there is a good sense of the level of noncompliance in the recreational fishery. Staff did not have a multiyear analysis of noncompliance available but noted that when conducting bag limit analyses using MRIP data, anglers kept up to 15 bluefish on trips in 2021. More work needs to be done to quantify the levels of noncompliance in this fishery over time.

An advisor asked if the MC was recommending both an RHL liberalization and status quo recreational measures. Staff responded that the MC did recommend an RHL that is higher than 2021recreational harvest, however given the level of management uncertainty the MC discussed, they did not recommend liberalization of measures.

One advisor commented that management doesn't fit the for-hire and private sector equally and different states and regions have different management needs. Regulations in one region should not take away from business in another region.

One advisor asked whether the MC discussed the large difference in total catch in 2010 compared with recent years while the stock biomass remains similar. They added that they thought that if catch had been reduced to zero, there would still be the same biomass. Staff responded that the MC did not specifically discuss this.

In terms of next steps, an advisor asked when and how the research track assessment results would be shared with the AP. Staff responded that they can distribute information to the AP in advance of the public meetings for the peer review and that staff would also plan to update the AP on assessment results at their June fishery performance report meeting next year. They also asked whether there is any intention to adjust 2023 specifications as a result of the June management track assessment. Staff responded that no midyear adjustments are anticipated resulting from the assessment.

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

Bluefish Monitoring Committee Meeting Summary

Wednesday, July 27, 2022

Monitoring Committee Attendees: Amy Zimney (SC DNR), Cynthia Ferrio (GARFO), Eric Durell (MD DNR), Michael Celestino (NJ DFW), Karson Cisneros (Council staff), Jim Gartland (VIMS), Joshua McGilly (VMRC), Rich Wong (DNREC), Tony Wood (NEFSC), Rachel Sysak (NY DEC), Nicole Lengyel Costa (RI DMF), Sam Truesdell (MA DMF), Dustin Colson Leaning (ASMFC), David Behringer (NC DMF), Kurt Gottschall (CT BMF), Joseph Munyandorero (FL FWC)

Additional Attendees: Chris Batsavage (Council and Board member), Alan Bianchi (NC DMF), Brooke Lowman (VMRC), James Fletcher (United National Fisherman's Association), Julia Beaty (Council staff), Mike Waine (American Sportfishing Association), Nichola Meserve (Board member), Greg DiDomenico (Lund's Fisheries), Megan Ware (Board Member)

The Monitoring Committee (MC) met via webinar on Wednesday, July 27, to review the previously implemented bluefish catch and landings limits, commercial and recreational measures for 2023 and recommend any changes if needed. At the meeting, the MC reviewed the Scientific and Statistical Committee (SSC) recommendation, staff memos, recent fishery performance, and the fishery information document to assist the MC in their deliberations. Briefing materials considered by the MC are available at: https://www.mafmc.org/council-events/2022/bluefish-monitoring-committee-meeting

Summary

Compliance and outreach
MC members discussed the benefits of increasing outreach and education efforts on best practices for fishing and handling of fish. For example, encouraging the use of circle hooks and educating anglers on the drawbacks of treble hooks could increase survival of released bluefish. Outreach could achieve voluntary improvements to bluefish survival without implementing any mandates. MC members also agreed that outreach could be useful in increasing compliance with current regulations. Based on 2021 Marine Recreational Information Program (MRIP) data, some anglers are keeping more than the current bag limit, and staff discussed that this has occurred in the past under the 15 fish bag limit as well. A MC member suggested evaluating the rate of noncompliance with the bag limit before and after the bag limit was reduced. The MC agreed that this type of analysis could be helpful in the future to inform the Council and Board on the impacts of the bag limit change.

Discard mortality estimates
The MC discussed the discrepancy between the two approaches used to estimate discards in the recreational fishery; both methods assume a 15% mortality rate. The approach that the Greater Atlantic Regional Fisheries Office (GARFO) and the Council have used in recent years to monitor the recreational fishery uses the MRIP estimated mean weight (by year, state, and wave) of harvested fish (A+B1) times the number of released fish (MRIP-B2s by year, state, and wave; referred to as the 'GARFO method'). The second approach is used in the stock assessment and applies a length-weight

relationship to released fish size composition data from the MRIP, American Littoral Society tag releases, and volunteer angler surveys from Connecticut, Rhode Island, and New Jersey and is scaled by the MRIP B2 releases (referred to as the 'NEFSC method'). The MC discussed that this will be the last year that these two differing methodologies will be used. GARFO staff have indicated that moving forward, they will use the discard estimates resulting from the ongoing research track assessment, similar to what is done for other species. Through this assessment, recreational discard estimation is being improved upon through the addition of more data and by applying differing discard weights by region and will undergo peer review in early December. One MC member voiced some concerns over the science center methodology and felt that the MC may be the best group to decide between the different methods of calculating discards. The stock assessment scientist on the MC noted that the NEFSC method is currently the only peer reviewed method available, and the two estimates will be much more in line with each other with the improved regional data. In addition, the stock assessment scientist noted that the discard mortality rate is also being reevaluated. Upon hearing these updates, the MC member commented that they felt more confident in the recreational discard estimates coming out of the research track stock assessment which will be available next year.

Overall Management Uncertainty
The MC discussed management uncertainty for both sectors, and noted that through the recent bluefish amendment, management uncertainty can now be considered at the sector specific ACL/ACT level. They voiced some frustration that each year they discuss specific concerns and areas of uncertainty, however they struggle to quantify the amount of uncertainty to provide a buffer between the ACL and ACT. Given the desire to be better prepared to quantify management uncertainty that is applied as a buffer to the ACL, the MC felt it would be useful to have a specific meeting, potentially in spring 2023, to discuss quantitative approaches to applying uncertainty buffers. This meeting could also be used to update the MC on the December peer-review of the research track assessment.

Commercial Fishery
The commercial fishery has stayed within their coastwide quota in recent years and MC members did not voice concerns over the currently implemented quota. One MC member discussed that there is some uncertainty related to potentially increasing commercial discards but the best information we have now suggests that those are probably minor. Another MC member had concerns that in their state of Rhode Island, as the commercial sector has had reduced commercial quotas, there have been reports of an increase in commercial discards. They added that Rhode Island is looking to implement a state waters observer program, with the hope of starting a pilot program next year for the state waters gillnet fleet to get a better handle on the fishery. One MC member felt that there may be regional increases in discards, however, their sense was that commercial discards are still fairly low on a coastwide level.

Given these considerations, the MC recommended maintaining the previously implemented 2023 commercial ACT equal to the Commercial ACL with no buffer for management uncertainty and no changes to the commercial quota (Table 1).

Recreational Fishery
The MC discussed that recreational catch has not been constrained to the catch limits in recent years, leading to overages and pound for pound paybacks in 2020 and 2021 (applied to 2022 and the upcoming 2023 specifications). Given the information available, the discrepancy in estimating dead discards may be a contributing factor to these overages and GARFO may be using an underestimate, while the truth may be in between the GARFO and NEFSC methods. One mitigating factor against the

overages is that the ABC is increasing and if catch remains similar to 2021 in 2023, there may not be another overage.

Another cause for concern for some MC members was the noncompliance that is occurring with the current bag limits, potentially adding to management uncertainty related to constraining catch. Another MC member felt that because the noncompliant recreational harvest is captured in the MRIP estimates, it is not necessarily a big source of uncertainty (as it relates to quantifying catch) and has been accounted for in the harvest estimates and paybacks.

An additional concern discussed was that the last assessment used data through 2019 for projections through 2023 so we are further away from that terminal year of data with a track record of overages, leading to more uncertainty. For this reason, one MC member commented that it seemed there is more uncertainty this year than previous years.

Given all of these concerns, a MC member proposed an uncertainty buffer equal to 10% of the 2021 GARFO dead discard estimate of 6.64 million pounds, which would result in a buffer of 0.66 million pounds. This would be applied to the recreational ACL to derive a more precautionary ACT. This MC member discussed that, though imperfect, this addresses the source of uncertainty related to the GARFO estimate that is thought to be underestimating discards. Although it is hard to quantify, this number may be more appropriate than doing nothing to address the recreational uncertainty that has been discussed. They noted that doing nothing is particularly concerning given multiple years of overages. Another MC member agreed with this idea, noting that if no buffer is added, there appears to be potential for liberalization between recent harvest and the 2023 adjusted RHL, which may be a risky management decision and may decrease the chance for fishery stability in the future if more paybacks are needed. GARFO staff clarified that this calculation of 10% added to the GARFO discards could be applied as an uncertainty buffer, however it would not make sense to revise the 2021 discard estimate for catch accounting and paybacks since it is not a specific estimate derived from the data.

Multiple MC members voiced concerns over the justification for that specific percentage. One MC member added that they are not very concerned about the GARFO discard estimate and they were in favor of keeping the management measures status quo. Other MC members were in favor of the idea of an uncertainty buffer and felt it was a valid discussion, however, they did not feel that there was enough justification of a specific calculation to apply a buffer value at this meeting. One MC member also noted that this level of uncertainty may not be an issue next year due to the results of the new assessment, especially if the NEFSC and GARFO use the same discard estimate within the stock assessment and catch accounting moving forward.

Another MC member said they are supportive of status quo limits and measures at this meeting but supported developing an uncertainty metric in the future which uses RHL overages as a way to inform the level of management uncertainty. An MC member agreed with this and thought applying the percentage that results from the overage is an objective percentage and may be more justified than the 10% approach. Ultimately, the MC did not feel comfortable applying this method for the 2023 fishing year. The MC thought this method could have merit in the future with potentially more years of data under the same bag limits.

Although two MC members preferred an uncertainty buffer be applied, overall, <u>the MC recommended keeping the previously implemented 2023 recreational ACT equal to the recreational ACL (Table 1).</u>

Several MC members felt unable to recommend a specific uncertainty buffer, however they felt that recreational measures should remain status quo. This was partially due to uncertainty in the discard estimates, and some members felt this was maintaining a middle ground. One MC member observed that this is similar to implementing an uncertainty buffer and asked for clarification from those who did not support the uncertainty buffer but did support status quo measures. One MC member noted that they did not want to increase the chances of an ACT overage based on a more arbitrary number, though it was clarified that an ACT overage would not trigger a pound for pound payback as the accountability measure. Another member indicated that adding an uncertainty buffer of 10% of the 2021 GARFO discard estimate was not a precedent that they felt comfortable setting.

RHL and Recreational Management Measures

The MC agreed with the staff recommendation of using 2021 recreational harvest as expected 2023 harvest because it is the first full year of the 5 fish (for-hire) and 3 fish (private anglers) bag limits that are currently in place. They also agreed with the adjusted RHL calculated from the required pound for pound payback and the staff recommended 2021 GARFO discard value as a proxy for 2023 discards, resulting in an adjusted RHL of 14.11 million pounds (Table 1).

MC members commented that status quo recreational measures would contribute to management stability which may not be an option next year when setting measures for 2024 and beyond. It was discussed that because of the varying potential changes to data inputs and aspects of the bluefish assessment model that occur in a research track assessment, there may need to be management changes in 2024 in response to the best available information on the stock. Another MC member added that harvest can vary across years under the same bag limit so multiyear averages are helpful, and since we only have 2021 harvest under the current bag limits, more years of these measures can help us understand the overall impacts of the bag limit change from 15 fish to 5 and 3 fish.

Another MC member discussed that given the recent overages and uncertainty concerns related to 2023, they did not support the liberalizations that had been requested by some members of the for-hire sector. They also acknowledged the frustration of some in the private angler sector with the current measures being split by sector within the recreational fishery. There is currently a recreational sector separation amendment under consideration as part of the recreational reform initiative by the Council and Board which can evaluate challenges related to these different stakeholder groups and develop a more formal approach to divergent measures by sector.

Overall, the MC recommended status quo measures and no MC members voiced support for liberalizations or restrictions in recreational management measures for 2023 (Table 1).

Public Comments

One member of the public commented that uncertainty buffers have been put into place for fisheries where the commercial sector is dominant. For example, they have been used for butterfish and Atlantic mackerel so the methodologies used for these fisheries may be helpful to inform how to calculate management uncertainty.

Another member of the public asked what recreational bag, size and season the MC would consider after applying an uncertainty buffer and wondered how that plays out when management makes these micromanaging adjustments. The member of the public asked if the MC retrospectively evaluates how management measure changes impact fishing mortality. They commented that they do not believe that there is enough certainty in the data to successfully implement changes to recreational measures to achieve a 10% reduction in harvest, for example.

A member of the public asked whether the MC had addressed that the bluefish population goes in cycles. They recommended that the MC members research their local newspapers over the past 30-40 years to understand these cycles. They added that this level of micromanagement isn't accomplishing anything for the bluefish stock. They also recommended mandatory hook sizes to catch less small fish.

Table 1: Original 2023 bluefish specifications (left) and adjustments (right) to the RHL based on the 2021 recreational ACL overage payback and Monitoring Committee recommended updated 2021 discard information. Measures are in millions of pounds.

Management Measure	**Year**		**Basis**
	2023 (original)	**2023 (adjusted)**	
OFL	45.17	45.17	Stock assessment projections
ABC	30.62	30.62	Derived by SSC; Follows the rebuilding plan through NEFSC projections
ACL	30.62	30.62	Defined in FMP as equal to ABC
Comm. ACL=ACT	4.29	4.29	ABC x 14% sector allocation, no adjustment for management uncertainty
Rec. ACL=ACT	26.34	26.34	ABC x 86% sector allocation, no adjustment for management uncertainty
Recreational AMs	0	5.59	2021 rec. ACL overage payback
Comm. Discards	0	0	Value used in assessment
Rec. Discards	4.19	6.64	MC recommend adjusting from 2020 GARFO estimate (original), to 2021 GARFO estimate (adjusted)
Commercial Quota	4.29	4.29	Comm. ACT minus discards
RHL	22.14	14.11	Rec. ACT minus discards and AM payback
Possession limit	3: private 5: for-hire	3: private 5: for-hire	2023 implemented, and 2023 MC rec.

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: July 20, 2022

To: Dr. Chris Moore, Executive Director

From: Karson Cisneros, Staff

Subject: Review of 2023 Bluefish Recreational Management Measures

Introduction and Background

In August 2021, the Council and Board set 2022-2023 annual catch targets (ACTs), total allowable landings (TALs), commercial quotas, recreational harvest limits (RHLs), and other associated management measures (Final Rule 2/2/2022, 87 FR 5739). In December 2021, the Council and Board set recreational management measures for 2022-2023, maintaining the 3 fish possession limit for private angler modes and a 5 fish possession limit for the for-hire modes (Table 1). The Monitoring Committee is tasked with reviewing the currently implemented 2023 recreational ACTs, RHLs and recreational management measures and recommending any changes if warranted.

This memo describes recent recreational fishery performance and several considerations related to 2023 recreational management measures. Notably, recreational landings and dead discards in 2021 resulted in an ACL overage and accountability measures are triggered for 2023 (Table 3). Bluefish recreational accountability measures require a pound for pound overage payback when the stock is overfished. To make a recommendation on recreational management measures for 2023, the MC needs to compare expected recreational harvest to a payback adjusted RHL for 2023 to recommend if any changes in measures are warranted.

Recent Fishery Performance

In 2021, MRIP estimated recreational landings were 12.46 million pounds and dead discards were 6.64 million pounds (based on the GARFO discard methodology; Table 1, Figure 1). Since 2018, recreational landings have dropped to the lowest values of the time series with a 2018-2021 average harvest of 13.72 million pounds.

Recreational catch and harvest estimates by state for 2021 are provided in Table 2. The greatest catches occurred in Florida with 13.88 million fish, followed by North Carolina with 4.52 million fish, New York with 3.57 million fish, and New Jersey with 2.90 million fish. The greatest harvest of bluefish by weight in 2021 occurred in Florida with 3.55 million pounds, followed by New

Jersey with 3.36 million pounds, New York with 2.35 million pounds and North Carolina with just over 1 million pounds. Average weights, based on dividing MRIP landings in weight by landings in number for each state, suggest that bluefish size tends to increase along the north Atlantic coast.

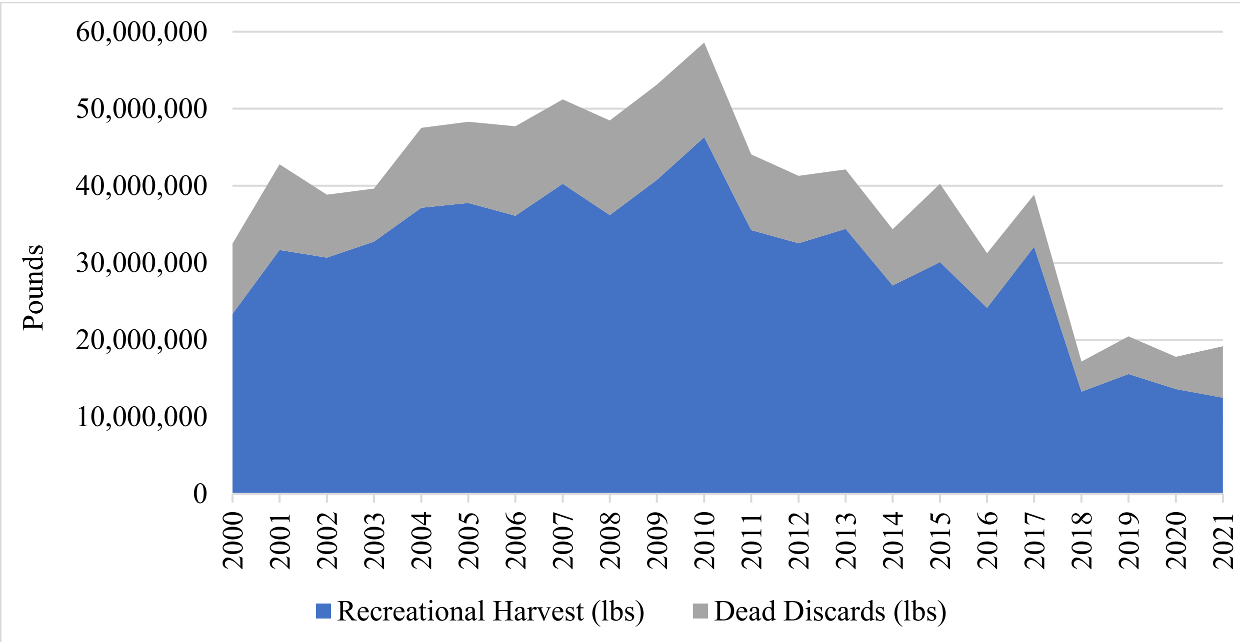


Figure 1: Recreational bluefish harvest and dead discards in pounds from 2000-2021 using MRIP estimates and GARFO discard methodology.

Table 1: Summary of bluefish recreational harvest and management measures, 2016-2023. In 2019, recreational landings were provided using new MRIP estimates while the RHL was developed using old MRIP estimates so cannot be directly compared.

Management Measures	RHL	Rec. Harvest, Old MRIP	Rec. Harvest, New MRIP	RHL Overage/underage	Rec. Bag Limit (# fish)	
2016	11.58	9.54	24.16	-2.04	15	
2017	9.65	9.52	32.07	-0.13	15	
2018	11.58	3.64	13.27	-7.94	15	
2019	11.62	--	15.56	--	15	
2020*	9.48	--	13.58	+ 4.10	3: Private*	5: For-Hire*
2021	8.34	--	12.46	+ 4.12	3: Private	5: For-Hire
2022	13.89	--	--	--	3: Private	5: For-Hire
2023	22.14	--	--	--	3: Private	5: For-Hire

* The bag limit reductions from 15 to 3/5 fish were not implemented by all states until mid-late 2020.

Table 2: MRIP estimates of 2021 bluefish recreational harvest, total catch, and average weight.

State	Harvest			Catch	Total Released	Dead Discards
	Pounds	Number	Average Weight[1] (pounds)	Number	Number	Number
ME	3,633	673	5.4	6,104	5,431	815
NH	3,796	698	5.4	698	-	-
MA	833,962	116,547	7.2	855,041	738,494	110,774
RI	718,950	140,504	5.1	774,409	633,905	95,086
CT	206,429	263,966	0.8	1,180,092	916,126	137,419
NY	2,353,527	861,060	2.7	3,565,667	2,704,607	405,691
NJ	3,357,809	921,667	3.6	2,895,008	1,973,341	296,001
DE	8,460	14,019	0.6	179,562	165,543	24,831
MD	117,545	105,711	1.1	316,949	211,238	31,686
VA	153,199	216,317	0.7	719,804	503,487	75,523
NC	1,031,761	982,391	1.1	4,521,724	3,539,333	530,900
SC	107,268	172,528	0.6	722,532	550,004	82,501
GA	12,870	13,811	0.9	136,588	122,777	18,417
FL	3,553,572	2,373,891	1.5	13,875,822	11,501,931	1,725,290
Total	12,462,781	6,183,783	-	29,750,000	23,566,217	3,534,932

[1] Average weight is the pounds harvested divided by the number of fish harvested. Recreational dead discards are calculated as 15% of total recreational discards.

Dead Discard Estimation

Last year, the MC discussed the two approaches used to characterize discards in the recreational fishery. [1] The Greater Atlantic Regional Fisheries Office (GARFO) and the Council have used an approach that uses the MRIP estimated mean weight (by year, state, and wave) of harvested fish (A+B1) times the number of released fish (MRIP-B2s by year, state, and wave) and an assumed 15% release mortality. The MC generally agreed that this estimate does not fully capture recreational fishery dynamics because this approach uses the mean weight of harvested fish, not discards, and the length frequency data suggests that released fish tend to be larger than retained fish. The second approach uses the NEFSC discard estimates, which applies a length-weight relationship to released fish data from the MRIP, American Littoral Society tag releases, and volunteer angler surveys from Connecticut, Rhode Island, and New Jersey. However, this

[1] A summary of the past MC discard discussion can be found in the August 2021 briefing materials on page 6.

sampling approach does not characterize the entire coast, which adds to the uncertainty in these estimates.

2021 Recreational Catch Accounting

In 2021, MRIP reported the recreational fishery landed 12.46 million pounds compared to the 8.34 million pounds RHL. The dead discard estimate from GARFO for 2021 is 6.64 million pounds. Recreational landings and dead discards in 2021 result in an ACL overage and accountability measures are triggered for 2023. Bluefish recreational accountability measures require a pound for pound overage payback when the stock is overfished. For example, due to a recreational ACL overage in 2020, a pound for pound payback was applied to the 2022 recreational ACT (along with recreational discards) to derive the RHL.

Table 3: Bluefish recreational estimates for 2021 catch accounting in millions of pounds. Landings, dead discards (GARFO methodology), and catch were provided by GARFO on July 19, 2022. Recreational ACL overage was calculated by Council staff.

2021 Recreational Value	Millions of Pounds
Landings	12.46
Dead discards	6.64
Catch	19.10
Rec. ACL	13.51
Rec. ACL overage	**+5.59**

2023 Payback Adjusted RHL

Adjusted RHLs that incorporate the accountability measure (AM) payback and updated 2021 discards are shown in Table 4. When the 2022 and 2023 RHLs were set in 2021, the 2020 GARFO discard estimate was used as a proxy for expected discards for both 2022 and 2023. Given the disparate discard methodologies, Table 4 illustrates an adjusted 2023 RHL based on the 2021 NEFSC discards and 2021 GARFO discards. Next year, GARFO has indicated that they will use the estimate resulting from the research track assessment that is scheduled for peer review in December 2022, and there will no longer be two different estimates to consider. The discard estimation methodology resulting from the ongoing research track assessment may differ from that used by the NEFSC in recent years.

From 2001-2019, the recreational bag limit was set at 15 fish. As a result of the 2019 operational assessment, the bluefish stock was designated as overfished with overfishing not occurring. For 2020, the recreational sector was projected to land 13.27 million pounds, which exceeded the RHL by 28.56%. Therefore, the Council and Board approved recreational management measures to constrain harvest to the reduced RHL, which included a 3-fish bag limit for private and shore modes and a 5-fish bag limit for the for-hire mode. These bag limit reductions were not implemented by all states until mid-late 2020. In addition, MRIP used data from 2018 and 2019 to fill in COVID-19 related data gaps in 2020. Because of this, there are imputed 2020 data using years that had a 15 fish bag limit. Given these considerations, 2021 discards may be more indicative of 2023 fishery conditions and expected 2023 discards than 2020 discards.

For the above reasons, staff recommend using 2021 GARFO discard estimates as expected discards for the updated 2023 RHL, resulting in a payback adjusted RHL of 14.11 mil lb. Staff recommend no changes to the recreational ACL or ACT.

Table 4: Adjusted calculations of the 2023 RHL accounting for the 2021 AM payback and using either NEFSC or GARFO discards as a proxy for expected 2023 discards.

2023 RHL Calculations	Millions of Pounds	% Difference from 2021 Harvest
Rec. ACL=ACT	26.34	n/a
Unadjusted RHL	22.14	
2021 overage payback	5.59	
Adjusted RHL with 2021 NEFSC Discards	**8.15**	**-34.60%**
Adjusted RHL with 2021 GARFO Discards	**14.11**	**+13.24%**

2023 Expected Recreational Harvest

As mentioned in the previous section, COVID-related MRIP imputations used 2018 and 2019 data to estimate 2020 harvest, which were years where the 3 and 5-fish bag limits were not in place. Therefore, the 2020 data may not reflect a harvest estimate that takes into consideration the smaller bag limits. In addition, last year's projections for 2021 based on 2020 harvest and waves 1-3 in 2021 overestimated 2021 harvest by about 2.8 million pounds.

The first full year of the currently implemented recreational management measures of a 3 fish bag limit for private and shore modes and a 5 fish bag limit for the for-hire mode was 2021. Because of this, staff recommend using 2021 recreational harvest of 12.46 million pounds as the expected harvest in 2023, for comparison with the 2023 RHL. In future years, multi-year averages can be used if recreational measures remain similar across those years.

2023 Recreational Management Measures

In December 2021, the Council and Board requested that the MC analyze the impacts of increasing the for-hire sector bag limit from a 5 fish limit to a 7 fish bag limit. Three sets of percent change in harvest relative to status quo measures using three methodologies are presented in Table 5. The MC discussed that viewing all three methods could be a useful comparison of the potential impacts of bag limit liberalizations given that various assumptions are required for each. All methods use the 2021 MRIP survey microdata available for download.[2] Method one assumes that anglers who caught the full bag limit at 5 fish would retain the higher bag limits. This method may overestimate harvest if all anglers that kept 5 fish would not keep 7 if allowed. However, it may underestimate harvest by not making any changes to the number of anglers who kept 6 fish. The second method calculates the percent reduction in harvest and assumes that the percent liberalization would be equal to that reduction. A third method assumes a log linear relationship between the bag limit and percent change in harvest. Under this modeling approach, harvest still increases as bag limits liberalize, however the rate of increase tapers, which may better describe the data. This method was used for summer flounder bag limit liberalizations by some states in 2022.

[2] https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads

Under these methodologies, increasing the bag limit from 5 fish to 7 fish for the for-hire sector would yield a 0.20% to 0.39% increase to overall expected recreational harvest. This small percentage is largely due to the for-hire sector making up only 6% of harvest in 2021.

Table 5: Three sets of calculations estimating the percent change in harvest relative to status quo bag limits by sector. Negative numbers indicate a reduction in harvest and positive numbers indicate an increase in harvest.

Percent liberalization or reduction: method 1					
Bag Limit	3	4	5	6	7
Private Angler	Status quo	8.03%	16.07%	24.10%	32.14%
For Hire	-0.30%	-0.10%	Status quo	0.10%	0.20%
Total	-0.30%	7.93%	16.07%	24.20%	32.34%
Percent liberalization or reduction: method 2					
Bag Limit	3	4	5	6	7
Private Angler	Status quo	8.03%	27.05%	66.77%	*
For Hire	-0.30%	-0.10%	Status quo	0.10%	0.30%
Total	-0.30%	7.93%	27.05%	66.87%	0.30%
Percent liberalization or reduction: method 3					
Bag Limit	3	4	5	6	7
Private Angler	Status quo	7.97%	13.54%	18.08%	21.92%
For Hire	-0.38%	-0.12%	Status quo	0.25%	0.39%
Total	-0.38%	7.85%	13.54%	18.33%	22.31%

*This methodology would require calculating a reduction based on a negative bag limit so cannot be used for liberalizations over a 6 fish bag limit.

A member of the MC and a few members of the AP discussed the consideration of a minimum size limit to complement an increased bag limit and achieve harvest similar to status quo. However, given that the size of bluefish available to anglers can vary across the coast, and the importance of the snapper fishery (small bluefish) to some states, size limits may be a more appropriate tool for individual states to consider. Similarly, seasonal availability varies by state so coastwide seasonal closures to allow for increased bag limits are currently not recommended for consideration.

Staff recommendations are shown in Table 6. Staff recommend no changes to the current recreational management measures that were set for 2022-2023 for the following reasons:

The difference between the two discard estimates for 2021 result in an estimated 13% liberalization (GARFO discards) or a 35% reduction (NEFSC discards) needed in 2021 harvest compared to the 2023 RHL. While staff recommend using the GARFO methodology for 2023 for consistency with the estimates used to set measures and evaluate ACLs, the NEFSC methodology has been discussed as the more scientifically sound approach, though it lacks comprehensive data inputs. The ongoing bluefish research track assessment is addressing this issue and the peer reviewed approach from that assessment will be used by GARFO moving forward. If the current NEFSC discard estimates were used to adjust the RHL, restrictions to the bag, size, or season for bluefish would be needed to achieve the 2023 RHL.

Bluefish recreational measures were set in 2021 for 2022-2023, and the Council and Board have indicated that setting measures for two years can increase stability and predictability. In June 2022 the Council and Board took final action on the Harvest Control Rule (HCR) which changes the recreational fisheries management programs for summer flounder, scup, black sea bass, and bluefish, however the new process will not be used for bluefish until the stock is declared rebuilt. Although it is not required to implement the HCR in 2023 for bluefish, the ability to maintain status quo measures without a predicted overage (using the GARFO discards) aligns with the intent of stability in recreational management measures.

There is currently only one full year of data to assess the impacts of the bag limit change from 15 fish to 5 fish (for-hire) and 3 fish (private angler). A comparison of 2018-2019 average harvest (15 fish bag) to 2021 harvest (3/5 fish bag) shows a 1.95 million pound decrease in harvest. Several other factors may influence harvest including availability of the fish and economic considerations for anglers, so multi-year averages of harvest may be more informative.

The ongoing bluefish research track assessment is evaluating new data and approaches used to assess the stock and is scheduled for peer-review in December 2022. The results of the research track assessment are expected to be available for an updated management track assessment to set measures in 2024-2025. Through this process, a new set of biological reference points and updated stock status will be available that may result in liberalizations or restrictions to recreational management measures. Because of this, recommending changes to recreational measures may be more appropriate with the updated stock information that is expected to be available next year.

Table 6: Original 2023 bluefish specifications (left) and adjustments (right) to the RHL based on the 2021 recreational ACL overage payback and staff recommended updated 2021 discard information. Measures are in millions of pounds.

Management Measure	Year		Basis
	2023 (original)	2023 (adjusted)	
OFL	45.17	45.17	Stock assessment projections
ABC	30.62	30.62	Derived by SSC; Follows the rebuilding plan through NEFSC projections
ACL	30.62	30.62	Defined in FMP as equal to ABC
Comm. ACL=ACT	4.29	4.29	ABC x 14% sector allocation, no adjustment for management uncertainty
Rec. ACL=ACT	26.34	26.34	ABC x 86% sector allocation, no adjustment for management uncertainty
Recreational AMs	0	5.59	Adjusted to estimated 2021 rec. ACL overage payback
Comm. Discards	0	0	Value used in assessment
Rec. Discards	4.19	6.64	2020 GARFO estimate (original), 2021 GARFO estimate (adjusted)
Commercial Quota	4.29	4.29	Comm. ACT minus discards
RHL	22.14	14.11	Rec. ACT minus discards and AM payback
Possession limit	3: private 5: for-hire	3: private 5: for-hire	2023 implemented, and 2023 staff rec.

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

M E M O R A N D U M

Date: July 12, 2022

To: Dr. Chris Moore, Executive Director

From: Karson Cisneros (Coutre), Staff

Subject: Review of 2023 Bluefish Specifications

Executive Summary

The Magnuson-Stevens Act (MSA) requires each Council's SSC to provide ongoing scientific advice for fishery management decisions, including recommendations for ABC, preventing overfishing, and achieving maximum sustainable yield. The Council's catch limit recommendations for the upcoming fishing year(s) cannot exceed the ABC recommendation of the SSC. In addition, the Monitoring Committee (MC) established by the Fishery Management Plan (FMP) is responsible for developing recommendations for management measures designed to achieve the recommended catch limits. The SSC recommends ABCs that addresses scientific uncertainty, while the MC recommends ACTs that address management uncertainty and management measures to constrain catch to the TALs.

A management track assessment for bluefish was conducted in June 2021. The assessment incorporates data through 2019, including the revised time series (1985-2019) of recreational catch provided by the Marine Recreational Information Program (MRIP).

The Council and Board approved the Bluefish Allocation and Rebuilding Amendment at their June 2021 meeting. The rebuilding portion of the Amendment includes a 7-year constant fishing mortality plan that began in 2022. Projections will be rerun every two years through the Northeast Fisheries Science Center (NEFSC) assessment process to ensure adequate rebuilding progress is being made. A research track assessment is currently scheduled for late in 2022 (currently ongoing), which will be followed by a management track assessment in June 2023 with data through 2022 to inform the 2024-2025 specifications package.

In July 2021, the SSC recommended 2022-2023 bluefish ABCs using the total catch value from the 7-year constant rebuilding fishing mortality as an OFL proxy and accounting for scientific uncertainty associated with the OFL proxy. This resulted in an ABC of 25.26 million pounds (11,460 mt) for 2022 and 30.62 million pounds (13,890 mt) for 2023. In August 2021, the Council and Board set 2022-2023 annual catch targets (ACTs), total allowable landings (TALs), commercial quotas, recreational harvest limits (RHLs), and other associated management measures (Final Rule 2/2/2022, 87 FR 5739).

The SSC should review the previously adopted 2023 ABC to consider if changes are needed. Staff recommend no changes to the 2023 ABC of 30.62 million pounds (13,890 mt) for bluefish.

Staff recommend no changes to the 2023 implemented commercial ACL, ACT, and quota and no changes to the 2023 recreational ACL and ACT. Bluefish recreational accountability measures require a pound for pound overage payback when the stock is overfished. Staff recommend using 2021 GARFO recreational discard estimates (as soon as available) as expected discards for the updated 2023 RHL. A separate recreational management measures memo will outline staff recommendations for 2023 recreational management measures, based on the payback-adjusted RHL, to be discussed by the MC at their July 2022 meeting.

Table 1. Currently implemented 2022 and originally projected 2023 bluefish specifications. **Note:** The 2023 recreational accountability measures, expected discards, and RHL will likely be adjusted based on official GARFO recreational discard estimates and resulting payback values. These estimates have not yet been released.

Management Measure	Year				Basis
	2022		2023		
	mil lb.	mt	mil lb.	mt	
Overfishing Limit (OFL)	40.56	18,399	45.17	20,490	Stock assessment projections
ABC	25.26	11,460	30.62	13,890	Derived by SSC; Follows the rebuilding plan through NEFSC projections
ACL	25.26	11,460	30.62	13,890	Defined in FMP as equal to ABC
Commercial ACL	3.54	1,604	4.29	1,945	ABC x 14%
Commercial Management Uncertainty	0	0	0	0	Derived by the Monitoring Committee
Commercial ACT	3.54	1,604	4.29	1,945	(ACL – Management Uncertainty)
Recreational ACL	21.73	9,856	26.34	11,945	ABC x 86%
Recreational Management Uncertainty	0	0	0	0	Derived by the Monitoring Committee
Recreational ACT	21.73	9,856	26.34	11,945	(ACL – Management Uncertainty)
Recreational AMs	3.65	1,656	0	0	2022 based on 2020 ABC overage
Commercial Discards	0	0	0	0	Value used in assessment
Recreational Discards	4.19	1,901	4.19[1]	1,901[1]	2020 GARFO-estimated (MRIP) discards[1]
Commercial TAL	3.54	1,604	4.29	1,945	Commercial ACT - commercial discards
Recreational TAL	13.89	6,298	22.14	10,044	Recreational ACT - recreational discards and rec. AM for 2022
Combined TAL	17.42	7,903	26.43	11,989	Commercial TAL + Recreational TAL
Transfer	0	0	0	0	No transfer while overfished or overfishing
Commercial Quota	3.54	1,604	4.29	1,945	Commercial TAL +/- transfer
RHL	13.89	6,298	22.14	10,044	Recreational TAL +/- transfer

[1]Staff recommend revising recreational discards to the 2021 GARFO estimate once available.

Recent Catch and Landings

Recreational harvest, dead discards, and commercial landings from 2000-2021 are presented in Figure 1. Recreational landings were 12.46 million pounds in 2021, a 1.12 million pound decrease compared with 2020, and the lowest harvest for the time series. This coincides with lower effort, as the number of recreational trips[1] in 2021 (7,409,375) is the second lowest reported in the 2000-2021 period. Recreational catch and harvest and commercial landings by state are shown in Table 2. In 2019, the Council and Board approved recreational management measures to constrain harvest to the RHL, which included going from a 15 fish bag limit across all modes to a 3-fish bag limit for private and shore modes and a 5-fish bag limit for the for-hire mode. The recreational management measures were not implemented by all states until mid-late 2020. The first full year of these more restrictive bag limits was 2021.

Commercial landings were 2.07 million pounds in 2021, a 0.09 million pound decrease compared with 2020. Similar to recreational harvest, 2021 commercial harvest represents the lowest commercial landings in the time series. Commercial bluefish harvest identified through the dealer database (cfders) was comprised of gillnet (59%), followed by unknown gear (26%), otter trawl/bottom fish (7%), handline (5%) and other (3%).

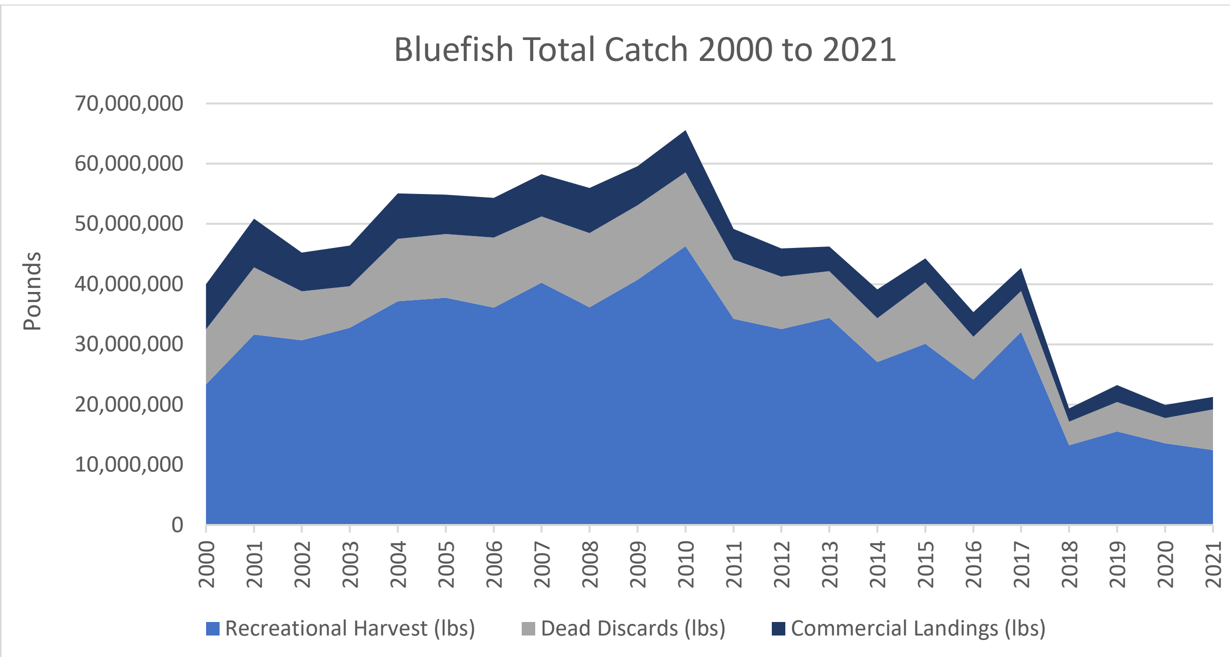


Figure 1. Bluefish total catch (recreational harvest, recreational dead discards and commercial landings) from 2000-2021. Source: MRIP and dealer data). Commercial discards are thought to be negligible.

[1] Estimated number of recreational fishing trips where the primary or secondary target was bluefish, Maine – Florida's East Coast. Source: MRIP.

Table 2. MRIP estimates of 2021 bluefish recreational harvest, total catch, and average weight.

	Recreational						*Commercial*
State	**Harvest**			**Catch**	**Released Alive**	**Dead Discards**[2]	**Landings**
	Pounds	**Number**	**Ave. Wt.**[1] **(lbs)**	**Number**	**Number**	**Number**	**Pounds**
ME	3,633	673	5.4	6,104	5,431	815	0
NH	3,796	698	5.4	698	-	-	0
MA	833,962	116,547	7.2	855,041	738,494	110,774	223,723
RI	718,950	140,504	5.1	774,409	633,905	95,086	254,607
CT	206,429	263,966	0.8	1,180,092	916,126	137,419	33,648
NY	2,353,527	861,060	2.7	3,565,667	2,704,607	405,691	324,186
NJ	3,357,809	921,667	3.6	2,895,008	1,973,341	296,001	230,157
DE	8,460	14,019	0.6	179,562	165,543	24,831	2,171
MD	117,545	105,711	1.1	316,949	211,238	31,686	3,065
VA	153,199	216,317	0.7	719,804	503,487	75,523	44,626
NC	1,031,761	982,391	1.1	4,521,724	3,539,333	530,900	851,860
SC	107,268	172,528	0.6	722,532	550,004	82,501	0
GA	12,870	13,811	0.9	136,588	122,777	18,417	0
FL	3,553,572	2,373,891	1.5	13,875,822	11,501,931	1,725,290	102,623
Total	12,462,781	6,183,783	-	29,750,000	23,566,217	3,534,932	2,070,666

[1] Average weight is the pounds harvested divided by the number of fish harvested. [2]Recreational dead discards are calculated as 15% of total recreational discards.

Discard Estimates

There are currently two methods used to estimate recreational bluefish discards that result in very different estimates (e.g., 2019 GARFO estimated = 4,880,759 pounds, 2019 NEFSC estimated = 15,414,721 pounds). Discard estimate methodologies are being evaluated in the ongoing bluefish research track assessment and the peer reviewed methodology resulting from the assessment is expected to be used throughout the management process in the future. The first approach, which is used by GARFO for catch accounting, applies the MRIP estimated mean weight (by year, state and wave) of harvested fish (A+B1) times the number of released fish (MRIP-B2s by year, state and wave) and an assumed 15% release mortality. Previously, the Monitoring Committee generally agreed that this estimate does not fully capture recreational fishery dynamics because this approach uses the mean weight of harvested fish, not discards, and the length frequency data suggests that released fish tend to be larger than retained fish. The second approach, which is used by the NEFSC in the bluefish stock assessment, incorporates a length-weight relationship for released fish data from the MRIP, American Littoral Society tag releases, and volunteer angler surveys from Connecticut, Rhode Island, and New Jersey. However, this sampling approach does not characterize the entire coast, which adds to the uncertainty in these estimates. The constant F-rebuilding projections used to inform the 2022-2023 ABCs incorporated the 2020 GARFO estimated discards.

Stock Status and Biological Reference Points

In June 2021, a bluefish management track assessment, which included revised bluefish MRIP estimates and commercial landings through 2019 indicated the bluefish stock is still overfished and overfishing is not occurring. This update builds upon the 2019 operational assessment with data through 2018 that first indicated the stock was overfished and overfishing was not occurring.

The biological reference points for bluefish revised through the 2021 management track assessment include an updated fishing mortality threshold of $F_{MSY} = F_{35\%}$ (as the F_{MSY} proxy) = 0.181, and a biomass reference point of $SSB_{MSY} = SSB_{35\%}$ (as the SSB_{MSY} proxy) = 444.74 million lbs (201,729 mt). The minimum stock size threshold (1/2 SSB_{MSY}) is estimated to be 222.37 million lbs (100,865 mt); Table 3. SSB in 2019 was 211.07 million lbs (95,742 mt), 47.5% of the SSB_{MSY} proxy reference point (Figure 2 and Table 3).

Fishing mortality on the fully selected age 2 fish was estimated to be 0.172 in 2019, 95% of the updated fishing mortality threshold reference point F_{MSY} proxy = $F_{35\%}$ = 0.181 (Figure 3). There is a 90% probability that the fishing mortality rate in 2019 was between 0.140 and 0.230.

Table 3. Summary of changes in biological reference points and terminal year SSB and F estimates resulting from SAW/SARC 60 process to the 2019 operational assessment and 2021 management track assessment.

	SAW/SARC 60 (2015) Biological Reference Points and most recent update stock status results (data through 2014)	**Bluefish Operational Assessment (2019) Biological Reference Points and stock status results (data through 2018)**	**Bluefish Management Track Assessment (2021) Biological Reference Points and stock status results (data through 2019)**
Stock Status	Not Overfished, Not Overfishing	Overfished, Not Overfishing	Overfished, Not Overfishing
SSB_{MSY}	223.42 million lbs (101,343 mt)	438.10 million lbs (198,717 mt)	444.74 million lbs (201,729 mt)
½ SSB_{MSY}	111.71 million lbs (50,672 mt)	219.05 million lbs (99,359 mt)	222.37 million lbs (100,865 mt)
Terminal year SSB	*2014:* 258.76 million lbs (86,534 mt) 85% of SSB_{MSY}	*2018:* 200.71 million lbs (91,041 mt) 46% of SSB_{MSY}	*2019:* 211.07 million lbs (95,742 mt) 47.5% of SSB_{MSY}
F_{MSY}	0.190	0.183	0.181
Terminal year F	*2014:* 0.157 83% of F_{MSY}	*2018:* 0.146 80% of F_{MSY}	*2019:* 0.172 95% of F_{MSY}

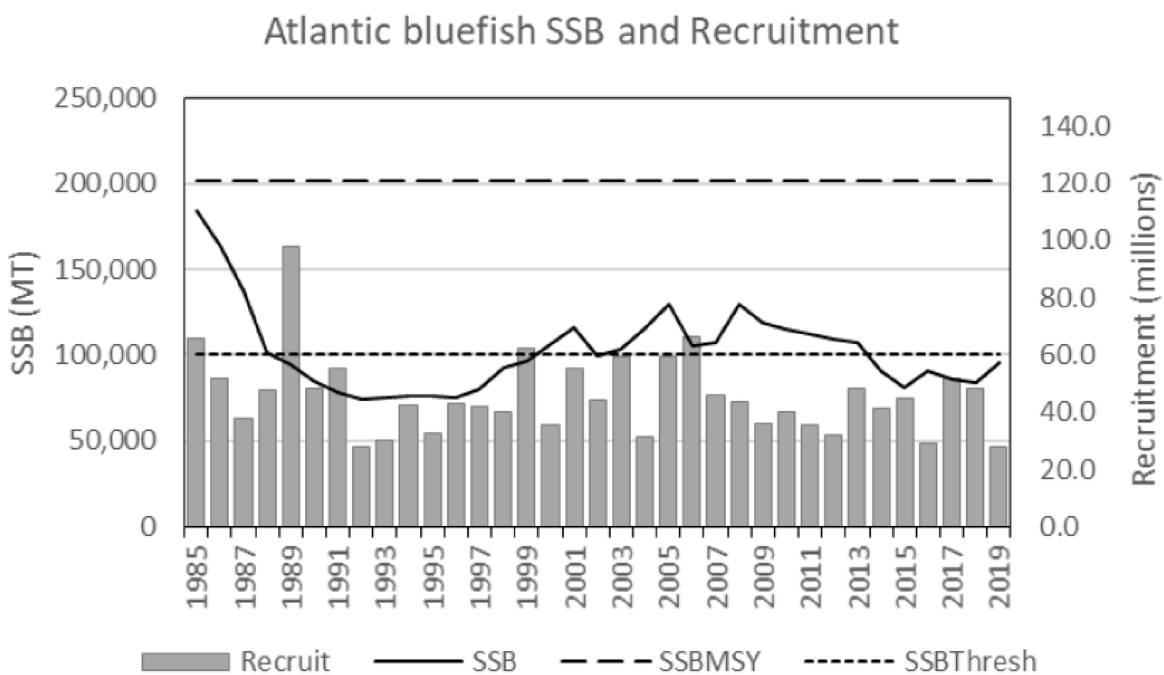


Figure 2. Atlantic bluefish spawning stock biomass (SSB; solid black line) and recruitment at age 0 (R; gray vertical bars) by calendar year. The horizontal dashed line is the updated SSB_{MSY} proxy = $SSB_{35\%}$ = 201,729 MT, and the dotted black line is the $SSB_{Threshold}$ = 100,865 MT.

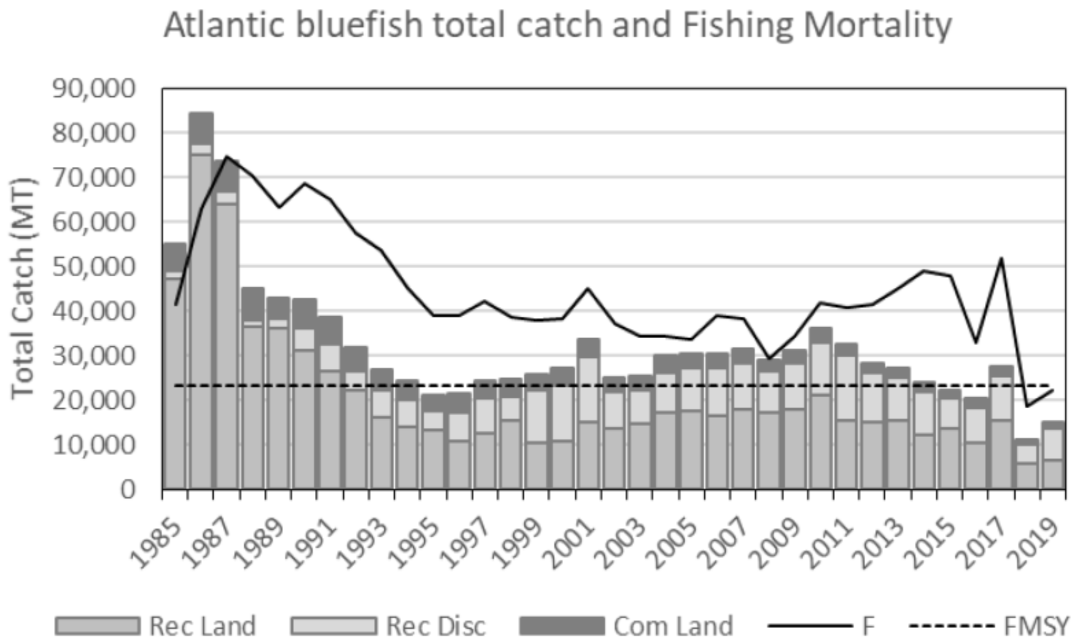


Figure 3. Total fishery catch (metric tons; MT; solid line) and fishing mortality (F, peak at age 3; squares) for Atlantic bluefish. The horizontal dashed line is the updated F_{MSY} proxy = F35% = 0.181.

The 2021 management track assessment indicated the bluefish stock has experienced a decline in SSB over the past decade, coinciding with an increasing trend in F. Recruitment has remained fairly steady, fluctuating just below the time-series mean of 46 million fish. Both commercial and recreational fisheries have had lower catches in recent years. These lower catches are possibly a result of availability.

<u>Review of Prior SSC Recommendations</u>

In July 2021, the SSC recommended new ABCs for 2022-2023, which incorporated the results of the 2021 management track stock assessment. To make this recommendation, the SSC reviewed 2020 fishery performance and materials from the management track assessment.

The SSC also discussed the Council-approved rebuilding schedule, including the treatment of the rebuilding F proposed by the Council and its implications for generating ABCs. The Council's rebuild policy is to achieve rebuilding within a seven-year period commencing in 2022. A constant F strategy was selected such that biomass in 2028 has a 50% chance of exceeding the Bmsy proxy rebuilding target. Given the basis for the rebuilding, the SSC determined that the constant F for rebuilding in seven years (denoted as Frebuild,7 = 0.154) should be treated as a Fmsy proxy. As such, the usual Council risk policy, P* criteria, and OFL CV process should apply. Failure to include scientific uncertainty through the direct application of Frebuild,7 alone could generate instances where the probability of overfishing exceeded 0.5 between 2022 and 2028. Accounting for scientific uncertainty and the resulting lower ABCs should also increase the chance (i.e., greater than 50%) of exceeding the Bmsy target to rebuild the stock within the seven year timeframe.

The SSC recommended that a CV of 100% be applied to the OFL estimate as an appropriate ABC and noted that the chief uncertainty for Bluefish relates to patterns in the revised MRIP estimates.

The SSC also discussed the most significant sources of uncertainty, ecosystem considerations, and research recommendations to reduce uncertainty. These discussions can be found summarized here: https://www.mafmc.org/s/July-2021-SSC-Report.pdf.

Staff Recommendation for 2023 ABC

Staff recommend maintaining the previously implemented 2023 ABC for bluefish of 30.62 million pounds (13,890 mt). In 2022, a research track assessment is ongoing and scheduled for peer review in December 2022. This assessment may change the overall model used to assess bluefish, and in turn update all biological reference points and the resulting rebuilding plan. This assessment will ultimately inform the 2024-2025 specifications package.

Sector Specific Catch and Landings Limits

The flow chart in Figure 4 on page 9 was used to derive the sector specific catch and landings limits shown in Table 1. No transfers between sectors occur when the stock is overfished.

Recreational

In 2021, MRIP reported the recreational fishery landed 12.46 million pounds compared to the 8.34 million pounds RHL. This RHL overage along with recreational discards likely results in an ACL overage, in which case accountability measures will be triggered. Official 2021 recreational discard estimates are not yet available from GARFO, however they are expected to be released before the August Council and Board meeting. Bluefish recreational accountability measures require a pound for pound overage payback when the stock is overfished. A separate recreational management measures memo will outline staff recommendations for 2023 recreational management measures, based on a payback-adjusted RHL, to be discussed by the MC at their July 2022 meeting.

Commercial

In 2021, the commercial fishery landed 2.07 million pounds compared to the 2.77-million-pound quota and commercial discards are assumed to be zero. Staff recommend no changes to the 2023 implemented commercial ACL, ACT, and quota.

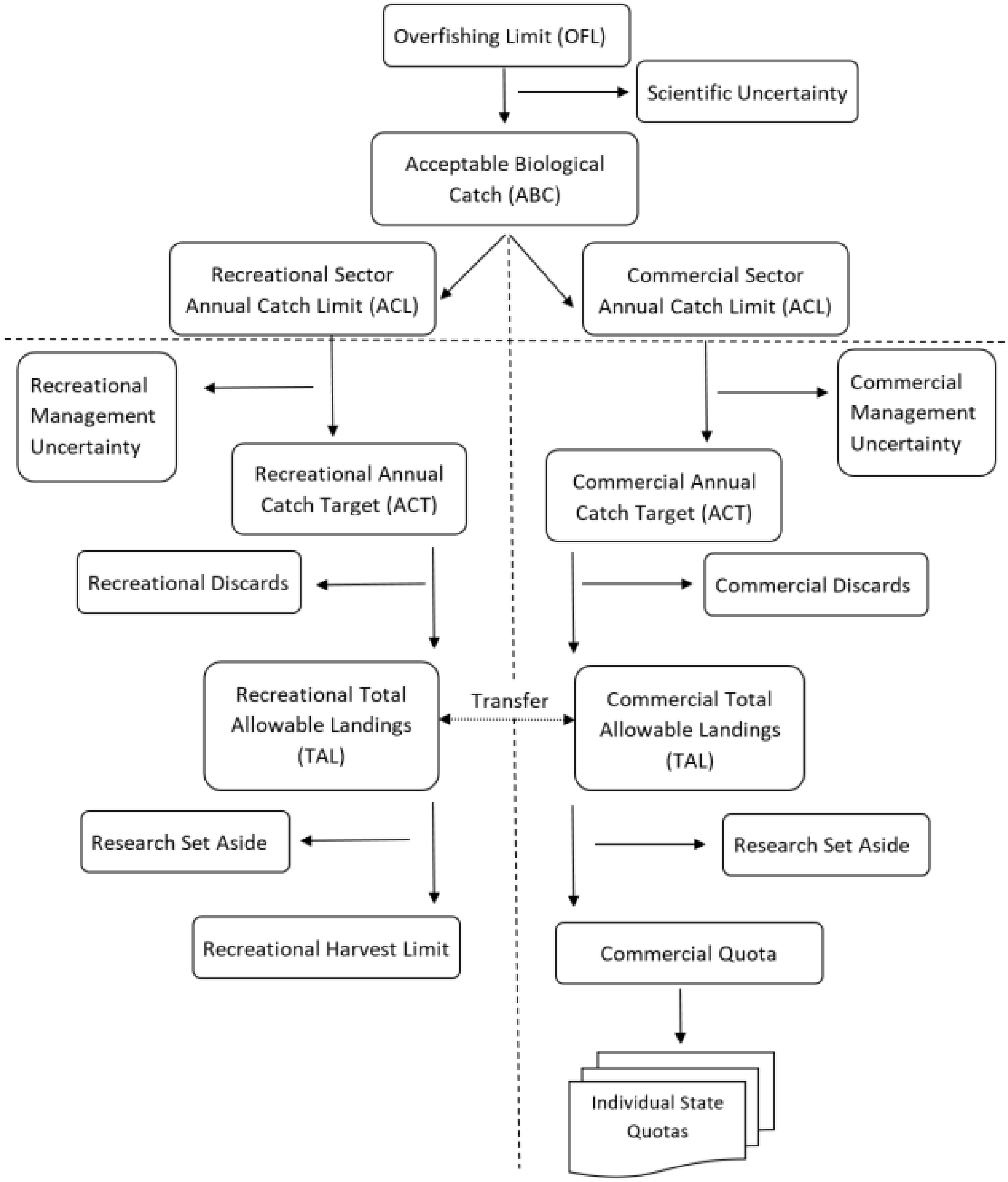


Figure 4. Bluefish flow chart from the Bluefish Allocation and Rebuilding Amendment, which includes sector specific management uncertainty. The research set aside program is currently discontinued so no further calculations are needed from the sector specific TALs to the RHL and commercial quota.

Bluefish Fishery Performance Report

June 2022

The Mid-Atlantic Fishery Management Council's (Council) and the Atlantic States Marine Fisheries Commission's Bluefish Advisory Panels (AP) met via webinar on June 22, 2022 to review the Fishery Information Document and develop the following Fishery Performance Report. The primary purpose of this report is to contextualize catch histories 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 the bluefish fishery. Please note: Advisor comments described below are not necessarily consensus or majority statements.

MAFMC Advisory Panel members present: Victor Hartley (NJ), Phil Simon (NJ), William Mandulak (NC), Jim Kaczynski (RI), Michael Plaia (CT), Steve Heins (NC), Eric Burnley (DE)

ASMFC Advisory Panel members present: Peter Fallon (ME), John LaFountain (RI)

Others present: Dustin Colson Leaning (ASMFC Staff), Cynthia Ferrio (GARFO Staff), Cynthia Jones (MAFMC SSC), Maureen Davidson (MAFMC), Joe Cimino (MAFMC), Chris Batsavage (MAFMC), Abby Tyrell (NMFS), and Karson Coutre (MAFMC Staff).

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?

Environmental Factors Influencing Catch

The bluefish recreational fishery is unusual because it is almost exclusively catch and release except for those fishing for snappers. When the regulations changed from a 15 fish bag limit to a 3 fish bag limit, there was not a big impact on angler behavior. The current regulations are not the primary factor impacting how many people fish and how often they fish for bluefish. Reduced bag limits are not going to limit fishing mortality and regulations are not going to help this stock. It looks like the spawning stock biomass has remained fairly steady over time, especially since the 1980s, based on the recent operational assessment graph.

Recreational catch has been relatively flat since the big drop off after 2017. Generally, anglers fishing from shore and beaches do not keep a lot of bluefish. Last November there were quite a few bluefish and they were in the 3-5 pound range.

Bluefish are a pelagic fish, and the fish that move inshore are a spillover for bluefish that are looking for additional forage. In New Jersey, fishing mostly on party or charter boats, the bluefish showed up late this year, normally they come much earlier.

In Rhode Island, the commercial and recreational fishing started out very strong last year and then it fell off on the latter half of the year, especially gillnetting. Giant bluefin tuna moved inshore in the fall and scared off the smaller bluefish, which could have affected landings. This year bluefish seems like a strong stock. People are reaching their quotas quickly.

For the New Jersey for-hire sector, fishing out of Point Pleasant, bluefish is not a catch and release fishery. In this area we saw plenty of bluefish last year, while this year the bluefish came in a little late. Fall bluefish fishing is pretty good, and most boats switch to striped bass at this time, while bluefish become more of a secondary target. They may have come in late this year because menhaden came in late. The bluefish are definitely plentiful.

In Maine, bluefish were historically important for the for-hire trips, especially in August when other species' seasons close. Maine is the northern end of the range and as the population has decreased, there have been very few bluefish in Maine and New Hampshire for the past five years. In Massachusetts there were more bluefish in the fall last year, especially on the south side of the cape. North of Massachusetts it would be beneficial for us if the bluefish population would come back.

A bluefish dealer and smokehouse owner in Rhode Island purchases bluefish up and down the coast and used to see big bluefish prior to 2018. In North Carolina and New Jersey, they used to see bigger fish but now they are seeing much smaller fish, which has been true up and down the coast. The exception is this year, when up and down the coast they started getting really big fish. An environmental shift has likely caused big bluefish to go offshore and come up north more and that is reflected in the allocations. Northern states have been getting more fish. In the Rhode Island area, when the tuna moved in close to shore it affected the inshore gillnetters and it had been a while since that had been seen. Those fishing 10-11 miles south of Block Island were catching a ton of bluefish and were only restricted by the quota. They would limit out very quickly and the commercial coastwide quota was underharvested last year due to allocations not being updated yet. In the fall, bluefish were coming by RI offshore.

In the Delaware and Maryland area, we aren't seeing tiny snappers and jumbos, but we have a good supply of fish at 28 inches in Maryland. Bluefish have been in the surf, and even going up into estuaries. There is now a fishery that had not been there for the past few years. The local fishing pier had a good run with them as well.

Looking at the fishing literature, not necessarily the scientific literature, bluefish have been very cyclical. Given that, we should sit back and see what happens. In Long Island Sound there have been plenty of bluefish so maybe the population is on the upswing.

The state of Florida accounts for so much of the bluefish catch recreationally, their dead discard estimate is more dead fish than we catch in New York and New Jersey. Do we know what is going on there? No advisors from Florida were present to comment on this.

One advisor commented that Connecticut's average weight for bluefish seems difficult to believe. Other AP members commented that the snapper fishery is very common in Connecticut and the high number of snappers can explain the low average weight per fish.

Market/Economic Conditions and Management Issues

The assumed discard mortality rate seems high, however in general treble hooks make it harder to release bluefish so choosing to fish with a single hook may increase survival.

No AP members from Florida were present, however, one advisor noted that they have heard anglers are upset about the minimum size limit in Florida.

One advisor asked how Marine Recreational Information Program (MRIP) data was collected during COVID-19 and what the impact was on the intercept surveys. In response, staff discussed the use of imputed MRIP estimates for certain states/waves of 2020.

Another advisor asked about the implications of the 2021 recreational harvest estimate being over the recreational harvest limit (RHL). Staff discussed that the Monitoring Committee and Council and Board would consider that when setting 2023 recreational measures. However, staff also pointed out that the 2023 RHL is higher than in recent years, which may offset the effect of an overage payback.

Five AP members supported an increase in bag limit for the for-hire sector. Four specified that this could be supported with implementation of a minimum size for this sector. One advisor did not support different bag limits across modes. Additional context is included in the comments below:

The party boats are getting decimated in New Jersey. There used to be 3-4 in Barnegat Bay and now there is only one and it may be gone soon. The party boats should be supported if possible.

The for-hire fleet would like to see a bag limit of 7 fish with a minimum size.

The bag limit should be increased and a minimum size could be increased for the for-hire industry. They fish further offshore and their clients are looking at how much protein they can bring home. A bigger bag limit allows people to bring more home so they will want to take the trips.

In the Gulf of Mexico there is sector separation between private and for-hire modes with different regulations. The more robust for-hire reporting can allow for a better managed fishery and opportunities to have higher bag limits or different size limits informed by better data.

Regarding the recreational bag limit, everyone should have the same bag limit across modes. It is not fair or equal to have them different for the for-hire and private sectors.

Two advisors supported investigating a minimum size (regardless of bag limit) in order to help protect the stock. A small but reasonable size limit would allow kids to still catch fish but the stock would benefit from protecting younger year classes.

Research Priorities

More research is needed on release mortality and single hook lures should be promoted along with a circle hook requirement.

It would be beneficial to research the cyclical nature of bluefish, however that may take generations.

More research is needed on the impact of the snapper fishery on the stock. What is the impact of removing a lot of these small bluefish from the future population?

Email Comments

From: Capt. TJ Karbowski [mailto:tedkarbowski@yahoo.com]
Sent: Thursday, July 7, 2022 4:47 AM
To: Dustin C. Leaning <DLeaning@asmfc.org>
Subject: [External] Re: Bluefish Fishery Performance Report Draft

Good morning.
I read through quickly. In my opinion as a 6 pack charter vessel. not a party boat. The current bag is completely fine. We CATCH a ton of blues. We release about 90%.

Small baitfish such as sand eels and silversides you will find plenty of smaller blues.

When menhaden are around you will find the larger (alligator) bluefish. No big bunker= No big blues.

Thank you,
Capt. TJ Karbowski
Rock & Roll Charters
Clinton, CT
203.314.3765
https://rockandrollcharters.com/

Atlantic Bluefish Data Update for 2022

National Marine Fisheries Service
Northeast Fisheries Science Center
166 Water St.
Woods Hole, MA 02543

Commercial bluefish landings data were provided directly by the Atlantic Coastal Cooperative Statistics Program (ACCSP). Commercial landings in 2020 were 1,112 MT (2.45 million lbs), and slightly decreased to 1,090 MT (2.40 million lbs) in 2021, which was 80% of the 2021 commercial quota (1,255 MT, 2.77 million lbs). Estimated recreational landings in 2020 were 6,160 MT (13.58 million lbs), and decreased to 5,653 MT (12.46 million lbs) in 2021, which was 131% of the 2021 recreational harvest limit (4,301 MT, 9.48 million lbs). Total recreational discards (assuming 15% mortality, and calculated using NEFSC methodology from SARC60) were 3,747 MT = 8.3 million lbs in 2020, and 5,709 MT = 12.6 million lbs in 2021. Total bluefish catch in 2020 was 11,019 MT (24.29 million lbs), and in 2021 was 12,452 MT (27.45 million lbs, Figure 1).

A recreational catch-per-unit-effort index was updated through 2021 from the MRIP intercept data. This index is an important index incorporated into the stock assessment and shows a slight increase from the 2020 estimate. In addition, the NEFSC Fall bottom trawl survey was updated through 2021, noting that there is no survey value for 2017 due to incomplete sampling (vessel issues) and no information for 2020 due to COVID. The 2021 NEFSC fall index value of 1.54 is an increase from the 2019 value of 1.13, which was the lowest of the time-series (Figure 2). The NEFSC fall survey length frequency distributions show a typical peak of smaller fish centering around 20 cm and the historical bi-modal pattern was not present in 2021 (Figure 3).

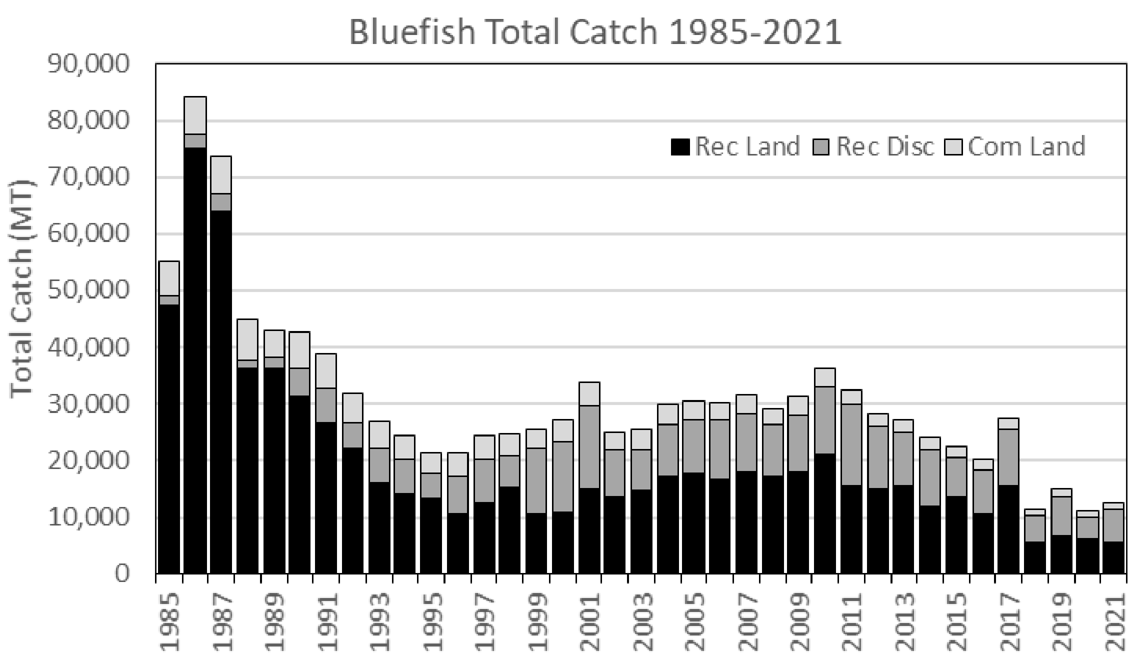
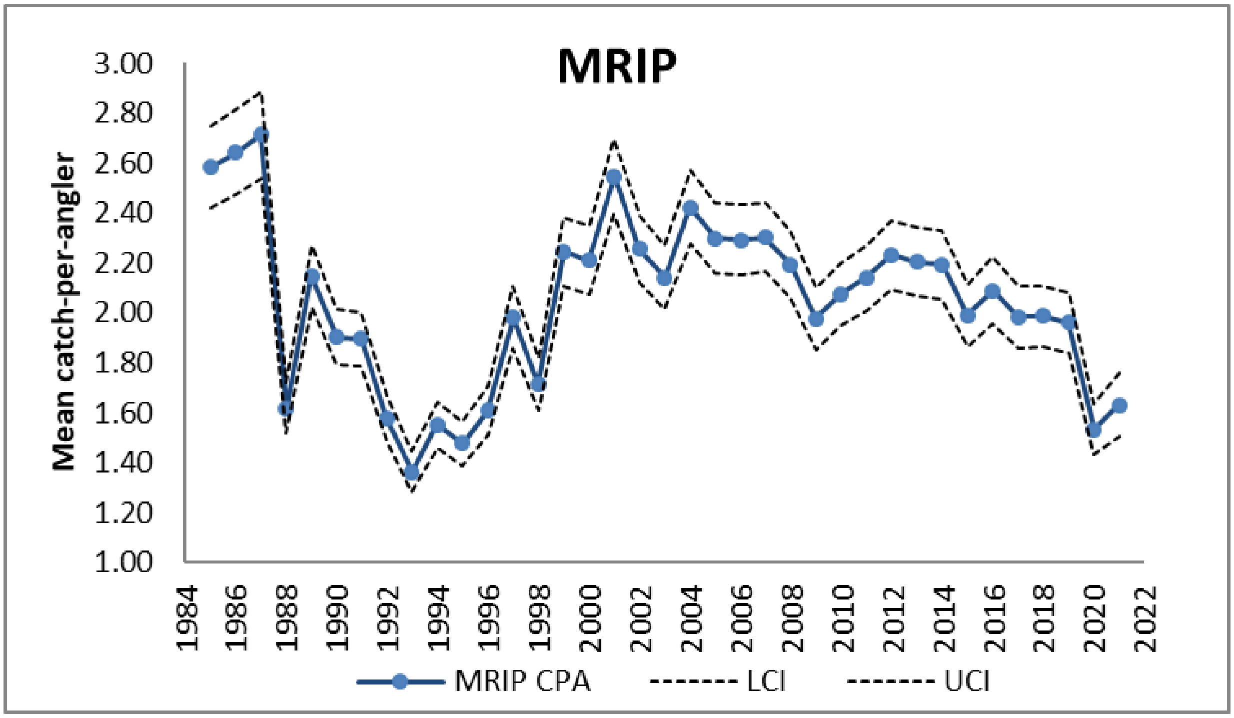


Figure 1. Atlantic bluefish fishery total catch.



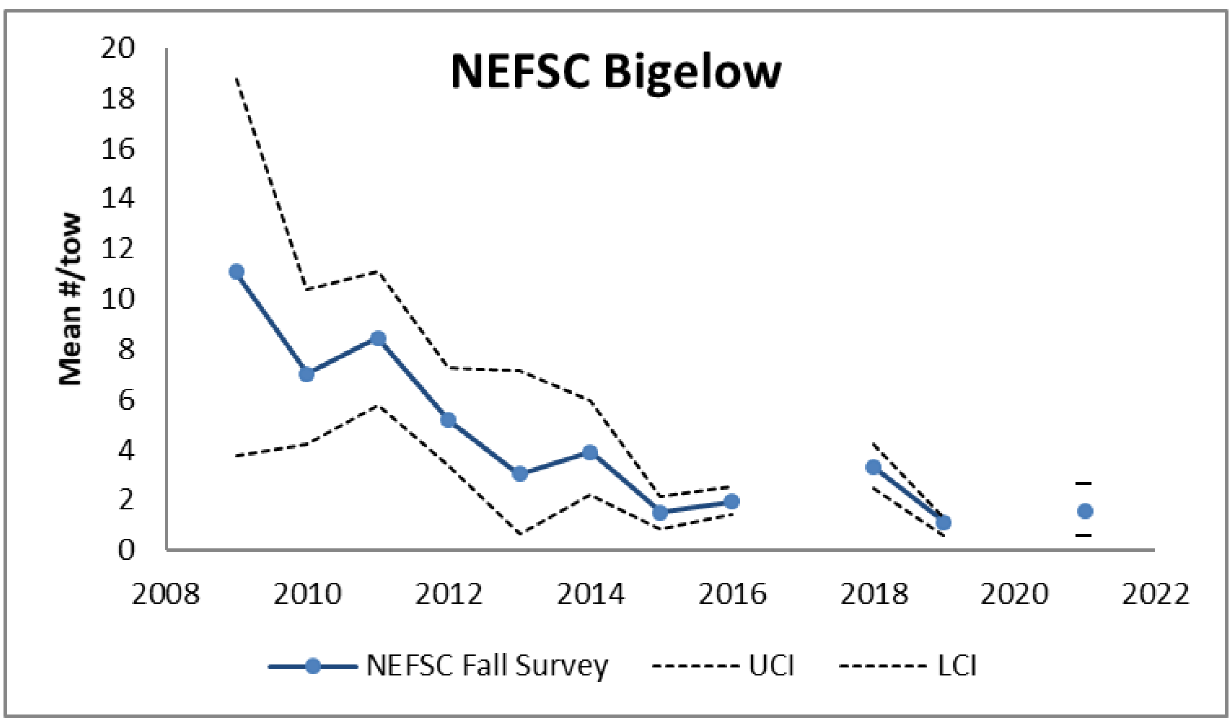


Figure 2. A. MRIP CPUE index and B. NEFSC trawl survey index for bluefish. The Bigelow did not sample southern strata in 2017 and there was no 2020 survey due to COVID.

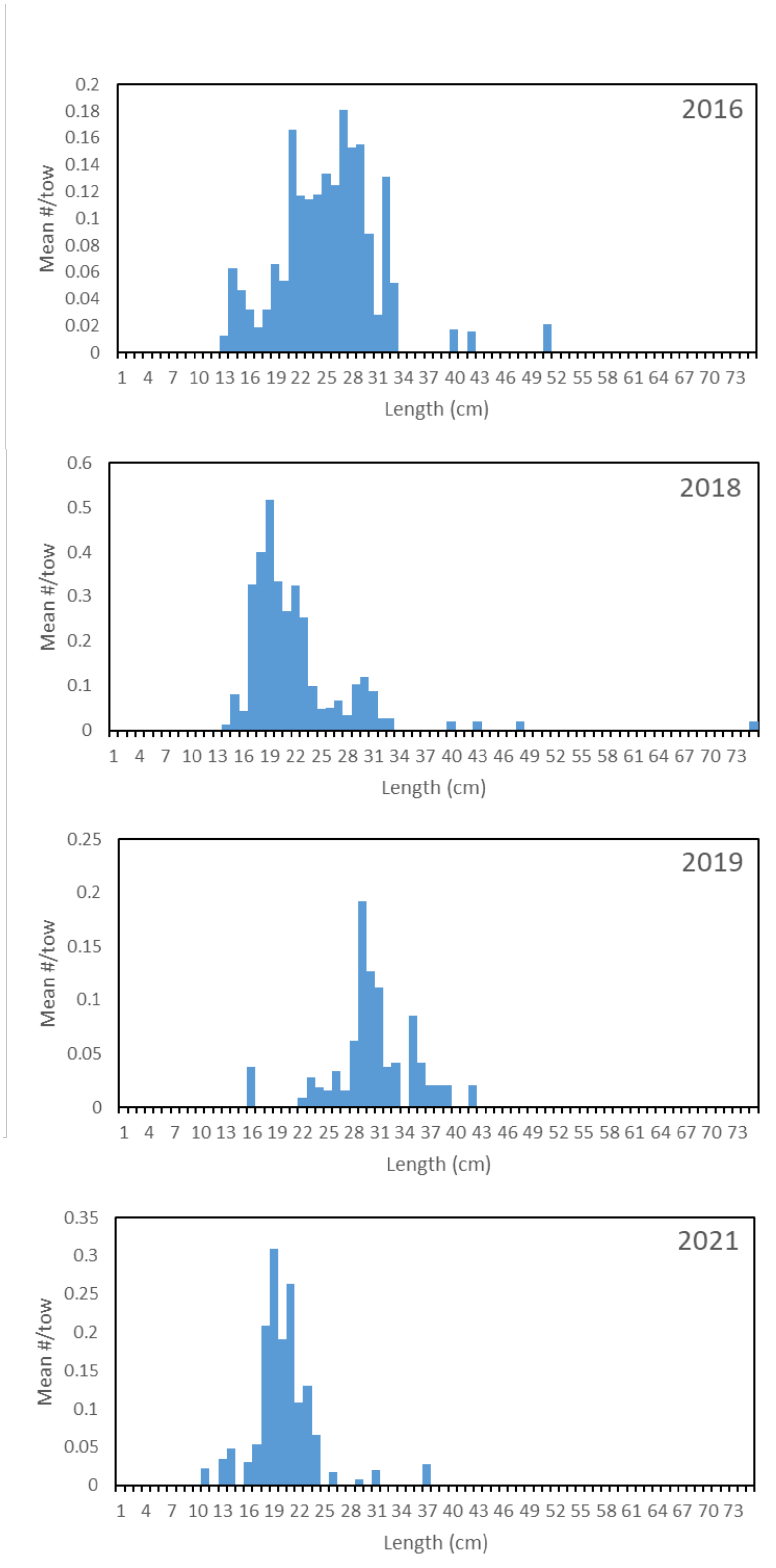


Figure 3. Northeast Fisheries Science Center (NEFSC) fall trawl survey indices at length. There is no valid fall 2017 or 2020 index for bluefish.

Bluefish Fishery Information Document

June 2022

This Fishery Information Document provides a brief overview of the biology, stock condition, management system, and fishery performance for bluefish with an emphasis on 2021. Data sources for Fishery Information Documents are generally from 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/bluefish/.

Key Facts

- According to the 2021 Management Track Assessment, bluefish is overfished and overfishing is not occurring. The bluefish stock entered a rebuilding plan in 2022 to rebuild the stock. A research track assessment will undergo peer review in late 2022.
- Recreational landings were 12.46 million pounds in 2021, a 1.12 million pound decrease compared with 2020.
- Recreational dead discards in 2021 were 3.53 million fish, which represents a slight increase compared with 3.20 million fish in 2020.
- Commercial landings were 2.07 million pounds in 2021, a 0.09 million pound decrease compared with 2020.

Basic Biology

Bluefish are found worldwide in tropical and subtropical waters, but in the western North Atlantic range from Nova Scotia and Bermuda to Argentina. Bluefish travel in schools of like-sized individuals and undertake seasonal migrations, moving into the Middle Atlantic Bight (MAB) during spring and then south or farther offshore during fall. Within the MAB they occur in large bays and estuaries as well as across the entire continental shelf. Juvenile stages have been recorded in all estuaries within the MAB, but eggs and larvae occur in oceanic waters (Able and Fahay 1998). Bluefish have fast growth rates and reach lengths of 3.5 ft and can weigh up to 27 pounds (Bigelow and Schroeder 1953). Bluefish live to age 12 and greater (Salerno et al. 2001).

Bluefish eat a wide variety of prey items. The species has been described by Bigelow and Schroeder (1953) as “perhaps the most ferocious and bloodthirsty fish in the sea, leaving in its wake a trail of dead and mangled mackerel, menhaden, herring, alewives, and other species on which it preys."

Bluefish born in a given year (young of the year) typically fall into two distinct size classes suggesting that there are two spawning events along the east coast. Studies suggest, however, that spawning is a single, continuous event, but that young are lost from the middle portion resulting in the appearance of a split season (Smith et al. 1994). As a result of the bimodal size distribution, young are referred to as spring-spawned or summer-spawned. In the MAB, spring-spawned bluefish appear to be the dominant component of the stock.

Status of the Stock

2021 Management Track Assessment

In June 2021, a bluefish management track assessment, which included revised bluefish MRIP estimates and commercial landings through 2019 indicated the bluefish stock is still overfished and overfishing is not occurring. This update builds upon the 2019 operational assessment with data through 2018 that first indicated the stock was overfished and overfishing was not occurring.

The biological reference points for bluefish revised through the 2021 management track assessment include an updated fishing mortality threshold of FMSY = F35% (as the FMSY proxy) = 0.181, and a biomass reference point of SSBMSY = SSB35% (as the SSBMSY proxy) = 444.74 million lbs. The minimum stock size threshold (1/2 SSBMSY) is estimated to be 222.37 million lbs. SSB in 2019 was 211.07 million lbs.

Fishing mortality on the fully selected age 2 fish was estimated to be 0.172 in 2019, 95% of the updated fishing mortality threshold reference point FMSY proxy = F35% = 0.181. There is a 90% probability that the fishing mortality rate in 2019 was between 0.140 and 0.230.

The 2021 management track assessment indicated the bluefish stock has experienced a decline in SSB over the past decade, coinciding with an increasing trend in F. Recruitment has remained fairly steady, fluctuating just below the time-series mean of 46 million fish. Both commercial and recreational fisheries have had lower catches in recent years. These lower catches are possibly a result of availability. Anecdotal evidence suggests larger bluefish stayed offshore and inaccessible to most of the recreational fishery during the past few years.

2022 Research Track Assessment

There is an ongoing bluefish research track stock assessment which will undergo peer review in late 2022. Research track assessments evaluate new datasets that can either inform or be used in new or existing stock assessment models. The goal is to develop an improved stock assessment for bluefish that can be used for future management track assessments.

Management System and Fishery Performance

Management

The Mid-Atlantic Fishery Management Council (Council or MAFMC) and the Atlantic States Marine Fisheries Commission (ASMFC) work cooperatively to develop fishery regulations for bluefish off the east coast of the United States. The Council and Commission work in conjunction with the National Marine Fisheries Service (NMFS), which serves as the federal implementation and enforcement entity. This cooperative management endeavor was developed because a significant portion of the catch is taken from both state waters (0-3 miles offshore) and federal waters (3-200 miles offshore, also known as the Exclusive Economic Zone or EEZ). The management unit for bluefish is the U.S. waters in the western Atlantic Ocean.

The Bluefish Fishery Management Plan (FMP) was implemented in 1990 and established the Mid-Atlantic Fishery Management Council's management authority over the fishery in federal waters. Amendment 1, implemented in 2000, addressed stock rebuilding and created the Bluefish Monitoring Committee which meets annually to make management measure recommendations to the Council. Amendment 3 incorporated the development of annual catch limits (ACLs) and accountability measures (AMs) into the specification process and Amendment 4 modified recreational accountability measures to accommodate uncertainty in recreational management and catch estimation. The original FMP and subsequent amendments and frameworks are available at: http://www.mafmc.org/fisheries/fmp/bluefish.

Until 2022, the annual catch limit was split 83 percent and 17 percent into recreational and commercial limits, respectively, and the discarded component of that catch was deducted to arrive at recreational and commercial total allowable landings (TAL). Additionally, landings above the expected recreational harvest could be "transferred" from the recreational to the commercial fishery as long as the final commercial quota did not exceed 10.5 million pounds. In June 2021, the Council and ASMFC's Bluefish Board took final action on the Bluefish Allocation and Rebuilding Amendment. This action allocates 14 percent of the fishery annual catch limit to the commercial fishery and 86 percent to the recreational fishery, which is a 3-percentage point shift to the recreational sector from the prior allocations. This amendment also adjusted the commercial state quota allocations and allows bi-directional quota transfers. Amendment documentation is available at: https://www.mafmc.org/actions/bluefish-allocation-amendment.

The Council's SSC reviews stock assessment results and the Advisory Panel's fishery performance report and sets the ABCs on a two year cycle with a review occurring between those two years. The Council's Bluefish Monitoring Committee develops and recommends specific coastwide management measures (commercial quota, recreational harvest limit) that will achieve the catch target and makes further adjustments to total catch as needed based on management uncertainty. Finally, the Council and Board meet jointly to develop recommendations to be submitted to the NMFS.

Table 1. Summary of bluefish catch, harvest, and management measures, 2013 – 2022 (Values are in millions of pounds). 2019 is the transition year for when recreational landings are reported using only new MRIP estimates. In 2019, recreational landings were provided using new MRIP estimates while the RHL was developed using old MRIP estimates so cannot be directly compared. In 2020 onward, the new MRIP estimates were used in setting the RHL and estimating catch and landings.

Management Measures	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
ABC	**27.47**	**24.43**	**21.54**	**19.45**	**20.64**	**21.81**	**21.81**	**16.28**	**16.28**	**25.26**
TAL	23.86	21.08	18.19	16.46	18.19	18.82	19.33	12.25	12.25	17.43
Comm. Quota	9.08	7.46	5.24	4.88	8.54	7.24	7.71	2.77	2.77	3.54
Comm. Landings[1]	4.12	4.77	4.02	4.1	3.64	2.20	2.78	2.16	2.07	--
Rec. Harvest Limit	14.07	13.62	12.95	11.58	9.65	11.58	11.62	9.48	8.34	13.89
Rec. Harvest, Old MRIP	16.46	10.46	11.67	9.54	9.52	3.64	--	--	--	--
Rec. Harvest, New MRIP	34.40	27.04	30.10	24.16	32.07	13.27	15.56	13.58	12.46	--
Rec. Possession Limit (# fish)	15	15	15	15	15	15	15	3: Private 5: For-Hire	3: Private 5: For-Hire	3: Private 5: For-Hire
Total Landings	20.58	15.23	15.69	13.64	13.16	5.84	18.34	15.74	14.53	--
Overage/Underage	-3.28	-5.85	-2.5	-2.82	-5.03	-12.98	N/A*	+3.49	+2.28	--
Total Catch[2]	24.06	17.96	18.65	16.09	15.65	6.96	23.50	19.93	21.25[3]	--
Overage/Underage	-3.41	-6.47	-2.89	-3.36	-4.99	-14.85	N/A*	+3.65	+4.97	--

[1]Dealer data (cfders) was used to generate commercial landings. [2] Recreational discards were calculated assuming MRIP mean weight of fish harvested by state in a given year multiplied by the MRIP B2s and assumed discard mortality rate of 15%. [3] A previous version of this document reported a lower catch value due to a calculation error, 2021 catch data are preliminary.

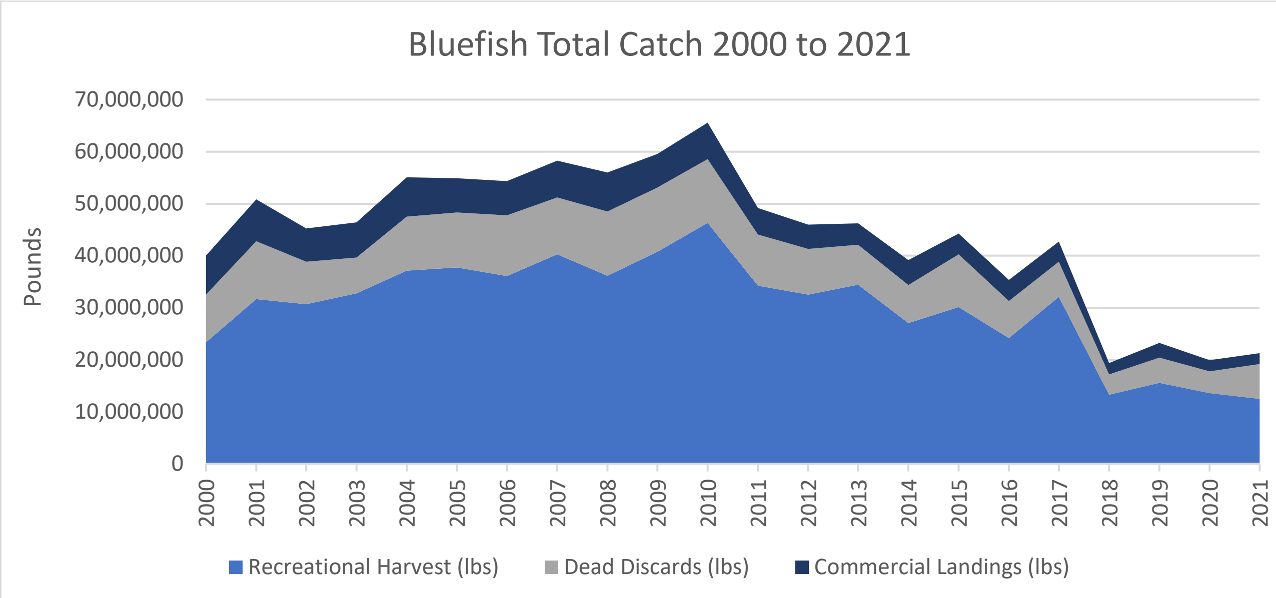


Figure 2. Bluefish catch (landings and dead discards), 2000-2021. Recreational dead discards are calculated as the average weight of a harvested fish by year and state multiplied by the B2s and 15% discard mortality rate (Source: MRIP and Dealer data – cfders). Commercial discards are thought to be negligible.

Fishery Performance Relative to Management Measures

The recreational and commercial landings relative to specified management measures through 2022 are provided in Table 1. In 2021, MRIP reported the recreational fishery landed 12.46 million pounds compared to the 8.34 million pounds RHL. This RHL overage will be reviewed by the Monitoring Committee and Council and Board, as well as the Greater Atlantic Regional Fisheries Office to identify if/how accountability measures will be triggered. In 2021, the commercial fishery landed 2.07 million pounds compared to the 2.77-million-pound quota.

Recreational Fishery

In July 2018, MRIP released revisions to their time series of recreational catch and landings estimates based on adjustments for a revised angler intercept methodology and a new effort estimation methodology (i.e., a transition from a telephone-based effort survey to a mail-based effort survey). The revised estimates of catch and landings are several times higher than the previous estimates for shore and private boat modes. All recreational estimates in this document reflect revised MRIP estimates except where otherwise noted.

Recreational harvest estimates for 2020 were impacted by temporary suspension of shoreside intercept surveys due to the COVID-19 pandemic. NMFS used imputation methods to fill gaps in 2020 catch data with data collected in 2018 and 2019.

Trends in recreational trips associated with targeting or harvesting bluefish from 2012 to 2021 are provided in Table 2. During the past ten years, the lowest annual estimate of bluefish trips was 7.17 million (2018) and the highest annual estimate of bluefish trips was 12.82 million in 2012. Over the last 5 years (2017-2021), the number of bluefish trips averaged 8.95 million trips.

Table 2. Number of bluefish recreational fishing trips, landings per trip, harvest, catch and releases for the past 10 years, ME-FL.

Year	bluefish trips[1] (N)	Rec. landings per trip	Recreational Harvest (N)	Recreational Harvest (lbs)	Released (N)	Catch (N)
2012	12,817,838	1.45	18,578,838	32,530,917	32,079,529	50,658,367
2013	9,353,805	2.14	19,975,051	34,398,327	33,519,613	53,494,664
2014	12,441,771	1.73	21,510,651	27,044,276	33,583,115	55,093,766
2015	9,406,704	1.46	13,725,106	30,098,649	28,423,854	42,148,960
2016	10,626,957	1.40	14,899,723	24,155,304	27,629,023	42,528,746
2017	9,952,090	1.39	13,845,806	32,071,432	28,317,327	42,163,133
2018	7,169,536	1.43	10,245,710	13,270,862	20,682,992	30,928,703
2019	8,250,853	1.47	12,137,290	15,555,889	26,494,646	38,631,936
2020	8,745,993	1.07	9,336,222	13,581,218	21,345,604	30,681,826
2021	7,409,375	0.83	6,183,783	12,462,781	23,566,217	29,750,000

[1] Estimated number of recreational fishing trips where the primary target was bluefish or bluefish were harvested regardless of target

From the early 1980s to the early 1990s, recreational landings declined about 70% (avg. 1981-1983 = 156.34 million pounds; avg. 1991-1993 = 46.14 million pounds). Recreational landings continued to decline at a slower rate until reaching a low level in 1999-2000 but have since grown to a peak of over 46 million pounds in 2010. Since 2018, recreational landings have dropped to the lowest values of the time series with a 2018-2021 average harvest of 13.72 million pounds. In 2021, landings were 12.46 million pounds. From 2000 to 2010 landings were relatively stable, however, recreational landings have been trending downward since 2010 (Figure 2). Commercial discards are insignificant and are not estimated in the current assessment.

Recreational catch and harvest by state for 2021 are provided in Table 3. The greatest catches (includes discards) occurred in Florida with 13.88 million fish, followed by North Carolina with 4.52 million fish, and New York and New Jersey with over 2 million fish.

The greatest harvest of bluefish by weight in 2021 occurred in Florida with 3.55 million pounds, followed by New Jersey with 3.36 million pounds, New York with 2.35 million pounds and North Carolina with just over 1 million pounds. Average weights, based on dividing MRIP landings in weight by landings in number for each state, suggest that bluefish size tends to increase along the north Atlantic coast.

Table 3. MRIP estimates of 2021 bluefish recreational harvest, total catch, and average weight.

State	Harvest			Catch	Total Released	Dead Discards
	Pounds	Number	Average Weight[1] (pounds)	Number	Number	Number
ME	3,633	673	5.4	6,104	5,431	815
NH	3,796	698	5.4	698	-	-
MA	833,962	116,547	7.2	855,041	738,494	110,774
RI	718,950	140,504	5.1	774,409	633,905	95,086
CT	206,429	263,966	0.8	1,180,092	916,126	137,419
NY	2,353,527	861,060	2.7	3,565,667	2,704,607	405,691
NJ	3,357,809	921,667	3.6	2,895,008	1,973,341	296,001
DE	8,460	14,019	0.6	179,562	165,543	24,831
MD	117,545	105,711	1.1	316,949	211,238	31,686
VA	153,199	216,317	0.7	719,804	503,487	75,523
NC	1,031,761	982,391	1.1	4,521,724	3,539,333	530,900
SC	107,268	172,528	0.6	722,532	550,004	82,501
GA	12,870	13,811	0.9	136,588	122,777	18,417
FL	3,553,572	2,373,891	1.5	13,875,822	11,501,931	1,725,290
Total	12,462,781	6,183,783	-	29,750,000	23,566,217	3,534,932

[1] Average weight is the pounds harvested divided by the number of fish harvested. Recreational dead discards are calculated as 15% of total recreational discards.

Figure 3 presents new MRIP estimates of landings by mode since 2000 and indicates that the recent primary modes landing bluefish are shore mode and private boats. Based on recreational harvest in 2021, landings from shore represented 66% of overall landings, followed by private rental mode at 29% and the for-hire sector at 6%. Over the last five years (2017-2021), ~67% of the total bluefish landings came from shore, ~29% from private/rental boats, and ~4% from for-hire boats. In 2021, 926 federal for-hire permits were issued for bluefish.

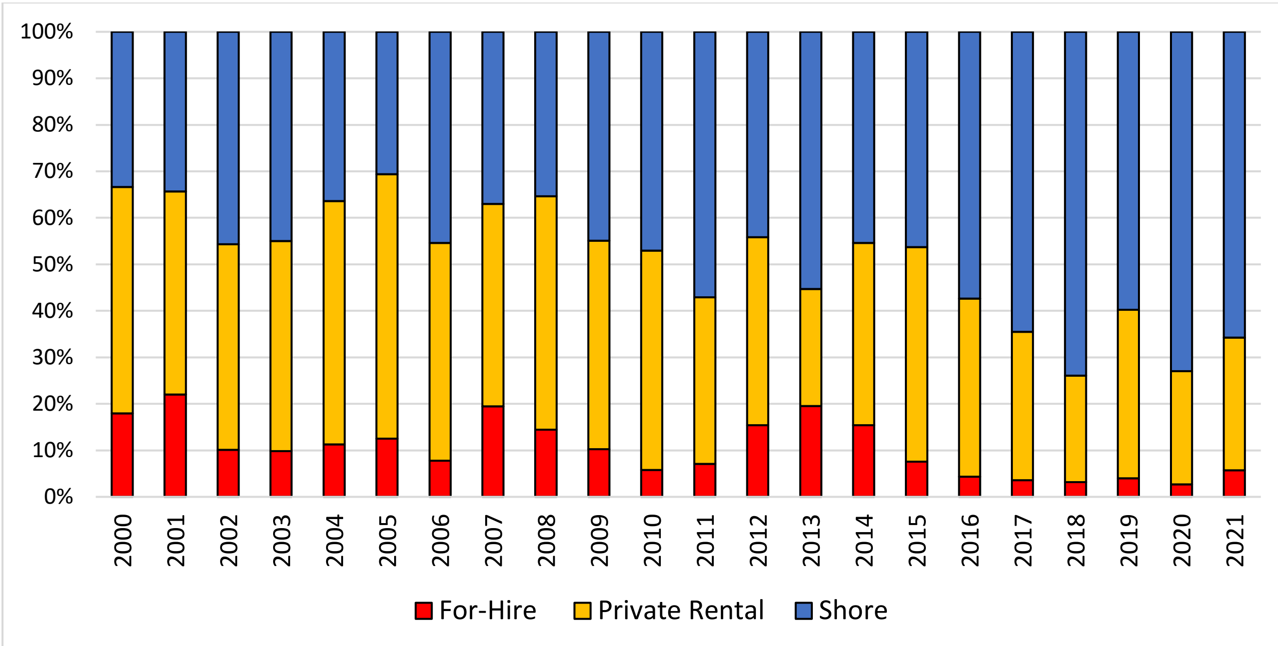


Figure 3. Bluefish recreational harvest (pounds) by mode on the Atlantic Coast, 2000-2021. Source: MRIP.

MRIP classifies catch into three fishing areas: inland, nearshore ocean (< 3 mi), and offshore ocean (> 3 mi). In 2021, the majority of coastwide bluefish harvest occurred in nearshore ocean waters at 62%, followed by 35% from inland waters, and 3% from offshore waters. Inland and nearshore ocean are considered state waters while offshore ocean (>3 miles) is federal waters, therefore 97% of bluefish harvest by weight occurred in state waters in 2021. Over the last five years (2017-2021), 37% of the total bluefish landings came from inland waters, 59% from nearshore ocean, and 4% from offshore ocean.

In the recreational fishery, bluefish released alive (B2) are estimated by MRIP. To calculate discard mortality[1], a 15% mortality rate is applied to the B2 value. In 2021, there were 3.53 million bluefish dead discards, which represents a slight increase compared with 3.20 million fish in 2020 however there is an overall downward trend from the 2001 peak of 6.37 million bluefish dead discards (Figure 4).

[1] To estimate discards in pounds, multiply the number of dead discards times the average weight of fish in a given year. For more detailed results, which are used in Table 2, characterize the average weight of a bluefish by state and mode using the MRIP query tool: https://www.st.nmfs.noaa.gov/recreational-fisheries/data-and-documentation/queries/index.

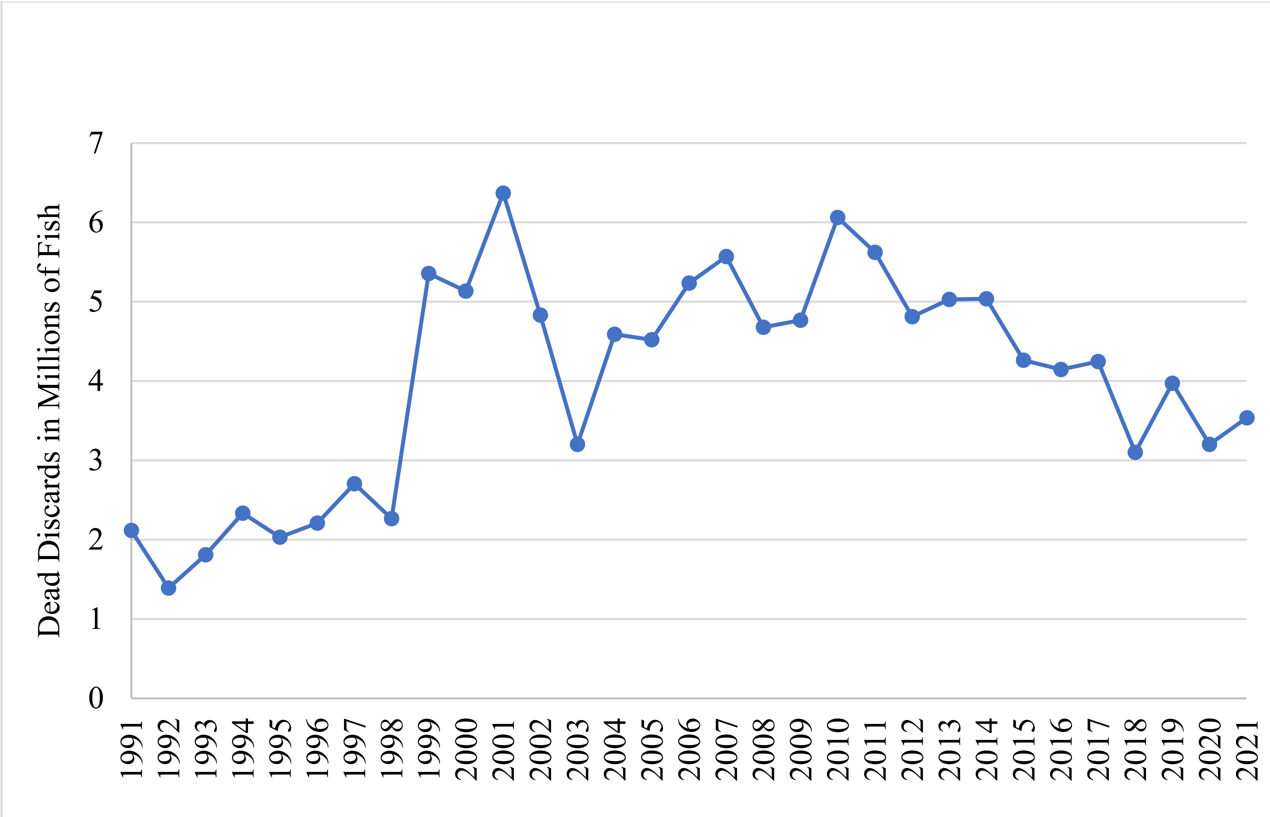


Figure 4. Bluefish dead discards in numbers of fish (all areas and modes combined) from 1991-2021. Fish released alive (B2) are assumed to have a 15% mortality rate. Source: MRIP.

Commercial Fishery

Federal permit data indicate that 2,291 commercial bluefish permits were issued in 2021. A subset of federally permitted vessels was active in 2021 with dealer reports identifying 248 vessels with commercial bluefish permits that landed bluefish. Of the 141 federally permitted bluefish dealers in 2021, there were 119 dealers who bought bluefish.

In 2021, the commercial fishery landed 2.07 million pounds. Dealer data for 2021 indicate that most of the bluefish commercial landings were taken by gillnet (59%), followed by unknown gear (26%), trawl/dredge (7%), handline (5%), and other (3%).

Across states, 2021 commercial landings were the highest in North Carolina with 0.85 million pounds of bluefish landed, followed by New York at 0.32 million pounds and Rhode Island at 0.25 million pounds (Table 4). VTR catch data was used to identify all NMFS statistical areas that accounted for at least 5 percent of the total bluefish catch (Table 5). Six statistical areas accounted for approximately 86% of the VTR-reported catch in 2021. The highest percentage of catch was from statistical area 612 with the most trips targeting bluefish conducted in statistical area 611. A map of the proportion of bluefish catch by statistical area based on federal VTR data is shown in Figure 5.

Table 4. Commercial landings by state for 2021based on dealer data (cfders). Note that state only commercial landings from North Carolina and Florida are not always present in the cfders database. Final commercial catch accounting will be made available by GARFO prior to setting specifications.

State	2021 Landings (Pounds)
ME	0
NH	0
MA	223,723
RI	254,607
CT	33,648
NY	324,186
NJ	230,157
DE	2,171
MD	3,065
VA	44,626
NC	851,860
SC	0
GA	0
FL	102,623
Total	2,070,666

Table 5. Statistical areas that accounted for at least 5 percent of the total bluefish catch. Source: VTR database.

Statistical area	Pounds of bluefish caught	Percent of 2021 commercial bluefish catch	Number of trips
612	141,311	27%	382
539	136,954	26%	688
611	53,380	10%	968
636	44,208	8%	13
613	42,194	8%	526
537	37,134	7%	334

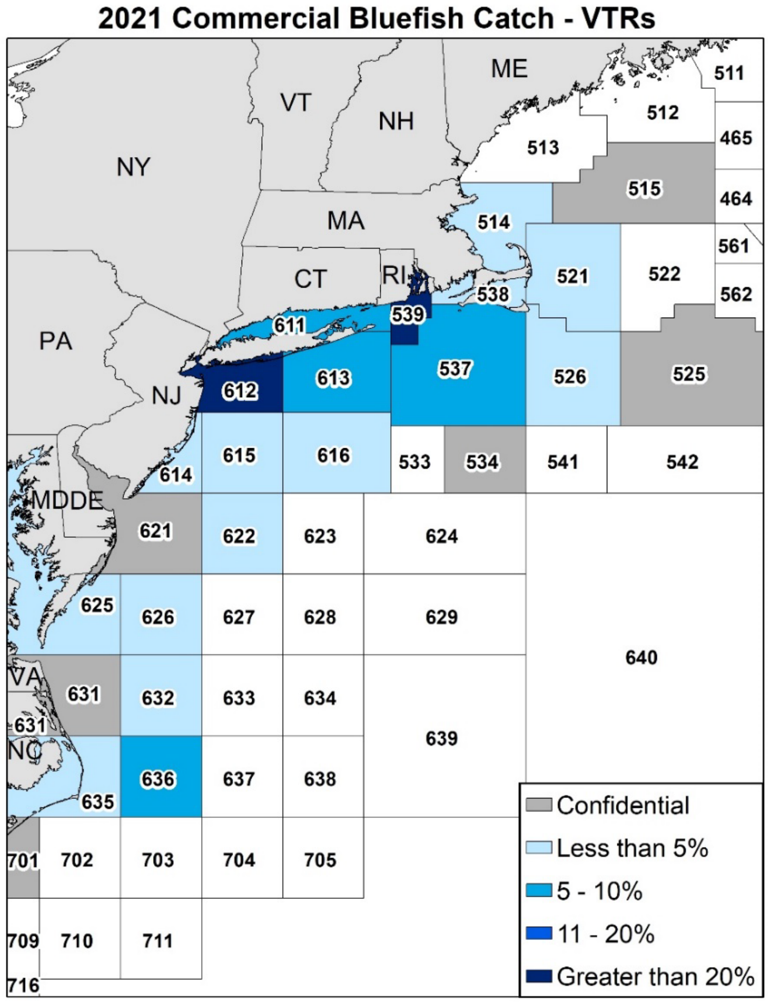


Figure 5. Proportion of bluefish catch by NMFS Statistical Area in 2021 based on federal VTR data. The amount of catch not reported on federal VTRs (e.g., catch from vessels permitted to fish only in state waters) is unknown.

The top commercial landings ports for bluefish in 2021 are shown in Table 6. Six ports qualified as "top bluefish ports," i.e., those ports where 100,000 pounds or more of bluefish were landed. Wanchese, NC landed the most commercial bluefish with over 350,000 pounds landed. The ports and communities that are dependent on bluefish are described in Amendment 1 to the FMP (available at http://www.mafmc.org/fisheries/fmp/bluefish). Additional information on "Community Profiles for the Northeast US Fisheries" can be found at http://www.nefsc.noaa.gov/read/socialsci/community_profiles/.

According to dealer data, commercial vessels landed about 2.07 million pounds of bluefish valued at approximately $1.94 million in 2021. Average coastwide ex-vessel price of bluefish was $0.89 per pound in 2021, a $0.05 increase from the previous year (2020 price = $0.84 per pound). A time series of bluefish revenue and price is provided in Figure 6.

Table 6. Bluefish landings in pounds for top ports (landings > 100,000 pounds) based on NMFS 2021 dealer data (cfders).

Port	Pounds	% of total commercial bluefish landings	# vessels
Wanchese, NC	352,350	17%	<10
Hatteras, NC	306,615	15%	<10
Point Judith, RI	201,228	10%	96
Montauk, NY	140,827	7%	83
Point Pleasant, NJ	129,975	6%	28
Boston, MA	124,787	6%	<10

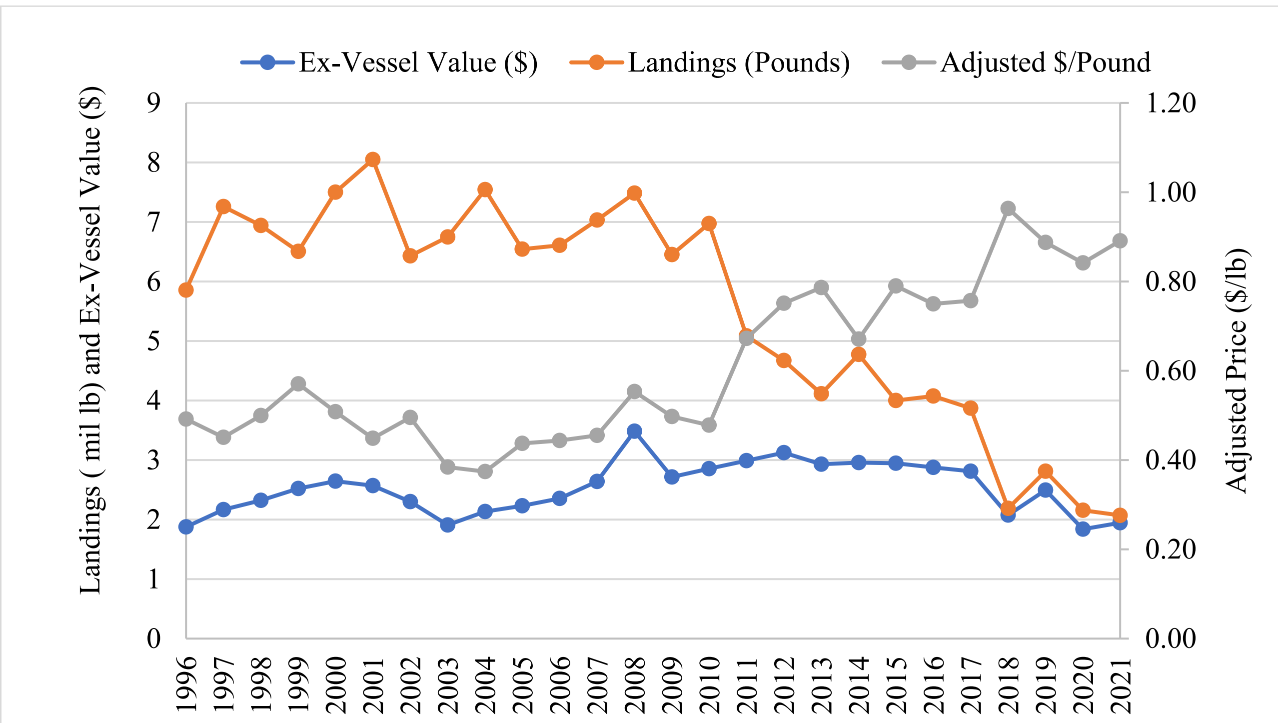


Figure 6. Bluefish commercial landings (in millions of pounds), ex-vessel value, and price per pound (adjusted to 2021 real dollars) from 1996-2021.

The commercial bluefish fishery is primarily prosecuted with gillnets and handlines, although there are other small localized fisheries, such as the beach seine fishery that operates along the Outer Banks of North Carolina. Many of these fisheries do not fish exclusively for bluefish, but target a combination of species including croaker, mullet, Spanish mackerel, spot, striped bass, and weakfish. Given the mixed-species nature of the bluefish fishery, incidental catch of non-target species is not directly attributable to the bluefish fishery.

References

Able, K.W. and M.P. Fahay. 1998. The first year in the life of estuarine fishes in the Middle Atlantic Bight. Rutgers University Press, New Brunswick, NJ. 342 p.

Bigelow, H.B. and W.C. Schroeder. 1953. Fishes of the Gulf of Maine. U.S. Fish Wildl. Serv., Fish. Bull. 53. 577 p.

Salerno, D.J., J. Burnett, and R.M. Ibara. 2001. Age, growth, maturity and spatial distribution of bluefish, *Pomatomus saltatrix* (Linnaeus), off the northeast coast of the United States, 1985-96. J. Northwest Atl. Fish. Sci., 29: 31-39.

Smith, W., P. Berrien, and T. Potthoff. 1994. Spawning patterns of bluefish, *Pomatomus saltatrix*, in the northeast continental shelf ecosystem. Bull. Mar. Sci. 54(1): 8-16.

NEFSC (Northeast Fisheries Science Center). 2015. 60th Northeast Regional Stock Assessment Workshop (60th SAW) Assessment Report. NEFSC Reference Document 15-08; 870 pp.
Wood, T. 2014. Bluefish 2014 Stock Assessment Update Data and Model Update Through 2013. Coastal/Pelagic Working Group, Northeast Fisheries Science Center, National Marine Fisheries Service, Woods Hole, MA. 37 p.

NEFSC (Northeast Fisheries Science Center). 2019. Atlantic Bluefish Operational Assessment for 2019, Northeast Fisheries Science Center, National Marine Fisheries Service, Woods Hole, MA.

NEFSC (Northeast Fisheries Science Center). 2021. Atlantic Bluefish Management Track Assessment for 2021, Northeast Fisheries Science Center, National Marine Fisheries Service, Woods Hole, MA.

Personal communication (MRIP query) from the National Marine Fisheries Service, Fisheries Statistics Division. Accessed June 2022. Available at: https://www.st.nmfs.noaa.gov/recreational-fisheries/data-and-documentation/queries/index.

Unpublished NMFS Vessel Trip Report, Dealer, and Permit data.

From:	Mary Sabo
To:	Coutre, Karson
Subject:	FW: Form Submission - Contact Info - Bluefish
Date:	Thursday, April 28, 2022 11:17:00 AM

From: Squarespace <form-submission@squarespace.info>
Sent: Wednesday, April 27, 2022 12:04 PM
To: Mary Sabo <msabo@mafmc.org>
Subject: Form Submission - Contact Info - Bluefish

Name: Buddy Aiken

Email Address: aikenbud@gmail.com

Subject: Bluefish

Message:
I'm an avid saltwater fisherman and I'm very concerned about the Bluefish population. There haven't been any Bluefish in New England waters for over 10 years. The south has very low population of bluefish as well.
We had severe Cod fish depletion a few years ago but when the new laws toke affect, they came back in heavy numbers. This is what the bluefish need. I want future populations to have the same opportunity as I did many years ago to hear that drag rip.
Please STOP the netting and pole fishing for 2 years and then create strong laws to keep the population high.

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

Name: Buddy Aiken

Email Address: aikenbud@gmail.com

Subject: Bluefish

Message: I'm an avid saltwater fisherman and I'm very concerned about the Bluefish population. There haven't been any Bluefish in New England waters for over 10 years. The south has very low population of bluefish as well.
We had severe Cod fish depletion a few years ago but when the new laws toke affect, they came back in heavy numbers. This is what the bluefish need. I want future populations to have the same opportunity as I did many years ago to hear that drag rip.
Please STOP the netting and pole fishing for 2 years and then create strong laws to keep the population high.

Does this submission look like spam? Report it here.

From: James Fletcher
To: Coutre, Karson; Didden, Jason
Subject: BLUEFISH SCIENCE / CYCLES
Date: Wednesday, July 27, 2022 1:01:13 PM

ASK: committee members to research local news papers for stories on blue fish over last 50 years, see if cycles become apparent. Thus some restrictions are NOT BASED ON SCIENCE! THINK OUT SIDE OF GROUP THINK FOR SCIENCE BASED MANAGEMENT! THANK YOU!

--

United National Fisherman's Association James Fletcher Director 123 Apple Rd Manns Harbor NC 27953 land 252-473-3287 cell 757-435-8475

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: July 29, 2022

To: Council

From: Brandon Muffley, Council staff

Subject: Summer Flounder Management Strategy Evaluation: Meeting Materials

On Tuesday, August 9, 2022, the Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission Summer Flounder, Scup, and Black Sea Bass Board (Board) will review the final results and outcomes from the EAFM recreational summer flounder management strategy evaluation (MSE).

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

Materials behind the tab:

- Staff Memo: Overview of MSE Process, Outcomes, and Potential Application
- Executive Summary and Overview of MSE Results
- Updated: Overview of the Summer Flounder MSE Simulation Model Specifications (by G. Fay)
- Updated: Overview of the Summer Flounder Recreational Demand Model (by A. Carr-Harris)
- All MSE model outputs (by performance metric, operating model alternative, and state) can be found here - https://bit.ly/fluke-mse-metrics.

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

EAFM Recreational Summer Flounder Management Strategy Evaluation

Summary of Process, Outcomes, and Potential Application

August 2022 Council Meeting

Prepared By: Brandon Muffley, Council Staff

July 29, 2022

Background

This briefing document provides a summary on the overall process, general outcomes, and potential application regarding the recreational summer flounder management strategy evaluation (MSE)[1]. Development of this MSE is part of the continued implementation of the Mid-Atlantic Fishery Management Council's (Council) Ecosystem Approach to Fisheries Management (EAFM) structured framework process. Through the EAFM process, the Council identified summer flounder as a high-risk stock and agreed to conduct an MSE that would focus on discards in the recreational fishery. The overall objectives of this MSE are to (1) evaluate the biological and economic benefits of minimizing discards and converting discards into landings in the recreational summer flounder fishery, and (2) identify management procedures to effectively realize these benefits.

A technical work group and core stakeholder group worked collaboratively to complete this task and the MSE successfully met the objectives identified by the Council and Atlantic States Marine Fisheries Commission's Summer Flounder, Scup, and Black Seas Bass Management Board (Board). The performance of eight different management procedures under three different states of the world (scenarios) were assessed using a suite of biological, social, and economic performance metrics (e.g., stock biomass and fishing mortality as well as angler welfare and ability to keep a fish). Results from the MSE suggest there are management procedures that outperform status quo management at reducing discards and converting those discards into harvest while limiting risk to the summer flounder stock.

At the August meeting, the Council and Board will be presented with the model outcomes, trade-off analysis results, and broader MSE project takeaways. Staff will then offer potential next steps and opportunities to utilize the results of the MSE, the MSE simulation models, and general framework developed through the MSE process. Given the results of the MSE, the Council and Board should be prepared to offer feedback and direction regarding interest in additional analyses to be considered and the anticipated

[1] To find more information about the entire summer flounder MSE project, please see: https://www.mafmc.org/actions/summer-flounder-mse.

timeline for potential application (e.g., to help inform and identify potential recreational summer flounder regulations in 2023 or future).

Why an MSE?

MSE's are a tool that allows scientists, managers, and stakeholders to identify and test different management strategies and their ability to achieve desired, and often conflicting, management objectives before implementation. By utilizing an MSE to evaluate the objectives associated with this project, the Council and Board can consider new and more comprehensive information regarding the performance of traditional recreational management strategies within an ecosystem context and align the EAFM process and the typical recreational management process.

Two models were developed as part of this project, an operating/biological model and an implementation/recreational demand model, which are coupled within an MSE simulation framework that is designed to emulate summer flounder stock dynamics, both commercial and recreational fisheries, and the management system. Together these models and the MSE framework simulate the summer flounder population, its ecosystem, and different management procedures of interest while also considering key uncertainties and ecosystem drivers. This MSE won't specify a single outcome or strategy that will solve and address all management issues or concerns associated with recreational summer flounder discards. It will, however, provide the Council and Board an opportunity to evaluate and balance different management procedures and their associated biological, social, and economic trade-offs that best address their management objectives.

The Recreational Summer Flounder MSE Process

This MSE was structured into two different phases – a public scoping and stakeholder engagement phase, followed by a management considerations and model development phase – each lasting about one year. Stakeholder participation and input is a critical component of a successful MSE and since the MSE process was relatively new to the Mid-Atlantic, an extensive and inclusive stakeholder process was developed as part of phase 1 for this project (Figure 1). A variety of scoping and outreach initiatives were conducted covering a range of targeted audiences that offered different levels of engagement for input. The goal of this approach was to invest a significant amount of time early in the process on education and outreach and then continued, targeted feedback throughout the process to ensure better outcomes at the end of the project. The public response and interest, in terms of the total number of participants and the diversity of feedback, was very high for all steps in phase 1.

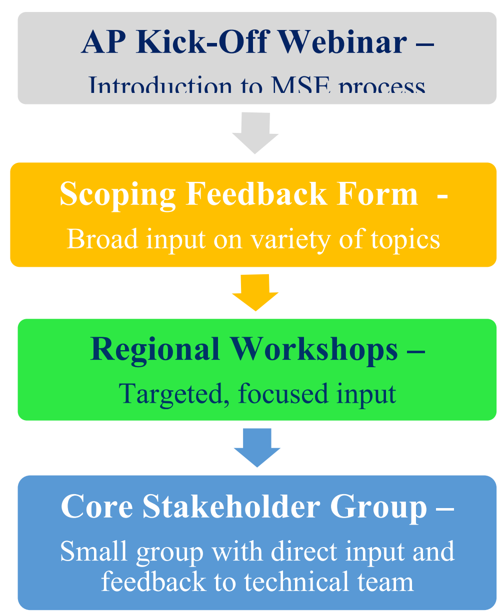


Figure 1. Process and approach to Phase 1 (public scoping and stakeholder engagement) of the

All of the input received in phase 1 was synthesized and used as a starting point and idea generator for the second phase of the project. Through a series of five webinar and in-person workshops, a small core group of diverse stakeholders collaborated with an MSE technical work group (Table 1) to identify the different management considerations and priorities and develop the decision tools and modeling framework necessary to address the management interests. Each workshop would build off the work conducted at the previous workshop as the core stakeholder group members would identify, refine, and prioritize management objectives, performance metrics, management procedures, management tradeoffs, key uncertainties and assumptions, data considerations, and model outputs. Following each workshop, the technical work group would then work to incorporate this feedback into the development of the biological and recreational demand models given the model structure, capabilities and limitations, the availability and uncertainty of the data elements, and the overall project focus and deadlines. This collaborative and iterative process between the two groups was a positive experience that worked very well to help ensure a common understanding, general agreement, and support for the process and project outcomes.

Management and Modeling Considerations

Here we describe the rationale by the core group and technical work group for the development and prioritization of the different management components and model alternatives that comprised the simulation experimental design that were evaluated within the MSE framework.

Management Objectives

While the Council identified the overall project objectives when originally agreeing to conduct an MSE, they are quite broad and don't explicitly provide direction or guidance for other important management considerations. For example, management may also be interested in a goal to ensure that any management alternatives developed to address recreational discards don't significantly disadvantage one state, region, or sector. To help identify additional management objectives to be considered by the MSE, potential management objective themes or categories were identified during public scoping and were then refined by the core group and approved by the Council and Board. These expanded management objectives, listed below, are intended to help us define and understand what a successful recreational fishery would look like that minimizes discards and discard mortality.

1. Improve the quality of the angler experience
2. Maximize the equity of anglers' experience
3. Maximize stock sustainability
4. Maximize the socio-economic sustainability of the fishery

Management procedures

Management procedures represent example recreational management regulations (i.e., size, season, and possession limits) to be evaluated relative to different performance metrics (details below) and identify which procedures best meet the four different management objectives. The management procedures considered here are not intended to specify an exact set of recreational regulations that would be implemented in 2023 or future date. Rather, these management procedures are examples intended to represent the range and scope of regulations the fishery is likely to operate in and are of interest to management and stakeholders. In addition, it was important to consider management procedures that were different enough from one another in order to evaluate the relative differences in performance. Should the Council and Board express interest in certain management procedures or particular procedure categories (e.g., current regions, new regions, coastwide, slot limits), more refined alternatives would be developed and analyzed for consideration and potential implementation in 2023 or beyond.

The management procedures consider different size limits, including slots, season length adjustments, coastwide options, and existing and different regional configurations. Other management tools or actions (e.g., reporting requirements, hook/terminal tackle) were discussed and proposed by stakeholders but not included in the analysis because there was either a lack of data to inform the impact of those regulations or not enough time for them to accurately and appropriately be modeled.

The same management procedure was implemented for an entire 26-year projection period (13 new/updated stock assessments and specification cycles). This was done for a few reasons. First, given the time scales at which summer flounder stock dynamics operate (e.g., growth, recruitment, sex ratios, generation time), it would be difficult to evaluate the benefits and/or effects on the summer flounder stock under continually changing regulations. In addition, the goal of the MSE is to provide strategic advice and information regarding the "long-term" performance of different management procedures on both the stock and fishery.

There were seven different alternative management procedures evaluated that were grouped into four different categories based on similar configurations. Details on each management procedure alternative are provided below and the management procedure number and shorthand description in parentheses is the same in all of the background materials included behind Tab 2.

Status Quo/Current Region Breakdown Alternatives

The 2019 regional regulations were specified as status quo and are the baseline regulations which other alternative management procedures are compared and evaluated against. The 2019 regulations were selected as the status quo/baseline regulations for a variety of reasons. First, regulations remained relatively unchanged from 2019 – 2021 and managers and stakeholders likely have a good understanding of management performance and angler satisfaction with these regulations. In addition, when model development was started in 2020 and into 2021, the 2019 recreational data was the most complete dataset available. The 2020 data includes imputed data because of the loss of sampling due to COVID-19 and the 2021 data was not available until the spring of 2022. Regulations for many states changed in 2022 and the technical work group did not want to use 2022 regulations given the lack of data on their performance and to minimize conflating the MSE project goals and the desire to predict 2022 harvest.

Management procedure alternatives #2 and #3 would retain the existing regional configuration but consider the implications of a reduction in the minimum size for all states or, for many states, extending the open season. Under management procedure #2, states/regions would retain their existing regulations but the minimum size within each state/region would be dropped by 1 inch in an effort to increase angler retention, reduce discards, and lower the proportion of female harvest. Management procedure #3 would retain the same size and possession limits for each state/region but would extend the season length, for most states, into April and October. This would allow for greater overlap in season with other fisheries and hopefully minimize discards of summer flounder when other fisheries are open and summer flounder are available.

Management Procedure #	Procedure Explanation
1 (status quo)	Status Quo - 2019 regulations
2 (minsize-1)	2019 regulations except for a 1 inch decrease in minimum size within each state, but not to go below a minimum of 16 inches
3 (season)	2019 regulations except season of April 1 - Oct 31 for all states

Modified Regional Breakdown Alternative

Management procedure #4 would consider a different regional breakdown and each state within a region would have the same management measures. The same regional breakdown as currently implemented for black sea bass was considered here. This alternative was developed to address feedback received from stakeholders interested in reducing regulatory complexity and increasing state angler equity while also allowing for some modifications and liberalizations from the current regulations.

Management Procedure #	Procedure Explanation
4 (region)	**New Regional Breakdown:** **MA - NY:** 5 fish possession, 18 inch minimum size, season of May 1 - Sept 31 **NJ:** 4 fish possession, 17 inch minimum size, season of May 1 - Sept 31 **DE - NC:** 4 fish possession, 16 inch minimum size, season of May 1 - Sept 31

Coastwide Alternatives

Historically, the recreational summer flounder fishery was managed under coastwide regulations with one set of regulations for all states. There was a lot of stakeholder interest in considering coastwide measures again given real or perceived inequities in regulations between the states and different sectors. Coastwide management measures would reduce management complexity, make enforcement easier, and may provide for more predictable stock responses to regulations.

Management procedure #5 was initially considered by the core group as a potential lower bound option that would greatly minimize the possession and size limit in order to increase the potential that trips, for any sector, would produce a fish to take home. The 14 inch minimum size limit would align with the commercial minimum size for consistency across sectors and potentially reduce the harvest of female summer flounder. After reviewing the initial model results for this alternative, the core group agreed to remove this alternative given the extremely low possession limit and the likelihood that this option may lead to increased discards as anglers are likely to continue fishing despite catching a 14 inch in the hopes of retaining larger fish.

Management procedure #6 represented a coastwide option that was generally in the middle of all the existing state regulations (pre-2022) with components in some states more liberal and some more restrictive. This option is also generally within the range of recent options considered for non-preferred coastwide measures.

Management Procedure #	Procedure Explanation
5	1 fish possession limit, 14 inch minimum size, May 15 - Sept 15 – removed
6 (c3@17)	3 fish possession limit, 17 inch minimum size, May 1 - Sept 30

Slot Limit Alternatives

Slot limits within the recreational summer flounder fishery have been considered and analyzed on several occasions and a maximum size limit for federal waters was recently added to the FMP so that slot limits could be implemented if there was an interest from management. Many stakeholders expressed a lot of interest in considering slot limits and noted the successful use of slot limits in other recreational fisheries. Two different types of slot limit options were developed for this MSE and these options were modeled and considered to be implemented at the coastwide level.

Management procedure #7 is based on management measures implemented in 2022 by New Jersey and modified based on feedback from the core group and comments made by the ASMFC Technical Committee when they reviewed New Jersey's proposal. This alternative would allow for one smaller fish between 16 and 19 inches and then two fish greater than 19 inches. Allowing for one small fish is intended to provide for increased opportunities for anglers to take home one fish across modes and states while retaining a two fish possession at a larger size could constrain harvest yet allow anglers the ability to take home a trophy fish.

Management procedure #8 would implement a true slot and would not allow for the harvest of summer flounder greater than 20 inches. This alternative is intended to provide for greater opportunities to retain a fish across states and modes, while also reducing the amount of larger female harvest.

Management Procedure #	Procedure Explanation
7 (c1@16-19)	**Modified slot:** 1 fish from 16 inches - 19 inches, 2 fish 19 inches and greater, May 1 - Sept 31
8 (slot)	**True slot limit**: 3 fish possession limit between 16 inches and 20 inches, May 1 - Sept 31

Performance Metrics
Quantifiable performance metrics are used to evaluate the success of a particular management procedure in achieving the desired management objectives. The metrics considered here were compiled from survey responses, refined and prioritized by the core group, turned into measurable units by the technical work group, and calculated using the outputs from the different MSE models. Different metrics were specified for

each of the four management objectives and calculated at either the trip, state/region, or coastwide level. In addition, several metrics are calculated relative to the modeled baseline or *status quo* (i.e., 2019 recreational) regulations to determine if an alternative management procedure represented an improvement or a less favorable outcome. In addition, these performance metrics were calculated across three different operating model configurations (more information below) to test how robust the performance of these different management procedures will be under different ecosystem conditions and management drivers.

The core group expressed a lot of interest in calculating performance metrics by mode given the differential impacts changing regulations, particularly minimum size limits, are likely to have by mode. However, the technical work group expressed concerns given the limited and variable recreational data by mode, particularly at the state, wave, or trip level needed for some of the metric calculations at the mode level. In addition, the technical work group noted the significant amount of information and outcomes already being generated from the MSE model outputs (17 metrics by state or region, across 7 management procedures, for 3 different operating models) could make interpretation and summarizing difficult. However, the technical work group did indicate the modeling framework is built in a way that it could be adapted to evaluate mode specific outcomes and this may be an area of future exploration. The core group and technical work group also discussed a number of other metrics that might evaluate changes in non-compliance rates, changes in discard mortality rates, and regulatory complexity. However, given time constraints, data availability, output complexity, and modeling assumptions, as well as the relative importance of those metrics to the stakeholders, these metrics were considered a lower priority and removed from consideration in the results presented here.

Listed below are the 17 final performance metrics, by management objective, that were prioritized by the core group and calculated by the technical work group:

<u>Management Objective 1: Improve the quality of the angler experience</u>

1. Percent of trips that harvest one fish
2. Average number of harvested fish per trip
3. Consumer surplus* per trip
4. Percent of trips harvesting a trophy fish (>28 inches)

* Consumer surplus – a measure of the amount of money anglers would be willing to pay to see a management procedure implemented. An economic calculation of angler satisfaction.

<u>Management Objective 2: Maximize the equity of anglers' experience</u>

5. Percent change in chance of a trip with a harvested fish
6. Percent difference across states in chance of a trip with a harvested fish
7. Change in retention rate (harvested:discarded)
8. Change in retention rate across states

<u>Management Objective 3: Maximize stock sustainability</u>

9. Percent chance the stock is overfished
10. Percent chance of overfishing

11. Total spawning stock biomass (mature males and females)
12. Average number of discards per trip
13. Change in recreational removals (harvest and dead discards)
14. Percent of harvest that are female

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

15. Total number (millions) of summer flounder trips
16. Percent change in consumer surplus (angler satisfaction) by state (across all trips)
17. Percent change in fishery investment (e.g., sales, income, employment)

These metrics, and the four management objectives, were also used in a trade-off based decision analysis designed to evaluate how well each management procedure achieves the stated management goals for the project. To determine the overall performance of a particular management procedure, an overall score for each management procedure was calculated by having core group members rank and weight the objectives and associated metrics to understand their overall relative importance. Objectives and metrics that were weighted more heavily (i.e., more important) contributed more to the overall score than those that were considered less important. The final score for each management procedure can then be used to evaluate the relative performance and associated trade-offs a management procedure may have in meeting the overall management objectives. More information regarding the trade-off analysis can be found in the Summer Flounder MSE Final Report behind Tab 2.

Alternative Operating Model Scenarios

Three different operating model scenarios were developed for this MSE, 1) a baseline model, 2) an MRIP bias model and, 3) a stock distribution change model. These different model configurations incorporate some of the critical uncertainties (e.g., data, biology, climate, etc.) identified through stakeholder scoping and by the technical work group. They are intended to evaluate how different management procedures perform under these different assumptions about the "true" summer flounder population. All seven management procedures were run under each operating model scenario and the same 17 performance metrics were produced for each management procedure to allow for comparisons across the different operating model scenarios.

MRIP bias alternative

Stakeholders and the core group consistently raised concerns about Marine Recreational Information Program (MRIP) data and their belief that MRIP overestimates the total number of summer flounder trips, catch, and harvest. The MRIP bias model scenario was developed to understand the potential management and fishery implications under different recreational catch and effort assumptions. This scenario was not an evaluation of the MRIP program or the accuracy and reliability of the data. For model runs in this scenario, instead of using the catch and effort point estimate, the lower bound of the 95% confidence interval of the MRIP estimates were used. These lower catch and effort estimates were used to calibrate the recreational demand model and to adjust the stock dynamics in the biological model to account for the lower recreational catch history.

Stock distribution change alternative

As mentioned earlier, this MSE is part of the Council's implementation of its EAFM guidance document. Prior to initiating the MSE, the Council developed a conceptual model that considered risk factors and ecosystem elements affecting summer flounder and its fisheries[2]. The conceptual model identified stock distribution changes as the most linked risk factor with potential implications across the summer flounder ecosystem (e.g., stock productivity, science, and management). Historical stock distribution information by region was used to inform future potential changes in the spatial distribution of the stock over time and the implications for future availability of summer flounder to recreational anglers along the coast (Figure 2). This scenario provides an opportunity to evaluate if changes in summer flounder availability could undermine the effectiveness of implemented management measures.

Additional details and information on the model structure, data elements, and assumptions of the operating model scenario configurations can be found in the model reports by Dr. Fay and Dr. Carr-Harris behind Tab 2.

Overview of MSE Outcomes

Listed below are some of the key findings and outcomes from the MSE. Additional results, including details explaining the outcomes, can be found in the MSE Results Summary document behind Tab 2.

- Under the baseline operating model scenario, all management procedure alternatives, except for one, outperformed the status quo alternative (MP#1) across a majority of performance metrics including those that reduce recreational discards and provide for increased harvest opportunities (Figure 3 and Table 2).
- No management procedure resulted in the stock becoming overfished. Most had low risk of overfishing, while two had increased risk of overfishing (Figure 3).
- Under different states of the world (scenarios), relative performance of the different management procedures are the same as those observed under the baseline, but outcomes are slightly degraded with the MRIP bias scenario and more degraded with the distribution shift scenario (Figure 4).
- All management procedures, except for one, reduce the proportion of females in the recreational harvest when compared to the status quo. However, reducing the harvest of females does not appear to result in increases to the overall population spawning stock biomass (Figure 5a-b)
- All management procedures, except for one, resulted in higher levels of angler welfare relative to the status quo. Angler welfare is measured by changes in consumer surplus, or the amount of money anglers would be willing to pay for a fishing trip under a given management procedure (Figure 6).
- According to trade-off analysis, relative to the performance of the status quo, the overall satisfaction provided by the fishery is expected to increase by 4 to 106% by implementing MP #2-8, respectively (Figures 7a-b).
    - This result is highly robust to both the range of weightings provided by stakeholders and the set of scenarios evaluated.

[2] For more information about the summer flounder EAFM conceptual model, please visit: https://www.mafmc.org/eafm.

- The relative performance of a management procedure, particularly when comparing to the status quo, is highly variable at the state or regional level.
- Management procedures assessed season length, bag limit, and size limit; size and bag limit were most influential on performance.
- Due to priorities, data availability, and time constraints, not all areas of interest raised by stakeholders were able to be considered in the project.
- Overall, the core stakeholder group found the process to be very informative, appreciated their ability to participate and contribute, and believe the results and outcomes will be useful for management. They also identified and suggested a number of areas of improvement for any future MSE project.

Results from the MSE suggest there are opportunities to make management adjustments that can reduce the overall number of recreational discards, increase recreational opportunities, minimize risk to the stock, and provide for greater equity and access across states and likely fishing modes. The technical work group does note that there are a range of uncertainties and variabilities in the modeling framework that could have an affect the model outputs. In addition, some management procedures considered here have never been implemented, or there is limited experience with their implementation, and our understanding of how the stock, reference points, or angler behavior may change in response to new management measures is uncertain. However, the incorporation of the recreational demand model to capture angler behavior in response to changing regulations and stock conditions should help account for these changes and reduce uncertainty.

Future Direction and Meeting Goals

Potential Application of MSE Process and Results

As mentioned earlier, this MSE is designed to provide strategic advice to the Council and Board regarding a range of management procedures and their overall performance relative to priority management objectives intended to address discards in the recreational summer flounder fishery. Through a very collaborative process, drive both by stakeholder input and scientific rigor, this MSE has developed a novel, forward-thinking, and robust modeling framework unique to the Mid-Atlantic region that integrates a full summer flounder population dynamics model with an angler economic behavior model to understand how recreational behavior responds to changing regulations and stock availability. Results from the MSE demonstrate that there are different management procedures and management procedure categories, particularly when compared to status quo regulations, that achieve the overall management goals of reducing discards and converting discards to increased harvest opportunities, while maintaining stock biomass above the threshold and limiting risk to overfishing. In addition, the results suggest these same management procedures also increase angler welfare, result in more fishing trips and higher expenditures on fishing, reduce female harvest and keep total catch (commercial and recreational) relatively constant. However, as the trade-off analysis indicates, no management procedure achieves all of the management goals and procedures are likely to have differential effects across regions, states, and modes. The MSE is a different approach that has provided the Council and Board with a comprehensive understanding of how traditional management tools (e.g., size, season, and possession limits), within an ecosystem context, may perform over the long term and what the potential implications and associated trade-offs might be for the stock and fishery.

In addition, the MSE successfully developed new tools that can also provide tactical advice to management. While the MSE developed a simulation framework designed at evaluating the long-term performance of different management procedures relative to B_{MSY} and F_{MSY}, the quantitative models developed within the framework can provide short-term (annual) recreational catch and harvest estimates for a given stock size and length structure. These estimates could then be compared to recreational catch (ACL) or harvest limits (RHL) and we can evaluate the overall effectiveness and response to different management measures. While the simulation framework and specific models are currently built for summer flounder, the overall application and approach could be applied to other recreational species.

While the MSE was not able to address all stakeholder and management interests raised throughout the process, the foundation and modeling framework is set up to investigate these other issues should there be interest from management, and given there are appropriate data sources and resources that are made available to conduct the necessary analyses. Topics such as alternative recreational management strategies (e.g., education, terminal tackle, changes in discard mortality, compliance, and enforcement), allocations, the interaction between commercial and recreational harvest strategies, mode specific considerations, habitat management, and additional uncertainties (e.g., changes in stock productivity, environmental drivers) were all identified as other areas of interest. Some core group members also expressed interest in conducting a similar MSE for other recreational species like scup and black sea bass. Lastly, there may also be a need/interest to update the analysis with the results of the 2022 discrete choice experiment survey. The 2010 survey served as the foundation to developing the angler preferences used in the recreational demand model. It is anticipated the results and information from the 2022 survey will be available this fall and evaluating and comparing how potential changes in angler preferences for popular recreational species may affect the results of this MSE is likely worth considering.

Council and Board Direction in August

Given the range in the potential utilization and applications of the MSE results, the Council and Board will need to offer the technical work group feedback and direction on next steps – focusing on any additional analysis and timing for implementation. If the Council and Board are interested in potentially implementing management procedures that reduce discards in the recreational summer flounder fishery, input on refining individual management procedures and/or categories with guidance on specific alternatives should be provided. In addition, direction on the priority management objectives and metrics will be needed to ensure any analysis and evaluation of the management procedures is focused on the most important considerations for management. Any additional analysis would retain the existing modeling framework, data elements, and assumptions. The only modifications, if desired, could include revising the performance metrics to be estimated and evaluated or their weights, the management procedures to be tested and, if available, possibly incorporating the 2022 discrete choice experiment results.

The Council and Board will also need to provide feedback regarding the potential timing for future implementation of the MSE results – 2023 specifications or sometime later. If there is interest in utilizing the results of the MSE for 2023 recreational management considerations and specifications, the technical work group will take the feedback from the Council and Board and work with the Monitoring Committee as part of their recreational process. Coordinating with the Monitoring Committee will also allow for considerations as to how to integrate the results and management procedures from the MSE and the application and development of recreational management measures as part of the recently approved recreational harvest control rule.

THIS SPACE INTENTIONALLY LEFT BLANK

Table 1. Members of the Mid-Atlantic Council's EAFM management strategy evaluation technical work group. * Denotes members that were independent contract facilitators to help support core group work and decision analysis.

Name	Affiliation	Name	Affiliation
Andrew (Lou) Carr-Harris	NEFSC	Jorge Holzer	SSC/Univ. of Maryland
Dustin Colson-Leaning	ASMFC	Emily Keiley	GARFO
Jonathan Cummings*	UMass Dartmouth/USFWS	Jeff Kipp	ASMFC
Kiley Dancy	MAFMC staff	Doug Lipton	NOAA Fisheries
Geret DePiper	SSC/NEFSC	Brandon Muffley	MAFMC staff
Jon Deroba	NEFSC	Annabelle Stanley*	Cornell Univ.
Gavin Fay	SSC/UMass Dartmouth	Mark Terceiro	NEFSC
Sarah Gaichas	SSC/NEFSC	Mike Wilberg	SSC/Univ. of Maryland
Kaili Gregory*	Cornell Univ.	Greg Wojcik	CT DEEP/ASMFC TC chair

Table 2. Summary of model outputs for select performance metrics across the seven different management procedures under the baselines operating model configuration. MP#1 – 2019 regs; MP#2 – 2019 regs with 1 inch decrease in minimum size; MP#3 – 2019 regs with a standard season of April 1- Oct 31; MP#4 – new regional configuration; MP#6 – coastwide measures; MP#7 – modified slot; MP#8 – true slot.

Performance Metric	MP#1	MP#2	MP#3	MP#4	MP#6	MP#7	MP#8
Percent of trips that harvest one fish	0.193	0.284	0.197	0.279	0.301	0.350	0.357
Average number of harvested fish per trip	0.274	0.471	0.279	0.478	0.504	0.458	0.642
Harvest:Discards	0.102	0.207	0.104	0.202	0.240	0.189	0.390
Average number of discards per trip	2.91	2.45	2.89	2.55	2.29	2.58	1.84
Consumer surplus (angler satisfaction) per trip	3.703	12.896	4.001	13.100	13.502	14.352	19.873
Total recreational expenses (millions of $)	470.9	492.3	474.5	492.6	495.7	499.3	513.0
Total Spawning Stock Biomass (mature male & female) in metric tons	67,514	60,504	67,291	59,795	59,372	61,088	56,554
Percent of female harvest	0.676	0.607	0.677	0.608	0.591	0.602	0.49
Total catch (recreational+commercial) in metric tons	15,935	16,468	15,986	16,526	16,460	16,031	15,834
Total recreational removals (harvest+dead discards) in metric tons	6,331	8,157	6,498	8,337	8,263	7,685	8,085
Total number of recreational trips (millions)	11.22	11.72	11.31	11.74	11.82	11.91	12.22
Percent of trips harvesting a trophy fish (>28 inches)	0.017	0.008	0.018	0.008	0.007	0.008	0.000

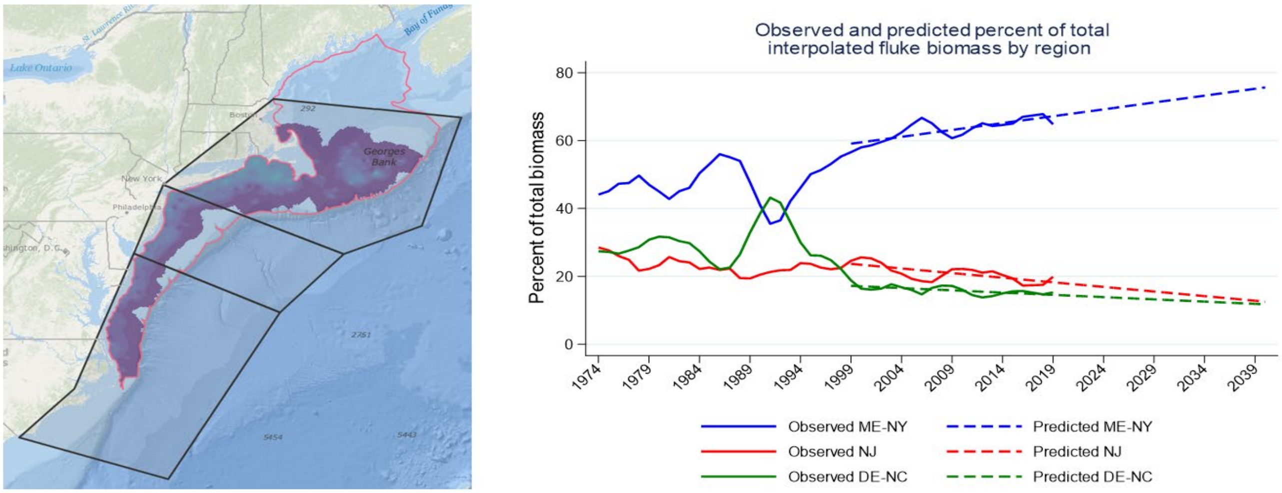


Figure 2. Proportion of observed and projected summer flounder stock biomass by region (ME-NY, NJ, DE-NC) based on the NEFSC fall bottom trawl survey used for an alternative MSE operating model to reflect potential changes in future stock distribution and availability to recreational anglers. Source: NOAA Fisheries. 2022. DisMAP data records. Retrieved from apps-st.fisheries.noaa.gov/dismap/DisMAP.html. Accessed 7/14/2022.

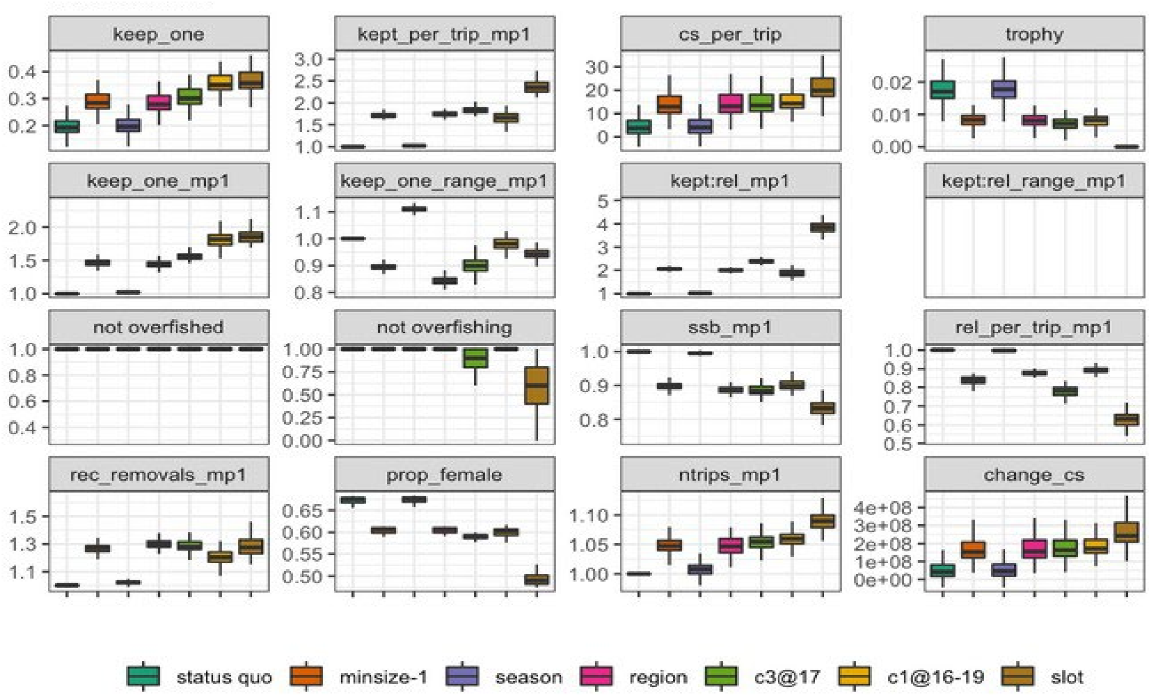


Figure 3. Coastwide results for a suite of biological, social, and economic performance metrics for seven different management procedures under the baseline operating model configuration.

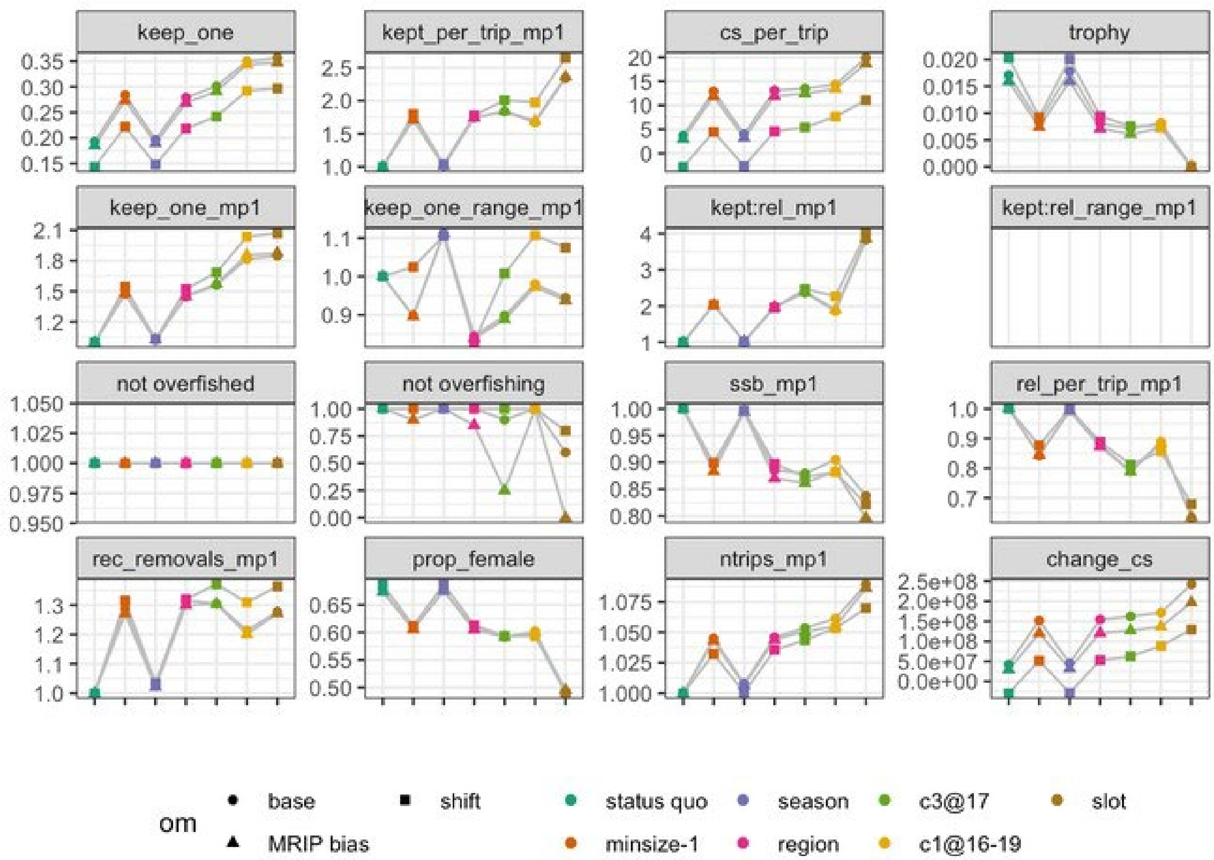


Figure 4. Comparison of the relative performance of seven different management procedures across a suite of biological, social, and economic performance metrics and three different operating model scenarios (baseline, MRIP bias, and stock distribution shift).

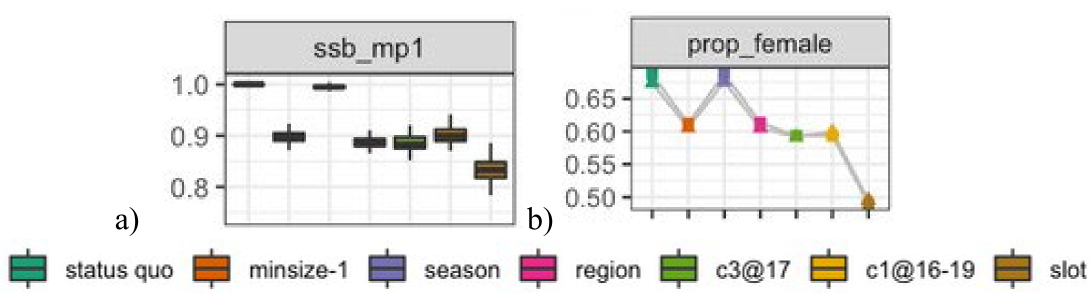


Figure 5 a) The relative difference in total spawning stock biomass (SSB) for the different management procedures compared to the status quo. SSB includes both mature male and female summer flounder. **b)** The average percentage of the recreational summer flounder harvest is female across the seven different management procedures.

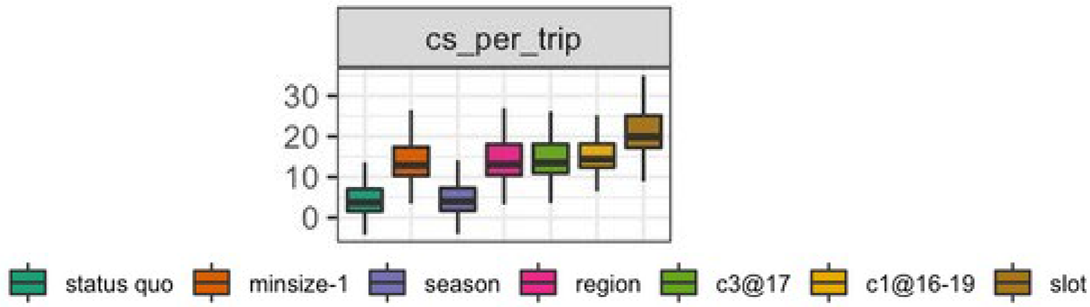


Figure 6. The differences in angler welfare measured by changes in consumer surplus, or the amount of money anglers would be willing to pay for a fishing trip under a given management procedure.

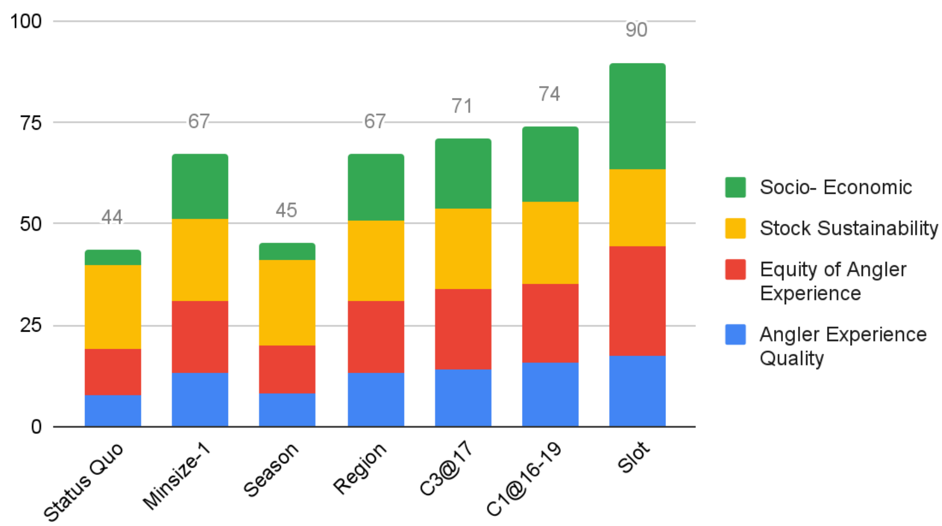


Figure 7a. Total Performance of each management procedure. Management procedures are listed across the bottom axis and the total performance score is displayed by the height of the stacked bar on the vertical axis. Scores reflect the expected degree of satisfaction provided by a management procedure, such that a doubling of the score indicates the average stakeholder expects to be twice as satisfied by the change in management procedure. The four colored regions of each bar show the degree of contribution each management objective provides to the total score.

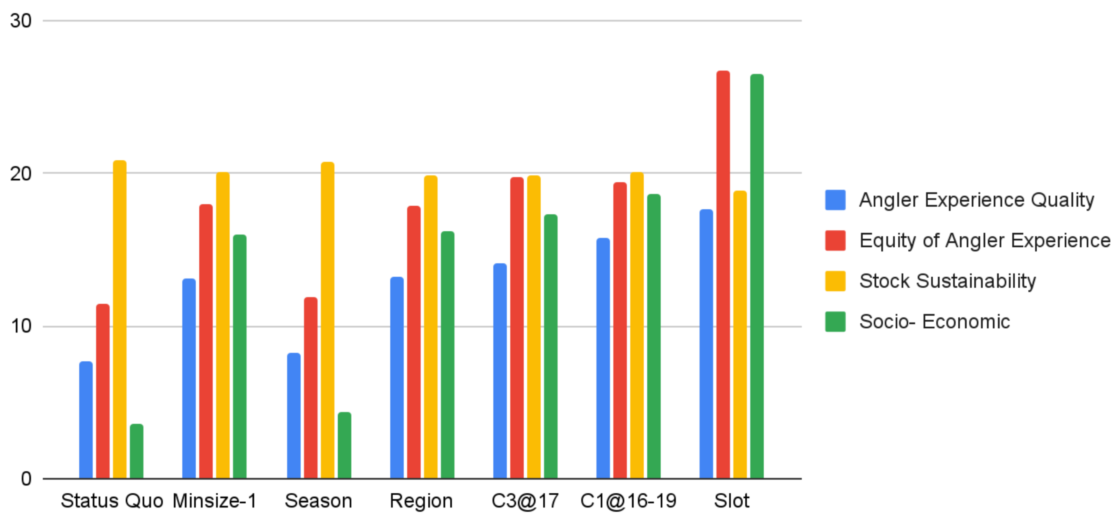


Figure 7b. Performance of each management procedure by management objective. Management procedures (MP) are listed across the bottom axis and the total performance score is displayed by the height of the stacked bar on the vertical axis. Looking only at a single color bar shows the relative performance of a MP for that objective (e.g., the blue bars display the relative performance of the MP for the Angler Experience Quality objective).

EAFM Recreational Summer Flounder Management Strategy Evaluation

Summary of MSE Results and Findings

Executive Summary

The Mid-Atlantic Fishery Management Council's (Council) Ecosystem Approach to Fisheries Management (EAFM) guidance document established a structured framework and process to incorporate ecosystem considerations into the evaluation of policy choices and trade-offs as they affect Council-managed species and the broader ecosystem. As part of this process, the Council requested a Management Strategy Evaluation (MSE) to "Evaluate the biological and economic benefits of minimizing discards and converting discards into landings in the recreational sector. Identify management strategies to realize these benefits."

Through a collaborative, stakeholder, and science driven process, the MSE successfully met its objectives and developed a modeling framework unique to the Mid-Atlantic region integrating a full summer flounder population dynamics model with an angler economic behavior model to understand how recreational behavior responds to changing regulations and stock availability. The performance of eight management procedures (MPs) were tested under three different states of the world (scenarios). A core group of stakeholders outlined objectives, developed performance metrics, and identified key uncertainties to test procedures against. The benefits of each management procedure were assessed using a suite of biological, social, and economic performance metrics (e.g. stock biomass and fishing mortality as well as angler welfare and ability to keep a fish) across four different management objectives.

Results from the MSE suggest there are management procedures that outperform status quo management at reducing discards and converting those discards into harvest while limiting risk to the summer flounder stock. In addition, the simulation framework and individual models developed as part of the MSE can help provide both strategic and tactical advice for a variety of potential management priorities. These models and results can be used to directly inform recreational management, through recreational harvest control rules and annual specifications, to achieve a range of Council objectives.

This document describes how the work undertaken achieved this task and summarizes the key outcomes and findings. The accompanying briefing memo outlines the details of the process itself.

Summary of key findings and outcomes

- Under the baseline operating model state of the world (scenario, all management procedures, except for one, outperformed the status quo alternative across a majority of performance metrics, including those that reduce recreational discards and provide for increased harvest opportunities.

- No management procedure resulted in the stock becoming overfished. Most had low risk of overfishing, while two had an increased risk of overfishing.
- Under different states of the world (scenarios), the performance of the management procedures relative to one another is the same as we observed under the baseline.
    - Relative to the outcomes from the baseline scenario a given management procedure's performance will be slightly degraded with the MRIP bias scenario and more degraded with the distribution shift scenario.
- All management procedures, except for one, reduce the proportion of females in the recreational harvest when compared to the status quo. However, reducing the harvest of females does not appear to result in increases to the overall population spawning stock biomass.
- All management procedures, except for one, resulted in higher levels of angler welfare relative to the status quo. Angler welfare is measured by changes in consumer surplus, or the amount of money anglers would be willing to pay for a fishing trip under a given management procedure.
- According to trade-off analysis, relative to the performance of the status quo, the overall satisfaction provided by the fishery is expected to increase by 4 to 106% by implementing alternative management procedures.
    - This result is highly robust to both the range of weightings provided by stakeholders and the set of scenarios evaluated.
- The relative performance of a management procedure, particularly when comparing to the status quo, is highly variable at the state or regional level.
- Management procedures assessed season length, bag limit, and size limit; of these, size and bag limit were most influential on performance.
- Due to stakeholder and technical team priorities, data availability, and time constraints, not all areas of interest raised by stakeholders were able to be considered within the timeline for this project.
- Overall, the core stakeholder group found the process to be very informative and positive, appreciated their ability to participate and contribute, and believe the results and outcomes will be useful for management. They also identified and suggested a number areas of improvement for any future MSE project.

Overview of MSE Results

Here we present additional details regarding the key project results and outcomes and offer insight as to why these results may have occurred. Given the significant amount of information produced and the nuance in interpreting outcomes for the different management procedures and performance metrics across regions and states, not all of the results are provided here. The results presented below focus on the priority project areas requested by the Council and ASMFC Summer Flounder, Scup, and Black Sea Bass Board. For those interested, all MSE results and outputs can be found at: https://bit.ly/fluke-mse-metrics. Here you can review results by performance metric, operating model scenario, and by state.

Harvest and Discard Outcomes

As requested by the Council, the primary objective of the MSE was to evaluate management procedures that reduce the number of recreational discards and develop strategies that convert discards into increased harvest and recreational opportunities. This section provides an overview of the outcomes that provide insight on addressing this primary objective.

For reference, Table 1 provides a summary of the seven different management procedures included in the results below. An additional management procedure was evaluated (coastwide, 1 fish possession limit, 14 inch minimum size, and a season of May 15 - September 15) but removed by the core stakeholder group and those results are not included.

Table 1. Summary of the seven different management procedures tested as part of the EAFM recreational summer flounder MSE.

Management Procedure #	Procedure Explanation
1 (status quo)	Status Quo - 2019 regulations
2 (minsize-1)	2019 regulations but a 1 inch decrease in minimum size within each state to a minimum of 16 inches
3 (season)	2019 regulations but season of April 1 - Oct 31 for all states
4 (region)	**Modified regions:** MA-NY - 5 fish, 18 inch min, May 1 - Sept 31 NJ - 3 fish, 17 inch minimum, May 1 - Sept 31 DE-NC - 3 fish, 16 inch minimum, May 1 - Sept 31
6 (c3@17)	3 fish possession limit, 17 inch minimum size, May 1 - Sept 30
7 (c1@16-19)	**Modified slot:** 1 fish from 16 inches - 19 inches, 2 fish 19 inches and greater, May 1 - Sept 31
8 (slot)	**True slot limit:** 3 fish possession limit between 16 inches and 20 inches, May 1 - Sept 31

Overall/coastwide results

Results demonstrate there are management tools and different management procedures that can reduce the number of discards, increase the keeper:discard ratio, and promote recreational opportunities that would convert discards into landings (Figure 1, Table 2). Nearly all of the management procedures tested performed better across the discard related performance metrics when compared to the status quo (MP#1).

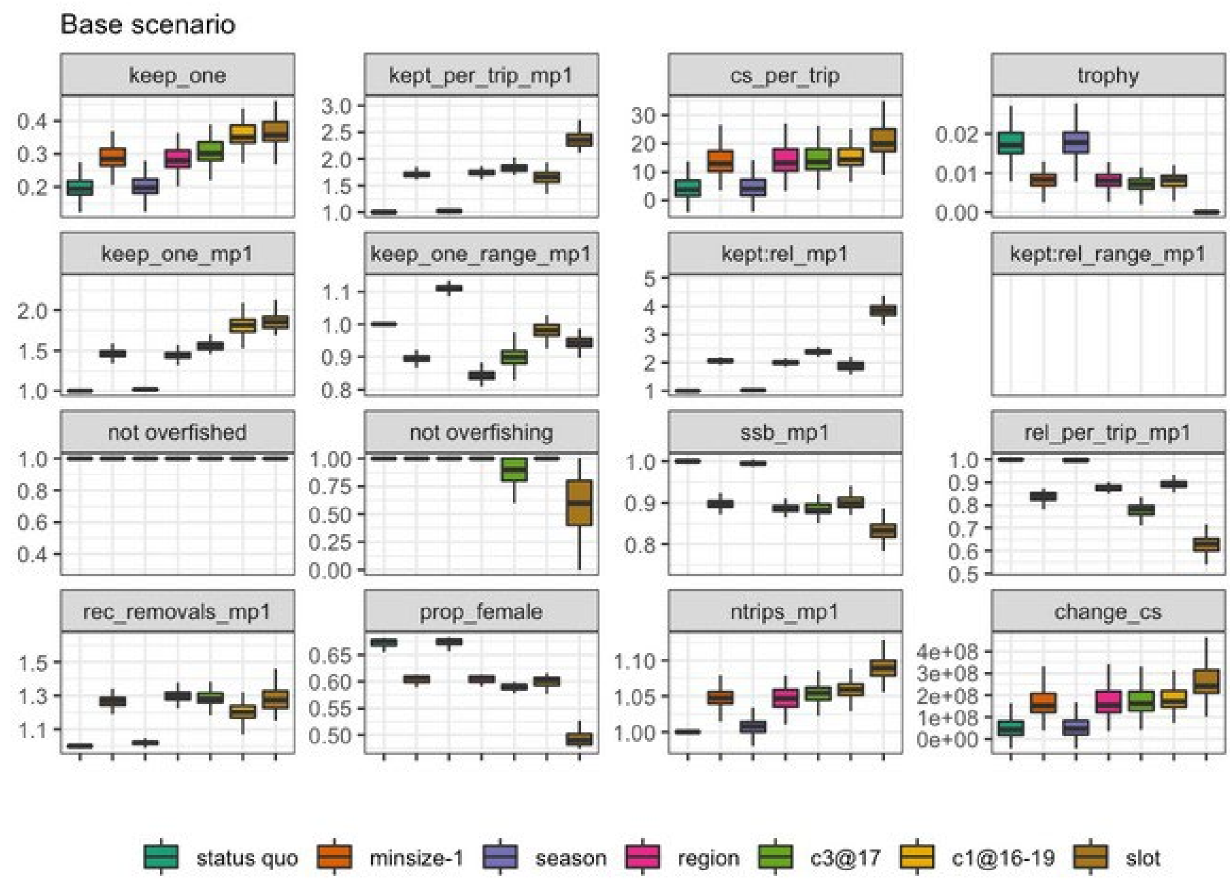


Figure 1. Coastwide results for a suite of biological, social, and economic performance metrics for seven different management procedures under the baseline operating model configuration.

- Kept:Discard ratio
    - MP#1 and #3 result, on average, in one keeper for every 10 fish caught.
    - MP #2, 4, and 7 double the keeper ratio with 2 fish kept for every 10 caught.
    - MP#6 was slightly better with 2.5 fish kept for every 10 caught.
    - MP#8 was nearly 4 times higher than status quo MP with 3.9 fish kept for every 10 caught.
- Percent of trips that keep a fish
    - MP#1 and #3 result, on average, in 19 percent of all trips keep a fish.

- MP#2, 4, and 6 result in an approximately 29 percent of all trips keep a fish.
- MP #7 and #8 result in substantially higher success rate with 46 percent and 64 percent of all trips keeping a fish, respectively.

- Average # of fish kept per trip
  - MP #1 and #3 result in an average of 0.27 fish kept per trip.
  - MP #2,4,6 and 7 are nearly double with close to a half fish (0.5) kept per trip.
  - MP #8 has the highest average number of fish kept per trip and more than double MP #1 and #3 with 0.64.
- Average # of discards per trip
  - MP #1 and #3 had the highest discard per trip with just under three (2.9) summer flounder released per trip.
  - MP #2, #4, and #7 had similar discards per trip with an average of 2.5 summer flounder discarded each trip. This is a 16 percent reduction in the number of discards.
  - MP #6 had the second fewest discards per trip with an average of 2.29 summer flounder discarded per trip or a 24 percent reduction compared to the status quo.
  - MP #8 had the lowest discards per trip with 1.84 summer flounder discarded on average. This is slightly more than one fewer fish released than under the status quo alternative, or a 38 percent reduction in discards.

Table 2. Summary of model outputs for select performance metrics across the seven different management procedures under the baselines operating model configuration.

Performance Metric	MP#1	MP#2	MP#3	MP#4	MP#6	MP#7	MP#8
Percent of trips that harvest one fish	0.193	0.284	0.197	0.279	0.301	0.350	0.357
Average number of harvested fish per trip	0.274	0.471	0.279	0.478	0.504	0.458	0.642
Harvest:Discards	0.102	0.207	0.104	0.202	0.240	0.189	0.390
Average number of discards per trip	2.91	2.45	2.89	2.55	2.29	2.58	1.84
Consumer surplus (angler satisfaction) per trip	3.703	12.896	4.001	13.100	13.502	14.352	19.873
Total recreational expenses (millions of $)	470.9	492.3	474.5	492.6	495.7	499.3	513.0
Total Spawning Stock Biomass (mature male & female) in metric tons	67,514	60,504	67,291	59,795	59,372	61,088	56,554
Percent of female harvest	0.676	0.607	0.677	0.608	0.591	0.602	0.49
Total catch (recreational+commercial) in metric tons	15,935	16,468	15,986	16,526	16,460	16,031	15,834
Total recreational removals (harvest+dead discards) in metric tons	6,331	8,157	6,498	8,337	8,263	7,685	8,085
Total number of recreational trips (millions)	11.22	11.72	11.31	11.74	11.82	11.91	12.22
Percent of trips harvesting a trophy fish (>28 inches)	0.017	0.008	0.018	0.008	0.007	0.008	0.000

While not specific performance metrics, the core group was interested in how the different management procedures might result in changes to the average length of harvested fish and how those would compare to the status quo (Figure 2). This information is an additional piece of information to demonstrate how the different management procedures reduce discards and allow for increased harvest opportunities. The results show that most management procedures resulted in a noticeable decrease in the average size of harvested fish compared to the status quo.

- The average length of a harvested summer flounder under MP #1 and #3 was 19.8 inches.
- MP #2, #4, and #6 resulted in a decline in the average size by nearly 1.5 inches down to 18.4 inches.
- MP #7 reduced the average size of a harvested fish by nearly 2 inches down to 18.0 inches.
- MP #8 reduced the minimum size even further with the average size of a harvested summer flounder of 17.0 inches, nearly 3 inches smaller than the status quo measures.

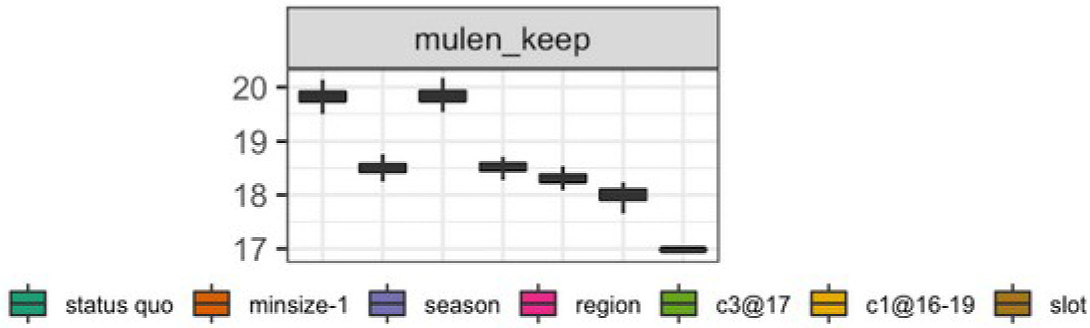


Figure 2. The average size (inches) of summer flounder harvested for the entire coast under the seven different management procedures.

The results also suggest that even with increasing total recreational removals, the total fishery removals, both commercial and recreational harvest and discards, are not very different across all management procedures (Figure 1, Table 2).

- For example, MP #2, #4, #6, #7, and #8 result in a 29% increase in total recreational removals, but there is only 2% difference across all management scenarios when looking at total catch (commercial and recreational).

State specific results

Overall, the relative performance of a particular management procedure, particularly when comparing to status quo (MP#1) is highly dependent upon the state/region (Figure 3). For states New Jersey and north, MP#1 (and #3) performed much worse (significantly worse in some cases) across most metrics compared to all other management procedures; while MP#1 (and #3) performed better, or as well as, the other management procedures for the states Delaware and south.

- This result is somewhat to be expected given that the states of DE through NC currently have more liberal measures (those associated with MP#1) compared to the states of NJ through MA and some management procedure alternatives would be more restrictive for certain measures compared to MP#1. Although MP#1 performed better for this region, there are a number of other management procedure alternatives that performed equally well, presenting possible opportunities to adjust management measures to meet other management objectives for this region.

There was also a difference in the relative consistency or variability in performance across management procedures across states (Figure 3).

- For example, when evaluating the percentage of trips that keep one summer flounder, in CT, NY, and NJ there was a similar pattern with MP #1 and #3 performing the worst with about 20% of all trips keeping one summer flounder. There was a general increasing pattern in the percentage of trips keeping one summer flounder across the remaining management procedures with MP #2 and #4 twice as high as MP #1 and 2.5 times higher for MP #7 and #8. MA had the same range (i.e., 2.5 times) in the differences between the worst performing and best performing management procedure for this metric, but MP #2 performed the best and MP #4 and #6 performed the worst. In contrast, in VA there was only a 6 percent difference in the percent of trips with a keeper summer flounder between the worst performing MP (#6) and the best performing MP (#2 and #4).

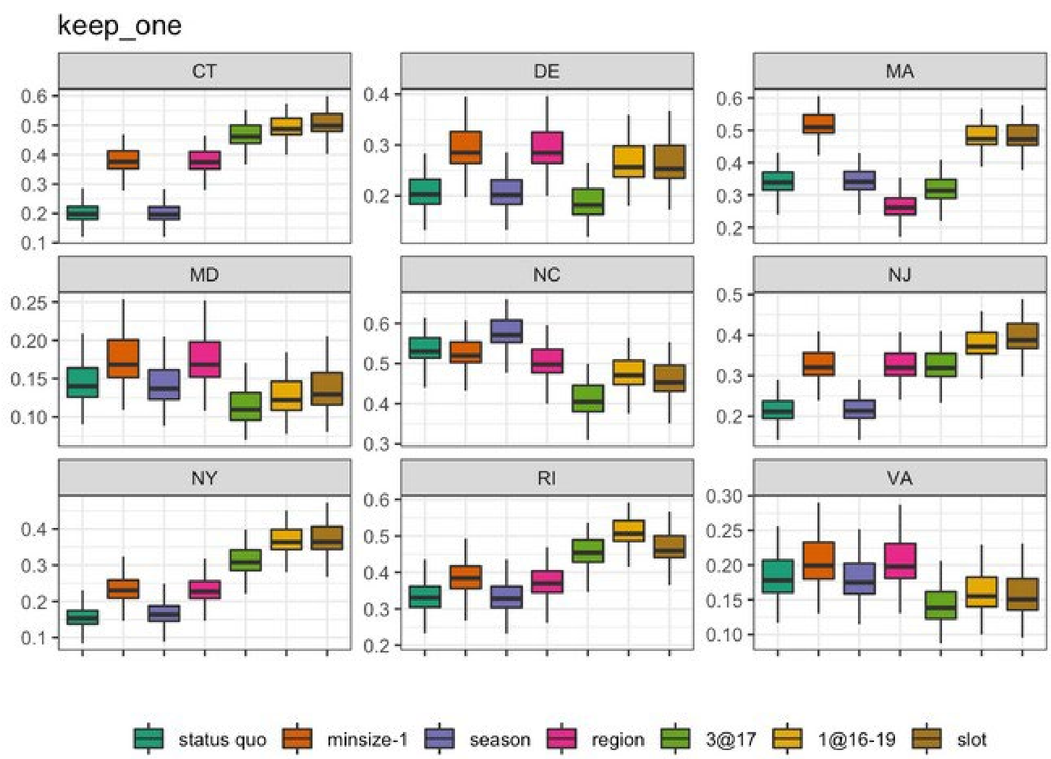


Figure 3. Comparison of the average number of trips where one summer flounder was kept across the seven different management procedures for each state under the baseline operating model.

We can also take a broader look at the performance of each management procedure at the state level by determining the number of states where a management procedure performed better/worse than the status quo (MP#1) for a particular metric. This type of evaluation allows us to determine if a particular management procedure benefited/disadvantaged a majority of states. It is worth noting that this evaluation does not consider the magnitude of improvement/decline.

- The results indicate that MP #2 performed better for 8 of the 9 states across several metrics (Figure 4). This was followed by MP #4, #7, and #8 that performed better for a majority of states. MP #3 and #6 did not perform better for a majority of states for the metrics considered.

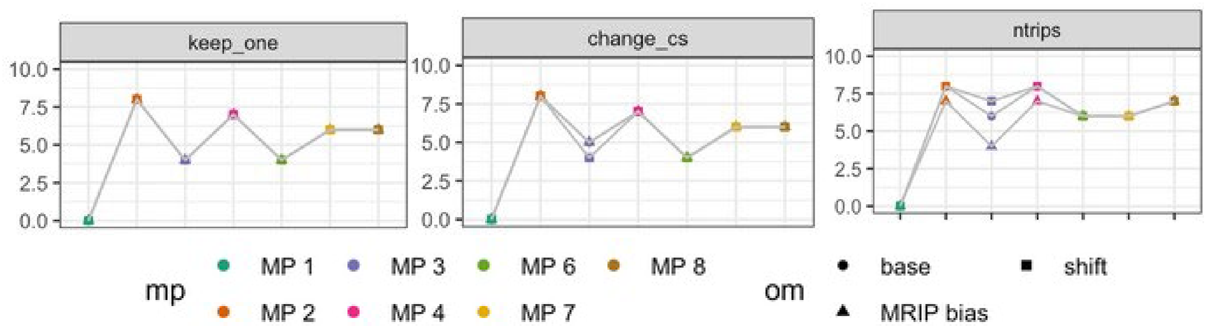


Figure 4. The number of states that perform better under different management procedures compared to status quo measures for three different metrics (keep_one is the percent of trips that keep at least one summer flounder; change_cs is the change in consumer surplus across all trips within state; ntrips is the total number of recreational summer flounder trips). This evaluation was also conducted across three different operating model configurations (baseline, MRIP bias, and stock distribution shift).

Biological Outcomes

Evaluating the biological impacts of implementing different management procedures was also a management objective of the MSE. Here we included metrics that focused on the Council's legal mandate under the Magnuson-Stevens Act (MSA) to prevent overfishing and a stock from becoming overfished. Other priority areas of interest from stakeholders included the proportion of female harvest and opportunities to catch and retain trophy summer flounder.

The results indicate that the risk of the stock becoming overfished during the last 10 years of the projection period (26 years) is very low regardless of the management procedure implemented (Figure 5). Results also indicate there is low risk of overfishing occurring across the different management procedures (Figure 5). It's worth noting that the fishing mortality estimated to determine the stock status metrics includes the removals of both the recreational and commercial sectors.

- MP #8 did result in the highest risk of overfishing, but below the 50% threshold, followed by a slight increase in risk associated with MP #6.

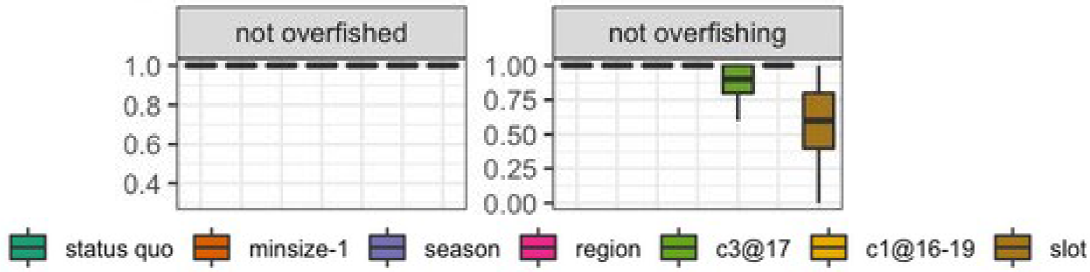


Figure 5. The percent chance that a particular management procedure results in the summer flounder stock not being overfished or not overfishing over the final 10 years of a 26 year projection period.

While there is little risk to the overall stock, there are differences across the different management procedures when evaluating the average total spawning stock biomass (SSB) over the last 10 years of the 26 year projection period (Figure 6, Table 2). Consistent with the stock assessment, total SSB is calculated as mature male and female summer flounder. MP #1 and #3 resulted in the highest average total SSB of approximately 67,400 metric tons (Table 1). These two management procedures resulted in total SSB that was about 10% higher than MP #2, #4, #6, and #7 and was about 16% higher than MP #8 with an average total SSB of 56,500 metric tons.

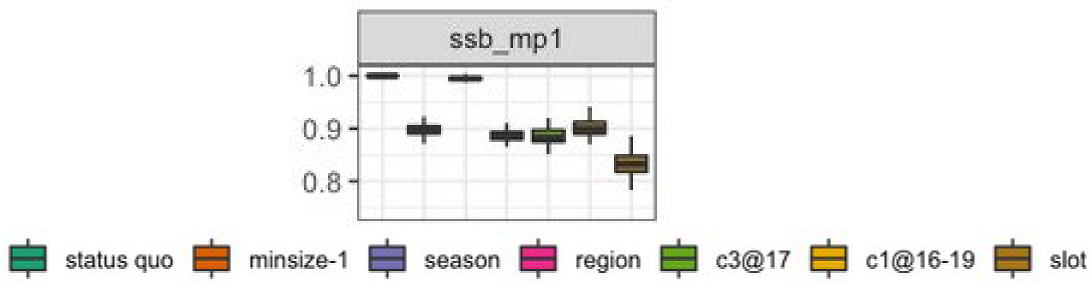


Figure 6. The relative difference in total spawning stock biomass (SSB) for the different management procedures compared to the status quo. SSB includes both mature male and female summer flounder.

There are management procedures that can reduce the percentage of females in the recreational harvest, some by as much as 33 percent (Figure 7, Table 2). Nearly 69 percent of the recreational harvest is comprised of females under MP #1 and #3. MP #2, #4, #6 and #7 reduce the proportion of female harvest to about 60 percent. MP #8 is the only alternative that reduces the proportion of female harvest to just below 50 percent. However, as discussed above, reducing the harvest of females does not appear to have much effect on increasing the total population SSB. In fact, MP #8 which had the lowest proportion of females in the harvest also had the lowest average total SSB.

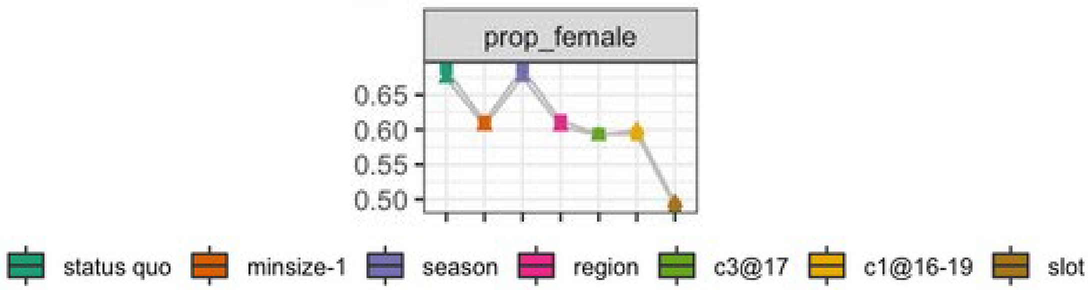


Figure 7. The average percentage of the recreational summer flounder harvest is female across the seven different management procedures.

While these results may seem counterintuitive, there are likely a number of reasons for this outcome and is consistent with previous analyses and with a review of the sex structure during the 2018 benchmark stock assessment. Many of the different management procedures, like MP #8 reduce the minimum size limit, which increases the harvest and fishing mortality rate on smaller male and female summer flounder. This results in removing more smaller and younger fish before they become a greater proportion of the total SSB. In addition, as recent management actions have set lower catches and reduced the total fishing mortality on the stock, sex ratios within the population are changing and more males are surviving to larger sizes and older ages and represent a greater contribution to the SSB. Lastly, consistent with the stock assessment, the operating model used for the MSE does not have a stock-recruit relationship, so there is no direct link between total SSB and stock productivity/recruitment.

Social and Economic Related Outcomes

One of the most significant advances associated with this MSE was the development and integration of the recreational demand model within the simulation framework. Not only did this advancement allow for the consideration of angler behavior in response to management and stock changes, but it also provided the opportunity to estimate the social and economic benefits associated with different management procedures. This was critical to ensure we could address the economic management objectives requested by the Council and Board.

Overall/coastwide results

In general, the economic metrics display a very similar pattern, at the individual trip level or across all trips, as the harvest and discard related metrics discussed earlier. Those management procedures with a higher percentage of trips with a keeper summer flounder, a greater the number of summer flounder kept per trip, and the higher harvest:discard ratio also had greater economic benefits (Figures 8 and 9).

- Angler welfare (consumer surplus) is a measure of an angler's willingness to pay for a fishing trip under a given set of regulations and generally reflects angler satisfaction. MP #1 and #3 had the lowest angler welfare across all seven management procedures evaluated. MP #2, #4, #6, and #7 performed equally well and increased angler welfare 3 times higher than the status quo (MP #1). MP #8 had the highest angler welfare and was nearly 5 times higher than MP #1. These results intuitively make sense, as angler welfare/satisfaction is positively and significantly related to harvest according to the analysis of angler preferences.

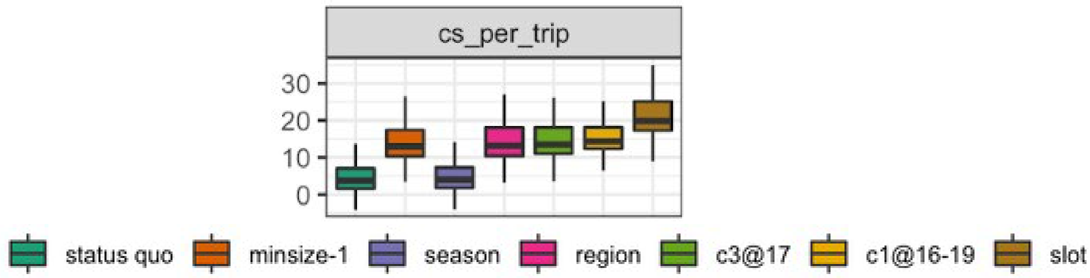


Figure 8. The estimated angler welfare (consumer surplus) per trip across all seven management procedures under the baseline operating model.

- Number of summer flounder recreational fishing trips is included as an economic metric because the more trips taken, the higher the angler welfare and the greater the economic benefit.
    - MP #1 and MP #3 resulted, on average, in 11.25 million directed summer flounder fishing trips per year.
    - MP #2, #4, #6, and #7 were all similar and resulted in approximately 11.8 million trips per year, which is a 5 percent increase over the status quo (Figure 9).
    - MP #8 resulted in the highest number of directed summer flounder tips at 12.22 million trips, or nearly a 9 percent increase compared to MP #1 (Figure 9).

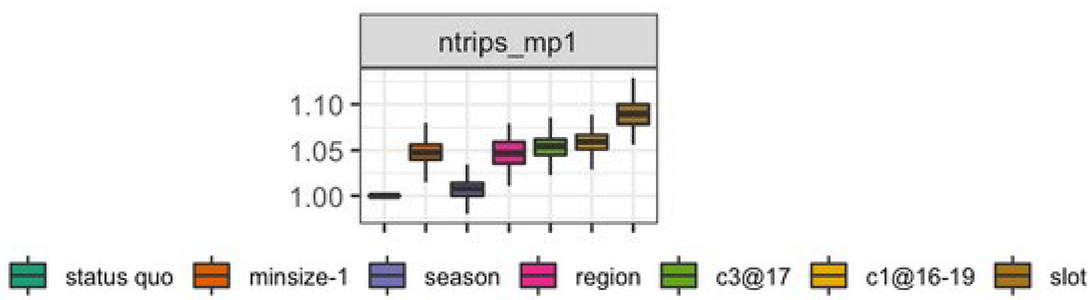


Figure 9. The change in the average total number of directed summer flounder fishing trips per year for all management procedures compared to the status quo (MP#1) under the baseline operating model.

- Fishery investment/expenses is closely linked to the total number of recreational trips and, therefore, the general pattern across the different management procedures is similar, particularly at the coastwide level with the status quo alternative (MP#1) performing the worst. The more trips taken, the more economic activity and greater investment and expenses. For reference, marine angler expenditures on fishing trips for all species totaled $3.6B across the study region in 2017.

- MP #1 resulted in the lowest fishery investment and expenses due to summer flounder activity totaling $470.9 million. This was followed by MP #3 with total fishery expenses estimated to be $474.4 million.
- MP #2, #4, #6 resulted in a 5 percent increase in total summer flounder expenses totaling $493.5 million, or $23 million more per year than the status quo.
- MP#7 had the second highest fishery investment totaling $499.3 million.
- MP#8 had the greatest economic impact with a total fishery investment of $513.0 million, a 9 percent increase compared to MP #1 or nearly $43 million more per year.

State specific results

- Angler welfare
  - State-level angler welfare generally follows the same trends in state-level numbers of trips; both of these metrics are driven by changes in expected harvest, which varies with regulations and state-specific catch-per-trip and catch-at-length distributions. Similar to the harvest and discard metrics, angler welfare is much more variable at the state or regional level with the states of NJ through MA displaying different patterns than those found in the states of DE through NC (Figure 10).

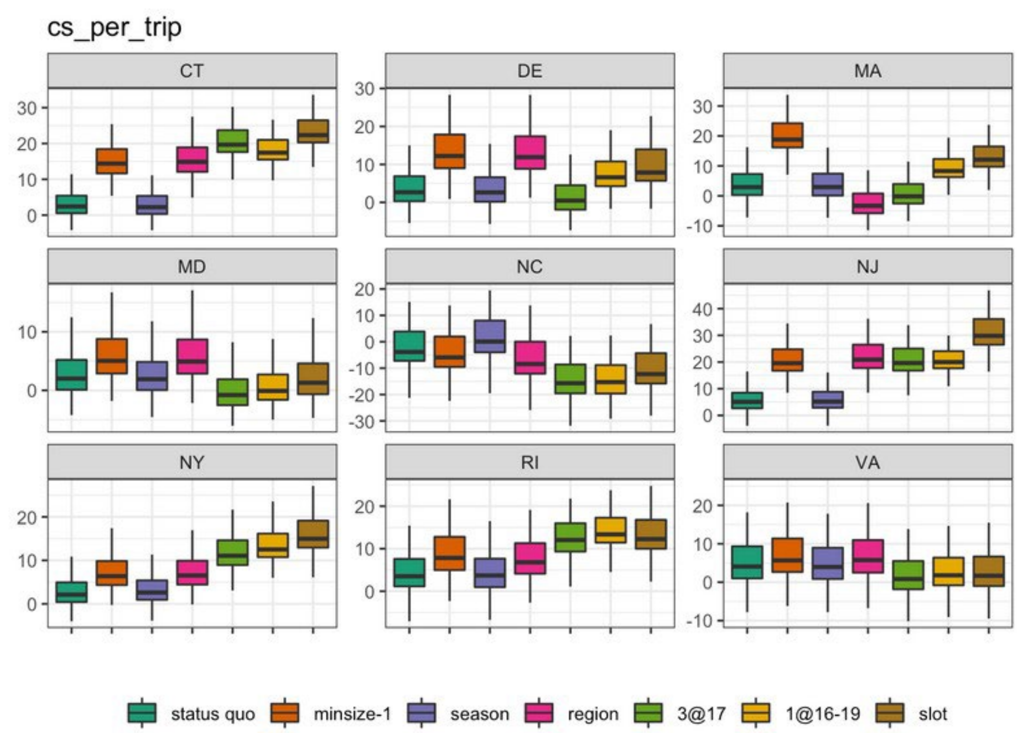


Figure 10. The estimated angler welfare (consumer surplus) per trip for each state across all seven management procedures under the baseline operating model.

- Fishery investment/expenses

- Total fishery investment/expenses are more variable than the angler welfare at the state level and across the different management scenarios than at the coastwide level (Figure 11). For example, in Massachusetts MP #3 results in significantly higher fishery expenses but is one of the lowest performing management procedures when considering angler welfare. This is due to more variability between the combination of total number of recreational trips and the trip expenses at the state level (e.g, average trip expenses range from $22 per trip in RI to $70 per trip in NC).

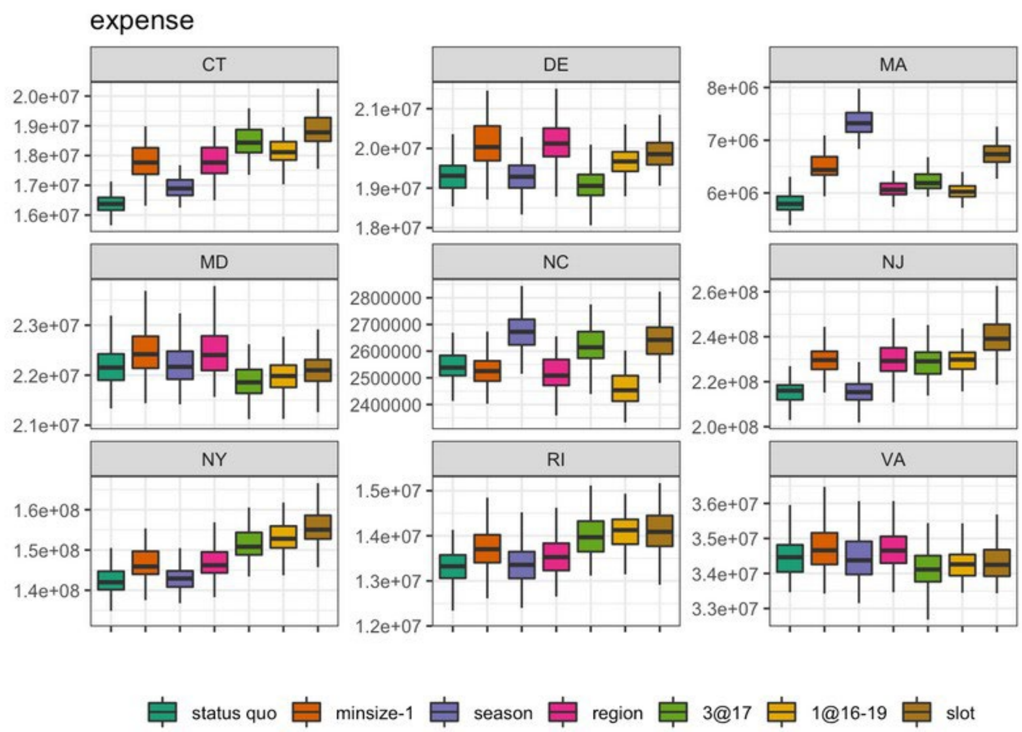


Figure 11. Total summer flounder fishery investment/expenses by state for each management procedure under the baseline operating model.

Outputs/results across operating model alternatives

A benefit of conducting an MSE is the ability to evaluate the performance of management procedures across different unknowns and uncertainties within the biological, fishery, or management system. Here we evaluate the relative performance of the same seven management procedures across two different states of the world (scenarios). One scenario assumes the Marine Recreational Information Program (MRIP) estimates of summer flounder effort and catch are lower than the point estimate used as the official measure. The second scenario considers the anticipated changes in the spatial distribution and availability of summer flounder along the Atlantic coast.

The results suggest that all seven of the management procedures are fairly robust and the relative performance was similar across the different operating model uncertainties (MRIP bias and stock distribution shifts). Those management procedures that performed better under baseline model also performed better under two operating model alternatives (Figure 12).

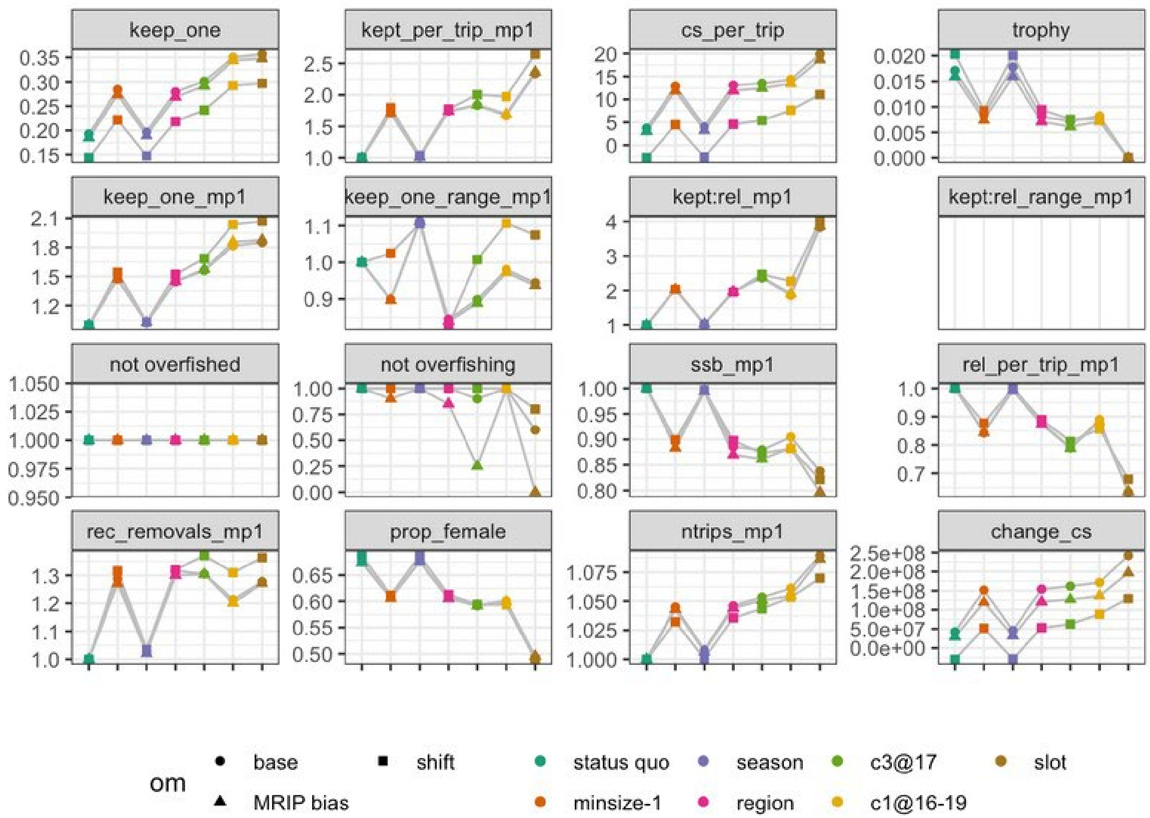


Figure 12. Comparison of the relative performance of seven different management procedures across a suite of biological, social, and economic performance metrics and three different operating model scenarios (baseline, MRIP bias, and stock distribution shift).

The MRIP bias operating model runs do show a slightly higher risk of overfishing across many management procedure alternatives. MP#6 and #8 result in significantly higher risk of overfishing under these scenarios with overfishing occurring 75 percent of the time under MP #6 and in most years for MP #8. While MP #6 and #8 do result in fishing mortality rates higher than F_{MSY} threshold, they are not significantly higher and, while they result in lower stock biomass, it never falls below the overfished threshold.

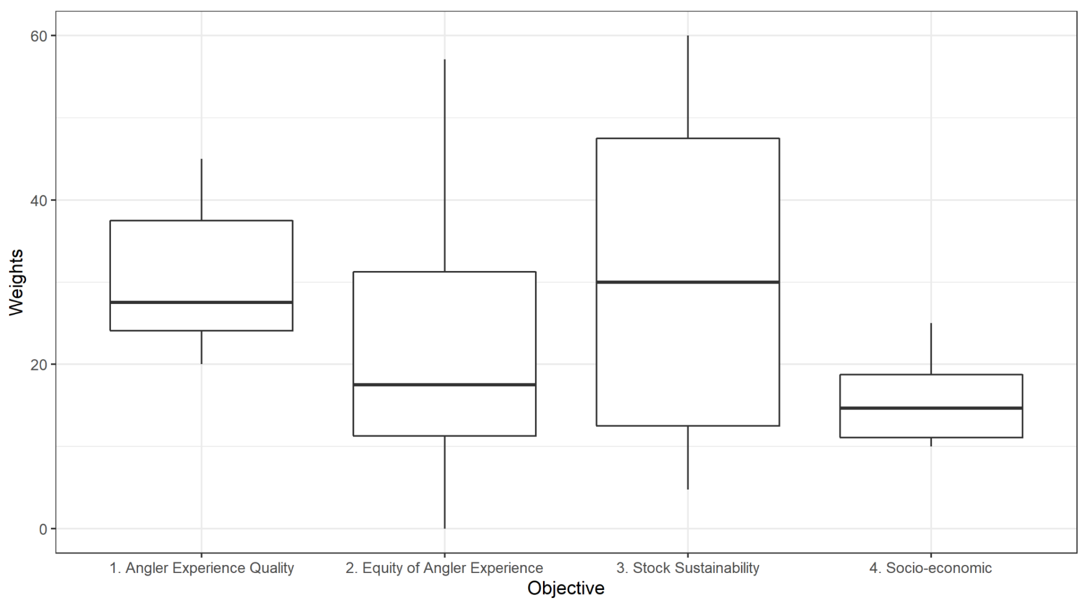
The distribution shift operating model results in poorer performance across all management scenarios for several metrics: percent of trips that kept 1 fish, consumer surplus per trip, and total number of recreational trips (Figure 13). When first considering the MRIP bias results, they may seem counterintuitive since this operating model includes much lower effort and catch estimates; however, the lower recreational catch estimates also change our understanding of stock productivity when compared to the baseline and distribution change operating model scenarios.

With the lower MRIP catch estimates being used, the total stock size is estimated to be lower and reference points would change given the changes in stock productivity.

In addition, the number of states where a metric performed better than MP #1 was also fairly robust and consistent across operating model alternatives (Figure 5). The exception was the MRIP bias alternative resulted in fewer recreational trips and recreational expenses under MP #3 and therefore, fewer states saw an improvement for those metrics compared to the status quo alternative.

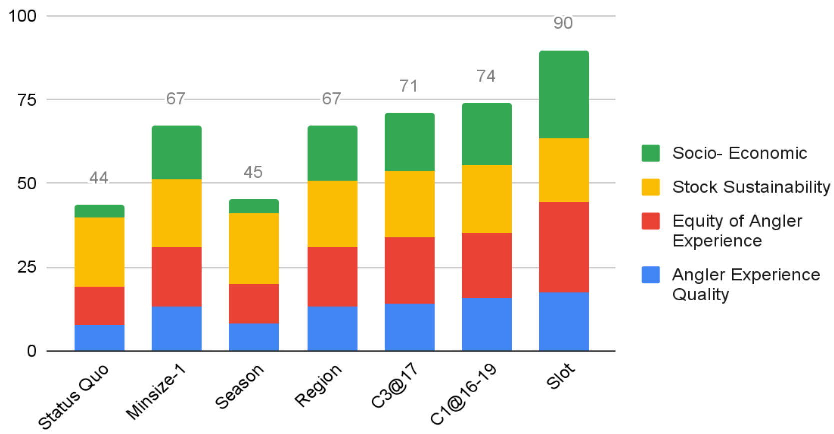
Tradeoff outputs/results

- Core group members have a diversity of preferences in terms of how important each objective and performance metric is, with the most agreement about the socio-economic objective's importance and a wide range of preferences in terms of the angler equity and stock sustainability objective. These preferences were captured through weights across objectives.
- On average core group members consider the Stock Sustainability and Quality of Angler Experience objectives as the highest priority. Equity of Angler Experience was third (quite a bit lower than stock sustainability) and lastly the Socio-Economic Sustainability objective was fourth.



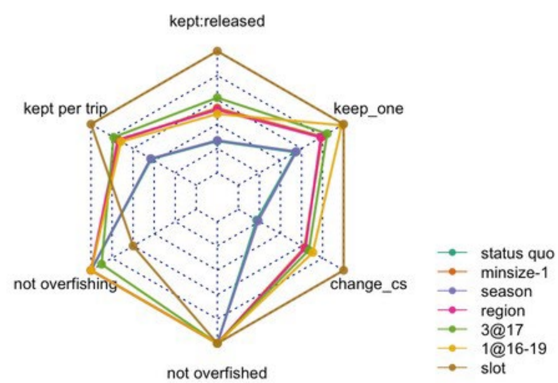
- Management procedures are fairly robust and relative performance was similar across the different weightings provided by the core group.
    - The relative ranking of the management procedures was consistent across the range of relative importance placed on each objective by the stakeholders.
- MP #8 had the highest score across weighting schemes, producing the greatest expected value for the management objectives considered.
    - MP #7, then MP #6, #2, and #4 had similar scores and MP #1 and #3 produced the lowest scores.

- Relative to the status quo (MP #1), MP #8 represented an 106% increase in degree to which satisfaction is produced by these management objectives.



Another way to visualize tradeoffs is using a spider plot where the greater the area enclosed by a management procedure the better it performs. Note that the performance here is unweighted (i.e., the raw model outputs).

- This also shows that MP #8 performs best on most of the metrics (not overfishing is the exception).
- We can see there isn't any difference between the management procedures in terms of their performance at avoiding an overfished stock while the consumer surplus and kept:released ratios exhibit the greatest difference in performance across the management procedures.



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

July 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 $0.25yr^{-1}$). 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, most quantities were calculated as:

$$\mathbf{X_{s,m}} = \mathbf{median}\left(X_{s,m,i=1}, X_{s,m,i=2}, \ldots, X_{s,m,i=100}\right)$$

$$X_{s,m,i} = \frac{1}{10}\sum_{2036}^{2045} X'_{s,m,i,t}$$

That is, the median (over simulations) of the average annual value for a quantity, and

$$X_{s,m,i} = \frac{1}{10}\sum_{2036}^{2045} \text{if}(X'_{s,m,i,t} = Z_X, 1, 0)$$

where Z_X is some threshold or condition associated with metric *X*. In this case, the metric is the median (over simulations) number of years in which a quantity is true.

The performance metrics were associated with each of the four management objectives:

7.1. Management Objective 1: Improve the quality of the angler experience

1. Percent of trips taken where the number of kept fish is greater than or equal to one.

$$X'_{s,m,i,t} = \frac{1}{N^T_{s,m,i,t}} \sum_{j=1}^{N^T_{s,m,i,t}} \text{if}(N^{keep}_{s,m,i,t,j} \geq 1, 1, 0)$$

2. Relative change in average annual numbers of kept fish per trip compared to that in management alternative 1.

$$X_{s,m,i} = \frac{\frac{1}{10}\sum_{2036}^{2045} X'_{s,m,i,t}}{\frac{1}{10}\sum_{2036}^{2045} X'_{s,1,i,t}}$$

$$X'_{s,m,i,t} = \frac{\sum(N^{keep}_{s,m,i,t})}{N^{T}_{s,m,i,t}}$$

3. Expected change in consumer surplus from 2019 expectation per trip

$$X'_{s,m,i,t} = \frac{\sum(\Delta CS_{s,m,i,t})}{N^{T}_{s,m,i,t}}$$

4. Proportion/number of fish caught greater than 28 inches

$$X'_{s,m,i,t} = \frac{\sum(N^{keep}_{s,m,i,t,l=28+})}{\sum(N^{keep}_{s,m,i,t})}$$

7.2. Management Objective 2: Maximize the equity of anglers' experience

5. ability to retain a fish 1.
    a. Relative change in the proportion of trips in each state that catch at least one fish compared to the baseline (status quo management alternative) for that state. (state subscripts not shown)

$$X_{s,m,i} = \frac{\frac{1}{10}\sum_{2036}^{2045} X'_{s,m,i,t}}{\frac{1}{10}\sum_{2036}^{2045} X'_{s,1,i,t}}$$

$$X'_{s,m,i,t} = \frac{1}{N^{T}_{s,m,i,t}} \sum_{j=1}^{N^{T}_{s,m,i,t}} \text{if}(N^{keep}_{s,m,i,t,j} \geq 1, 1, 0)$$

6. ability to retain a fish 2.
    a. Range (over states) in the proportion of trips in each state that catch at least one fish compared to the baseline (status quo management alternative) range over states.

$$X_{s,m,i} = \frac{\max_{state}(5_{s,m,i}) - \min_{state}(5_{s,m,i})}{\max_{state}(5_{s,1,i}) - \min_{state}(5_{s,1,i})}$$

7. retention rate 1.
    a. Relative change in the proportion kept:(kept+released) fish in each state compared to the baseline (status quo management alternative) for that state. (state subscript not shown)

$$X_{s,m,i} = \frac{\frac{1}{10}\sum_{2036}^{2045} X'_{s,m,i,t}}{\frac{1}{10}\sum_{2036}^{2045} X'_{s,1,i,t}}$$

$$X'_{s,m,i,t} = \frac{1}{N^{keep}_{s,m,i,t}} N^{keep}_{s,m,i,t} + N^{release}_{s,m,i,t}$$

8. retention rate 2.

a. Range (over states) in the proportion kept:(kept+released) fish in each state compared to the baseline (status quo management alternative) range over states.

$$X_{s,m,i} = \frac{\max_{state}(7_{s,m,i}) - \min_{state}(7_{s,m,i})}{\max_{state}(7_{s,1,i}) - \min_{state}(7_{s,1,i})}$$

7.3. Management Objective 3: Maximize stock sustainability

9. Proportion of years where SSB is less than 0.5 BMSY.

$$X_{s,m,i} = \frac{1}{10}\sum_{2036}^{2045} \text{if}(SSB_{s,m,i,t} < 0.5BMSY_{s,m,i,t}, 1, 0)$$

10. Proportion of years where F is greater than FMSY.

$$X_{s,m,i} = \frac{1}{10}\sum_{2036}^{2045} \text{if}(F_{s,m,i,t} > FMSY_{s,m,i,t}, 1, 0)$$

11. Relative change in average annual SSB compared to the average annual SSB under management alternative 1.

$$X_{s,m,i} = \frac{\frac{1}{10}\sum_{2036}^{2045} SSB_{s,m,i,t}}{\frac{1}{10}\sum_{2036}^{2045} SSB_{s,1,i,t}}$$

12. Relative change in average annual numbers of released fish per trip compared to that in management alternative 1, calculated for each state and region (state/region subscripts not shown)

$$X_{s,m,i} = \frac{\frac{1}{10}\sum_{2036}^{2045} X'_{s,m,i,t}}{\frac{1}{10}\sum_{2036}^{2045} X'_{s,1,i,t}}$$

$$X'_{s,m,i,t} = \frac{\sum(N^{release}_{s,m,i,t})}{N^{T}_{s,m,i,t}}$$

13. Relative change in average annual biomass of removals (retained and dead discard) compared to that in management alternative 1

$$X_{s,m,i} = \frac{\frac{1}{10}\sum_{2036}^{2045} X'_{s,m,i,t}}{\frac{1}{10}\sum_{2036}^{2045} X'_{s,1,i,t}}$$

$$X'_{s,m,i,t} = B^{keep}_{s,m,i,t} + B^{deaddiscard}_{s,m,i,t}$$

14. Proportion by numbers of the recreational removals (retained and dead discards) that are made up of female fish.

$$X'_{s,m,i,t} = \frac{C^{female}_{s,m,i,t}}{C^{female}_{s,m,i,t} + C^{male}_{s,m,i,t}}$$

where $C_{\{s,m,i,t\}}^{female}$ is the recreational removals (catch) in numbers for females.

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

15. Relative change in the average annual number of trips compared to management alternative 1, for each state and region (state and region subscripts not shown).

$$X_{s,m,i} = \frac{\frac{1}{10}\sum_{2036}^{2045} N^T_{s,m,i,t}}{\frac{1}{10}\sum_{2036}^{2045} N^T_{s,1,i,t}}$$

16. Average annual change in consumer surplus compared to 2019 expectation, for each state and region (state and region subscripts not shown).

$$X_{s,m,i} = \frac{1}{10}\sum_{t=2036}^{2045} \Delta CS_{s,m,i,t}$$

17. Relative change in annual average sales/income/employment/GDP compared to management alternative 1, by state/region/coast. (state/region subscripts not shown)

8. References

Bunnefeld, N., Hoshino, E. and Milner-Gulland, E.J., 2011. Management strategy evaluation: a powerful tool for conservation? Trends in ecology & evolution, 26(9), pp.441-447.

Carr-Harris, A. 2022. Summer Flounder Recreational Demand Model: Overview, Data, and Methods. Working paper presented at the June 2022 MAFMC meeting. 23p.

Fay, G. and G.N. Tuck. (eds.) 2011. Development of a multi-gear spatially explicit assessment and management strategy evaluation for the Macquarie Island Patagonian toothfish fishery. Australian Fisheries Management Authority and CSIRO Marine and Atmospheric Research, Hobart. 181p.

Fay, G., Punt, A.E. and Smith, A.D., 2011. Impacts of spatial uncertainty on performance of age structure-based harvest strategies for blue eye trevalla (Hyperoglyphe antarctica). Fisheries Research, 110(3), pp.391-407.

Fay, G. 2018. A comparison between IUCN categories of conservation status and fisheries reference points. In: Millar, S., and Dickey-Collas, M. 2018. Report on IUCN assessments and fisheries management approaches. ICES CM 2018/ACOM:60. 109 pp.

Klaer, N.L., Wayte, S.E. and Fay, G., 2012. An evaluation of the performance of a harvest strategy that uses an average-length-based assessment method. Fisheries Research, 134, pp.42-51.

Little, L.R., Parslow, J., Fay, G., Grafton, R.Q., Smith, A.D., Punt, A.E. and Tuck, G.N., 2014. Environmental derivatives, risk analysis, and conservation management. Conservation Letters, 7(3), pp.196-207.

Northeast Fisheries Science Center (NEFSC). 2019. 66th Northeast Regional Stock Assessment Workshop (66th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 19-08; 1170 p. Available from: http://www.nefsc.noaa.gov/publications/

Wiedenmann, J., Wilberg, M.J., Sylvia, A. and Miller, T.J., 2015. Autocorrelated error in stock assessment estimates: implications for management strategy evaluation. Fisheries research, 172, pp.325-334.

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

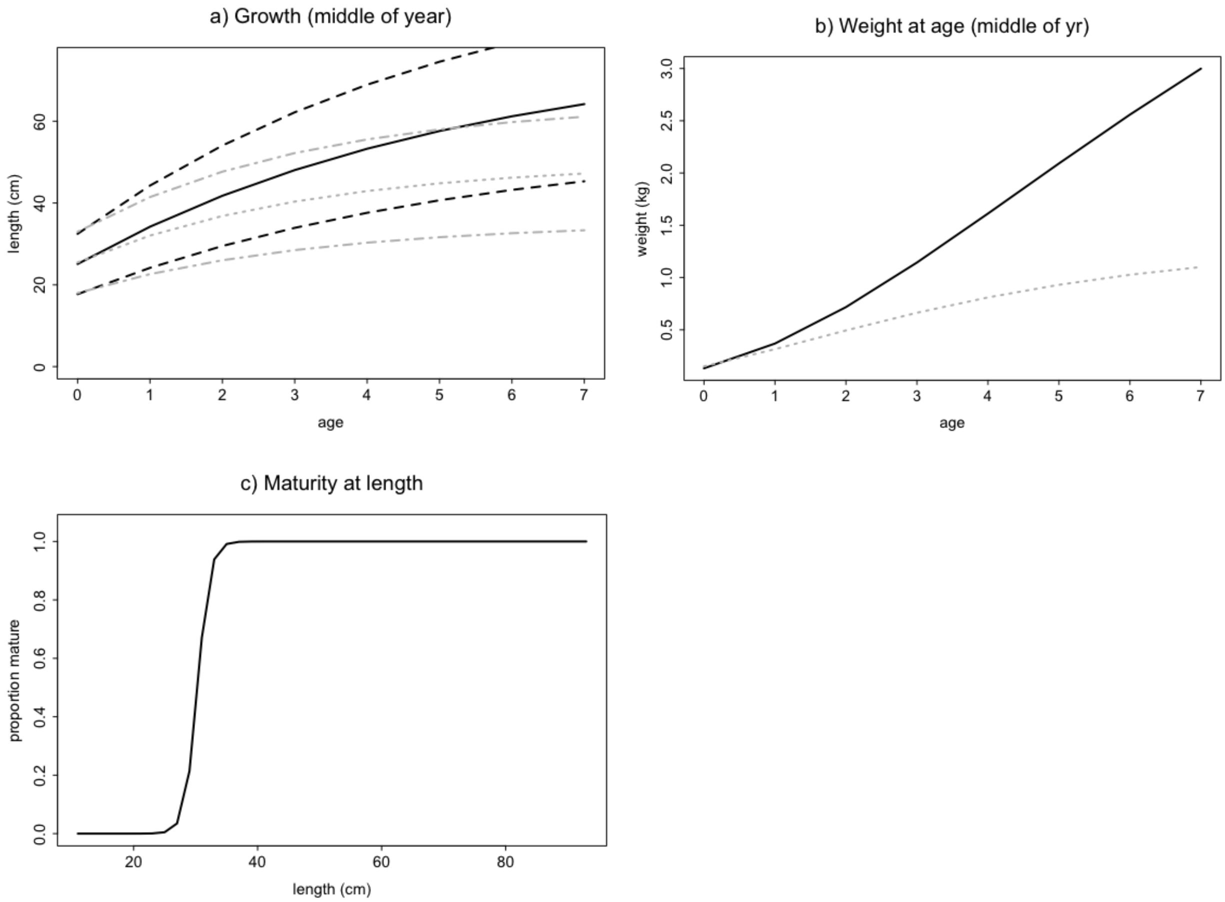


Figure 1. Operating model specifications for summer flounder showing a) mean (solid line) and standard deviation (dashed line) of length at age, b) weight at age (solid line females, dashed line males), c) maturity at length.

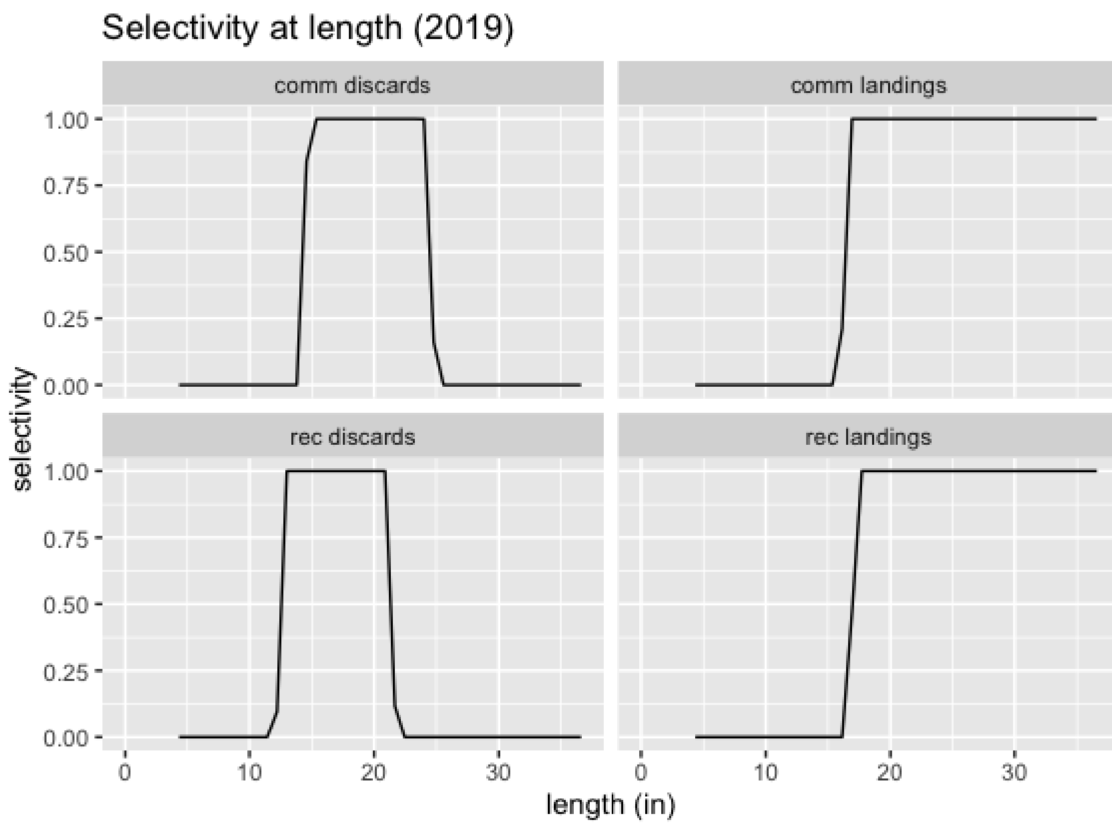


Figure 2. Operating model specifications for summer flounder showing selectivity at length for all years for the commercial fishing fleets and for the initial year for the recreational fleets.

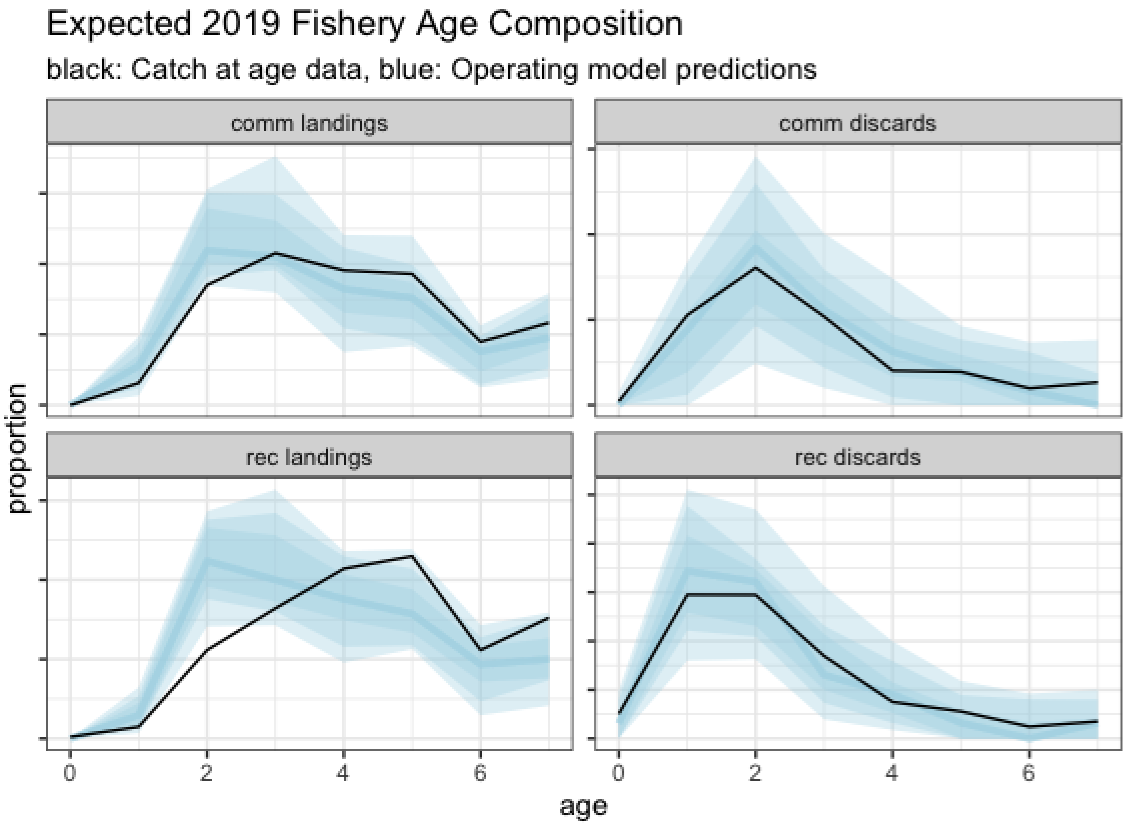


Figure 3. Operating model predictions for 2019 catch at age by fleet compared to the 2019 data.

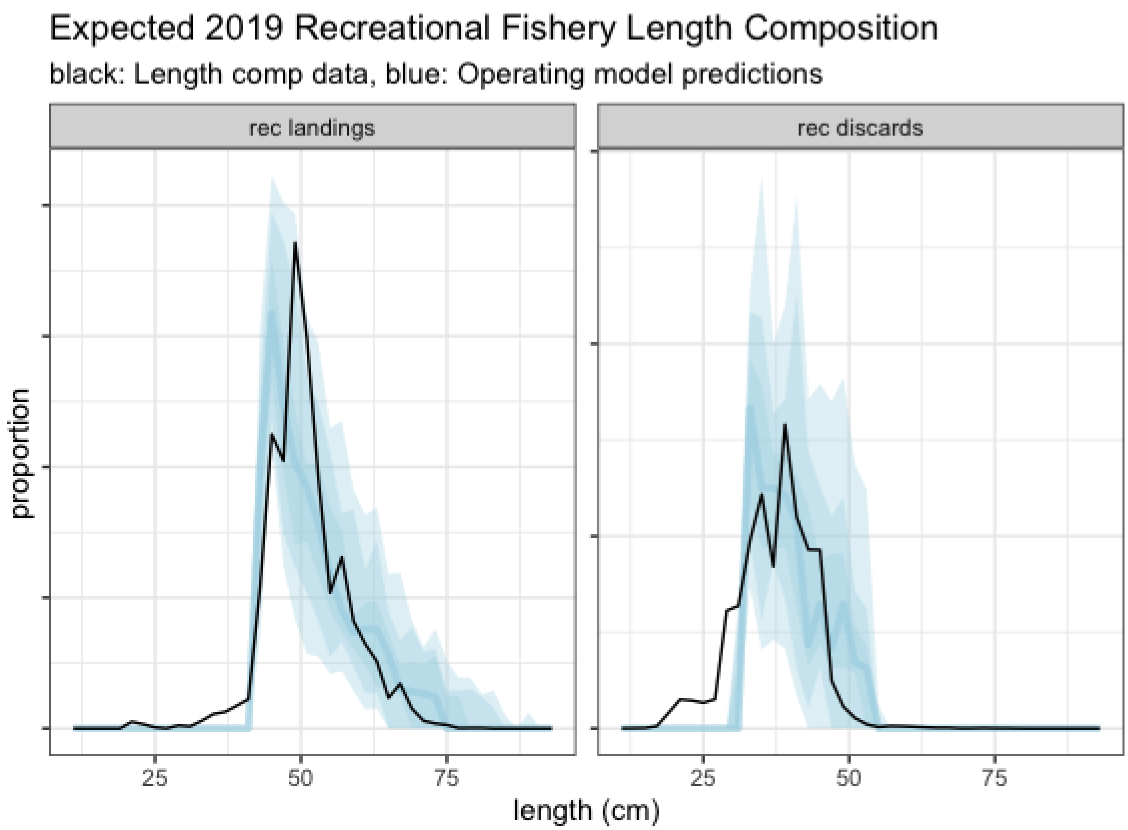


Figure 4. Operating model predictions for 2019 catch at length for the recreational fleets compared to the 2019 data.

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

Andrew (Lou) Carr-Harris

Northeast Fisheries Science Center

July 2022

1 Introduction

This document describes the data and methods underlying the recreational demand model (RDM) component of the MAFMC's Management Strategy Evaluation (MSE) of the recreational summer flounder (fluke) fishery. As part of a fully integrated bio-economic model,[1] the RDM provides the key link between projected fluke population abundances, regulations, and expected recreational fishing mortality.

The RDM is a unique approach to evaluating the potential impact of alternative fluke management strategies on fishery-wide outcomes because it explicitly models the relationship between policy- or stock-induced changes in trip outcomes and angler behavior. As Fenichel et al (2013) note, angler behavior has important consequences on several aspects of the recreational fishing system, including the cumulative effect on fishing mortality and subsequent impacts to biomass. However, angler behavior is often neglected in the policymaking process (Beard et al. 2011), which may lead to regulations that ineffectively meet management goals. In addition to measuring the likely effect of regulations on angler behavior and recreational fishing mortality, the RDM captures the economic implications of regulations in terms of changes in angler welfare and fishing trip expenditures, allowing for these metrics to be considered in the MSE.

There are three main components of the RDM: an angler behavioral model, a calibration sub-model, and a projection sub-model. Each component is described in detail below. The angler behavioral model uses choice experiment survey data (Sections 2) to estimate angler preferences for harvesting and discarding fluke and other primary species (Sections 3 and 4). These estimates parameterize the calibration and projection sub-models and are also used to calculate behavioral and welfare responses to regulations (Section 5). The calibration sub-model, discussed in Section 6, emulates coast-wide fishing activity in a baseline year using trip-level data and serves as a baseline to which we compare alternative management scenarios. The link between projected stock structures and angler catch is described in Section 7. The projection sub-model, described in Section 8, simulates the fishery conditional on a projected stock structure and management scenario and computes expected impacts to angler effort, angler welfare, the local economy, and recreational fishing mortality. Section 8.1 discusses the economic metrics captured by the RDM and Section 8.2 provides information about how alternative operating model assumptions enter

---

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

the RDM. We also the evaluate the out-of-sample predictive power of the RDM and provide these results in Section 8.3.

2 Choice experiment survey

Choice experiments (CEs) are a common stated-preference approach to non-market valuation and provide a means to estimate the value of goods and attributes that are not traded explicitly in a market and therefore lack prices to signal value (Adamowicz et al. 1998). Like other types of stated preferences methods, CEs rely on individuals' responses to hypothetical questions and are particularly useful when revealed preference, i.e., observational data on actual human behavior is inadequate or non-existent. In the case of the summer flounder MSE, the CE approach allowed us to derive the marginal value of harvesting and discarding fluke and therefore estimate the economic implications of current and previously unobserved management scenarios that might affect angler harvest and discards.

In a typical CE, respondents are presented with two or more hypothetical multi-attribute goods and asked to compare and choose their most preferred good. It is common for one attribute to represent the "price" of the good, defined in monetary (e.g., annual tax or one-time trip cost) or non-monetary units that can be monetized (e.g., travel distance) that provide a budget constraint to individuals' purchasing decisions. Individuals are assumed to choose a good only when its benefit outweighs its cost and it provides maximum utility overall all available goods in a given choice scenario. The resulting data on individual purchasing decisions can be used to evaluate consumer preferences for, behavioral response to, and welfare impacts of marginal changes in attribute levels (Louiviere et al. 2000). In recreational fishing contexts, there have been numerous applications of CEs and other types of stated preference surveys seeking to evaluate the influence of catch and non-catch related attributes on angler choices (Hunt et al. 2019).

Our CE data 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%.

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]

2.1 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

[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.

for a single respondent to answer, questions were randomly allocated into 16 subsets such that each respondent was presented with eight choice questions.

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.

2.2 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 following recommended best practices in Johnston et al. (2017).[3] We also excluded from the 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. Anglers fishing from private access points were therefore excluded from the sampling design. To understand the extent to which each fishing mode is represented in our

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

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 primary species by mode to the distribution of fishing effort indicated by our sample.[4] Compared to the population, shore trips were underrepresented in the sample while party and charter boat trips were 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 did not mirror the population distribution of fishing effort by mode in 2009, it did 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.

[4] The survey asked anglers how many trips they took in 2009 for fluke, black sea bass, and either scup, weakfish, and/or red drum depending on the survey version.

3 Behavioral model framework

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):

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

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,

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

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 et al. 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).

4 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 were generally of the expected sign. Across the regional models, the mean parameters on *trip cost*, the marginal utility of price, were negative and significant and intuitively suggest that higher trip costs reduce angler utility. Mean parameters on all keep variables were 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 other primary species' keep parameters 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 varied by species and region. For example, only in the VA/NC model was 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 $\sqrt{WF\ released}$ was 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*, were negative and significant. This mean that, when given the option, anglers derive 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 and 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.

5 Simulation modeling 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 (RDM). 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 Northeast U.S. recreational fluke (Holzer and McConnell 2017) and striped bass (Carr-Harris and Steinback 2020) fisheries, and for managing the recreational Gulf of Maine cod and haddock fishery (Lee et al. 2017).

The RDM is multipart algorithm that simulates individual choice occasions mirroring those depicted in the CE survey. Each simulated 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 based on historical and projected catch and effort data and utility parameters from the angler behavioral model. It then calculates the expected utility of each multi-attribute option, from which it derives the probability an angler would select that option and the associated consumer surplus. Expected utilities are calculated twice: first, in the baseline scenario in 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 projected stock conditions. Differences in expected utilities 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.

6 Calibration sub-model

The first of the two-part simulation algorithm, visually depicted in Appendix Figure 1, involves calibrating the recreational demand model to a baseline year. In essence, we attempted to replicate observed state-level 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 each 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 sharing a bottom-dwelling nature that makes them susceptible to similar fishing gears. We account for this 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 simulate catch data with a correlation structure approximating the observed correlation between the two series. This copula modeling approach provides the flexibility to generate multivariate catch-per-trip data with any specified correlation structure and distributional 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.[5]

The calibration sub-model then allocates catch as harvest and discards. 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.[6] These d^*_{fs} values, identified outside the simulation algorithm, 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 entering the ensuing projection sub-model.

[5] Catch-per-trip data for all species included in the simulation are based on recreational fishing trips that caught or primarily targeted fluke.

[6] 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.

Approximating MRIP-based estimates of harvest in the baseline years therefore 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.[7]

The calibration sub-model was designed to approximate estimated actual harvest, and thus simulated harvest for each species-state combination approximates the MRIP-based

[7] Catch statistics were only calculated in the model for state-species combinations in which a species' catch attributes entered the corresponding regional utility model.

estimates. Given that expected harvest is a key determinant of the probability of taking a fluke trip, this bolsters confidence that the calibration model generates an appropriate number of choice occasions for 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 Population-based adjustments to recreational catch__

Built into the RDM is an explicit relationship between the projected fluke population abundance and size distribution with the numbers and sizes of fluke caught by recreational anglers. For example, we assume that greater numbers of fluke in the ocean will lead to greater catch-per-trip, holding all else constant. Similarly, if the size distribution of fluke changes, so too will the size distribution of fish encountered by anglers. To account for these two links, we incorporated into the RDM two approaches based on angler targeting behavior.

We determined 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 required a recreational catch-at-length and population numbers-at-length distribution, the former of which we created using historical catch data adjusted by the d^*_{fs} values identified in the calibration sub-model model. The original 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 for state s.[8]

If $f(m_s)$ accurately represented the true catch-at-length distribution, we could for each simulated trip's draw of catch up to the bag limit, draw from $f(m_s)$, impose a size limit, and compute total harvest and discards overall all trips. However, we compared results from this method against MRIP estimates in a baseline year and found considerable differences in harvest and discards. The differences occurred because $f(m_s)$ does not represent the true catch-at-length distribution and is derived from available catch data that perhaps over- or under-samples fluke harvest- or discards-at-lengths. Left unaccounted for, this discrepancy would in some cases project shifts in harvest that move in a direction opposite to what we would expect under a given change in size limits. To ensure that hypothetical changes in size limits affect harvest in ways

[8] 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.

that follow *a priori* expectations (e.g., decreasing the minimum size limit relative to 2019 and holding all else constant will lead to increased harvest) we adjusted $f(m_s)$ based on the d_{fs}^* values for fluke attained in the calibration sub-model.

We did this by first using $f(m_s)$ to compute the relative probability of 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 distributed 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 $f(l_s)^*$ preserved the value of the catch-at-length cumulative distribution function evaluated at the minimum size limit which explains harvest in the baseline year (d_{fs}^*) and redistributed the remaining probability in proportion to the original catch-at-length probability distribution. Using $f(l_s)^*$, we computed an adjusted catch-at-length distribution:

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

We then used c^*_{ls}, the adjusted catch of length-l fluke, and median population numbers-at-age in the baseline year, N_a, from the Monte Carlo Markov Chain resampling procedure implemented in the fluke age-structured assessment program (NEFSC 2019) to compute recreational selectivity-at-length. After converting median population numbers-at-age to numbers-at-length using commercial trawl survey age-length indices, we followed Lee et al. (2017) and rearranged the Schaefer (1954) catch equation to solve for recreational selectivity of length-l fluke in state s:

$$q_{ls} = \frac{c^*_{ls}}{N_l}. \tag{11}$$

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 any projected size distribution of fluke in the ocean and the size distribution of fluke caught by recreational anglers.

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 from which we draw in the projection sub-model.

8 Projection sub-model

After adjusting the catch-per-trip and catch-at-length distributions based on projected numbers-at-length, the projection sub-model proceeds by re-simulating outcomes under the alternative management scenarios for each of the N_s^0 choice occasions. The projection sub-model, depicted in Figure A2, begins by assigning to each choice occasion β_n', trip costs, and numbers of scup, red drum, or weakfish harvest and discards from the calibration sub-model. It then draws fluke and black sea bass catch-per-trip values from the population-adjusted catch-per-trip distribution. 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 drawn from the population-adjusted catch-per-trip distribution, is allocated to a 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 using 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.

8.1 Economic impacts

We measured 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. Positive $\Delta E(CS_n)$ signifies angler welfare loss and is the amount of money needed to offset decreased angler utility from scenario 1 relative to scenario 0, thus maintaining scenario 0 utility. Conversely, negative $\Delta E(CS_n)$ signifies angler welfare gain and is the amount of money anglers would be willing to forego in scenario 1 to maintain scenario 0 utility. To ease the interpretation of our results, we multiply $\Delta E(CS_n)$ by -1 so that positive (negative) values of $\Delta E(CS_n)$ signify angler welfare gains (losses).

8.2 Alternative operating model assumptions

Two alternative operating model assumptions were considered in the MSE based on stakeholder and technical working group input that represent hypotheses about particular aspects of uncertainty in the summer flounder fishery. The first was that MRIP point estimates of recreational summer flounder effort are biased upward. We incorporated this scenario in the RDM by calibrating the model to the lower bounds of the 95% confidence intervals on MRIP estimates of effort, rather than the point estimates. Additionally, recreational selectivity-at-length in the baseline year was re-calculated from Equation 11 using (i) initial (2019) numbers-at-age data that was scaled down in proportion to the scaling of the MRIP effort data and (ii) MRIP catch estimates evaluated the lower 95% confidence interval.

The second assumption considered the expected northward shift of fluke biomass over time (Perretti and Thorson 2019) that may differentially affect recreational catch in different regions. To model these expectations, we first predicted future percentages of fluke biomass in three regions (Massachusetts to New York, New Jersey, and Delaware to North Carolina) using historical interpolated fluke biomass data downloaded from the Area Analysis Tool in the NOAA Fisheries Distribution Mapping and Analysis Portal (NOAA Fisheries, 2022). These data were derived from the NMFS Northeast U.S. fall trawl survey dataset and predictions were based on the most recent 10 years of available data. Percent total biomass by region was modeled as a function of a linear time trend and predicted values were obtained for the out-of-sample years. The left panel in Figure 2 shows the regional delineations, while the right panel shows observed and predicted percentages of interpolated fluke biomass by region.

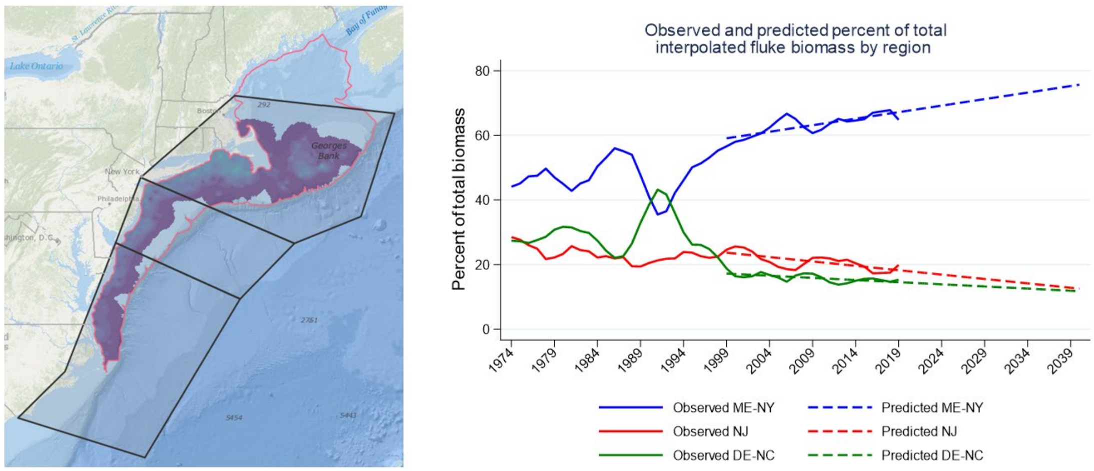


Figure 2. Left: regional delineations of interpolated biomass data. Right: observed and predicted percent of total biomass by region.

Predicted changes in the distribution of fluke biomass across the region entered the RDM through changes in mean catch-per-trip. For each year of the projection time horizon, we calculated state-level total catch relative to 2019 assuming differentiated biomass accessibility across states. After adjusting and rearranging and Equation (12) to reflect this assumption, total expected catch during projection year y for state s was calculated as:

$$\tilde{C}_{lsy} = \sum_{l}^{L} q_{ls} \tilde{p}_{sy} N_l. \tag{14}$$

where $\tilde{p}_{sy}$ was the predicted percent of total fluke biomass available to state s in projection year y. Note that in this formulation there is no distinction in availability across length classes. The ratio $\tilde{C}_{lsy}/C_{ls}$, where C_{ls} is total fluke catch in the baseline year for state s, was then computed for each year of the projection time horizon. During projection simulations, state-level mean parameters characterizing the catch-per-trip distribution were multiplied by $\tilde{C}_{lsy}/C_{ls}$, thus capturing a potential recreational catch response to the northward shifting biomass distribution.

This scenario results in a progressive increase in recreational summer flounder catch in the northern states with a concurrent decrease in catch in New Jersey and the southern region.

8.3 Out-of-sample predictions

We assessed the predictive accuracy of the RDM by comparing out-of-sample model forecasts of total fluke catch and harvest to MRIP-based estimates. After calibrating the model to 2019, forecasts were made for 2015, 2016, 2017, 2018, 2020, and 2021 conditional on state-specific recreational fishing regulations and distributions of stock sizes from the summer flounder management track 2021 assessment model in those years. We performed 30 iterations of the RDM to produce confidence bounds around the mean estimates. MRIP- and RDM-based estimates are shown in Figure 3.

Of important note is that 2020 and 2021 were both years in which COVID-19 induced substantial changes in recreational activities, including fishing behavior (e.g. Midway et al. 2021). Despite the massive disruption of a pandemic, the RDM does reasonably well at predicting fluke catch and harvest in 2018, 2020, and 2021, as mean projections fall within 95% confidence intervals of the MRIP estimates. However, the model consistently under-predicts total fluke catch and harvest in 2015, 2016, and 2017, as mean projections fall outside or just inside the MRIP confidence intervals. Given the good performance of the model during known behavioral shifts due to the COVID pandemic, the discrepancies in 2015, 2016, and 2017 could be an artifact of the MRIP's transition from the Coastal Household Telephone Survey (CHTS) to the Fishing Effort Survey (FES) in 2018 and the resulting calibration of its entire time series of catch and effort estimates through 2017.[9] Official MRIP estimates through 2017 are now based on calibrated CHTS data, while official MRIP estimates for 2018 and after are based on the FES data only. By conditioning the RDM to FES-based estimates in 2019 and comparing our projections to re-calibrated CHTS-based estimates in 2015 through 2017, we may be

[9] Prior to 2018, the CHTS collected data about recreational fishing effort through a random digit dialing sampling approach. Due largely to a decline in the use of landlines over time, between 2007 and 2017 the MRIP developed the FES, a mail survey that is sent to randomly sampled residential households in coastal states. Compared to the CHTS, the FES was found to be more representative sample of angler population and less susceptible to non-response and non-coverage bias. The FES was peered review in 2014 and certified as a scientifically sound replacement for the CHTS in 2015. For more information see https://www.fisheries.noaa.gov/recreational-fishing-data/effort-survey-improvements.

confounding model performance with differences in MRIP estimates driven by the alternative data collection methods used to generate the estimates.[10]

In an attempt to eliminate the possible effect of alternative MRIP data collection methods on our assessment of the RDM's predicative performance, we calibrated the RDM to 2017 (rather than 2019) and projected outcomes for 2015 and 2016. These three years share the same underlying data generating process by which recreational fishery statistics are estimated and so provide a consistent baseline to assess the predictive accuracy of the RDM for the period prior to the changes in the MRIP methodology. Comparisons of coast-wide output from the 2017-calibrated RDM to MRIP estimates are shown in Figure 4.

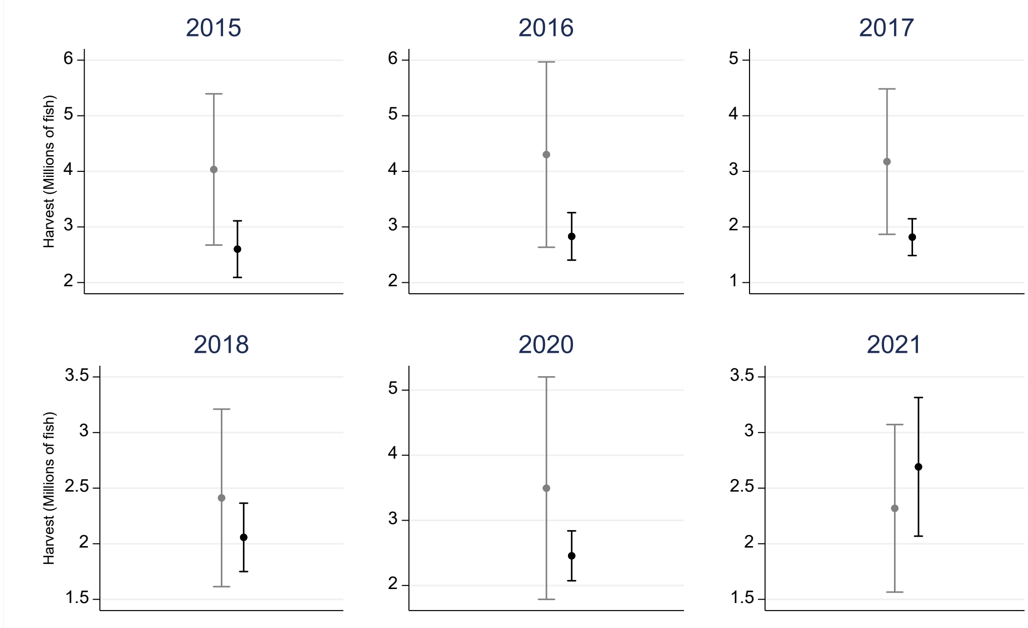
Figure 4 shows that calibrating the RDM to 2017 leads to more accurate predictions of total fluke harvest and catch in 2015 and 2016. While the model over-predicts coast-wide harvest in both years, mean estimates fall well within the MRIP-based confidence intervals. The RDM over-predicts total fluke catch in 2015 and under-predicts total fluke catch in 2016 but predicted means are similar to the MRIP-based point estimates. Furthermore, the predicted 95% confidence intervals for total catch in both years are nested within the MRIP-based confidence intervals.

Results in Figures 3 and 4 suggest the RDM is capable of making projections that fall within MRIP-based ranges of estimated outcomes. However, they also suggest that the baseline year used to calibrate the RDM is important and can affect the accuracy of model predictions. As a best practice when making projections for management purposes, the RDM should be calibrated to the most recent year of data and projections should be limited to a short, one- or two-year time horizon.

---

[10] Recreational harvest weight for all species in the Mid-Atlantic region dropped by roughly 50% from 2017 to a historic low in 2018 (NOAA Fisheries 2022), which may also be indicative of the alternative survey instruments used to generate these estimates.

Total fluke harvest



Total fluke catch

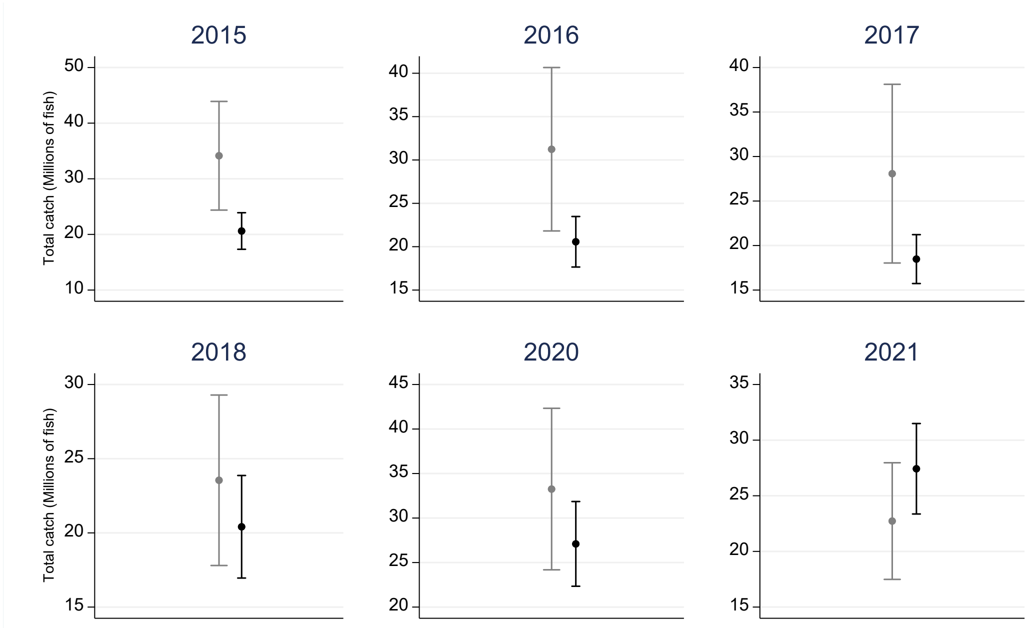


Figure 3. MRIP vs. model projections of coast-wide fluke catch (top) and harvest (bottom) in numbers of fish and 95% confidence intervals. Model calibrated to baseline year 2019. Gray = MRIP, black = model.

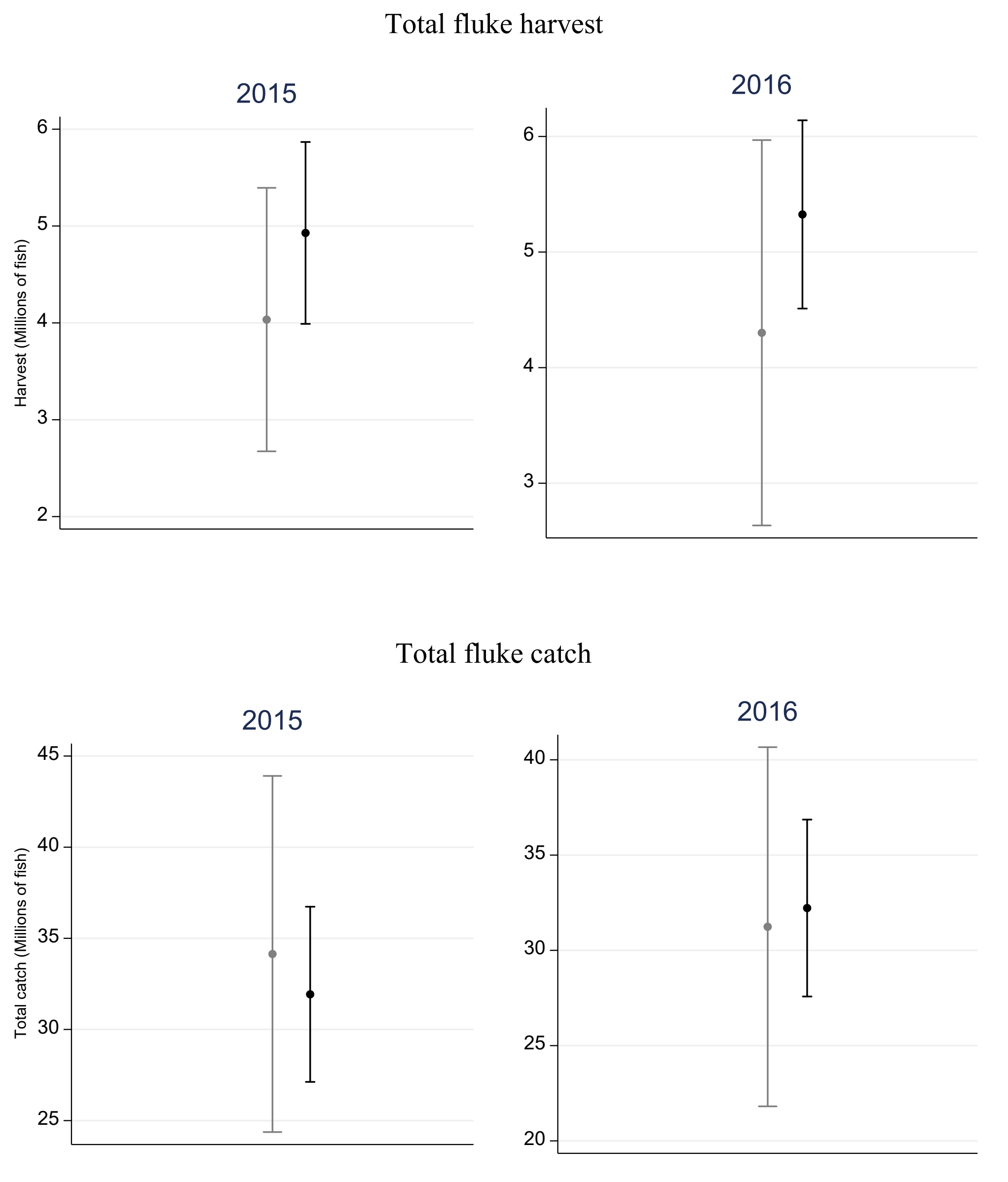


Figure 4. MRIP vs. model projections of coast-wide fluke catch (top) and harvest (bottom) in numbers of fish and 95% confidence intervals. Model calibrated to baseline year 2017. Gray = MRIP, black = model.

9 Summary

To recap, the RDM uses estimated preference parameters from the angler behavioral model to estimate changes in angler welfare and effort (fishing trips) conditional on expected harvest and discards. These estimates parameterize the ensuing calibration- and projection sub-models. Along with the behavioral parameters, the calibration sub-model uses historical catch, effort, and trip cost data to simulate fishing trips that emulate fishery conditions in the baseline year (2019). The calibration sub-model generates a number of fishing trips that enter and remain fixed in the subsequent projection sub-model.

Prior to the projection sub-model routine, the RDM 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 distributions and a given management scenario, 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. Predicted total harvest and discards feed back into the operating model, which subsequently produces $\widetilde{N}_{lt+1}$, the input for the RDM in year $t+1$. This recursive cycle continues for each year of the time horizon and over multiple iterations.

References

Adamowicz, Wiktor, Peter Boxall, Michael Williams, and Jordan Louviere. 1998. "Stated Preference Approaches for Measuring Passive Use Values: Choice Experiments and Contingent Valuation."

Beard, Douglas T., Sean P. Cox, and Stephen R. Carpenter. 2011. "Impacts of Daily Bag Limit Reductions on Angler Effort in Wisconsin Walleye Lakes." *North American Journal of Fisheries Management* 23 (4): 1283–93.

Carr-Harris, Andrew, and Scott Steinback. 2020. "Expected Economic and Biological Impacts of Recreational Atlantic Striped Bass Fishing Policy." *Frontiers in Marine Science* 6 (January): 1–20.

Fenichel, E., J. Abbott, and B. Huang. 2013. "Modelling Angler Behaviour as a Part of the Management System: Synthesizing a Multi-Disciplinary Literature." *Fish and Fisheries* 14 (2).

Hensher, David A., and William H. Greene. 2003. "The Mixed Logit Model: The State of Practice." *Transportation* 30 (2): 133–76.

Holzer, J., and K. McConnell. 2017. "Risk Preferences and Compliance in Recreational Fisheries." *Journal of the Association of Environmental and Resource Economists* 4 (S1): S1–43.

Johnston, Robert J., Kevin J. Boyle, Wiktor Vic Adamowicz, Jeff Bennett, Roy Brouwer, Trudy Ann Cameron, W. Michael Hanemann, et al. 2017. "Contemporary Guidance for Stated Preference Studies." *Journal of the Association of Environmental and Resource Economists* 4 (2): 319–405.

Lee, M., S. Steinback, and K. Wallmo. 2017. "Applying a Bioeconomic Model to Recreational Fisheries Management: Groundfish in the Northeast United States." *Marine Resource Economics* 32 (2): 191–216.

Lovell, Sabrina J, James Hilger, Emily Rollins, Noelle A Olsen, and Scott Steinback. 2020. "The Economic Contribution of Marine Angler Expenditures on Fishing Trips in the United States, 2017." *NOAA Technical Memorandum*. Vol. NMFS-F/SPO. U.S. Dep. Commerce.

McFadden, D. 1973. "Conditional Logit Analysis of Qualitative Choice Behavior." In *Frontiers in Econometrics*, 105–142. New York.

Midway, Stephen R., Abigail J. Lynch, Brandon K. Peoples, Michael Dance, and Rex Caffey. 2021. "COVID-19 Influences on US Recreational Angler Behavior." *PLoS ONE* 16 (8 August).

NOAA Fisheries. 2022. "DisMap Data Records." Retrieved from Apps-St.Fisheries.Noaa.Gov/Dismap/DisMAP.Html. Accessed 6/7/2022.

Northeast Fisheries Science Center (NEFSC). 2019. "66th Northeast Regional Stock Assessment Workshop (66th SAW) Assessment Report."

Perretti, Charles T., and James T. Thorson. 2019. "Spatio-Temporal Dynamics of Summer Flounder (Paralichthys Dentatus) on the Northeast US Shelf." *Fisheries Research* 215 (July): 62–68.

Revelt, David, and Kenneth Train. 2000. "Customer-Specific Taste Parameters and Mixed Logit: Households' Choice of Electricity Supplier." *Working Paper, University of California, Berkeley*, 1–32.

Schaefer, Milner B. 1954. "Some Aspects of the Dynamics of Populations Important to the Management of the Commercial Marine Fisheries." *Bulletin of Mathematical Biology*.

Terceiro, Mark. 2003. "The Statistical Properties of Recreational Catch Rate Data for Some Fish Stocks off the Northeast U.S. Coast." *Fishery Bulletin* 101 (3): 653–72.

Train, K. 2003. *Discrete Choice Methods with Simulation*. New York: Cambridge University Press.

Appendix

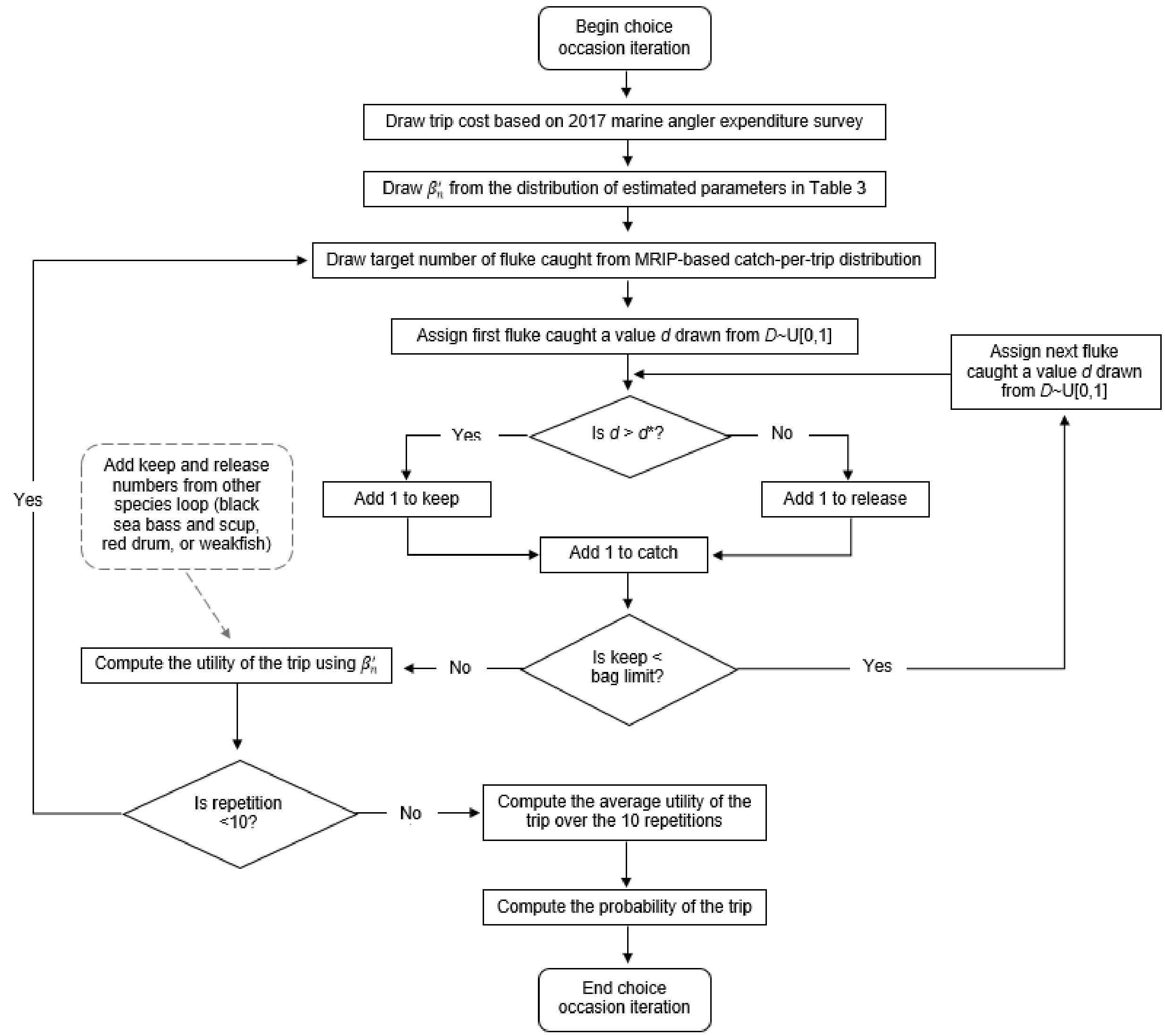


Figure A1. Calibration sub-model algorithm. Only the loop for summer flounder is shown in detail.

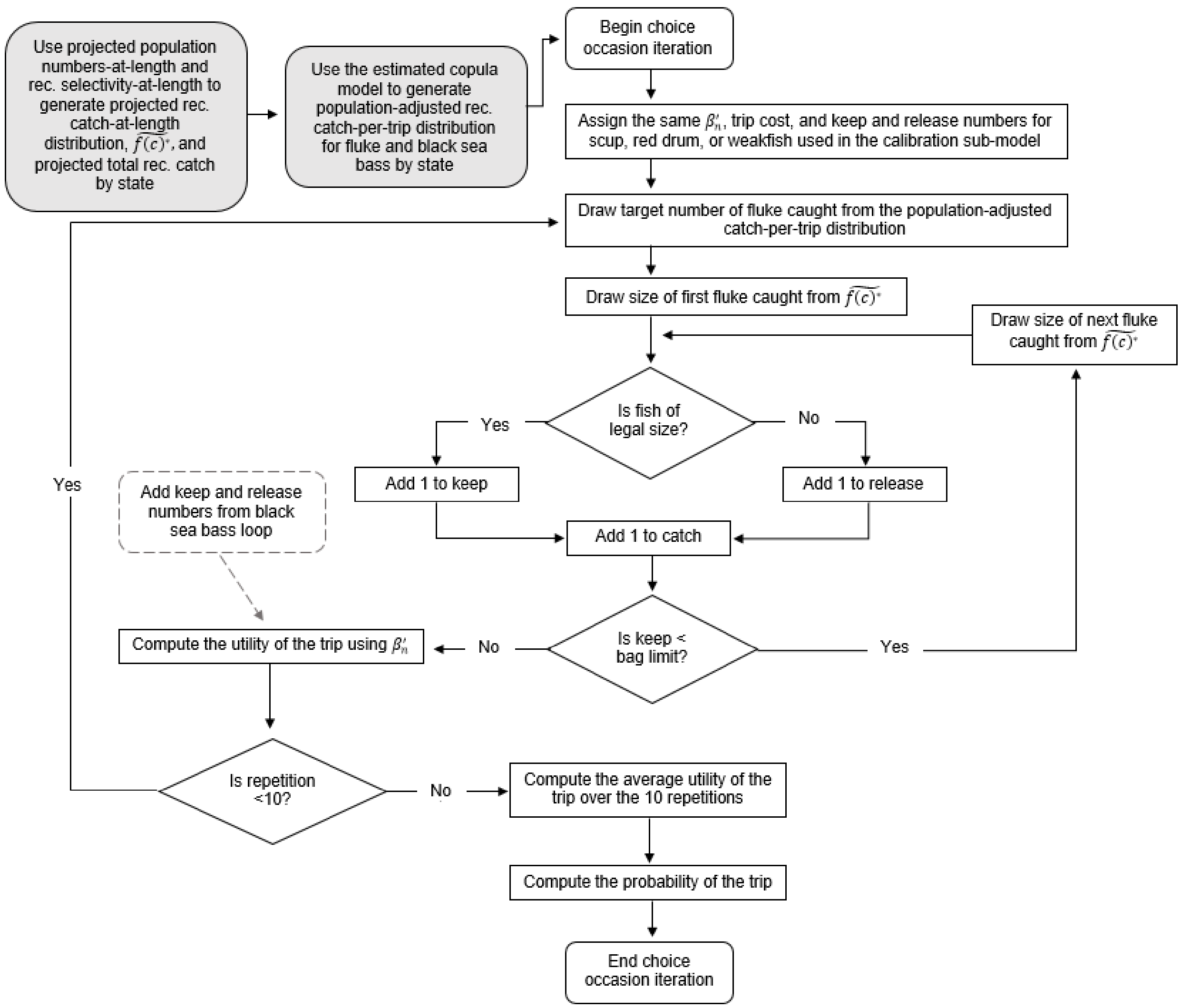


Figure A2. Projection sub-model algorithm. Only the loop for summer flounder is shown in detail.

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: July 28, 2022

To: Council and Board

From: Kiley Dancy, Staff

Subject: Summer Flounder 2023 Specifications

On Tuesday, August 9, the Council and Board will review previously adopted 2023 summer flounder specifications and recommend revisions as needed. Measures to be considered include 2023 commercial and recreational catch and landings limits, as well as any changes to the commercial management measures needed for 2023. As described in the staff memo, previously approved 2023 commercial and recreational catch and landings limits will require revisions based on recent modifications to the commercial/recreational allocation percentages.

Materials listed below are provided for the Council and Board's consideration of this agenda item. As noted below, some materials are behind other tabs, and some will be available on the August 2022 Meeting Page at a later date.

1) Monitoring Committee meeting summary from July 28, 2022

2) July 2022 Scientific and Statistical Committee meeting report *(behind Tab 15)*

3) Staff memo on 2023 summer flounder specifications dated July 14, 2022

4) June 2022 Advisory Panel Fishery Performance Report and additional AP email comments received through July 8, 2021

5) 2022 Summer Flounder Data Update

6) 2022 Summer Flounder Fishery Information Document

The following document is also posted on the August 2022 Meeting Page as a supplemental briefing document:

1) Summer Flounder Management Track Assessment for 2021

Summer Flounder, Scup, and Black Sea Bass Monitoring Committee
Webinar Meeting Summary
July 28, 2022

Monitoring Committee Attendees: Tracey Bauer (ASMFC), Julia Beaty (MAFMC), Peter Clarke (NJ F&W), Dustin Colson Leaning (ASMFC), Kiley Dancy (MAFMC), Lorena de la Garza (NC DMF), Steve Doctor (MD DNR), Alexa Galvan (VMRC), Hannah Hart (MAFMC), Emily Keiley (GARFO), Mike Schmidtke (SAFMC), Rachel Sysak (NY DEC), Mark Terceiro (NEFSC), Corinne Truesdale (RI DEM), Sam Truesdell (MA DMF), Greg Wojcik (CT DEP), Rich Wong (DNREC)

Additional Attendees: John Almeida, Chris Batsavage (Council/Board member), Karson Cisneros (MAFMC), Greg DiDomenico (AP member), Michelle Duval (Council member), James Fletcher (AP member), Sonny Gwin (Council member), Laura Hansen, Dewey Hemilright (Council member), Meghan Lapp, Nichola Meserve (Board member), Adam Nowalsky (Council member), Willow Patten, Mike Waine (AP member)

The Summer Flounder, Scup, and Black Sea Bass Monitoring Committee (MC) met via webinar on Thursday, July 28, 2022 to review previously implemented 2023 commercial and recreational Annual Catch Limits (ACLs), Annual Catch Targets (ACTs), commercial quotas, and recreational harvest limits (RHLs) for summer flounder, scup, and black sea bass. In addition, the MC reviewed commercial management measures for all three species, and the February recreational black sea bass opening, to consider whether changes were needed for 2023. As noted below, after the webinar, additional MC input was provided over email on the February recreational black sea bass fishery and projected recreational black sea bass discards.

Briefing materials considered by the Monitoring Committee are available at: https://www.mafmc.org/council-events/2022/summer-flounder-scup-and-black-sea-bass-monitoring-committee.

Summer Flounder 2023 Specifications

Based on the revised commercial/recreational allocation adopted in December 2021, 2023 ACLs will be derived by a formulaic application of the catch-based allocation to the Acceptable Biological Catch (ABC). Based on the SSC's recommendation to maintain the 33.12 million pound ABC for 2023, the resulting commercial ACL would be 18.21 million pounds and the recreational ACL would be 14.90 million pounds (Table 1).

The MC maintained their previous recommendation to take no deductions from the 2023 commercial or recreational ACLs to ACTs to account for management uncertainty. The MC agreed with the rationale in the staff memo, including that the commercial fishery is well controlled with in-season closure authority and commercial discard overages observed in 2017-2018 are less of a concern under higher quotas since mid-2019. Recreational harvest relative to the RHL has been variable in recent years but was well below the RHL in 2021. The recreational ACL has not been exceeded in recent years for which there is catch data (dead discard data are currently not available for 2020 or 2021).

The MC agreed with the staff recommendation to maintain the current method of projecting 2023 dead discards for each sector. Projected dead discards are subtracted from the sector ACTs to arrive at the commercial quota and RHL. Under this method, total expected discards are estimated from the ABC projections received from the Northeast Fisheries Science Center (NEFSC) and apportioned to the commercial and recreational fisheries based on a 3-year moving average of dead discards by sector. In this case, 2017-2019 dead discard data indicate that 41% of dead discards came from the commercial sector and 59% from the recreational sector. This remains the most recent 3-year period of available dead discards estimates in weight. One MC member asked if an alternative method of instead applying the revised allocation percentages (55% commercial/45% recreational) to total projected discards warranted consideration. Ultimately the MC agreed it was preferable to use more recent years of data to better capture recent trends in the proportion of discards by sector as the allocations are based on data from 1981-1989. Because the 2023 projection of total discards was not revised, maintaining the existing method results in the same quantity of expected discards for each sector in 2023 as the previously adopted specifications.

Removing projected dead discards from the MC recommended sector ACTs results in a commercial quota of 15.27 million pounds and an RHL of 10.62 million pounds (Table 1). Compared to the previously adopted 2022-2023 limits, the commercial quota would decrease by 2% and the RHL would increase by 3%.

The MC agreed with the staff recommendation that no changes be made to the Fishery Management Plan requirements for commercial minimum fish size (14-inch total length), commercial gear requirements, and mesh size exemption programs for 2023. However, the MC continues to support further analysis and future consideration of modifications for several issues related to the mesh size regulations and exemptions, as described in the July 14, 2022 staff memo for summer flounder. These issues have been discussed over the past several years, but additional evaluation has been identified as a lower priority by the Council and Board given other ongoing management actions and priorities.

Table 1: Previously approved 2022-2023 catch and landings limits for summer flounder as well as MC recommended revisions for 2023. Italicized text indicates a change in methodology for calculating the associated measure.

	2022-2023		Basis	2023 MC Rec.		Basis
Measure	**mil lb**	**mt**		**mil lb**	**mt**	
OFL	36.28 (2022) 34.98 (2023)	16,458 (2022) 15,865 (2023)	Stock assessment projections	34.98	15,865	Stock assessment projections
ABC	33.12	15,021	July 2021 SSC recommendation	33.12	15,021	July 2022 SSC recommendation (no changes to previous ABC)
ABC landings	25.89	11,743	ABC projections provided by the NEFSC; averaged 2022-2023 expected landings	NA	NA	Not needed under new catch-based allocation
ABC dead discards	7.23	3,279	ABC projections provided by the NEFSC; averaged 2022-2023	7.23	3,279	Same basis as previously approved.
Com. ACL	18.48	8,382	60% of ABC landings portion (current FMP allocation) + expected comm. dead discards	18.21	8,262	*55% of ABC (revised commercial allocation)*
Com. ACT	18.48	8,382	No deduction from ACL for management uncertainty	18.21	8,262	Same basis as previously approved.
Expected com. dead discards	2.95	1,336	59% of ABC dead discards portion, based on 2017-2019 average % dead discards by sector	2.95	1,336	Same basis as previously approved.
Com. quota	15.53	7,046	Comm. ACT, minus expected comm. dead discards	15.27	6,925	Same basis as previously approved.
Rec. ACL	14.64	6,639	40% of ABC landings portion (FMP allocation) + expected rec. dead discards	14.90	6,759	*45% of ABC (revised recreational allocation)*
Rec. ACT	14.64	6,639	No deduction from ACL for management uncertainty	14.90	6,759	Same basis as previously approved.
Expected rec. dead discards	4.28	1,942	59% of ABC dead discards portion, based on 2017-2019 average % dead discards by sector	4.28	1,942	Same basis as previously approved.
RHL	10.36	4,697	Rec. ACT minus expected rec. dead discards	10.62	4,817	Same basis as previously approved.

Scup 2022-2023 Specifications

The MC agreed with the staff recommendation for 2023 ACLs, ACTs, and landings limits based on the SSC's ABC recommendations to maintain the previously adopted 2023 ABC (Table 2). The recommendations for commercial and recreational ACLs reflect the revisions to the commercial/recreational allocation adopted in December 2021.

The MC maintained their previous recommendation to take no deductions from the 2023 commercial or recreational ACLs to ACTs to account for management uncertainty. The MC agreed with the rationale presented by staff, including that the commercial fishery is well monitored and can be controlled by in-season closures if needed. They also agreed that since commercial quota and commercial/recreational ACL overages are historically uncommon for this fishery adding a management uncertainty buffer was not necessary at this time. More restrictive recreational measures were put in place with the goal of preventing a 2022 RHL overage and an updated management track assessment is expected in 2023. Additionally, it is currently unknown if a reduction or liberalization compared to 2022 will be needed under the Recreational Harvest Control Rule Framework/Addenda Percent Change Approach, approved for use starting with 2023 recreational measures. For these reasons, the MC agreed that adding a management uncertainty buffer for the recreational sector does not seem necessary

The MC agreed with the staff recommendation to maintain the current method of projecting 2023 dead discards for each sector. The current method of projecting dead discards is the same method described above under summer flounder. Under this approach, using the most recent 3 years of discard data available, 2017-2019, 82.6% of total projected 2023 discards would be subtracted from the commercial ACT and 17.4% from the recreational ACT, resulting in the commercial quota and RHL shown in Table 2.

The MC recommended no changes to commercial measures which can be modified through specifications (Winter I and II possession limits, commercial minimum fish size, and commercial gear requirements) for 2023. The MC agreed because there is no new information and the lengthy discussion concerning commercial regulations last year, no changes are needed at this time. However, as described in the section above for summer flounder, the MC agrees further analysis and future consideration of modifications for several mesh size regulations and exemptions should be a conducted in a future year.

Public Comments

An AP member requested the MC to recommend decreasing the recreational size limit in state waters coast wide or move to a total length limit to increase angler satisfaction and reduce discard mortality.

A Council member also questioned at what point a percentage is deducted for management uncertainty and where that percentage is derived from. The Council member was curious as to why that buffer can be so variable from species to species and why the process differs between the different councils.

Table 2: Previously adopted 2022-2023 scup catch and landings limits as well as 2023 MC recommended changes. Italicized text indicates a change in methodology for calculating the associated measure.

Mgmt. measure	Previously adopted					MC recommendation		
	2022-2023				Basis	2023		Basis
	mil lbs.	mt	mil lbs.	mt		mil lbs.	mt	
OFL	32.56	14,770	30.09	13,648	Assessment projections	30.09	13,648	Same basis as previously approved.
ABC	32.11	14,566	29.67	13,460	Assessment projections & risk policy	29.67	13,460	Same basis as previously approved.
ABC discards	5.65	2,564	6.39	2,900	Assessment projections	6.39	2,900	Same basis as previously approved.
Com. ACL	25.05	11,361	23.15	10,499	78% of ABC	19.29	8,749	*65% of ABC (new commercial allocation)*
Com. ACT	25.05	11,361	23.15	10,499	Set equal to com. ACL; no deduction for management uncertainty	19.29	8,749	Same basis as previously approved.
Projected com. discards	4.67	2,117	5.28	2,394	82.6% of ABC discards (avg. % of dead discards from commercial fishery, 2017-2019)	5.28	2,394	Same basis as previously approved.
Com. quota	20.38	9,245	17.87	8,105	Commercial ACT minus projected commercial discards	14.01	6,355	Same basis as previously approved.
Rec. ACL	7.06	3,205	6.53	2,961	22% of ABC	10.39	4,711	*35% of ABC (new recreational allocation)*
Rec. ACT	7.06	3,205	6.53	2,961	Set equal to recreational ACL; no deduction for management uncertainty	10.39	4,711	Same basis as previously approved.
Projected rec. discards	0.99	447	1.12	506	17.4% of the ABC discards (avg. % of dead discards from rec. fishery, 2017-2019)	1.12	506	Same basis as previously approved.
RHL	6.08	2,757	5.41	2,455	Recreational ACT minus projected recreational discards	9.27	4,205	Same basis as previously approved.

Black Sea Bass 2023 Specifications

Summary

The MC agreed by consensus with the staff recommendations for 2023 black sea bass ACLs, ACTs, commercial discards projections, and commercial measures. The MC did not reach consensus on the recommended approach to 2023 projected recreational discards. As described in more detail below, **seven MC members supported the staff recommendation for recreational projected dead discards and five MC members supported the prior years' method.**

The MC agreed that further discussion was warranted regarding the February recreational fishery. After the webinar meeting, a sub-group of the MC continued to further discuss the February recreational fishery to help determine the best path forward. Their recommended approach is described below and was approved by the full MC over email.

The 2023 commercial and recreational catch and landings limits recommended by the MC are shown in Table 3.

Management Uncertainty

For similar reasons as described above for summer flounder and scup, the MC recommended no management uncertainty buffer in either sector for 2023.

Projected Dead Discards

For 2021-2022 specifications, black sea bass projected dead discards were calculated based on an assumption that dead discards as a proportion of total dead catch in each sector would be equal to the average sector-specific proportions during the most recent three years of available data. This method differs from that used for summer flounder and scup in that it is not informed by ABC projections provided by the NEFSC as those projections are not available for black sea bass. In addition, it starts with sector-specific assumptions, rather than dividing total projected dead discards into sector-specific amounts based on recent proportions. This method could be adapted for 2023 specifications under the revised catch-based allocation by applying the 3-year average proportion of dead discards in each sector to the respective ACLs. As previously stated, 2019 is the most recent year for which dead discard estimates are currently available.

The MC agreed that no change is needed to the dead discard projection methodology for the commercial sector for 2023. They had a lengthy discussion on the best method for projecting 2023 recreational dead discards. Some of this discussion continued over email. Ultimately, **seven MC members supported the staff recommendation of using a simple three-year average of recreational dead discards (i.e., 3.04 million pounds) and five MC members supported using the 2021-2022 method (i.e., 2.14 million pounds)**. Multiple Council and Commission staff are members of the MC. They agreed that for the purposes of voting, all Council staff would count as one vote and Commission staff would count as one vote.

One complication of comparing these two methods is that the 2021-2022 method was not reproduced for years prior to 2021 as it requires complex calculations due to the previous landings-based allocation. Given that discard estimates for 2020-2021 are not yet available, it is not yet possible to predict how well this method predicted discards.

Several MC members who supported the simple three-year average for the recreational fishery noted that the resulting value is more in line with recreational discard estimates through 2019 than the value resulting from the 2021-2022 method. One MC member said this is likely because the three-year average approach does not require an assumption that recreational dead catch will be equal to the ACL. This assumption can lead to underestimation of discards because the ACL has been exceeded for several years in a row. One MC member expressed concern that continued underestimation of discards could contribute to continued ACL overages. It is currently unknown how catch will compare to the ACL under the Recreational Harvest Control Rule Percent Change Approach, which will be used to set the bag, size, and season limits for 2023. However, under the Percent Change Approach, measures will not be tied as closely to an RHL (or, by extension, an ACL) as in previous years.

One MC member also noted that, although we don't have recent data, we also don't have information to suggest that discards decreased below 2015-2019 levels (Figure 1). However, one MC member noted that the black sea bass RHL increased by 59% and 73% in 2020 and 2021 relative to the 2019 RHL. This could have resulted in reduced discards.

One MC member noted that a rough estimate of 2020 recreational dead discards in weight using the average weight of discarded fish results in about 3 million pounds of recreational dead discards, which is similar to the 2017-2019 average.

Of the five MC members who supported use of the 2021-2022 method for both sectors, three noted similarities with the approach used for summer flounder and scup and supported consistency across species and sectors. Two MC members expressed concern about the lack of information to assess how accurately the 2021-2022 approach projected discards. Therefore, although it appears that this method may underestimate discards, we cannot know for sure how well it predicted 2021-2022 discards based on information currently available. Two MC members expressed support for maintaining the current approach for one more year because by this time next year, three additional years of data will be available through a management track assessment and these data will allow for evaluation of the performance of this approach. One MC member also expressed concern that over-estimating discards can create a negative feedback loop by leading to more restrictive measures, which can in turn increase discards.

Three MC members said they would not be opposed to averaging the two approaches described above, especially if it allowed the MC to reach consensus. However, no other MC members supported this and most continued to support one of the two approaches described above.

Commercial Management Measures

The MC agreed that no changes are needed to the commercial measures which can be modified through specifications (possession limits, including those triggering the minimum mesh requirements, gear restrictions, and minimum fish size) for 2023.

February Recreational Opening

Starting in 2018, the Council and Commission provided states the opportunity to open their recreational black sea bass fisheries during the month of February under specific conditions, as described in more detail in the July 14, 2022 staff memo for black sea bass.

Starting with the 2022 recreational measures, the Council and Board will now make an annual decision to either waive the federal waters recreational measures for black sea bass in favor of the state waters measures, or implement one set of coastwide measures which would be applied uniformly in all states and federal waters. This approach poses challenges for the February recreational opening because under the current process, states participating in the February opening would be held to the coastwide measures during February, even when those measures are waived as “non-preferred coastwide measures.” This is due to the typical timing of rulemaking for waiving federal waters measures. Federal measures cannot remain waived from one year to the next.

Virginia participated in the optional February opening during 2018-2021 and expressed an interested in participating in 2023. However, the MC representative from Virginia said the current non-preferred coastwide measures may be too restrictive for their recreational fishery stakeholders to see the benefits of the February opening. The MC has been very supportive of the Virginia monitoring program for the February fishery. Participating captains or operators of each vessel must have a permit that is specific to this February opening, must hail to the Virginia Marine Resources Commission’s Marine Police Operations station prior to or just after the start of each trip, and must report the number of anglers and number of kept and released black sea bass for every trip. This information is used to adjust measures in Virginia later in the year to account for February harvest. The MC agreed that under this same program, it should not be a problem for Virginia to open their season during the month of February with measures that are more liberal than the current non-preferred coastwide measures as all harvest will be accounted for when adjusting measures later in the year.

During the MC meeting, the group could not determine the best path forward to address the challenges posed by the non-preferred coastwide measures. A subset of the MC continued these discussions after the meeting and put forward a proposal to use the specifications process to clarify that **vessels landing black sea bass in a state with an approved Wave 1 recreational fishery are subject to the state regulations during that Wave 1 fishery**. This differs from the current process in that states with an approved February fishery would not need to match the federal waters measures. The full MC approved this recommendation over email.

The Commission’s Technical Committee will still review all state proposals for February recreational openings and those proposals would need to be approved by the Board. It is not anticipated that other states besides Virginia will participate in 2023; however, if they do, the MC recommends use of a monitoring approach similar to that used by Virginia.

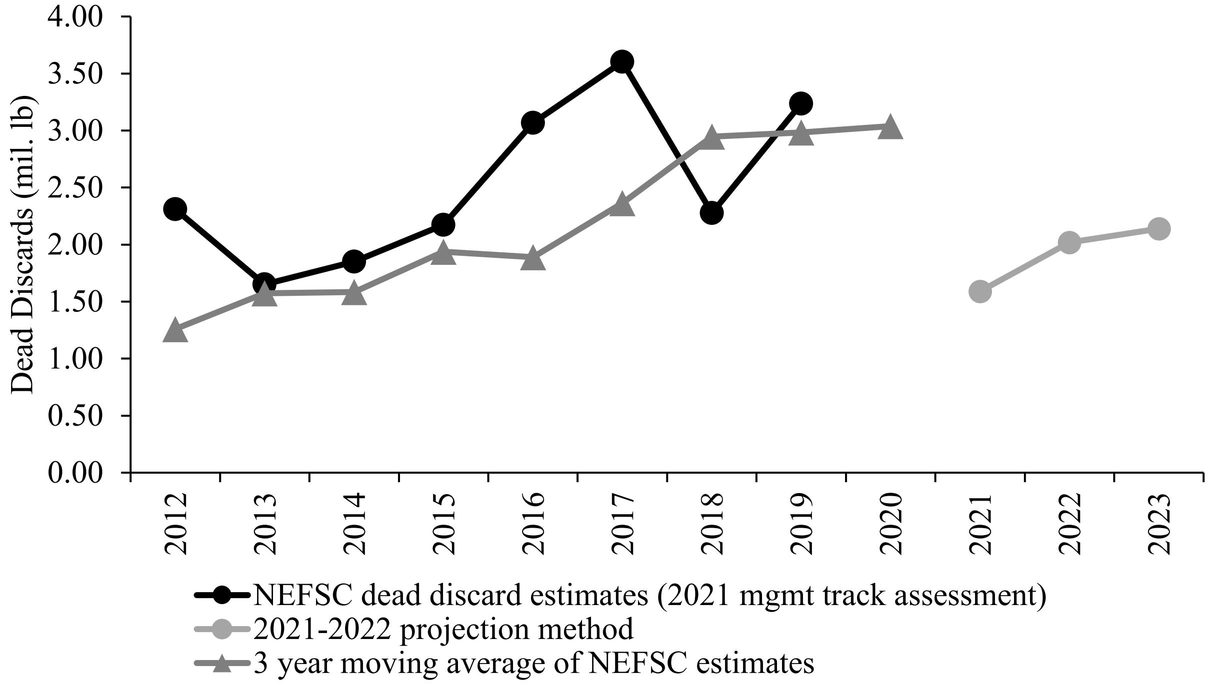


Figure 1: Black sea bass recreational dead discard estimates from the 2021 management track assessment (only available through 2019), compared to a three-year moving average of those estimates and the 2021-2022 method for projecting recreational dead discards.

Table 3: Previously approved 2022-2023 catch and landings limits for black sea bass as well as MC recommended revisions for 2023. Italicized text indicates a change in methodology for calculating the associated measure. See note above about the lack of MC consensus on the projected recreational discard estimate.

Measure	**Previously Approved**					**MC Recommended Revisions**		
	2022		**2023**		**Basis**	**2023**		
	mil lb	**mt**	**mil lb**	**mt**		**mil lb**	**mt**	**Basis**
OFL	19.26	8,735	17.01	7,716	SSC recommendation.	17.01	7,716	Same basis as previously approved.
ABC	18.86	8,555	16.66	7,557	SSC recommendation.	16.66	7,557	Same basis as previously approved.
ABC landings	13.20	5,990	11.66	5,291	ABC - expected com. and rec. dead discards	NA	NA	Not needed under new catch-based allocation.
Com. ACL	10.10	4,583	8.93	4,048	49% of ABC landings portion (com. allocation) + expected com. disc.	7.50	3,401	*45% of ABC (commercial allocation)*
Com. ACT	10.10	4,583	8.93	4,048	Equal to the ACL; no deduction for management uncertainty	7.50	3,401	Same basis as previously approved.
Expected com. dead discards	3.63	1,649	3.21	1,456	Com. dead disc. = 36% of com. catch (2017-2019 avg.)	2.70	1,224	Same basis as previously approved but accounting for allocation change.
Com. quota	6.47	2,934	5.71	2,592	Com. ACT minus expected com. dead discards	4.80	2,177	Same basis as previously approved.
Rec. ACL	8.76	3,972	7.74	3,509	51% of ABC landings portion (rec. allocation) + expected rec. disc.	9.16	4,156	*55% of ABC (recreational allocation)*
Rec. ACT	8.76	3,972	7.74	3,509	Equal to the ACL; no deduction for management uncertainty	9.16	4,156	Same basis as previously approved.
Expected rec. dead discards	2.02	917	1.79	810	Rec. dead disc. = 23% of rec. catch (2017-2019 avg)	3.04	1,378	*Three-year avg. of most recent discard estimates available (2017-2019)*
RHL	6.74	3,055	5.95	2,699	Rec. ACT minus expected rec. dead discards	6.12	2,778	Same basis as previously approved.

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: July 14, 2022

TO: Chris Moore, Executive Director

FROM: Kiley Dancy, Staff

SUBJECT: Summer Flounder Specifications for 2023

Executive Summary

This memorandum includes information to assist the Mid-Atlantic Fishery Management Council's (Council's) Scientific and Statistical Committee (SSC) and Monitoring Committee (MC) in reviewing the previously adopted 2023 catch and landings limits for summer flounder, as well as summer flounder commercial management measures for 2023. Additional information on fishery performance and past management measures can be found in the 2022 Summer Flounder Fishery Information Document and the 2022 Summer Flounder, Scup, and Black Sea Bass Fishery Performance Report developed by advisors.[1]

The Magnuson-Stevens Act requires the Council's SSC to provide ongoing scientific advice for fishery management decisions, including recommendations for Acceptable Biological Catch limits (ABCs), preventing overfishing, and achieving maximum sustainable yield. The Council's catch limit recommendations for the upcoming fishing year(s) cannot exceed the ABC recommendation of the SSC.

The 2021 stock assessment update indicated that the summer flounder stock was not overfished and overfishing was not occurring in 2019. In July 2021, the SSC provided recommendations for both varying and averaged two-year ABCs for 2022-2023 based on a management track stock assessment for summer flounder using data through 2019.[2]

In August 2021, the Council and the Atlantic States Marine Fisheries Commission's (Commission's) Summer Flounder, Scup, and Black Sea Bass Board (Board) approved constant catch and landings limits for 2022-2023 based on the two-year averaging approach. The final 2022 specifications and projected 2023 specifications were published in the Federal Register on December 23, 2021 (86 FR 72859).

[1] Available at: https://www.mafmc.org/fishery-performance-reports.
[2] Available at https://apps-nefsc.fisheries.noaa.gov/saw/sasi/uploads/2021_summer_flounder_MTA_report.pdf.

The SSC should review the previously adopted 2023 ABC to consider if changes are needed. Staff recommend no changes to the 2023 ABC of 33.12 million pounds (15,021 mt) as there is no new information to suggest a change is needed.

Following the SSC's consideration of the 2023 ABC, the Monitoring Committee should review previously adopted 2023 sector specific catch and landings limits including the commercial and recreational Annual Catch Limits (ACLs) and Annual Catch Targets (ACTs), commercial quota, and recreational harvest limit (RHL) (Table 1). These values will require revisions based on modifications to the commercial/recreational allocation percentages approved by the Council and Board in December 2021 and pending implementation for 2023. The staff recommendations for revised 2023 sector specific limits are described in more detail in the "Sector-Specific Catch and Landings Limits" section of this memo and are summarized in Table 1.

The Monitoring Committee should also consider whether any revisions are needed to the commercial management measures which can be modified through the annual specifications process (minimum fish size, minimum mesh size, and mesh exemption programs). Recreational measures for 2023 will be considered later in 2022. Staff recommend no changes to the commercial minimum size, minimum mesh size, or mesh exemption programs for 2023. As described below in the "Commercial Management Measures" section, staff continue to recommend further evaluation of potential changes to the commercial minimum mesh size and exemption programs in a future year, likely following the development of other ongoing actions for this Fishery Management Plan (FMP) given limited current staff capacity.

Table 1: Previously approved 2022-2023 catch and landings limits for summer flounder as well as staff recommended revisions for 2023. The final 2023 values may differ based on the recommendations of the SSC, Monitoring Committee, Council, and Board. *(Revised 7/27/22 to correct error in 2022-2023 commercial discards)*

	2022-2023		**Basis**	**2023 Staff Rec.**		**Basis**
Measure	**mil lb**	**mt**		**mil lb**	**mt**	
OFL	36.28 (2022) 34.98 (2023)	16,458 (2022) 15,865 (2023)	Stock assessment projections	34.98	15,865	Stock assessment projections
ABC	33.12	15,021	July 2021 SSC recommendation	33.12	15,021	July 2021 SSC recommendation (staff rec. no changes to previous ABC)
ABC landings	25.89	11,743	ABC projections provided by the NEFSC; averaged 2022-2023 expected landings	NA	NA	Not needed under new catch-based allocation
ABC dead discards	7.23	3,279	ABC projections provided by the NEFSC; averaged 2022-2023	7.23	3,279	Same basis as previously approved.
Com. ACL	18.48	8,382	60% of ABC landings portion (current FMP allocation) + expected comm. dead discards	18.21	8,262	55% of ABC (revised commercial allocation)
Com. ACT	18.48	8,382	No deduction from ACL for management uncertainty	18.21	8,262	Staff rec: Same basis as previously approved.
Expected com. dead discards	2.95	1,336	59% of ABC dead discards portion, based on 2017-2019 average % dead discards by sector	2.95	1,336	Staff rec: Same basis as previously approved.
Com. quota	15.53	7,046	Comm. ACT, minus expected comm. dead discards	15.27	6,925	Same basis as previously approved.
Rec. ACL	14.64	6,639	40% of ABC landings portion (FMP allocation) + expected rec. dead discards	14.90	6,759	45% of ABC (revised recreational allocation)
Rec. ACT	14.64	6,639	No deduction from ACL for management uncertainty	14.90	6,759	Staff rec: Same basis as previously approved.
Expected rec. dead discards	4.28	1,942	59% of ABC dead discards portion, based on 2017-2019 average % dead discards by sector	4.28	1,942	Staff rec: Same basis as previously approved.
RHL	10.36	4,697	Rec. ACT minus expected rec. dead discards	10.62	4,817	Same basis as previously approved.

Stock Status and Biological Reference Points

In June 2021, the Northeast Fisheries Science Center (NEFSC) provided a management track assessment for summer flounder with data through 2019, based on and update to the model developed through the 66th Stock Assessment Workshop/Stock Assessment Review Committee (SAW/SARC) in 2018.

The 2021 management track assessment update made minor revisions to the biological reference points for spawning stock biomass and fishing mortality. The 2021 management track assessment results indicated that the summer flounder stock was not overfished and overfishing was not occurring in 2019. SSB has generally decreased since 2003 and was estimated to be 104.49 million lb (47,397 mt) in 2019, about 86% of the updated biomass target reference point $SSB_{MSY\ proxy}$ = 121.73 million lb (55,217 mt). This estimate is 72% above the overfished threshold of ½ $SSB_{MSY\ proxy}$ = ½ $SSB_{35\%}$ = 60.87 million lb (27,609 mt; Figure 1; Table 2). There is a 90% chance that SSB in 2019 was between 42,000 and 54,000 mt.

Fishing mortality on the fully selected age 4 fish ranged between 0.744 and 1.622 during 1982-1996 and then decreased to 0.245 in 2007. Since 2007 the fishing mortality rate (F) has increased, and in 2019 was estimated at 0.340, 81% of the updated fishing mortality threshold reference point ($F_{MSY\ proxy} = F_{35\%}$ = 0.422; Figure 2; Table 2). There is a 90% probability that the fishing mortality rate in 2019 was between 0.280 and 0.396.

The average recruitment from 1982 to 2019 is 53 million fish at age 0. Recruitment of juvenile summer flounder was below-average from 2011-2017, ranging from 31 to 45 million fish and averaging 36 million fish. The driving factors behind this period of below average recruitment have not been identified. The 2018 year class is above average at an estimated 61 million fish, which is largest recruitment estimate since 2009, while the 2019 year class is below average at 49 million fish.

A data update provided by the NEFSC in July 2022 indicates that the NEFSC spring survey index of summer flounder stock biomass decreased by 41% from 2019 to 2022, and the fall index increased by 6% from 2019 to 2021. No surveys were conducted in 2020. The NEFSC fall survey length frequency distributions support the conclusion that an above average year class recruited to the stock in 2018 with average to below average recruitment since.[3]

The Northeast Regional Coordinating Council (NRCC)'s stock assessment process[4] now has summer flounder receiving management track assessments every two years. The next management track assessment is expected in 2023 to inform 2024-2025 limits.

[3] Summer Flounder Data Update for 2022 provided by the Northeast Fisheries Science Center. Available at https://www.mafmc.org/ssc-meetings/2022/july-25-26

[4] http://www.mafmc.org/s/Stock-assessment-process-FINAL.pdf.

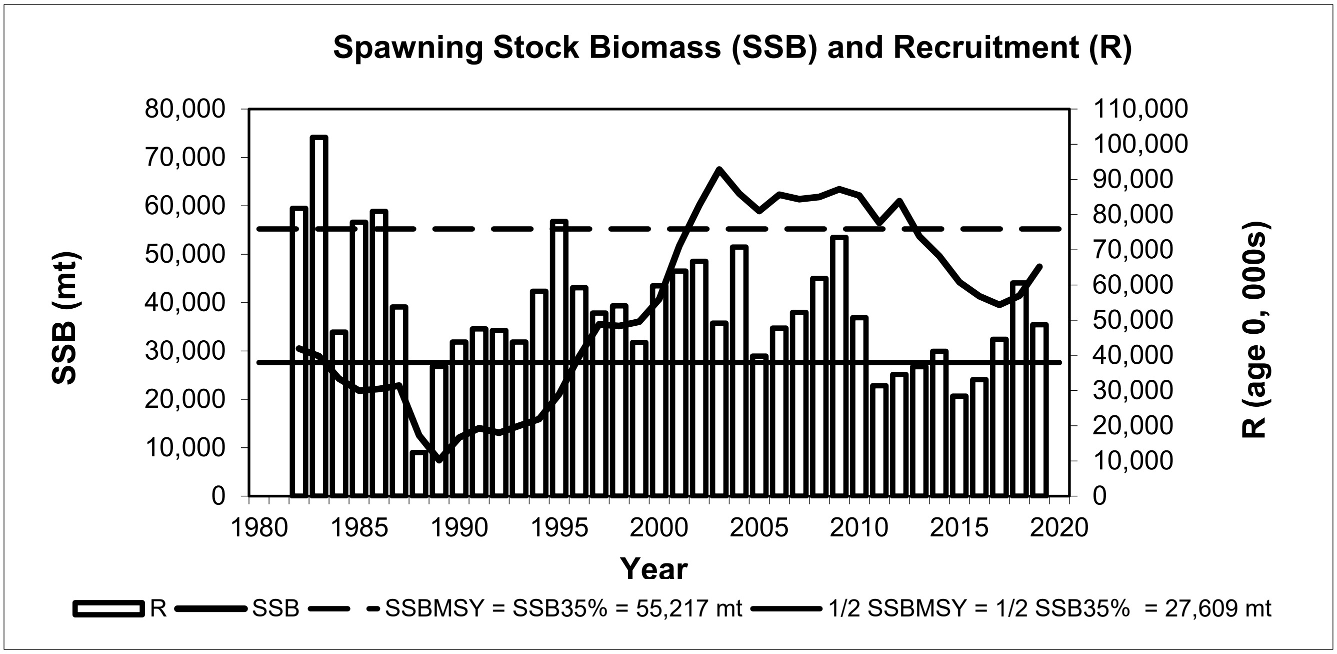


Figure 1: Summer flounder spawning stock biomass (SSB; solid line) and recruitment at age 0 (R; vertical bars),1982-2019. The horizontal dashed line is the updated target biomass reference point. The horizontal solid line is the updated threshold biomass reference point. Source: 2021 management track assessment.

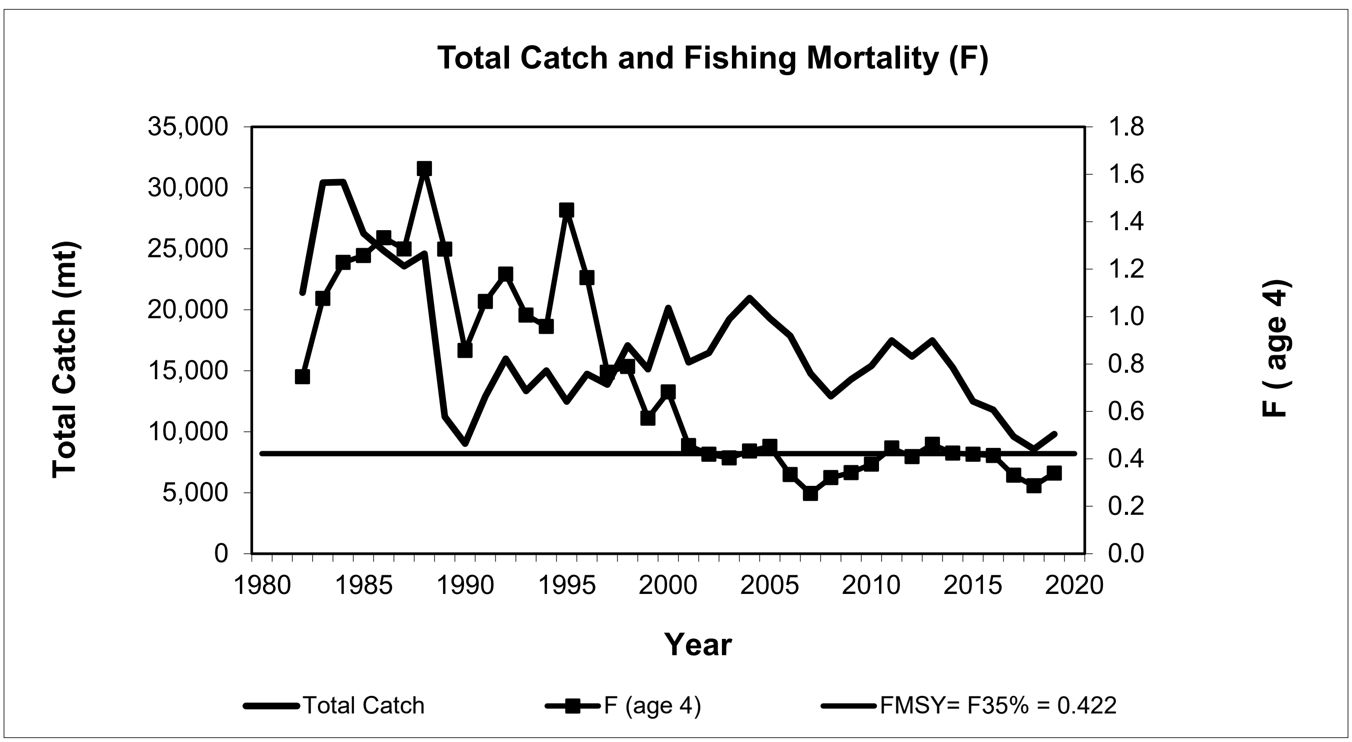


Figure 2: Total fishery catch (metric tons; mt; solid line) and fully-recruited fishing mortality (F, peak at age 4; squares) of summer flounder, 1982-2019. The horizontal solid line is the updated fishing mortality reference point. Source: 2021 management track assessment.

Table 2: Biomass and fishing mortality rate reference points and terminal year estimates for summer flounder from the 2021 management track assessment.

	Spawning stock biomass	Fishing mortality rate (F)
Terminal year estimate (2019)	104.49 million lb (47,397 mt)	0.340
Target	121.73 mil lb (55,217 mt)	N/A
Threshold	60.87 million lb (27,609 mt)	0.422
Status	**Not overfished**	**Not overfishing**

<u>Recent Catch and Fishery Performance</u>

Commercial landings in 2021 were approximately 10.36 million pounds (4,699 mt), about 83% of the commercial quota of 12.49 million pounds (5,663 mt). Commercial dead discard estimates are not currently available for 2021 due to delays in observer data processing for 2021. As such, it is not currently possible to evaluate 2021 commercial catch against the commercial ACL.

The recreational harvest was estimated at approximately 6.82 million pounds (3,093 mt) in 2021, about 82% of the 2021 RHL of 8.32 million pounds. This is the second lowest estimate of recreational harvest in the time series going back to 1981, with the lowest being 5.66 million pounds harvested in 1989. Recreational dead discard estimates in weight are not yet available for 2021.

The commercial fishery has underharvested their quota since 2018 (Table 3). The larger underages since 2019 (18-21%) are likely due in large part to a substantial increase in quota starting in mid-2019, with possible additional influence from market factors related to COVID-19. Performance of commercial dead discards relative to projected discard levels has been variable, with 2017 and 2018 seeing higher than expected discards, leading to ACL overages (19% and 8% ACL overages in 2017 and 2018, respectively). In those years, commercial ACLs were well below average, and it is likely that discard projections did not include appropriate consideration for the effects of below average landings limits. In 2019, commercial catch was 20% below the ACL. There are no discard estimates currently available to evaluate total commercial catch in 2020 or 2021, but given the performance of landings relative to the quota, it is unlikely that ACLs were exceeded in these years (Table 3).

Recreational fishery performance relative to RHLs through 2018 cannot be evaluated using the revised MRIP data, since past RHLs were set based on assessments that used the old data. A performance evaluation for 2012-2021 using old or new MRIP data, depending on the year, is provided in Table 4. Recreational performance has been variable relative to the RHLs given the difficulty in forecasting recreational effort and catch rates in any given year, as well as the lack of timely in-season data and in-season closure authority for the recreational fishery. Recreational harvest has been below the RHL in three of the last five years (2017 and 2018). In 2021, harvest was estimated to be 6.82 million pounds, the second lowest harvest estimate in the time series going back to 1981, and 18% below the 2021 RHL of 8.32 million pounds. Recreational catch has generally been below the recreational ACL since 2012 (calculated in old MRIP units through 2018), with the exception of 4% and 12% overages in 2014 and 2016, respectively (Table 4).

Table 3: Summer flounder commercial landings, dead discards, and dead catch compared to the commercial quota, projected commercial dead discards, and commercial ACL, 2012-2021. ACLs for summer flounder were first used starting in 2012. All values are in millions of pounds.

Year	Com. Landings [a]	Com. quota[c]	Quota overage/ underage	Com. dead discards [a,b]	Projected com. dead discards [c]	Projected dead discards overage/underage	Com. dead catch [a,b]	ACL	ACL overage/ underage[b]
2012	13.05	13.14	**-1%**	1.66	0.46	**261%**	14.71	14.00	**5%**
2013	12.56	11.44	**10%**	1.90	0.33	**477%**	14.46	12.11	**19%**
2014	11.00	10.51	**5%**	1.83	2.03	**-10%**	12.83	12.87	**0%**
2015	10.71	11.07	**-3%**	1.55	2.27	**-32%**	12.26	13.34	**-8%**
2016	7.80	8.12	**-4%**	1.70	1.31	**30%**	9.50	9.43	**1%**
2017	5.83	5.66	**3%**	2.00	0.92	**117%**	7.83	6.57	**19%**
2018	6.14	6.63	**-7%**	2.20	1.07	**105%**	8.34	7.70	**8%**
2019	9.05	10.98	**-18%**	1.73	2.00	**-14%**	10.79	13.53	**-20%**
2020	9.11	11.53	**-21%**	--	2.00	**--**	--	13.53	**--**
2021	10.36	12.49	**-17%**	--	2.14	**--**	--	18.48	**--**

[a] Based on NEFSC data provided in 2021 management track assessment (data through 2019) and 2022 data update (2020 and 2021 values).
[b] Dead discards for 2020 and 2021 are not yet available.
[c] From past staff memos, specifications documents, and *Federal Register* notices. The commercial quotas shown for 2012-2014 reflect a 3% deduction for Research Set Aside (RSA).

Table 4: Summer flounder recreational landings, dead discards, and dead catch compared to the RHL, projected recreational dead discards, and recreational ACL, 2012-2021. ACLs for summer flounder were first used starting in 2012. Values are provided in the "old" and "new" MRIP units where available as the ACLs and RHLs did not account for the revised MRIP data until 2019. Therefore, overage/underage evaluations must be based in the old MRIP units through 2018 and the new MRIP units starting in 2019. Old MRIP values and performance calculations are highlighted with italics. All values are in millions of pounds.

Year	Rec. land. OLD MRIP[a]	Rec. land. NEW MRIP[c]	RHL[e]	RHL over/ under[d]	Rec. dead disc. old MRIP units[a,b]	Rec. dead disc. new MRIP units[b]	Proj. rec. dead disc.[e]	Projected dead disc. over/under[c]	Rec. dead catch OLD MRIP[a]	Rec. dead catch NEW MRIP[c,d]	Rec ACL	Rec ACL over/ under[d]
2012	*6.49*	16.13	8.76	***-26%***	*1.80*	4.79	2.55	***-30%***	8.29	20.92	11.58	***-28%***
2013	*7.36*	19.41	7.63	***-4%***	*1.67*	4.67	2.37	***-29%***	9.03	24.08	10.23	***-12%***
2014	*7.39*	16.23	7.01	***5%***	*2.05*	4.61	1.84	***12%***	9.44	20.84	9.07	***4%***
2015	*4.72*	11.83	7.38	***-36%***	*1.24*	3.47	2.06	***-40%***	5.96	15.30	9.44	***-37%***
2016	*6.18*	13.24	5.42	***14%***	*1.48*	3.27	1.41	***5%***	7.66	16.51	6.84	***12%***
2017	*3.19*	10.09	3.77	***-15%***	*0.94*	3.30	0.95	***-1%***	4.13	13.39	4.72	***-13%***
2018	*3.35*	7.60	4.42	***-24%***	*0.97*	2.21	1.11	***-13%***	4.32	9.81	5.53	***-22%***
2019	NA	7.80	7.69	**1%**	NA	3.04	3.82	**-20%**	NA	10.84	11.51	**-6%**
2020	NA	10.06	7.69	**31%**	NA	--	3.82	**--**	NA	--	11.51	**--**
2021	NA	6.82	8.32	**-18%**	NA	--	4.16	**--**	NA	--	12.48	**--**

[a] Based on the data update provided by the NEFSC in 2018 (most recent data from NEFSC in "old" MRIP units). Values for 2018 provided by GARFO.

[b] Dead discards for 2020 and 2021 are not yet available due to data issues associated with COVID-19 and delays in processing commercial observer data.

[c] Based on NEFSC data as provided in 2021 management track assessment (data through 2019) and 2022 data update (2020 and 2021 values).

[d] Based on a comparison with old MRIP data through 2018 and new MRIP data starting in 2019.

[e] From past staff memos, specifications documents, and *Federal Register* notices. The RHLs shown for 2012-2014 reflect a 3% deduction for Research Set Aside (RSA).

The 2022 commercial landings as of July 6, 2022, indicate that 39% of the 2022 coastwide commercial quota has been landed.[5] As of this memo, recreational harvest estimates for 2022 are only available through wave 2 (March/April), which does not provide meaningful information about 2022 recreational harvest trends for summer flounder given that in recent years wave 2 has accounted for less than 1% of annual summer flounder harvest.

Review of Prior SSC Recommendations

In July 2021, as requested by the Council, the SSC recommended two alternative sets of two-year ABC recommendations based on the information and projections from the 2021 management track assessment: one with varying ABCs each year, and one with a constant ABC across 2022-2023.

The SSC indicated that the approach to estimating uncertainty in the OFL had not changed since the previous benchmark (SAW/SARC 66 in 2018). Accordingly, the SSC maintained its determination that the assessment should be assigned an "SSC-modified OFL probability distribution." In this type of assessment, the SSC provides its own estimate of uncertainty in the distribution of the OFL.

The SSC continued the application of a 60% OFL coefficient of variation (CV), because: (1) the latest management track assessment did not result in major changes to the quality of the data and model that the SSC has previously determined to meet the criteria for a 60% CV; (2) the summer flounder assessment continues to be a data rich assessment with many fishery independent surveys incorporated and with relatively good precision of the fishery dependent data; (3) several different models and model configurations were considered and evaluated by SAW-66, most of which showed similar stock trends and stock status; and (4) no major persistent retrospective patterns were identified in the most recent model. The SSC noted that significant improvements in quality of data and investigations of alternate model structures affirm the specification of the 60% OFL CV by the SSC.

The SSC accepted the OFL proxy ($F_{35\%} = 0.422$) used in the management tack assessment. Given recent trends in recruitment for summer flounder, the SSC recommended the use of the most recent 9-year recruitment series for OFL projections (2011-2019) because near-term future conditions were more likely to reflect recent recruitment patterns than those in the entire 38-year time series.

The SSC considered the following to be the most significant sources of uncertainty associated with the determination of the OFL and/or ABC:

- Changes in life history are apparent in the population; for example, declining growth rates and differences in sex-specific age structure.
- Uncertainty regarding recreational catch and discard estimates from MRIP, especially for 2020 where some data were imputed.
- Potential changes in productivity of the stock, which may affect estimates of biological reference points. Changes in size-at-age, growth, and recruitment may be environmentally mediated, but mechanisms are unknown.
- Potential changes in availability of fish to some surveys and to the fishery as a result of changes in the distribution of the population.

Table 5 shows the SSC recommended 2022-2023 ABCs along with the associated OFLs and P* values. In August 2021, the Council and Board ultimately adopted the SSC-recommended ABCs based on the

[5] Based on data available at https://www.fisheries.noaa.gov/new-england-mid-atlantic/commercial-fishing/quota-monitoring-greater-atlantic-region

two-year averaged approach, implementing a constant ABC of 33.12 million pounds (15,021 mt) in each year 2022-2023.

Table 5: SSC-recommended 2022-2023 OFLs, ABCs, and P* values for the variable and averaged ABC approaches.

Variable ABCs			
Year	**OFL**	**ABC**	**P***
2022	36.28 mil lb 16,458 mt	33.96 mil lb 15,403 mt	0.452
2023	34.74 mil lb 15,759 mt	32.27 mil lb 14,639 mt	0.447
Averaged ABCs[a]			
Year	**OFL**	**ABC**	**P***
2022	36.28 mil lb 16,458 mt	33.12 mil lb 15,021 mt	0.435
2023	34.98 mil lb 15,865 mt		0.461

[a] Reflects currently approved ABCs adopted by Council and Board in August 2021.

Staff Recommendation for 2023 ABC

Staff recommend maintaining the previously adopted ABC for summer flounder of 2023 ABC of 33.12 million pounds (15,021 mt). The 2022 data update indicates little evidence to suggest that stock condition has changed substantially from what was indicated in the 2021 management track assessment.

Recent Management Actions

The following sections briefly summarize recent management actions that should be considered during the discussion of sector-specific catch and landings limits for 2023.

Commercial/Recreational Allocation Revisions

In December 2021, the Council and Commission revised the summer flounder commercial/ recreational allocation such that 55% of the ABC will be allocated to the commercial fishery and 45% to the recreational fishery.[6] Under the previous allocation, 60% of the amount of the landings portion of the ABC was allocated to the commercial fishery and 40% to the recreational fishery. This represents a change from a landings-based allocation to a catch-based allocation. The allocation will now be applied directly to the ABC. Figure 3 illustrates the differences in how specifications will be set under the revised catch-based allocation compared to the previous landings-based allocation.

The revised and previous allocations are not directly comparable due to the change from a landings-based to a catch-based allocation. However, as illustrated by the recommended specifications shown Table 1, the revised allocations are expected to slightly increase the recreational ACL and RHL and slightly decrease the commercial ACL and quota compared to the previous allocations.

The allocation revisions are pending review by NMFS and if approved, are expected to be effective January 1, 2023. Therefore, the Monitoring Committee should recommend 2023 commercial and recreational ACLs, and other specifications that derive from the ACLs, based on the revised allocation.

[6] http://www.mafmc.org/actions/sfsbsb-allocation-amendment

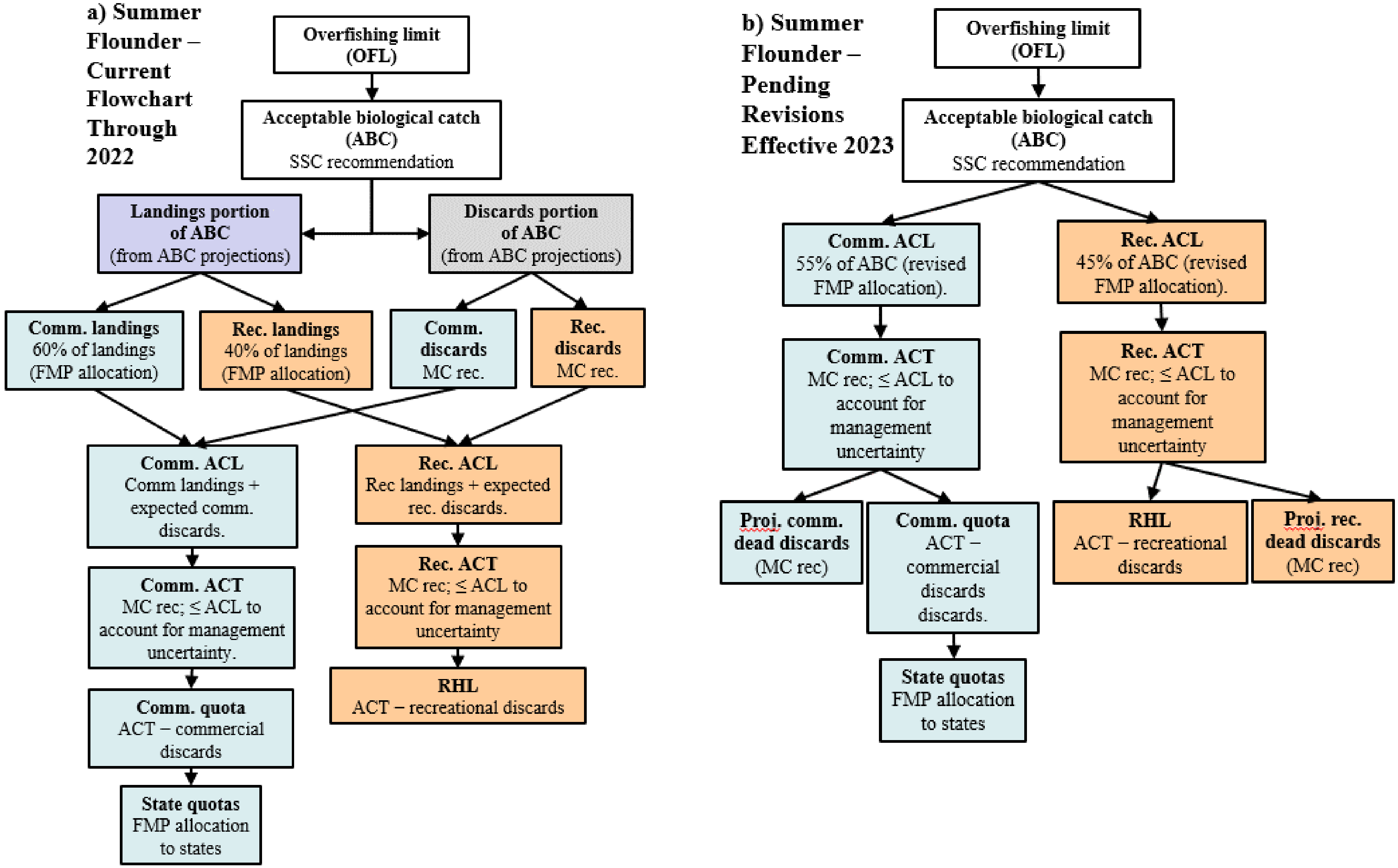


Figure 3: Flowcharts for summer flounder catch and landings limits based on a) the process through 2022, and b) pending revisions to the commercial/recreational allocations.

Recreational Harvest Control Rule Framework/Addenda

In June 2022, the Council and the Commission's Interstate Fishery Management Program Policy Board took final action on the Recreational Harvest Control Rule Framework/Addenda, with the goal of using a new approach, called the Percent Change Approach, to set recreational measures for summer flounder, scup, and black sea bass starting in 2023. Under the Percent Change Approach, recreational measures will not be tied as closely to an RHL (or, by extension, an ACL) as previously required. Instead, the target harvest level will vary based on a comparison of a confidence interval around expected harvest under status quo measures to the upcoming two-year average RHL, as well as biomass compared to the biomass target. This approach will allow for RHL overages in some cases (and therefore, by extension, likely ACL overages) and underages in other cases.[7]

It is not possible to predict the target level of harvest for 2023 recreational measures because the 2023 RHL has not been set and calculations of expected harvest under status quo measures will not be finalized until later in 2022.

The Monitoring Committee should consider the implications of this approach when making recommendations for 2023 recreational specifications, including considerations related to management uncertainty and projected dead discards.

Sector-Specific Catch and Landings Limits

Recreational and Commercial Annual Catch Limits

Under the revised catch-based allocations described above, the commercial and recreational ACLs are calculated with a straightforward application of the revised allocation percentages to the 2023 ABC. If no changes are made to the previously adopted 2023 ABC of 33.12 million pounds, this would result in a 2023 commercial ACL of 18.21 million pounds (8,262 mt) and a recreational ACL of 14.90 million pounds (6,759 mt; Table 1).

Annual Catch Targets

ACTs are set less than or equal to the sector-specific ACLs to account for management uncertainty. Management uncertainty is comprised of two parts: uncertainty in the ability of managers to control catch and uncertainty in quantifying the true catch (i.e., estimation errors). Management uncertainty can occur because of a lack of sufficient information about the catch (e.g., due to late reporting, underreporting, and/or misreporting of landings or discards) or because of a lack of management precision (i.e., the ability to constrain catch to desired levels). The Monitoring Committee should consider all relevant sources of management uncertainty in the summer flounder fishery when recommending ACTs.

Consistent with the previously adopted 2023 measures, staff recommend that the commercial and recreational ACTs remain equal to their respective ACLs for 2023, such that no reduction in catch is taken for management uncertainty.

As noted by the MC when originally recommending 2023 specifications, commercial fishery landings are well controlled with in-season closure authority and commercial quota monitoring systems which

[7] For more details on the Percent Change Approach, see https://www.mafmc.org/newsfeed/2022/mafmc-amp-asmfc-take-first-step-toward-recreational-management-reform-for-bluefish-sumer-flounder-scup-and-black-sea-bass

typically allow timely reactions to landings levels that approach quotas. The commercial fishery has underharvested their quota since 2018, more notably since 2019 when quotas were increased mid-year by approximately 50% (Table 3). Commercial dead discards estimates are only available through 2019. The Monitoring Committee had previously recommended closely monitoring commercial discards trends due to discards-driven overages of the commercial ACL in 2017 and 2018; however, in these years, a large proportion of discards were likely the result of below-average quotas. Observer data for observed trawl hauls from 2015-2019 support this conclusion (Table 6). Commercial discards decreased to below projected levels in 2019, possibly due in part to increased quotas, as commercial discards for summer flounder tend to decrease within increasing catch limits.

Table 6: Percent of observed bottom otter trawl hauls with discarded summer flounder by discard reason, 2015-2019. Complete observer data are not available for 2020 or 2021.

Recorded Discard Reason	2015	2016	2017	2018	2019	Average
Too small	56.7%	50.9%	37.4%	45.6%	62.8%	50.7%
No Quota	31.9%	37.3%	49.9%	42.3%	27.1%	37.7%
High graded	4.4%	7.4%	7.2%	7.1%	6.4%	6.5%
Market reasons (unknown, will spoil, poor quality, too large)	7.0%	4.3%	5.3%	4.8%	3.7%	5.0%

Recreational fishery performance relative to recreational ACLs and RHLs has been more variable, but generally near or below these limits since 2017, with the exception of a 31% RHL overage in 2020. As previously noted, 2021 harvest was estimated to be below average and 18% below the 2021 RHL. As previously described, the impact of the Percent Change Approach on recreational summer flounder measures in 2023 is not yet known, and it is not possible to accurately evaluate the likelihood of this approach resulting in differences in recreational fishery performance compared to the RHL or ACL compared to recent trends.

Based on these considerations, staff do not believe there is new information to support a deviation from the MC's previous recommendation of ACL=ACT for 2023.

Projected Dead Discards, Commercial Quotas and Recreational Harvest Limits

The MC should recommend projected discards for each sector, to be removed from the sector-specific ACTs to derive the commercial quota and RHL (Figure 3). This recommendation will likely need to rely on discard data through 2019, as estimates for 2020 and 2021 are not currently available as of the completion of this memo.

The previous landings-based allocation (through 2022) has required first separating the ABC into total expected discards and landings, and applying the FMP allocation percentages to the landings portion of the ABC (which for summer flounder has typically been provided by the NEFSC with ABC projections). Typically, discards have been apportioned based on a 3-year moving average of the proportion of discards from each sector, applied to the total projected discards for the upcoming fishing year(s).

Under the pending catch-based allocation, the MC could consider different approaches to recommending sector specific discards. Staff have considered several options, including:

- An approach similar to current methods, where total projected dead discards provided by NEFSC are split into expected commercial and recreational dead discards based on a moving 3-year average of the proportion of dead discards by sector. These projected sector discards are then removed from the sector-specific ACTs.

- A linear regression approach examining sector dead discards as a function of sector catch, ACLs, or landings. These approaches were used to develop example landings limits during the development of the commercial/recreational allocation amendment. While this would provide a systematic, data driven approach to estimating discards, the correlations associated with the regressions examined for summer flounder to date are not very strong.
- A simple moving average (3-year or other time frame) of discards in pounds for each sector. This approach has the advantage of being straightforward and reflective of recent fishery trends, but it may be problematic in situations where fishery conditions (stock status, catch limits, availability, etc.) change notably over the relevant time frame. For 2023, staff does not recommend this approach (which would use 2017-2019 discard data) because catch limits in 2017 and 2018 were much lower than current levels, and the fishery was under notably different constraints and regulations than are expected for 2023. Additionally, an above average 2018 year class has been observed that was largely not reflected in discard estimates through 2019.

Staff recommend that for 2023, sector discards continue to be calculated by applying the 3-year moving average proportion of discards by sector to total projected dead discards. This approach relies on projections of total discards from the NEFSC which account for age structure of the population. Because dead discard estimates are not available for 2020 or 2021, the most recent 3-year time frame to calculate the proportion of discards by sector remains 2017-2019. Over this time period, 59% of dead discards came from the recreational fishery and 41% from the commercial fishery. Applying this to the total 2023 projected dead discards of 7.23 million pounds (3,279 mt), resulting projected commercial dead discards are 2.95 million pounds (1,336 mt) and projected recreational dead discards are 4.28 million pounds (1,942 million pounds). These are the same projections of dead discards that were applied to the previously adopted 2023 specifications (Table 1). When comparing these projections to recent estimates of discards through 2019, it's possible that this method may overpredict discards. However, this may not ultimately be the case as the full impacts of higher landings limits since 2019 and of the large 2018 year class on discards are yet to be seen given the lack of data since 2019.

These discard projections result in a staff-recommended commercial quota of 15.27 million pounds (6,925 mt) and an RHL of 10.62 million pounds (4,817 mt) (Table 1). These values represent a 1.7% decrease in the commercial quota and a 2.5% increase in the RHL compared to the previously adopted values for 2022-2023.

The commercial quota is divided among the states based on the allocation percentages specified in the FMP, and each state sets measures to achieve their state-specific commercial quotas (including but not limited to the measures described below that are required by the joint FMP). The commercial allocations to the states were modified via Amendment 21, which became effective on January 1, 2021. The revised allocation system modifies the state-by-state commercial quota allocations in years when the annual coastwide commercial quota exceeds the specified trigger of 9.55 million pounds. Annual coastwide commercial quota of up to 9.55 million pounds is distributed according to the previous state allocations. In years when the coastwide quota exceeds 9.55 million pounds, the *additional* quota amount beyond this trigger is distributed in equal shares to all states except Maine, Delaware, and New Hampshire, which split 1% of the additional quota (Table 7). The total percentage allocated annually to each state is dependent on how much additional quota beyond 9.55 million pounds, if any, is available in any given year. This allocation system is designed to provide for more equitable distribution of quota when biomass is relatively higher, while also considering the historic importance of the fishery to each state.

Table 7: Allocation of summer flounder commercial quota to the states (effective January 2021 via Amendment 21).

State	Total state allocation = baseline quota allocation + additional quota allocation	
	Allocation of baseline quota ≤9.55 mil lb	Allocation of additional quota beyond 9.55 mil lb
ME	0.04756%	0.333%
NH	0.00046%	0.333%
MA	6.82046%	12.375%
RI	15.68298%	12.375%
CT	2.25708%	12.375%
NY	7.64699%	12.375%
NJ	16.72499%	12.375%
DE	0.01779%	0.333%
MD	2.03910%	12.375%
VA	21.31676%	12.375%
NC	27.44584%	12.375%
Total	100%	100%

Commercial Management Measures

Commercial measures that can be modified during specifications are discussed in the sections below, including the commercial minimum fish size, gear regulations, minimum mesh sizes, and exemptions. These measures have remained generally constant since 1999.

Commercial Gear Regulations and Minimum Fish Size

The minimum fish size and mesh requirements may be changed through specifications based on the recommendations of the Monitoring Committee. The current commercial minimum fish size is 14 inches total length (TL) and has been in place since 1997. Current trawl gear regulations require a 5.5-inch diamond or 6.0-inch square minimum mesh in the entire net for vessels possessing more than the threshold amount of summer flounder, i.e., 200 lb in the winter (November 1-April 30) and 100 lb in the summer (May 1-October 31).

In September 2019, the Monitoring Committee discussed various mesh size issues for summer flounder, scup, and black sea bass, and revisited the 2018 mesh selectivity study for summer flounder, scup, and black sea bass by Hasbrouck et al. (2018)[8]. Hasbrouck et al. study suggests that, in general, the current minimum mesh sizes are effective at releasing catch of most undersized and immature fish, but modifications could be considered to allow for consistent mesh sizes for black sea bass and scup, and to potentially reduce discards of undersized summer flounder. As described in the meeting summary, the MC identified additional analyses and input needed from industry before recommending changes to the mesh size regulations.

For summer flounder, the MC had noted that the selectivity curve described in the study for 6.0" square mesh does not appear to be equivalent to that of the 5.5" diamond. Instead, the 6.0" square is much more similar to a 5.0" diamond mesh. The 6.0" square mesh releases less than 50% of minimum size fish. The

[8] Hasbrouck et al. 2018 is available at: http://www.mafmc.org/s/Tab08_SFSBSB-Mesh-Selectivity-Study-Apr2018.pdf. The Monitoring Committee discussion document from September 2019 is available at https://www.mafmc.org/s/FSB-Mesh-Size-Issues-Overview-Sept-2019.pdf, and the MC report from that discussion can be found at: https://www.mafmc.org/s/SFSBSB_MC_Summary_Sept_2019_FINAL.pdf. T

MC had some concerns with the amount of undersized summer flounder caught with the 6.0" square mesh and recommended further exploring the impacts of this mesh size. Phasing out the use of 6.0" square mesh for summer flounder could reduce discards of undersized fish. The MC noted that further analysis should be done on how many vessels are currently using 6.0" square vs. 5.5" diamond mesh.

In recent discussions on this topic, the MC has been supportive of continuing to analyze this issue, but has also recognized that it should be a lower priority in the near term given other pressing management concerns for this FMP. The Council and Board have also agreed that while this issue should still be pursued, it has not been a near-term priority given other management activities. Staff will continue to work with the Monitoring Committee and Advisory Panel to further analyze and consider potential changes to mesh size regulations. However, given other workload constraints, it is not likely that additional work on this topic can be done in 2022. Staff recommend no changes to the current 14-inch minimum fish size, or seasonal possession thresholds triggering the minimum mesh size for 2023.

Minimum Mesh Size Exemption Programs

Small Mesh Exemption Area

Vessels landing more than 200 lb of summer flounder east of longitude 72° 30.0'W, from November 1 through April 30, and using mesh smaller than 5.5-inch diamond or 6.0-inch square are required to obtain a small mesh exemption program (SMEP) permit from NMFS. The exemption is designed to allow vessels to retain some bycatch of summer flounder while operating in other small-mesh fisheries.

The FMP requires that observer data be reviewed annually to determine whether vessels fishing seaward of the SMEP line with smaller than the required minimum mesh size and landing more than 200 lb of summer flounder are discarding more than 10% (by weight) of their summer flounder catch per trip. Typically, staff evaluate the Northeast Fisheries Observer Program (NEFOP) data for the period from November 1 in the previous year to April 30 in the current year. However, when this analysis is conducted each summer, complete observer data is not yet available through the end of April in the current year. As such, a year-long lag in the analysis is used.

Due to issues accessing observer data, staff have been unable to complete this analysis for the November 1, 2020-April 30, 2021 period. If data can be accessed prior to upcoming meetings, staff will provide the analysis as a supplemental document.

The most recent analysis includes examination of observer data from November 1, 2019 through approximately March 19, 2020.[9] Last year, staff were unable to evaluate observer data from the full time period of November 1, 2019 through April 30, 2020 in given COVID related gaps in observer coverage in early 2020. For this time period, a total of 397 trips with at least one tow were observed east of 72° 30.0'W and 204 of these trips used small mesh (Table 8). Of those 204 trips, 97 trips (47%) reported landing more than 200 lb of summer flounder. Of those 97 trips, 24 trips (25%) discarded more than 10% of their summer flounder catch. The percentage of trips that met all these criteria relative to the total number of observed trips east of 72° 30.0'W is 6.0% (24/397 trips).

The number of vessels issued a letter of authorization (LOA) for the small mesh exemption program has remained relatively stable since 2013, fluctuating around an average of 67 vessels (Figure 4).

[9] The observer requirement was first waived on March 20, 2020, although there are a few relevant observer records after this date, presumably from vessels which were already at sea.

The MC had previously identified concerns with an increased percentage in the number of observed trips in the small mesh exemption area landing over 200 pounds of summer flounder but discarding more than 10% of their summer flounder catch (Table 8). While the amount of observed discards from these trips is low relative to the commercial catch limit, because these observed trips are a subset of the fishery operating under this exemption, the actual extent of discards under the exemption program is not known. The MC has also noted that these increases in discards were possibly related to decreased commercial quotas, especially from 2017 through the first half of 2019, and that increases in quota since 2019 should reduce the rates of discarding in general, including under this exemption. General analysis of recorded discard reasons in the observer data (not specific to this exemption program) indicate that discards in recent years prior to 2019 have been more heavily driven by quota-related reasons, but in 2019 quota-related reasons accounted for a much smaller percentage of observed discards. The MC indicated that an analysis of the recorded discard reasons specifically for vessels operating under this exemption program would be useful in the future.

The MC should consider whether changes may be needed to this exemption program. Staff recommend no changes to this exemption program for 2023, but that it be more thoroughly evaluated for potential changes in a future year. Similar to the mesh size discussion above, additional work is unlikely on this issue in the near term due to other management priorities.

Table 8: Numbers of observed trips that meet specific criteria based on NEFOP data from November 1-April 30 for 2014 through 2020; observer data for 2020 is only available through mid-March due to the COVID-19 related suspension of the observer program.

Criteria		Nov. 1, 2014 – April 30, 2015	Nov. 1, 2015 – April 30, 2016	Nov. 1, 2016 – April 30, 2017	Nov. 1, 2017 – April 30, 2018	Nov. 1, 2018 – April 30, 2019	Nov. 1, 2019 ~March 19, 2020
A	Observed trips with at least one catch record east of 72° 30' W Longitude	401	391	555	724	646	397
B	That met the criteria in row A and used small mesh at some point during their trip	172	252	376	364	354	204
C	That met the criteria in rows A-B and landed more than 200 pounds summer flounder on whole trip	72	92	150	135	164	97
D	That met the criteria in rows A-C and discarded >10% of summer flounder catch east of 72° 30' W Longitude	21	18	36	47	53	24
E	% of observed trips with catch east of 72° 30' W Longitude that also used small mesh, landed >200 pounds of summer flounder, and discarded >10% of summer flounder catch (row D/row A)	5.20%	4.60%	6.50%	6.50%	8.20%	6.05%
F	Total summer flounder discards (pounds) from trips meeting criteria in A-D	14,579	16,470	14,640	33,868	18,186	11,672
G	Total summer flounder landings (pounds) from trips meeting criteria in A-D	15,224	23,295	25,472	76,780	59,960	29,540
H	Total catch (pounds) from trips meeting criteria in A-D	29,804	39,763	40,113	110,648	69,145	41,212

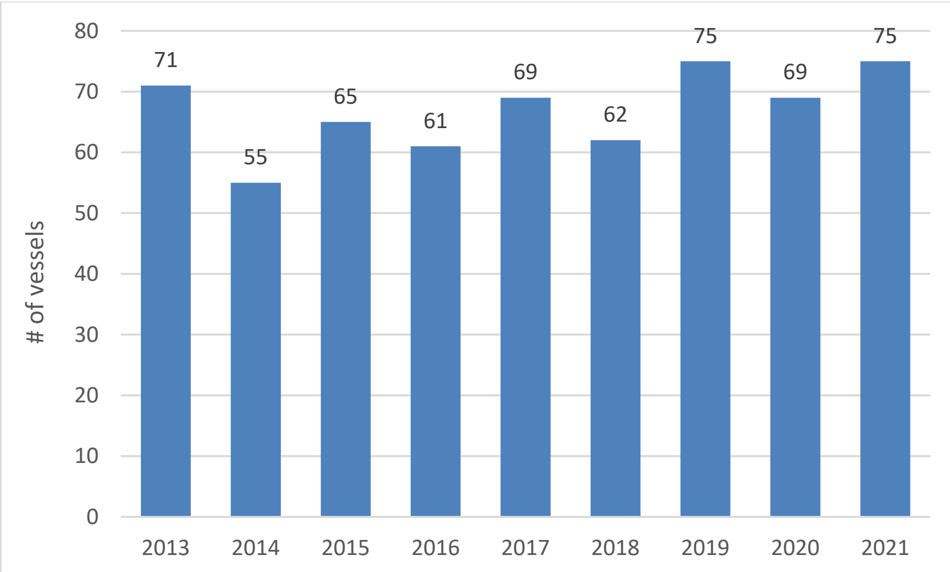


Figure 4: Number of vessels issued the small mesh LOA for the SMEP from fishing year 2013-2021. Source: Pers. Comm., GARFO Analysis & Program Support Division, July 11, 2022.

Flynet Exemption Program

Vessels fishing with a two-seam otter trawl flynet are also exempt from the minimum mesh size requirements. Exempt flynets have large mesh in the wings that measure 8 to 64 inches, the belly of the net has 35 or more meshes that are at least 8 inches, and the mesh decreases in size throughout the body of the net, sometimes to 2 inches or smaller. This exemption was created through Amendment 2 in 1993, as suggested by the South Atlantic Fishery Management Council and the State of North Carolina to accommodate flynet fisheries targeting other species and catching limited amounts of summer flounder. The NMFS Regional Administrator may withdraw the exemption if the annual average summer flounder catch in the flynet fishery exceeds 1% of the total flynet catch.

Typically, the MC reviews data from the North Carolina flynet fishery as the bulk of flynet landings in the Greater Atlantic region originate from North Carolina, though the flynet fishery in North Carolina is small. The supplemental memo from Lorena de la Garza dated June 24, 2022 (see Attachment) indicates that no summer flounder were landed in the North Carolina flynet fishery from 2015-2021. Flynet landings in North Carolina have declined in recent years due to shoaling issues at Oregon Inlet.

The flynet exemption was explored in more depth through the Monitoring Committee's 2015 comprehensive review of commercial management measures.[10] The MC determined at the time that other states, including Virginia, New Jersey, and Maryland may have small amounts of flynet landings; however, data were limited or unavailable for most other states and flynet landings of summer flounder in these states were believed to be insignificant.

In response to public and Board member comments, the MC has previously noted a need to better understand the use and configuration of flynet and high rise trawl nets as they relate to this exemption. Past discussion of this issue led to the MC identifying a possible compliance and enforcement issue of vessels that don't strictly meet the regulatory definition (which specifies a two-seam net) possibly fishing under the flynet exemption with four-seam high rise nets. The MC recommended exploration of

---

[10] See the report at: http://www.mafmc.org/s/Tab11_SF-S-BSB-Commercial-Measures.pdf.

the extent to which existing datasets allow for evaluation of specific trawl gear configurations, and noted the need for input from gear experts, industry, and enforcement on this issue.

As described above, there has not been sufficient staff time to dedicate to a more in depth evaluation of this exemption in 2022. Staff recommend no changes to this exemption for 2023, and that additional analysis be conducted in a future year if prioritized by the Council and Board.

Recreational Management Measures

Recreational management measures for 2023 will be determined later in 2022. Typically, the Council and Board review preliminary current year data through Wave 4 (July-August) to set recreational bag, size, and season limits for the upcoming year. Improved statistical methods for predicting the impacts of bag, size, and season limits on recreational harvest (i.e., the Recreational Economic Demand Model and the Recreational Fleet Dynamics Model) are expected to be available for summer flounder by fall 2022. The Monitoring Committee will meet in November 2022 to review available data and model outputs and to make recommendations for recreational bag, size, and season limits for 2023. 2023 will be the first year that recreational measures for summer flounder, scup, and black sea bass will be set using the recently approved Percent Change Approach.

Attachment

ROY COOPER
Governor

ELIZABETH S. BISER
Secretary

KATHY B. RAWLS
Director

Memorandum

To: Kiley Dancy, MAFMC

From: Lorena de la Garza, NCDMF

Date: June 24, 2022

Subject: Species composition and landings from the 2021 North Carolina flynet fishery

The 2021 North Carolina flynet fishery landed 5,889 pounds of finfish consisting of black sea bass, scup, and smooth dogfish. The 2021 North Carolina flynet fishery landings are not reported within a table because the data are confidential and cannot be distributed to sources outside the North Carolina Division of Marine Fisheries (North Carolina General Statute 113-170.3 (c)). Confidential data can only be released in a summarized format that does not allow the user to track landings or purchases to an individual. Summer flounder were not landed in the 2013, 2015, 2016, 2017, 2018, 2019, 2020 and 2021 flynet fisheries. Total flynet landings in 2021 are the second lowest since the trip ticket program began in 1994 (2013 being the lowest at 5,797 pounds). Reduced fishing effort on targeted fish species and shoaling at Oregon Inlet continue to result in a low number of flynet boats landing at North Carolina ports.

Summer Flounder, Scup, and Black Sea Bass Fishery Performance Report

June 2022

The Mid-Atlantic Fishery Management Council's (Council's) Summer Flounder, Scup, and Black Sea Bass Advisory Panel (AP) met jointly with the Atlantic States Marine Fisheries Commission's (Commission's) Summer Flounder, Scup, and Black Sea Bass AP on June 16, 2022 to review the Fishery Information Documents and develop the following Fishery Performance Report for all three species. The primary purpose of this 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.

Please note: Advisor comments described below are not necessarily consensus or majority statements.

Additional comments provided by advisors via email are attached to this document.

Council Advisory Panel members present: Katie Almeida (MA), Frank Blount (RI)*, Bonnie Brady (NY), Greg DiDomenico (NJ)*, Jeff Deem (VA), Joseph Devito (NY), James Fletcher (NC), Jeremy Hancher (PA), Victor Hartley (NJ), Greg Hueth (NJ), Mike Plaia (CT)*, Bob Pride (VA), Mike Waine (NC), Harvey Yenkinson (PA)

Commission Advisory Panel members present: Frank Blount (RI)*, Greg DiDomenico (NJ)*, Jim Lovgren (NJ), Mike Plaia (CT)*

*These individuals serve on both the Council and Commission APs.

Others present: Chris Batsavage (Council/Board member, NC DMF), Tracey Bauer (ASMFC Staff), Julia Beaty (MAFMC Staff), John Boreman (SSC), Dustin Colson Leaning (ASMFC Staff), Karson Coutré (MAFMC Staff), Kiley Dancy (MAFMC Staff), Justin Davis (Board member, CT DEEP), Neil Delanoy, Steve Doctor (MD DNR), Hannah Hart (MAFMC Staff), Mark Holliday (SSC), Carolyn Iwicki, Emily Keiley (NMFS GARFO), Adam Nowalsky (Council/Board member, NJ)

Discussion questions

1. What factors 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?

General Comments (All 3 Species)

Market/Economic Conditions

Several advisors voiced concerns about the impacts of increasing costs of gas, bait, packing boxes, ice, equipment, etc. on commercial and recreational fisheries. Multiple advisors said this was the biggest issue facing commercial and recreational fisheries for all three fisheries this year.

One advisor said commercial fisheries will not be able to operate profitably and will struggle to pay crew. This advisor recommended an emergency action from the White House to provide economic relief to commercial fishermen given that they supply critical food to the nation.

A few advisors said increased prices are resulting in reduced recreational fishing effort, and they are observing fewer boats on the water and in marinas. For-hire businesses are incurring higher costs and are having to charge more for trips. One advisor noted a decline in for-hire clients, including fewer trips from clients who used to be regulars. Due to the added cost of gas, tolls, and the price of a trip, clients are being more selective on how many and what trips they take. Another advisor said he has made this same personal decision himself as it is not economically feasible to take the same number of party boat trips as he would have typically done in past years. Another advisor noted that these increased costs are also coming at a time of more restrictive regulations for species such as scup and black sea bass, which will further reduce fishing effort. Multiple advisors also commented on increased prices for recreational bait and how this may impact what species anglers are targeting.

One advisor noted that the world is in a unique post COVID-19 time where people are starting to get back into their "normal" day to day, but the current state of the economy is going to impact seafood purchases, fishing effort, and the number of anglers on the water. One advisor expressed concern about the impacts of imported fish on the U.S. market. He said imports flood the market and affect the price of U.S. caught fish and suggested the need to further investigate this issue.

Recreational Management Issues

One advisor said more people are comfortable gathering together this year compared to 2020 and 2021. This may be working in combination with the increased prices described above to further reduce recreational fisheries participation this year. In 2020 and 2021 recreational fishing was viewed as safe outdoor activity during the pandemic and effort was higher. This advisor thought these impacts on effort will be important to consider in upcoming assessments.

Another advisor asked what number of recreational fishermen NMFS is using to generate recreational harvest estimates. Staff responded that NMFS does not produce a number of recreational fishermen, and instead measures effort in the number of angler trips. This advisor also said an accurate count of all saltwater recreational anglers is needed to comply with the Magnuson Stevens Act and to better manage recreational fisheries for all species. This advisor recommended requiring electronic reporting for the recreational sector and said that that until this requirement is in place, we will continue to make decisions off flawed data.

One advisor expressed concern about the Council and Commission's recent final action decision on the Harvest Control Rule. She questioned how the Harvest Control Rule would prevent overfishing and would prevent negative impacts to the commercial sector.

Commercial Management Issues

One advisor suggested modifying the minimum trawl mesh size to 5 inches for all three species from November through April so fishermen could use one net to target all three species during this period. He noted that during this time of year, the commercial fisheries for these species mostly take place offshore where there are fewer juveniles compared to inshore. He suggested using a high rise style net that doesn't hit the bottom as hard as a typical summer flounder net.

Another advisor expressed support for a common mesh size but preferred 4 inches over 5 inches. He also said the minimum fish sizes should be modified to correspond with the changed minimum mesh sizes. He suggested a 10 or 11 inch summer flounder minimum fish size and a minimum size for black sea bass and scup of between 6 and 8 inches.

Environmental Conditions

One advisor voiced concern on the Outer Banks in North Carolina eventually being washed away due to sea level rise and storms.

Another advisor said the impacts of the addition of chemicals in the water, including chemicals and disinfectants used to kill the COVID virus, should be investigated. This advisor also noted the need to investigate other pollutants being dumped into water bodies in the south and the northward movement of these pollutants and potential impacts on mid-Atlantic fisheries.

One advisor suggested that environmental cycles impact fisheries and their influence on fish abundance and behavior should be studied.

Summer Flounder

Market/Economic Conditions

One advisor said that from January through April this year, commercial fishermen reported unusually low prices for summer flounder. Prices have since recovered to typical levels for this time of year. Low prices earlier this year may have been driven by the lack of the hospitality business in New York, as summer flounder is not a big retail fish and is bought mostly by hotels and restaurants, where demand is still down due to COVID.

An advisor from New York said summer flounder prices have increased there for the first time in years, to the $5-6 per pound range. Because New York has a low quota allocation, this may not be indicative of the rest of the market.

As described under General Comments, several advisors voiced concerns about high fuel prices. One New York advisor stated that fishermen will not necessarily fish as far as they typically do for summer flounder and may not use permits they hold in other states as much. For example, New York fishermen permitted in other states won't make a trip to land in Virginia or North Carolina due to the two to three day steam time required. Another advisor agreed that high costs will likely cause lower landings in Virginia and North Carolina, contributing to continued commercial quota underages. He stated that managers should come up with new "outside the box" ideas for that quota, because those states do not have the boats anymore to harvest it and vessels from other states won't incur a $30,000 fuel bill to fish there.

This advisor also said recently he was aware of two boats fishing a few miles from Point Pleasant, NJ for three or four days, getting only a few hundred pounds for 15 hours, since there are not a lot of fluke available yet this year. While they sold them for a good price, over $6 per pound, after the cost of fuel there was nothing left. He said this is not sustainable, and while managers cannot do anything about this, they should be aware that it will reduce participation.

Environmental Conditions and Availability

One advisor noted that the current assessment update includes data through 2019 and shows increasing biomass during 2017-2019. However, recreational harvest over these has not shown the same increasing trend. He is curious what the next assessment (in 2023) will show and is interested in tracking how landings correspond with the biomass trends from the assessment.

Three advisors said this year, summer flounder do not seem to be inshore or in the bays yet in large numbers and recreational summer flounder fishing has not taken off yet this summer. One advisor suggested that this was due to water temperatures and that some are starting to show up now.

General Management Issues

One advisor suggested that the decline in recruitment between 2010 and 2019 is because the spawning stock biomass came to consist of smaller fish due to Council and Commission's policies which drove increased harvest of larger female fish. He stated that spawning stock biomass was lower in the 90s but recruitment was higher, because the fisheries were harvesting smaller fish and allowing the larger fish to spawn. He emphasized that management needs to change its current policies and recognize the importance of "big old fat fecund female fish."

Recreational Fishery Issues

A few advisors commented on the 2022 recreational regulations in New Jersey which include a split slot limit measure (two fish allowed at 17-17.99 inches and one fish above 18 inches). One advisor was supportive of this measure, but hoped that next year the slot limit range could be widened. He hoped that a slot limit would protect more larger females and have positive impacts on the summer flounder stock.

Another advisor expressed some hesitation about the slot limit, stating that he believes more fish have been harvested in southern New Jersey so far this year than all of last year combined. He was concerned that harvest estimates may notably increase which could have negative impacts on the recreational fishery in the long run. While he noted that a slot limit may slightly reduce discards, he thinks people will continue to fish until they catch a big fish, such that harvest of larger breeders may not be substantially reduced. This advisor also thought the lower bag limit this year of three total fish in New Jersey would have negative economic impacts by preventing out of town anglers from investing in fishing trips to target summer flounder.

Research Recommendations

One advisor said he believes recent low summer flounder recruitment is caused not by the number of eggs produced, but by predation on larvae in the first year of life. He suggested that researchers determine what is eating them and how that is impacting the summer flounder stock.

One advisor noted that there will be extensive wind farms throughout the continental shelf and we need to know how that will impact fishery migrations. He noted that summer flounder will be affected by underground cables and magnetic fields, and we need to know if they will avoid these cables and how this will change their migratory routes as they are bottom dwellers. This could also drive them into less optimal areas, for example, areas with higher concentrations of predators. He requested that these impacts be documented. Another advisor agreed with this recommendation.

One advisor expressed concern that we don't know as much as we should about the migration patterns of summer flounder beyond a general East-West pattern. There has been a shift in the stock distribution toward the Northeast that is blamed on oceanic factors, but he suggested that we need to better understand this distribution change as there may be more to it. This same advisor also suggested that we get a better handle on the question of summer flounder recruitment by adjusting sampling locations to better account for changes in stock distribution. Finally, this advisor recommended that we find better ways to conduct population surveys than trawl surveys, which disturb fish and their habitat and kill a lot of fish. Newer and better technology may exist to conduct surveys without killing the fish and destroying vulnerable habitats.

Scup

Market/Economic Conditions

One advisor said prices for scup this winter were good, and prices got up to $2.50 per pound for jumbos, $1.75 per pound for larges, and $1 per pound for mediums. She added that it was extremely windy off New York during this year's Winter I season, so optimal fishing days were few and far between and only those bold enough to face the poor weather conditions were able to fish.

In addition to the comments described above about impacts of higher prices on for-hire fisheries for all three species, one advisor said scup are not common in state waters off New Jersey and the price of fuel will likely impact recreational effort and individuals' willingness to make the trip into federal waters.

One advisor expressed concern on the impact of imported fish on the U.S. scup market. This advisor also commented on the historical importance of small fish for low-income families and suggested decreasing the commercial minimum size limit to six or seven inches to help bring that market back.

Commercial Fishery Issues

One advisor recommended modifying the southern portion of the Southern Scup Gear Restricted Area (GRA). He said scup are no longer common as far south as Virginia and the southern 20 miles of the southern GRA is only taking away fishing area from small mesh trawl fisheries with no biological benefit to scup.

A few advisors recommended allowing commercial transfers at sea. These advisors indicated allowing transfers at sea would reduce regulatory discards and help commercial fishermen harvest more of the commercial quota each year. However, there was some confusion on which species at sea transfers was already permitted and one advisor brought up that at sea transfers for scup is already allowed in rule. One advisor suggested implementing some provisions on how far from shore and time of year at sea transfers are allowed.

Recreational Fishery Issues

Advisors voiced concern about the high landing estimates produced by MRIP. Two advisors questioned if poor data scenarios are inflating harvest estimates and requested reaching out to MRIP staff to get more details. One advisor said the 2021 wave two estimates for Massachusetts were particularly concerning and expressed frustration on how they were driven by a single trip intercept.

Some advisors also questioned why the recreational sector is continuing to exceed the recreational harvest limit (RHL) and one advisor expressed concern about the new Recreational Harvest Control Rule, as described above in the General Comments section for all three species.

Research Recommendations

Several advisors voiced the need to better understand how offshore wind energy development will impact scup. One advisor said some of the planned project areas are within the scup migratory path and expressed the need to better understand how noise pollution and vibrations caused by offshore wind energy structures will impact scup behavior and biology.

Black Sea Bass

Market/Economic Issues

One advisor from New York noted that the price for black sea bass remains low and has not yet fully recovered from impacts of the pandemic, likely because the market for black sea bass is largely driven by restaurants.

Commercial Fishery Issues

One advisor suggested a 7,500 pound commercial trip limit for black sea bass in federal waters. There is currently no commercial trip limit in federal waters. Several states have implemented trip limits for state waters; however, states that manage their commercial black sea bass fisheries with individual transferable quotas (ITQs) do not have trip limits. This advisor noted that a single 50,000 pound trip from an ITQ vessel once caused the price to crash for two weeks. Lower prices result in fishermen needing to catch more fish to make the same amount of money. He noted that some pot fishermen have sold their ITQs to trawl fishermen, which has contributed to the issue of high landings from single trips negatively impacting the price for all fishermen in an area. This advisor said he did not support ITQs for black sea bass for this reason and because they can lead to a few fishermen landing most of the fish.

Recreational Fishery Issues

Two advisors noted that black sea bass availability to recreational anglers remains very high.

One advisor said he hasn't seen as many recreational boats on the water as in previous years, but the boats that are out are doing very well catching black sea bass. He said no matter what management does, the recreational fishery will keep going over their limits because availability is so high. Even with fewer boats in the fishery, less clients on for-hire trips, and bait prices rising, he predicted that the recreational fishery would still exceed the RHL due to high availability. He thought the recreational fishery should be less restricted given that biomass is so high.

One advisor noted that if the RHL is decreased in future years due to past overages, then the reduced RHL could cause the stock to grow even more. This would lead to even higher availability and continued overages. He argued that reducing landings limits in response to overages is counterproductive for abundant stocks. He also noted that minimum size limits for black sea bass result in anglers mostly harvesting male fish, which should not be overly detrimental to the stock.

One advisor from New Jersey said that with increased costs, for-hire vessels are charging $105 per trip with a 10 fish bag limit for black sea bass. He did not think these trips would be economically feasible with an 8 fish bag limit. He noted that for-hire vessels don't have many other species to target besides black sea bass, especially with lower summer flounder availability.

Research Recommendations

One advisor asked if black sea bass can transition from female to male and then back to female. He asked this question because he observed an 8-10 pound black sea bass which was full of roe and normally female black sea bass do not reach this size, to his knowledge. He questioned if this could be happening due to contaminants in the water and recommended research into this topic. Another advisor noted that dogfish can store sperm and wondered if black sea bass could store roe after starting to transition to males.

Additional Email Comments

From: Katie Almeida <kalmeida@towndock.com>
Sent: Wednesday, July 6, 2022 11:26 AM
To: Hart, Hannah <hhart@mafmc.org>
Subject: RE: SFSBSB draft Fishery Performance Report

Hi Hannah,

I had to leave the call early, but I just wanted to say that I am against decreasing the commercial minimum size scup. Can that be noted?

Thank you,

Katie

Katie Almeida

Senior Representative, Government Relations and Sustainability

45 State Street | Narragansett, RI 02882 USA

O: 401-789-2200 x143 | C: 508-930-2633

www.towndock.com

COMMENTS BY ERIC BURNLEY 6/17/22

Summer flounder:

Summer flounder are the most important recreational fish in Delaware. They are available from the shallow water on the Inland Bays out to the offshore wrecks.
At this time, I would say flounder fishing is decent. No one is setting the world on fire, but if you know how to fish, you can pick up a few here and there and if you work at it, you can box a four-fish limit.
Everything got off to a late start this year due to cold water sticking around into late spring. I suspect we will see the best of the flounder fishing in the ocean beginning in late June into early July.

The drop in minimum size from 16.5 to 16 inches has not made a great difference. The photos I see and the reports I get don't mention many 16-inch fish. I am also not hearing complaints about having to sort through lots of shorts to find a few keepers. I don't see this as a good sign. A lack of short fish could mean a lack of flounder in the pipeline for the future.

I am always concerned about global warming. I have seen what it has done with triggerfish, sheepshead, striped bass and spadefish. I wonder what it will do with flounder?

In the past, the marshes behind the Barrier Islands of Virginia and up into Delaware were the nursery grounds for summer flounder. As these waters warm will the flounder try to move north and find it hard to relocate into New York City?

Then there is the normal progression of summer flounder from south to north. Smaller flounder head north every spring after spending the winter on the shelf. They summer further north every year ending up on the New England Shoals right now. Will they be going into Canada in the future as the ocean warms?

Summer flounder could use more research on their breeding habits. We know they spawn in the fall in the ocean, but where in the ocean? Should we stop flounder fishing during the spawning season? Should we have a maximum size limit on flounder as we do on striped bass? Do we know the spawning stock biomass for summer flounder?

Of course, some people always want more and some always want less, but I think for summer flounder a four-fish limit at 16 inches is just right for now. These fish are not easy to catch and most anglers don't catch a limit on any given day so I think the current limit is safe.

Black sea bass:

What happened with black sea bass in 2022 was a travesty. There was no logical reason to raise the size limit to 13 inches and cut the season by 20 days when the biomass was three times the target level.

Black sea bass fishing is a drop and crank operation. Most of the time. There are times when you will mark thousands of fish and not one will bite. I am sure they have a good reason, but so far no one I know has been able to figure it out.

With the increase in the size limit, I must assume there will be an increase in release mortality. When fishing from a head boat, as I often do, the number of small sea bas floating away is quite high. Granted, many will right themselves and swim back down to the bottom, but not all. Perhaps managers might consider this factor before arbitrary raising the minimum size limit.

To say black sea bass are numerous on the artificial reef sites such as the Del-Jersey-Land is quite an understatement. Trying to fish for flounder or tog on these structures is difficult due to the overwhelming presence of the sea bass. They do thin out in the winter giving tog fishermen some relief.

I certainly would like to see more information on the breeding habits of black sea bass. When do they spawn? Where do they spawn? When they get lockjaw is that because they are spawning? At what age do they spawn?

I have seen the data on the migration of black sea bass from south to north. At what point will we lose them in Delaware? Is there any similar species that might take their place?

As for future regulations, lets go back to 12.5 inches. Let's keep the season running from May 15 to December 31. There are plenty of black sea bass out there so let's share the bounty.

Scup:

I will save scup comments for those to my north. While there was a time when porgies were an important fishery in Delaware that time is past. A few more show up every year, but not enough to consider this a fishery.

From:	James Fletcher <bamboosavefish@gmail.com>
Sent:	Wednesday, June 1, 2022 1:25 PM
To:	Kiley Dancy; Andrew Petersen
Subject:	Re: Agenda for 6/16 Summer Flounder, Scup, Black Sea Bass Advisory Panel meeting

Before we go down same line of thought:::
CAN ADVISORS DISCUSS BOFFFF *** BIG OLD FAT FECUND FEMALE FISH*** **AND CELL PHONE REPORTING BY RECREATIONAL IN EEZ? BLUE FIN DATA HAS AN APP FOR RECREATIONAL REPORTING AND WILL HANDLE DATA FOR A FEE.**

SCUP SUMMER FLOUNDER BLACK SEA BASS PLANS ARE BASED ON FAULTY INCORRECT SCIENCE!
All net sizes are incorrect for all three species; fishermen asked for 5 inch cod end all three species.
BOFFFF would favor recreational total length & no discards. if videoed throwing anything back NOVA in EEZ. LOW INCOME FROM SHORE WOULD HAVE FISH FOR FOOD **NO DEAD DISCARDS!**
BOFFFF commercial vessel has dollar value for year *** must land and sell all catch ** no exceptions NO DEAD DISCARDS.

ARE CLOSED SEASONS AND SIZE LIMITS A NOAA / NMFS DEPARTMENT OF COMMERCE; METHOD TO ALLOW IMPORTS A MARKET SHARE?

WILL STAFF PROVIDE IMPORT INFORMATION FOR FISH THAT COMPETE WITH SCUP BLACK SEA BASS & SUMMER FLOUNDER?

COMMERCE NOAA NMFS FIRST PROPOSED SIZE LIMITS AND CLOSED SEASONS AS PART OF MAGNUSON. WHY DOES MAGNUSON ALLOW DEAD DISCARDS?

ALLOW AN ADVISOR DISCUSSION OF BOFFFF JAMES FLETCHER

From:	James Fletcher <unfa34@gmail.com>
Sent:	Monday, June 13, 2022 10:19 AM
To:	Kiley Dancy
Subject:	Up coming review Summer Flounder Scup Black Sea Bass.

I have asked in the past for the pounds of imports for Talipa and imports that are sold in place of summer Flounder and Black Sea bass, The Council has an economist who should be able to obtain the numbers .

in the past I requested these numbers with no results so I am asking again.
Advisors need to know the amount of fish that are imported into the market U.S. fishermen could fill.
Our discards are only discards because of Council size limits.
BOFFF beggs the advisors to ask that all fish caught be utilized. I do not understand why for recreational.
1. Council can / will NOT SUPPLY A NUMBER OF SALT WATER ANGLERS 7 comply with
2006 Magnuson. 2 why Council NMFS WILL NOT REQUIRE MANDATORY CELL PHONE
BY RECREATIONAL!

back to original request. NUMBER OF POUNDS FOR IMPORTS THAT COMPETE WITH SUMMER FLOUNDER, SCUP ** TALIPA SUMMER FLOUNDER IF POSSIBLE PRICES.

THANK YOU JAMES FLETCHER.

From: James Fletcher <unfa34@gmail.com>
Sent: Thursday, June 16, 2022 11:05 AM
To: Beaty, Julia <jbeaty@mafmc.org>
Subject: Today's meeting possible question

With low income fishers fishing from shore not being able to keep fish smaller than size set for EEZ by affluent council members;

sizes set for bragging rather than food.

DOES ANY METHOD EXIST TO IMPLEMENT*** TOTAL LENGTH RETENTION AND NO **DISCARDING**?

Could Council and mainly STATES enact a A temporary rule ;;; RECREATIONAL FISHERS REPORTING ON CELL PHONE TO A BLUE FIN DATA RECREATIONAL APP. CAN RETAIN 70 INCHES OF FLOUNDER (SUMMER & sOUTHERN) 150 INCHES black sea bass 300 inches scup.

NO DISCARDS !! [MUST REPORT CATCHES {LENGTHS} DAILY

Persons wishing not t report by cell phone would fish with current regulations:::

HARD TIMES CALL FOR DRASTIC MEASURES!!!

THOSE WORKING FOR GOVERNMENT AND APPOINTED TO COUNCIL DO NOT KNOW WHAT HARD ECONOMIC CONDITIONS ARE!

BLUE FIN DATA HAS AN APP READY FOR REPORTING.

GORDON WILL THROW A FIT *** NMFS WILL SAY DOES NOT COMPLY WITH MAGNUSON ***

NMFS AND GORDON HAS NOT COMPLIED WITH MAGNUSON 2006 RECREATIONAL SALT WATER ANGLER REGISTRATION LIST. ***THES GROUPS ARE THE FIRST TO STOP LOW INCOME FISHERS FROM BEING ABLE TO KEEP FISH FOR FOOD!*** THEY HAVE BEEN SILENT ON BOFFFF !

THIS IS VOLUNTARY REPORTING TO GIVE FOOD TO LOWER INCOME SHORE SIDE FISHERS FOOD ####!

CAN THE ADVISORS HOLD A ROLL CALL VOTE ON TOTAL LENGTH AND NO DISCARDS WITH CELL PHONE REPORTING?

PROVIDED COUNCIL DOES NOT HAVE FUNDS FOR THE **BLUE FIN DATA APP PERHAPS A GO FUND ME PAGE COULD BE USED TO PAY FOR APP.**

PLEASE FORWARD TO ALL ADVISORS!

i WAS ASKED TO LEAVE A DOCK AREA SO A FAMILY COULD KEEP THE FISH THEY WERE CATCHING FOR FOOD!

COUNCIL MEMBERS WANTING BRAGGING FISH SHOULD FISH WITH ONLY 7 O HOOKS ON BOATS NOTHING SMALLER {FEW SCUP WILL BE CAUGHT} !

THANK YOU

JAMES FLETCHER

UNITED NATIONAL FISHERMAN'S ASSOCIATION YES I AM UPSET!

From: James Fletcher <unfa34@gmail.com>
Sent: Tuesday, June 21, 2022 8:28 AM
To: Lewis, June; Beaty, Julia; Kiley Dancy
Subject: No Answer to Question on SF Scup BSB

I receive no answer from a number of request.

1. What is number of recreational fishers in EEZ
2. Why no Comments for a total length for all manages species {no discards}
3. Why do regulations target the largest females?
4. WHAT ARE THE IMPORT NUMBERS FOR FISH { POUNDS OF IMPORTS ALLOWED INTO U.S. BY NMFS & NOAA THAT REPLACE THESE FISH IN MARKET ?.

THE BAD PART IS 80% OF RECREATIONAL FISHERS FISH FROM SHORE & THE CURRENT REGULATIONS DO NOT ALLOW THEM TO KEEP FISH FOR FOOD.
DISCARDS FROM SHORE SIDE FISHING IS NOT CALCULATED CORRECTLY. WHY NOT DISCUSS TOTAL LENGTH RETENTION & NO DISCARDS ESPECIALLY FOR STATE WATERS? THUS ALLOWING LOW INCOME FISHERS FOOD?
Have you ever considered stock enhancement / ocean ranching where faster growing fish or eggs are released.

NO I SELDOM EVER GET ANSWERS! SOME OF MY PROJECTS TAKE 10 YEARS TO BECOME REALITY & THEN ONLY BECAUSE SOME ONE ELSE HELPS TO PUSH THE PROJECT.
NOAA NMFS WANTS REDUCTION OF FISH FOR FOOD NOT PRODUCTION FOR FOOD.

THANKS FOR ANY AND ALL HELP James Fletcher.

From: James Fletcher <unfa34@gmail.com>
Sent: Wednesday, June 29, 2022 10:46 AM
To: Hart, Hannah
Subject: Re: SFSBSB draft Fishery Performance Report

Information

https://www.pewresearch.org/internet/fact-sheet/mobile/ this number of people with cell phones.

council should require reporting using *BLUEFIN DATA APP FOR RECREATIONAL REPORTING!*

would you send the Advisor report to Matthew.cutler@noaa.gov Some how his group is looking at under served population of people AKA low income minority groups.

Side line question: do you know why council will not provide a number for salt water recreational fishers as required by 2006 magnuson?

Do you know who opposes total length retention & NODISCARDS?

WELCOME TO MAFMC STAFF people like me asking questions are reason your work is hard.

THANK YOU

From: James Fletcher <unfa34@gmail.com>
Sent: Thursday, July 7, 2022 12:26 PM
To: Hart, Hannah <hhart@mafmc.org>; Moore, Christopher <cmoore@mafmc.org>; Beal, Robert <rbeal@asmfc.org>
Subject: Re: SFSBSB draft Fishery Performance Report

CONSIDER THE COUNCIL IS AND HAS BEEN PROTECTING **** NEW TERM *** PE*** PRESTIGIOUS ELITE***

WE KNOW THEY ARE ON COUNCIL & ASMFC

THE DEPRIVED SHORE SIDE ANGLER [DSSA[*** NEW *** IS NOT REPRESENTED! COUNCIL OR ASMFC

I HOPE ATTACHED DEFINITION TRAVELS WITH THIS EMAIL.

THE PROTECTED PRESTIGIOUS ELITE MUST BE IDENTIFIED AS THIS GROUP MAKES UP ALL SINGLE VESSEL ANGLERS IN EEZ.

need / want to know number of warm bodies that fish in EEZ and or salt water MAGNUSON 2006

thank you Fletcher UNFA

Attachment:

Who are the 20% PRESTIGIOUS ELITE RECREATIONAL FISHERMEN ?

Who are the 80% deprived shore side subsistence recreational anglers?

When will State fishery Management agencies manage the natural resource of fish for food not fun for the prestigious Elite?

-Prestigious Elite
prestigious
pre-ste'jas, -stij'as

adjective Having

prestige; esteemed.

1. Practicing tricks; juggling.
2. Definition of *prestigious*

1 ; having prestige : honored
2 archaic : of, relating to, or marked by illusion, conjuring, or trickery

Elite
singular or plural in construction : the socially superior part of society

A group or class of persons considered to be superior to others because of their intelligence, social standing, or wealth
A group of persons exercising the major share of authority or influence within a larger group:

The group or part of a group selected or regarded as the finest, best, most distinguished, most powerful, etc.

Definition of *deprived*

; marked by deprivation especially of the necessities of life or of healthful environmental influences

not having the things that are necessary for a pleasant life, such as enough money, food, or good living conditions:
Synonyms for *deprived*

- depressed,
- disadvantaged,
- underprivileged Lacking in advantage, opportunity, or experience.

Who are the 20% PRESTIGIOUS ELITE RECREATIONAL FISHERMEN ?

Who are the 80% deprived shore side subsistence anglers?

When will State fishery Management agencies manage the natural resource of fish for food not fun for the prestigious Elite?

Summer flounder Data Update for 2022

National Marine Fisheries Service
Northeast Fisheries Science Center
166 Water St.
Woods Hole, MA 02543

Fishery and Survey Data

Reported 2021 landings in the commercial fishery were 4,731 mt = 10.430 million lb, an increase of 14% from 2020, and 83% of the 2021 commercial quota (Figure 1). Estimated 2021 landings in the recreational fishery were 3,092 mt = 6.817 million lb, a decrease of 32% from 2020, and 82% of the 2021 recreational harvest limit (Figure 1). Total commercial and recreational landings in 2021 were 7,823 mt = 17.247 million lb, a decrease of 10% from 2020. Final estimates of fishery discards for 2020-2021 are not yet available.

There were no NEFSC bottom trawl surveys conducted in 2020. The NEFSC spring survey index of summer flounder stock biomass decreased by 41% from 2019 to 2022; the fall index increased by 6% from 2019 to 2021 (Figure 2). The NEFSC fall survey length frequency distributions suggest that an above average year class (mode at about 20 cm total length) recruited to the stock in 2018 with average to below average recruitment since (Figure 3).

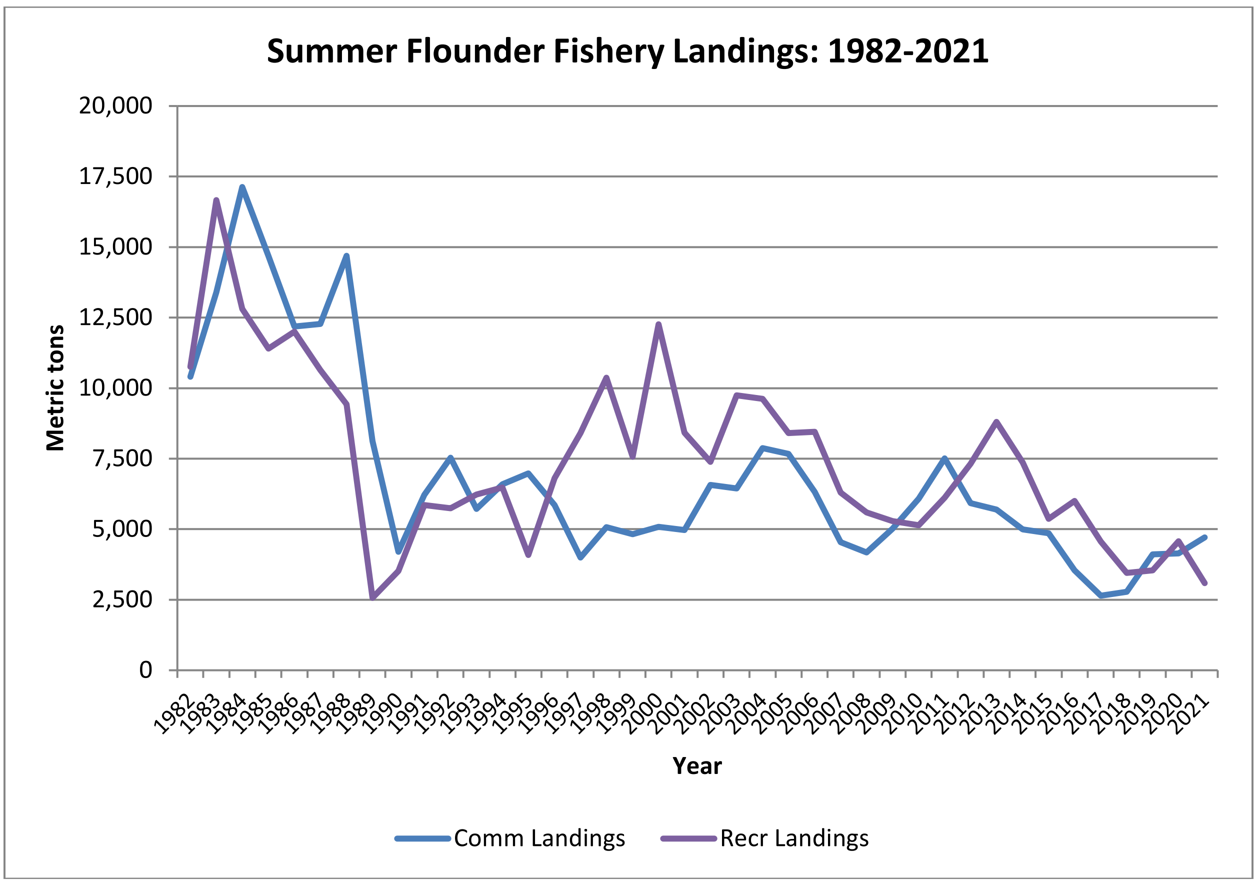


Figure 1. Summer flounder fishery landings.

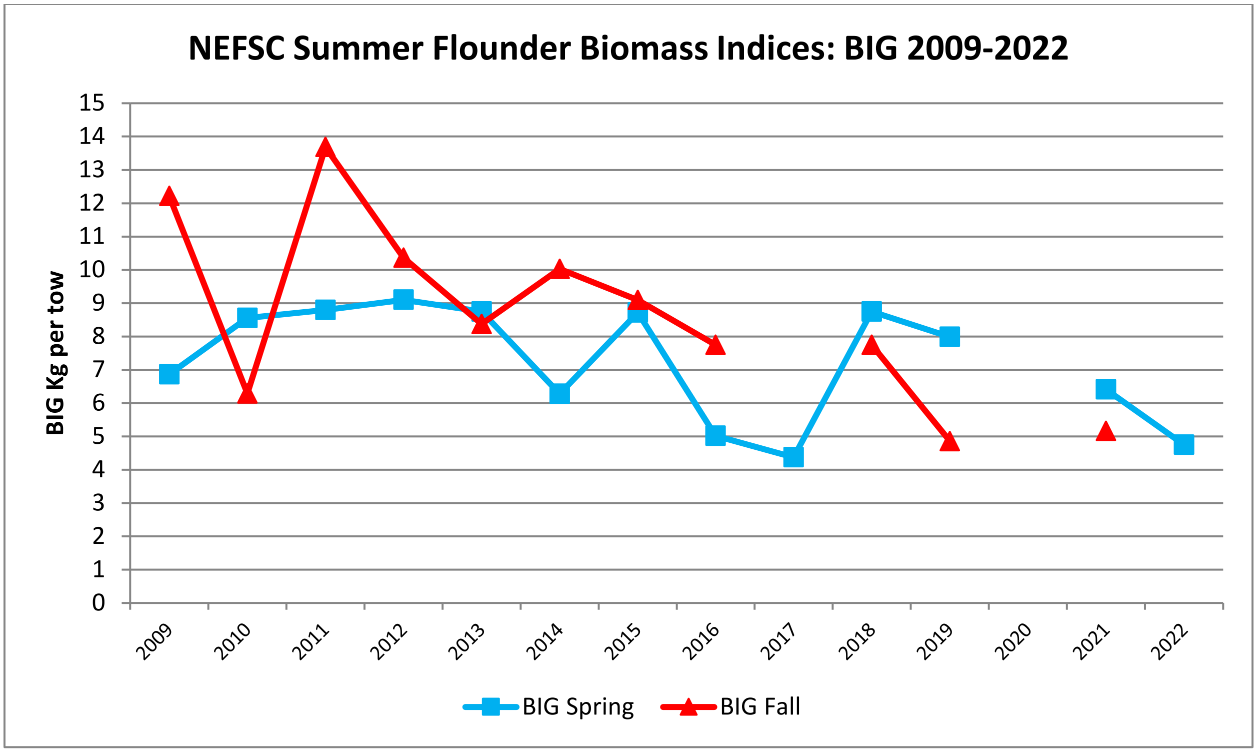


Figure 2. Northeast Fisheries Science Center (NEFSC) bottom trawl survey aggregate biomass indices for summer flounder. There are no valid fall 2017 or spring and fall 2020 indices for summer flounder. Surveys have been conducted with the FSV HB Bigelow (BIG) during 2009-2022.

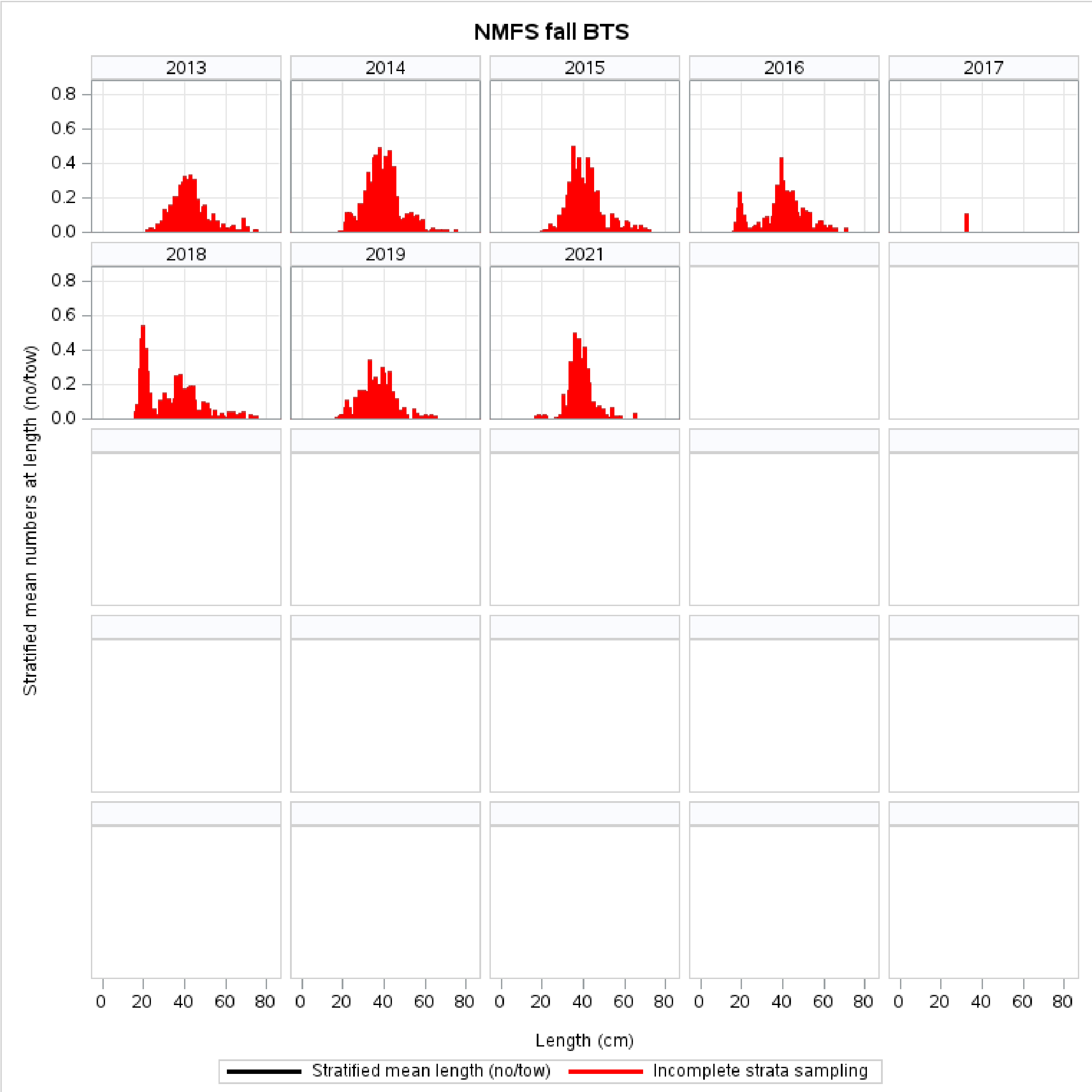


Figure 3. Northeast Fisheries Science Center (NEFSC) fall bottom trawl survey FSV HB Bigelow indices at length since 2013. There was an incomplete survey conducted in 2017 and no survey conducted in 2020.

Summer Flounder Fishery Information Document

June 2022

This document provides a brief overview of the biology, stock condition, management system, and fishery performance for summer flounder (*Paralichthys dentatus*), with an emphasis on 2021. Data sources include unpublished National Marine Fisheries Service (NMFS) survey, dealer, vessel trip report (VTR), permit, as well as Marine Recreational Information Program (MRIP) data and stock assessment information. All 2021 data should be considered preliminary. For more resources on summer flounder management, including previous Fishery Information Documents, please visit http://www.mafmc.org/sf-s-bsb.

Key Facts:

- The 2021 management track stock assessment found that in 2019, summer flounder was not overfished and overfishing was not occurring.
- While recruitment for summer flounder has generally been below-average since 2011, the 2018 estimate of recruitment was above average and the largest year class estimated since 2009. 2019 recruitment is estimated to be below average.
- 2021 recreational summer flounder harvest was estimated at 6.82 million pounds, about 82% of the harvest limit of 8.32 million pounds. This is the lowest estimate of recreational harvest since 1989.
- Commercial landings in 2021 (10.36 million pounds; 83% of commercial quota) increased by about 14% from 2020 landings (9.12 million pounds; 79% of commercial quota).
- Average commercial ex-vessel price increased from $2.69 in 2020 to $2.91 in 2021. Average price per pound has decreased in recent years from its peak in 2017 ($4.64 per pound in 2021 dollars).

Basic Biology

Summer flounder spawn during the fall and winter over the open ocean areas of the continental shelf. From October to May, larvae and postlarvae migrate inshore, entering coastal and estuarine nursery areas. Juveniles are distributed inshore and in many estuaries throughout the range of the species during spring, summer, and fall. Adult summer flounder exhibit strong seasonal inshore-offshore movements, normally inhabiting shallow coastal and estuarine waters during the warmer months of the year and remaining offshore during the colder months.

Summer flounder habitat includes pelagic waters, demersal waters, saltmarsh creeks, seagrass beds, mudflats, and open bay areas from the Gulf of Maine through North Carolina. Summer flounder are opportunistic feeders; their prey includes a variety of fish and crustaceans. While the natural predators of adult summer flounder are not fully documented, larger predators (e.g., large sharks, rays, and monkfish) probably include summer flounder in their diets.[1]

Spawning occurs during autumn and early winter, and the larvae are transported toward coastal areas by prevailing water currents. Development of post larvae and juveniles occurs primarily within bays and estuarine areas. Most fish are sexually mature by age 2. The largest fish are females, which can attain lengths over 90 cm (36 in) and weights up to 11.8 kg (26 lb). The Northeast Fisheries Science Center (NEFSC) commercial fishery sampling in 2018 observed the oldest summer flounder collected to date, a 57 cm (22.4 in) fish (likely a male) estimated to be age 20. Also sampled were two age 17 fish, at 52 cm (20.5 in; likely a male) and at 72 cm (28.3 in; likely a female). Two large (likely female) fish at 80 and 82 cm (31.5 and 32.3 in) were both estimated to be age 9, from the 2009 year class (the 6th largest of the 36 year modeled time series). These samples indicate that increased survival of summer flounder over the last two decades has allowed fish of both sexes to grow to the oldest ages estimated to date.[2]

Status of the Stock

In June 2021, the NEFSC provided a management track assessment update for summer flounder with data through 2019. Given data gaps for 2020 related to COVID-19 and the time required to address those gaps where possible, 2020 data could not be incorporated into this update.

The 2021 management track assessment update made minor revisions to the biological reference points for spawning stock biomass (SSB) and fishing mortality (F). The 2021 assessment update results indicate that the summer flounder stock was not overfished in 2019. SSB has generally decreased since 2003. SSB in 2019 was estimated to be about 86% of the biomass target reference point and about 72% above the overfished threshold which is equivalent to ½ of the biomass target (Table 1; Figure 1).

The 2021 assessment also indicated that overfishing was not occurring in 2019, as 2019 F was estimated to be 19% below the fishing mortality threshold reference point (Table 1; Figure 2).

The average recruitment from 1982 to 2019 is 53 million fish at age 0. Recruitment of juvenile summer flounder was below-average from 2011-2017, ranging from 31 to 45 million fish and averaging 36 million fish. The driving factors behind this period of below average recruitment have not been identified. The 2018 year class is above average at an estimated 61 million fish, which is largest recruitment estimate since 2009, while the 2019 year class is below average at 49 million fish.[3]

Table 1: Biomass and fishing mortality rate reference points and terminal year estimates for summer flounder from the 2021 management track assessment.[3]

	Spawning stock biomass	**Fishing mortality rate (F)**
Terminal year estimate (2019)	104.49 million lb (47,397 mt)	0.340
Target	121.73 mil lb (55,217 mt)	N/A
Threshold	60.87 million lb (27,609 mt)	0.422
Status	**Not overfished**	**Not overfishing**

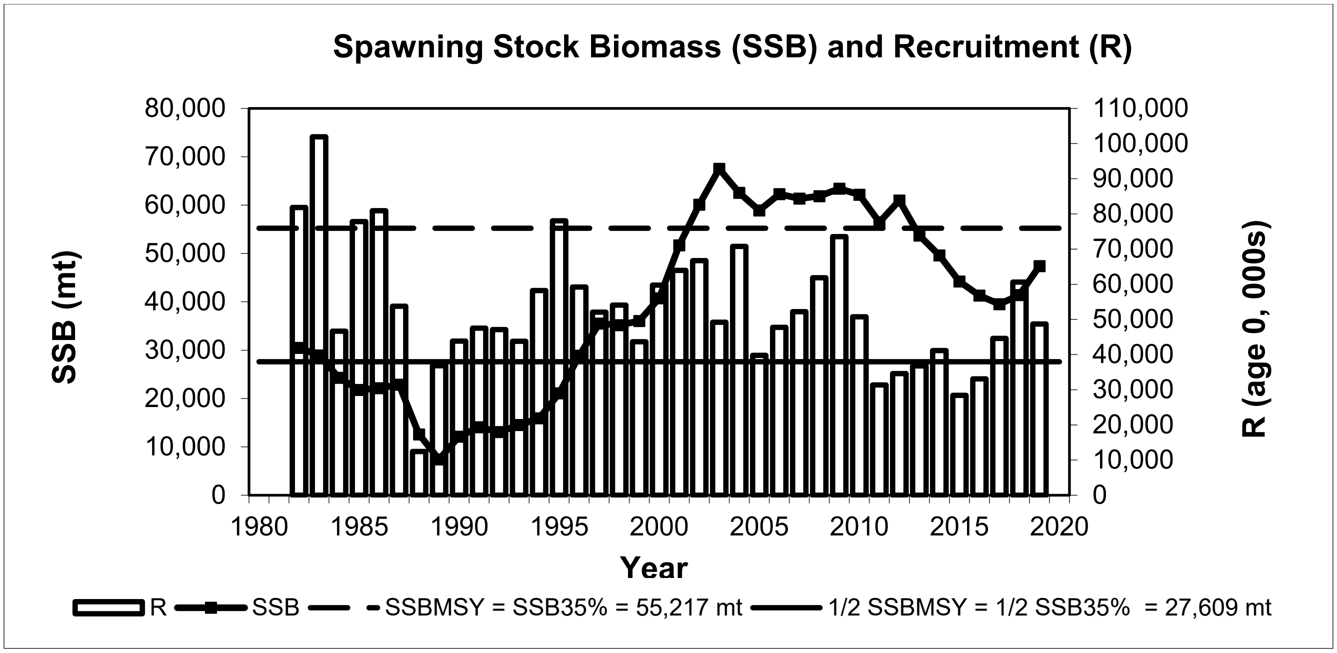


Figure 1: Summer flounder spawning stock biomass (SSB; solid line with square markers) and recruitment at age 0 (R; vertical bars),1982-2019. The horizontal dashed line is the target biomass level. The horizontal solid line is the threshold biomass level defining an overfished condition.

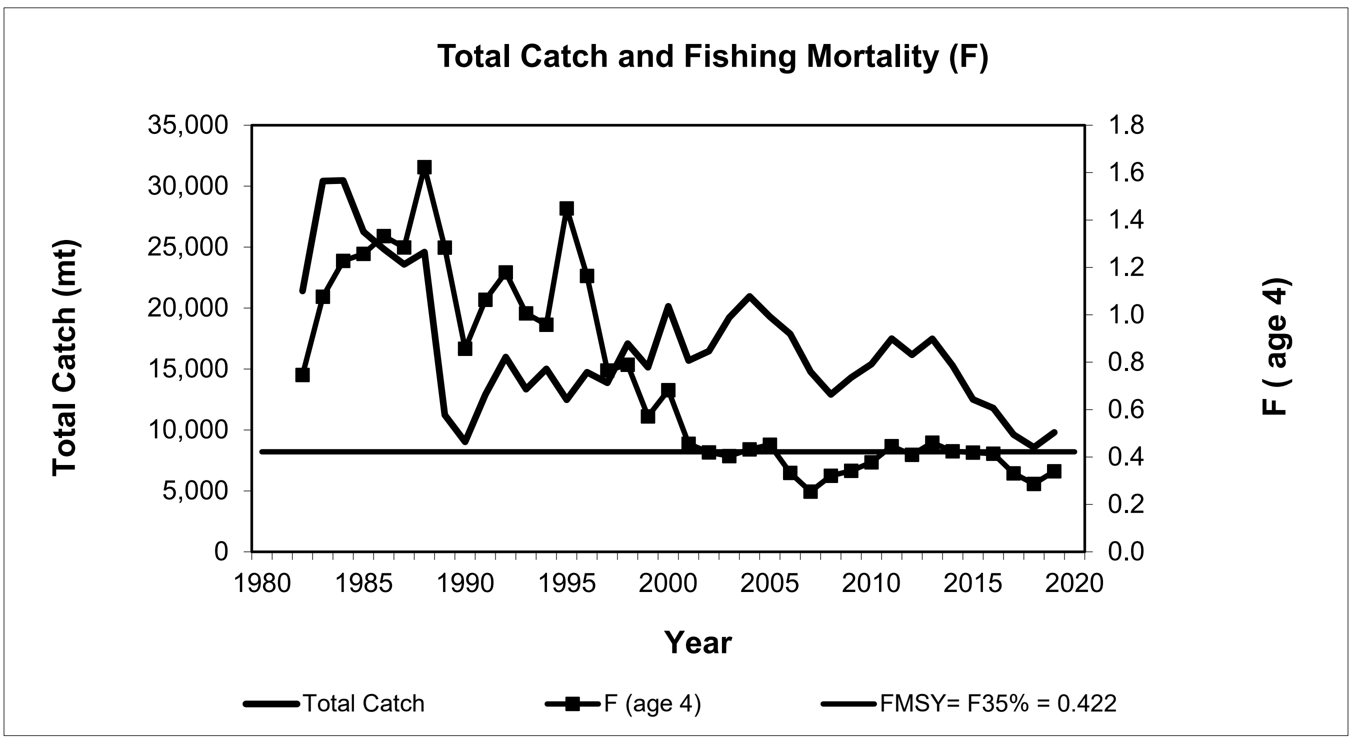


Figure 2: Total fishery catch (metric tons; mt; solid line) and fully-recruited fishing mortality (F, peak at age 4; squares) of summer flounder, 1982-2019. The horizontal solid line is the fishing mortality reference point. When F exceeds this threshold, overfishing is occurring.

Management System and Fishery Performance

Management

The Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission (Commission) work cooperatively to develop fishery regulations for summer flounder off the east coast of the United States. The Council and Commission work in conjunction with NMFS, which serves as the federal implementation and enforcement entity. This cooperative management endeavor was developed because a significant portion of the catch is taken from both state (0-3 miles offshore) and federal waters (3-200 miles offshore, also known as the Exclusive Economic Zone, or EEZ).

The joint Fishery Management Plan (FMP) for summer flounder became effective in 1988 and established the management unit for summer flounder as U.S. waters from the southern border of North Carolina northward to the U.S.-Canadian border. The FMP also established measures to ensure effective management of summer flounder fisheries, which currently include catch and landings limits, commercial quotas, recreational harvest limits (RHLs), minimum size limits, gear regulations, permit requirements, and other provisions as prescribed by the FMP. The Summer Flounder FMP, including subsequent Amendments and Frameworks, are available on the Council website at: http://www.mafmc.org/fisheries/fmp/sf-s-bsb.

There are large commercial and recreational fisheries for summer flounder. These fisheries are managed primarily using output controls (catch and landings limits). The Council's Scientific and Statistical Committee (SSC) recommends annual Acceptable Biological Catch (ABC) levels for summer flounder. The ABC is divided into commercial and recreational Annual Catch Limits (ACLs), which include both allowable landings and expected dead discards. Currently, 60% of the total allowable landings (calculated by subtracting total expected dead discards from the ABC) are allocated to the commercial fishery as a commercial quota and 40% allocated to the recreational fishery as an RHL. In December 2021, the Council and Commission revised the commercial/recreational allocation such that 55% of the ABC will be allocated to the commercial fishery and 45% to the recreational fishery. This represents a change from a landings-based allocation to a catch-based allocation, such that the allocation will be applied directly to the ABC instead of to the total allowable landings. These changes are pending review by NMFS and if approved, are expected to be effective January 1, 2023.[1]

Fishery Landings Summary

Table 2 shows summer flounder catch and landings limits from 2012 through 2023, as well as commercial and recreational landings through 2021. Total (commercial and recreational combined) summer flounder landings generally declined throughout the early 1980s, and increased again in the mid-2000s before dropping to a time series low of 13.74 million lb in 2018 (Figure 3).[4,5]

In July 2018, MRIP released revisions to their time series of recreational catch and landings estimates based on adjustments for a revised angler intercept methodology and a new effort estimation methodology (i.e., a transition from a telephone-based effort survey to a mail-based effort survey). The revised estimates of catch and landings are several times higher than the

[1] For more information on these allocation revisions, see the fact sheet at: https://www.mafmc.org/s/SFSBSB-Allocation-FAQs.pdf.

previous estimates for shore and private boat modes. All recreational estimates in this document reflect revised MRIP estimates except where otherwise noted.

Recreational harvest estimates for 2020 were impacted by temporary suspension of shoreside intercept surveys due to the COVID-19 pandemic. 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 intercept surveys continued uninterrupted. Proxy data were combined with observed data to produce 2020 catch estimates using the standard estimation methodology. NMFS previously indicated that 2020 data may be revised based on potential incorporation of 2021 data into these imputation methods; as of completion of this document no updates have been made. Commercial landings reporting in 2020 continued uninterrupted.

Table 2: Summary of catch limits, landings limits, and landings for commercial and recreational summer flounder fisheries from 2012 through 2023. Values are in millions of pounds.

Measures	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023[d]
ABC	25.58	22.34	21.94	22.57	16.26	11.30	13.23	25.03	25.03	27.11	33.12	33.12
Commercial ACL	14.00	12.11	12.87	13.34	9.43	6.57	7.70	13.53	13.53	14.63	18.48	18.48
Commercial quota[a,b]	12.73	11.44	10.51	11.07	8.12	5.66	6.63	10.98	11.53	12.49	15.53	15.53
Commercial landings	13.05	12.56	11.00	10.71	7.80	5.87	6.17	9.06	9.12	10.36	--	--
% of commercial quota landed	102%	110%	105%	97%	96%	104%	93%	83%	79%	83%	--	--
Recreational ACL	11.58	10.23	9.07	9.44	6.84	4.72	5.53	11.51	11.51	12.48	14.64	14.64
Recreational harvest limit[a]	8.49	7.63	7.01	7.38	5.42	3.77	4.42	7.69	7.69	8.32	10.36	10.36
Harvest - OLD MRIP	6.49	7.36	7.39	4.72	6.18	3.19	3.35	--	--	--	--	--
Harvest - NEW MRIP	16.13	19.41	16.23	11.83	13.24	10.09	7.60	7.80	10.06	6.82	--	--
% of RHL landed[c]	76%	96%	105%	64%	114%	85%	76%	101%	131%[d]	82%	--	--

[a] For 2012-2014, commercial quotas and RHLs are adjusted for Research Set Aside (RSA). Quotas and RHLs for 2015-2023 do not reflect an adjustment for RSA due to the suspension of the program in 2014.
[b] Commercial quotas also reflect deductions from prior year landings overages and discard-based Accountability Measures.
[c] The revised MRIP data cannot be compared to RHLs prior to 2019, given that these limits were set based on an assessment that used previous MRIP data. For the comparison of harvest to the RHL, old MRIP values are used for 2012-2018 and revised MRIP values are used for 2019-2021.
[d] Previously adopted limits for 2023 will be reviewed in 2022 by the SSC, Monitoring Committee, and Council/Commission. Sector-specific limits including the commercial and recreational ACLs, RHL, and commercial quota are expected to be revised given recently adopted changes to the commercial/recreational allocation, expected to be effective January 1, 2023.

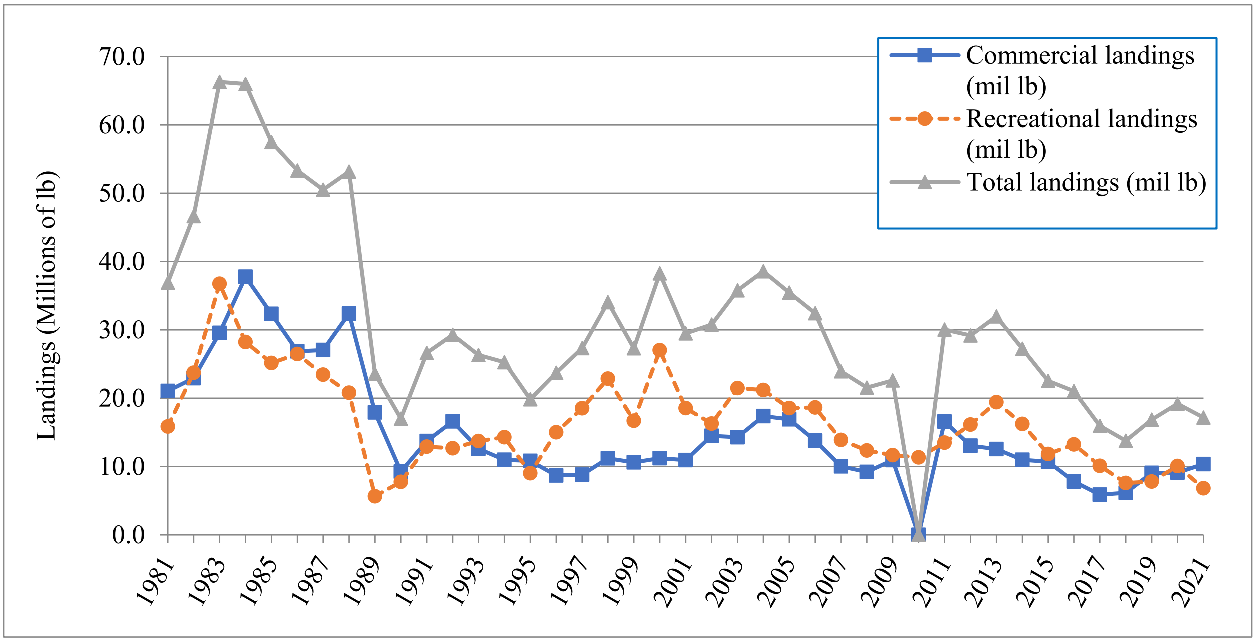


Figure 3: Commercial and recreational summer flounder landings in millions of pounds, Maine-North Carolina, 1981-2021.[5]

Commercial Fishery

Commercial landings of summer flounder peaked in 1984 at 37.77 million pounds and reached a low of 5.87 million pounds in 2017 (Figure 3). In 2021, commercial fishermen from Maine through North Carolina landed 10.36 million pounds of summer flounder, about 83% of the commercial quota (12.49 million pounds; Table 2). [4]

Since 1993, a moratorium permit has been required to fish commercially for summer flounder in federal waters. In 2021, 711 vessels held such permits.[6]

The commercial quota is divided among the states based on the allocation percentages specified in the FMP. Each state sets measures to achieve their state-specific commercial quotas. Two or more states may transfer or combine their summer flounder commercial quota under mutual agreement and with the approval of the NMFS Regional Administrator. The commercial allocations to the states were modified via Amendment 21, which became effective on January 1, 2021. The revised allocation system modifies the state-by-state commercial quota allocations in years when the annual coastwide commercial quota exceeds the specified trigger of 9.55 million pounds. Annual coastwide commercial quota of up to 9.55 million pounds is distributed according to the previous state allocations (Table 3). In years when the coastwide quota exceeds 9.55 million pounds, the *additional* quota amount beyond this trigger will be distributed by equal shares to all states except Maine, Delaware, and New Hampshire, which would split 1% of the additional quota (Table 3). The total percentage allocated annually to each state is dependent on how much additional quota beyond 9.55 million pounds, if any, is available in any given year. This allocation system is designed to provide for more equitable distribution of quota when stock biomass is higher, while also considering the historic importance of the fishery to each state.

Table 3: Current (effective January 2021) allocation of summer flounder commercial quota to the states.

State	Total state commercial quota allocation = baseline quota allocation + additional quota allocation	
	Allocation of baseline quota ≤9.55 mil lb	Allocation of additional quota beyond 9.55 mil lb
ME	0.04756%	0.333%
NH	0.00046%	0.333%
MA	6.82046%	12.375%
RI	15.68298%	12.375%
CT	2.25708%	12.375%
NY	7.64699%	12.375%
NJ	16.72499%	12.375%
DE	0.01779%	0.333%
MD	2.03910%	12.375%
VA	21.31676%	12.375%
NC	27.44584%	12.375%
Total	100%	100%

For 1994 through 2021, NMFS dealer data indicate that summer flounder total ex-vessel revenue from Maine to North Carolina ranged from a low of \$14.28 million in 1996 to a high of \$31.76 million in 2015 (values adjusted to 2021 dollars to account for inflation). The mean price per pound ranged from a low of \$1.34 in 2002 to a high of \$4.22 in 2017 (both values in 2021 dollars). In 2021, 10.36 million pounds of summer flounder were landed generating \$30.18 million in total ex-vessel revenue (an average of \$2.91 per pound; Figure 4).[4]

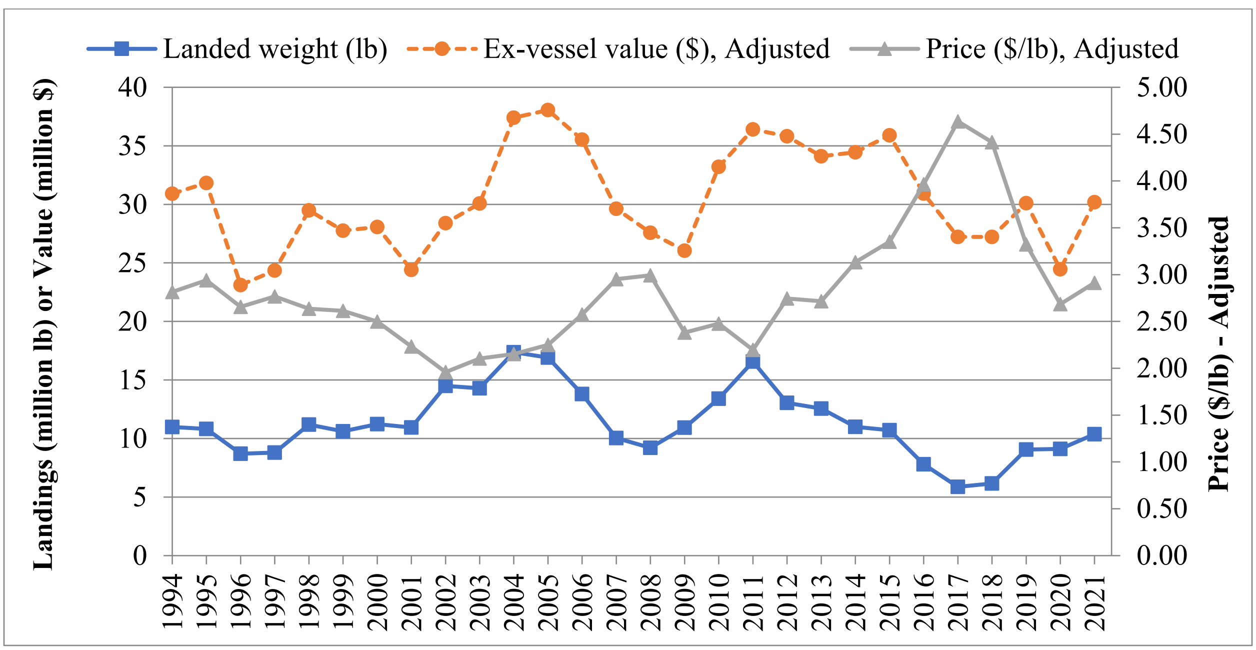


Figure 4: Landings, ex-vessel value, and price per pound for summer flounder, Maine through North Carolina, 1994-2021. Ex-vessel value and price are adjusted to real 2021 dollars using the Gross Domestic Product Price Deflator (GDPDEF).[4]

VTR data indicate that 99% of summer flounder landings in 2021 were taken by bottom otter trawls.[7] Current regulations require a 14-inch total length minimum fish size in the commercial fishery. Trawl nets are required to have 5.5-inch diamond or 6-inch square minimum mesh in the entire net for vessels possessing more than the threshold amount of summer flounder (i.e., 200 lb from November 1-April 30 and 100 lb from May 1-October 31).

According to federal VTR data, statistical areas 537 and 616 were responsible for the highest percentage of commercial summer flounder catch in 2021 (30% and 24% respectively; Table 4). While statistical area 539 accounted for only 5% of 2021 summer flounder catch, this area had the highest number of trips that caught summer flounder (2,177 trips; Table 4; Figure 5).[7]

Over 164 federally permitted dealers from Maine through North Carolina bought summer flounder in 2021. More dealers from New York bought summer flounder than any other state (Table 5). All dealers combined bought approximately $30.18 million worth of summer flounder in 2021.[4]

At least 100,000 pounds of summer flounder were landed by commercial fishermen in 16 ports in 8 states in 2021. These ports accounted for 90% of all 2021 commercial summer flounder landings. Point Judith, RI and Beaufort, NC were the leading ports in 2021 in pounds of summer flounder landed, while Point Judith, RI was the leading port in number of vessels landing summer flounder (Table 6).[4] Detailed community profiles developed by the Northeast Fisheries Science Center's Social Science Branch can be found at www.mafmc.org/communities/.

Table 4: Statistical areas that accounted for at least 5% of the total summer flounder catch in 2021, with associated number of trips.[7] Federal VTR data do not capture landings by vessels only permitted to fish in state waters.

Statistical Area	Percent of 2021 Commercial Summer Flounder Catch	Number of Trips
537	30%	1,362
616	24%	756
613	17%	1,521
539	5%	2,177
612	5%	899

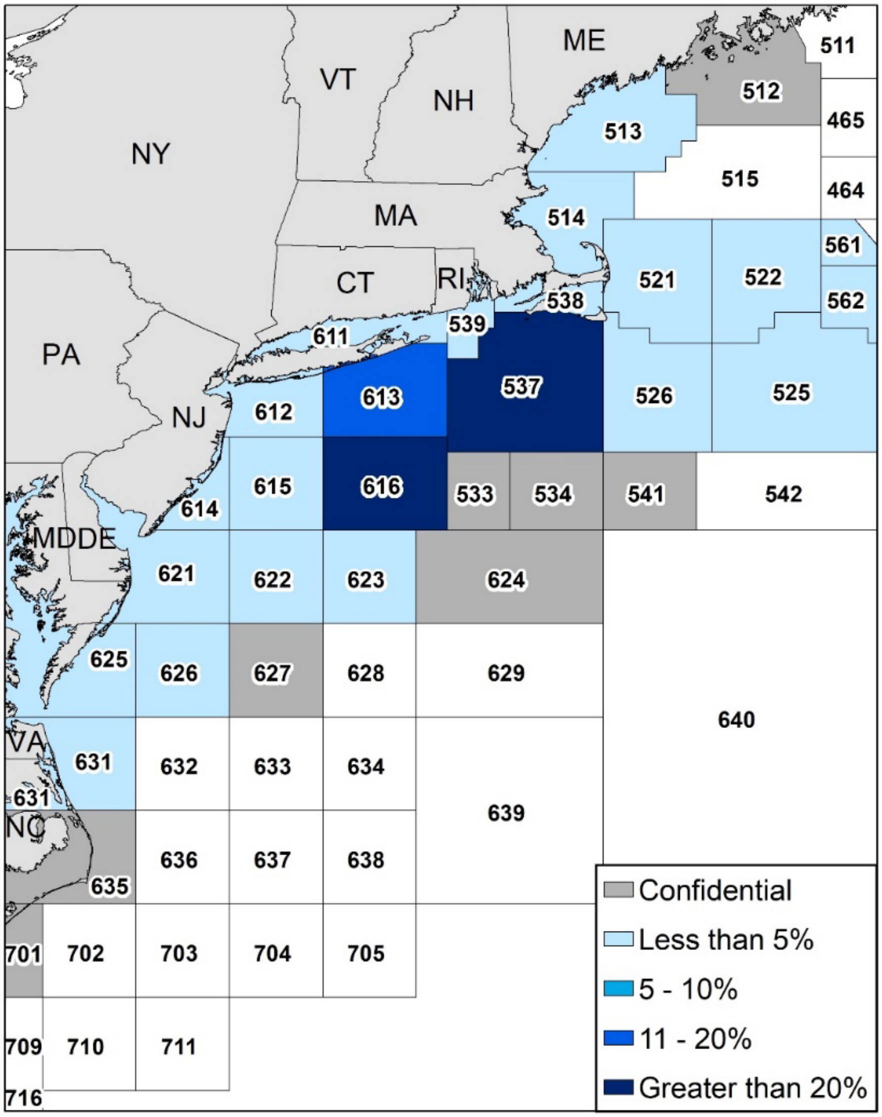


Figure 5: Proportion of commercial summer flounder catch (all vessel reported landings and discards) by NMFS statistical area in 2021 based on federal VTR data. Statistical areas marked "confidential" are associated with fewer than three vessels and/or dealers. The amount of catch not reported on federal VTRs (e.g., catch from vessels permitted to fish only in state waters) is unknown.[7]

Table 5: Number of dealers per state which reported purchases of summer flounder in 2021. C = Confidential.[4]

State	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC
# of Dealers	C	25	20	14	46	27	0	4	12	16

Table 6: Ports reporting at least 100,000 pounds of commercial summer flounder landings in 2021, based on dealer data.[4]

Port	Commercial summer flounder landings (lb)	% of total	Number of vessels
POINT JUDITH, RI	1,748,523	17%	128
BEAUFORT, NC	1,434,811	14%	47
PT. PLEASANT, NJ	1,174,359	11%	48
HAMPTON, VA	965,319	9%	47
NEWPORT NEWS, VA	620,942	6%	32
MONTAUK, NY	609,729	6%	67
STONINGTON, CT	393,382	4%	19
NEW BEDFORD, MA	372,109	4%	59
CAPE MAY, NJ	352,130	3%	35
OCEAN CITY, MD	345,249	3%	18
ENGELHARD, NC	240,539	2%	5
WANCHESE, NC	207,119	2%	7
BELFORD, NJ	194,955	2%	15
HAMPTON BAYS, NY	191,819	2%	28
EAST HAVEN, CT	174,107	2%	9
LONG BEACH/ BARNEGAT LIGHT, NJ	165,919	2%	12
CHINCOTEAGUE, VA	147,434	1%	14

Recreational Fishery

There is a significant recreational fishery for summer flounder, primarily in state waters when the fish migrate inshore during the warm summer months. The Council and Commission determine annually whether to manage the recreational fishery under coastwide measures or conservation equivalency. Under conservation equivalency, state- or region- specific measures are developed through the Commission's management process and submitted to NMFS. The combined state or regional measures must achieve the same level of harvest as a set of coastwide measures developed to adhere to the overall RHL. If NMFS considers the combination of the state- or region- specific measures to be "equivalent" to the coastwide measures, they may then waive regulations in federal waters. Anglers fishing in federal waters are then subject to the measures of the state in which they land summer flounder.

The recreational fishery has been managed using federal conservation equivalency each year since 2001. Since 2014, a regional approach has been used, under which the states within each region must have identical size limits, possession limits, and season length. Table 7 shows the 2021 and 2022 regional conservation equivalency measures. Measures were adjusted in 2022 to allow for up to a 16.5% liberalization in harvest, given the increase in the RHL between 2021 and 2022 and because recent harvest estimates have been well below the 2022 RHL.

Table 7: Summer flounder recreational fishing measures 2021-2022, by state, under regional conservation equivalency. Conservation equivalency regions (highlighted in alternating colors) include: 1) Massachusetts, 2) Rhode Island, 3) Connecticut and New York, 4) New Jersey, 5) Delaware, Maryland, The Potomac River Fisheries Commission, and Virginia, and 6) North Carolina.

	2021			2022		
State	**Minimum Size (inches)**	**Possession Limit**	**Open Season**	**Minimum Size (inches)**	**Possession Limit**	**Open Season**
Massachusetts	17	5 fish	May 23-October 9	16.5	5 fish	May 21-September 19
Rhode Island (Private, For-Hire, and all other shore-based fishing sites)	19	6 fish	May 3-December 31	18	4 fish	May 3-December 31
RI 7 designated shore sites	19	4 fish[a]		18	2 fish[a]	
	17	2 fish[a]		17	2 fish[a]	
Connecticut	19	4 fish	May 4-September 30	18.5	4 fish	May 1-October 9
CT Shore Program (45 designed shore sites)	17			17		
New York	19			18.5		
New Jersey	18	3 fish	May 22-September 19	17-17.99 slot limit	2 fish	May 2-September 27
				18	1 fish	
NJ Shore program site (ISBSP)	16	2 fish		16	2 fish	
New Jersey/Delaware Bay COLREGS	17	3 fish		17	3 fish	
Delaware	16.5	4 fish	January 1-December 31	16	4 fish	January 1-December 31
Maryland						
PRFC						
Virginia						
North Carolina	15	4 fish	August 16-September 30[b]	15	1 fish	September 1-September 30[b]

[a] Rhode Island's shore program includes a combined possession limit of 6 fish, no more than 2 fish at 17-inch minimum size limit.

[b] North Carolina has restricted their recreational season in recent years for all flounders in North Carolina (southern, gulf, and summer flounder) due to the need to end overfishing on southern flounder. North Carolina manages all flounder in the recreational fishery under the same regulations.

MRIP estimates indicate that recreational catch (harvest plus live and dead discards) for summer flounder peaked in 2010 with 58.89 million fish caught. Recreational harvest peaked in 1983, with 25.78 million fish landed, totaling 36.74 million pounds. Recreational catch was lowest in 1989 with 5.06 million fish caught. Recreational harvest in numbers of fish reached a low in 2021 with 2.32 million fish landed (6.82 million pounds), while recreational harvest in pounds was lowest in 1989 at 5.66 million pounds (3.10 million fish; Figure 6).[5]

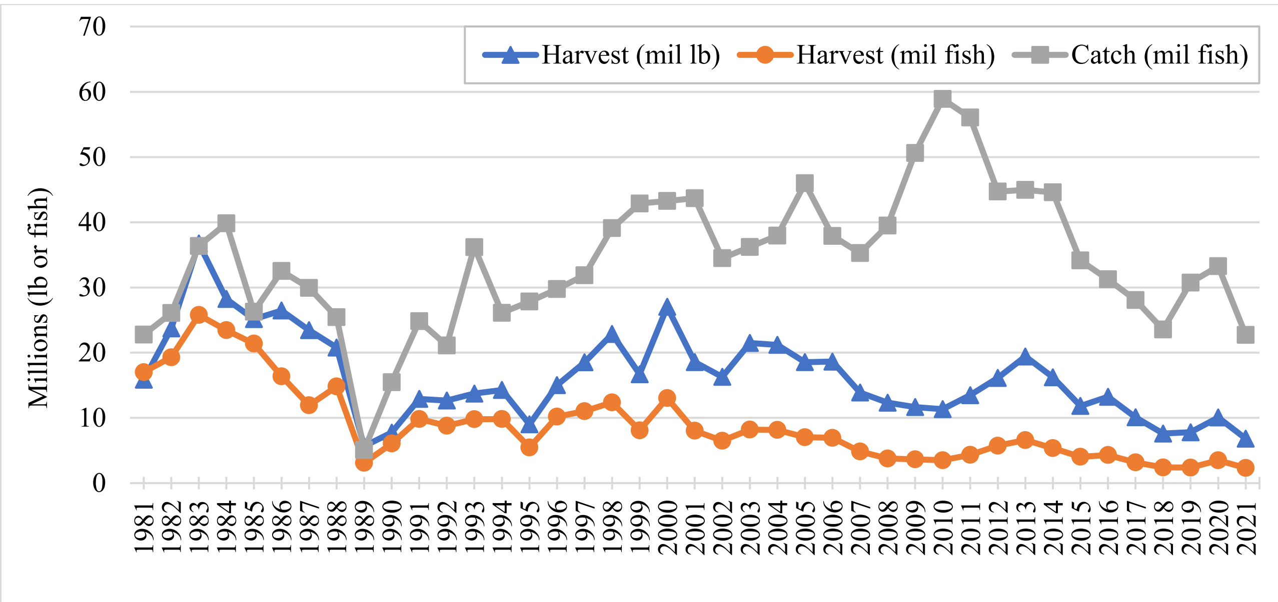


Figure 6: MRIP estimates of recreational summer flounder harvest in numbers of fish and pounds and catch in numbers of fish, ME - NC, 1981-2021.[5]

For-hire vessels carrying passengers in federal waters must obtain a federal party/charter permit. In 2021, 904 vessels held summer flounder federal party/charter permits.[6] Many of these vessels also hold recreational permits for scup and black sea bass.

On average, an estimated 77% of the recreational landings (in numbers of fish) occurred in state waters over the past ten years (Table 8). Most summer flounder are typically landed in New York and New Jersey (Table 9).[5]

About 86% of recreational summer flounder harvest from 2019-2021 was from anglers who fished on private or rental boats. About 4% was from party or charter boats, and about 10% was from anglers fishing from shore. The revised MRIP methodology resulted in an increase in the amount of harvest estimated to occur from private and shore modes while making only minor changes to the estimates for party/charter modes, modifying the percentages attributable to each mode (Table 10).[5]

Table 8: Estimated percentage of summer flounder recreational landings (in numbers of fish) from state vs. federal waters, Maine through North Carolina, 2012-2021.[5]

Year	State ≤ 3 mi	EEZ > 3 mi
2012	86%	14%
2013	77%	23%
2014	78%	22%
2015	82%	18%
2016	79%	21%
2017	79%	21%
2018	83%	17%
2019	77%	23%
2020	61%	39%
2021	66%	34%
Avg. 2012- 2021	**77%**	**23%**
Avg. 2019 - 2021	**69%**	**31%**

Table 9: State contribution (as a percentage) to total recreational landings of summer flounder (in numbers of fish), from Maine through North Carolina, 2019-2021.[5]

State	2019	2020	2021	2019-2021 average
Maine	0%	0%	0%	0%
New Hampshire	0%	0%	0%	0%
Massachusetts	2%	2%	2%	2%
Rhode Island	9%	3%	2%	6%
Connecticut	4%	4%	5%	4%
New York	24%	21%	15%	23%
New Jersey	46%	57%	58%	50%
Delaware	4%	6%	4%	5%
Maryland	3%	2%	3%	3%
Virginia	6%	4%	10%	5%
North Carolina	1%	1%	1%	1%
Total	100%	100%	100%	100%

Table 10: The percent of summer flounder landings (in number of fish) by recreational fishing mode, Maine through North Carolina, 2012-2021.[5]

Year	Shore	Party/Charter	Private/Rental	Total number of fish landed (millions)
2012	9%	3%	88%	5.74
2013	11%	4%	85%	6.60
2014	7%	8%	84%	5.36
2015	7%	7%	86%	4.03
2016	8%	4%	89%	4.30
2017	13%	4%	83%	3.17
2018	11%	6%	84%	2.41
2019	10%	3%	87%	2.38
2020	18%	2%	80%	3.49
2021	11%	7%	82%	2.32
% of Total, 2012-2021	**10%**	**4%**	**86%**	**--**
% of Total, 2019-2021	**13%**	**4%**	**83%**	**--**

References

[1] Packer, D. B, S. J. Griesbach, P. L. Berrien, C. A. Zetlin, D. L. Johnson, and W.W. Morse. 1999. Essential Fish Habitat Source Document: Summer Flounder, *Paralichthys dentatus*, Life History and Habitat Characteristics. NOAA Technical Memorandum NMFS-NE-151.

[2] Northeast Fisheries Science Center. 2019. Data Update for Summer Flounder.

[3] Northeast Fisheries Science Center (NEFSC). 2021. Summer Flounder Management Track Assessment for 2021. 14p. Available at: https://www.mafmc.org/s/c_2021_summer_flounder_MTA_report.pdf.

[4] Unpublished NMFS dealer data as of February 1, 2022.

[5] Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division. Accessed May 3, 2022. Available at: http://www.st.nmfs.noaa.gov/recreational-fisheries/index.

[6] Unpublished NMFS permit data as of February 1, 2022.

[7] Unpublished NMFS Vessel Trip Report (VTR) data as of February 1, 2022.

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: July 29, 2022

To: Council and Board

From: Hannah Hart, Staff

Subject: 2023 Scup Specifications

On Tuesday, August 9, the Council and Board will review previously adopted 2023 scup specifications and recommend revisions as needed. Measures to be considered include 2023 commercial and recreational catch and landings limits, as well as any changes to the commercial management measures needed for 2023. As described in the staff memo, previously approved 2023 commercial and recreational catch and landings limits will require revisions based on recent modifications to the commercial/recreational allocation percentages.

Materials listed below are provided for the Council and Board's consideration of this agenda item. Please note that some materials will be posted as supplemental, as noted below, some materials are behind other tabs, and some will be available on the August 2022 Meeting page at a later date.

1) Monitoring Committee meeting summary from July 28, 2022 (*behind Tab 3*)

2) July 2022 Scientific and Statistical Committee meeting report (*behind Tab 15*)

3) Staff memo on 2023 scup specifications dated July 14, 2022

4) June 2022 Advisory Panel Fishery Performance Report and additional AP email comments received through July 8, 2021 (*behind Tab 3*)

5) 2022 Scup Data Update

6) 2022 Scup Fishery Information Document

The following document is also posted on the August 2022 Meeting page as a supplemental briefing document:

1) Scup Management Track Assessment for 2021

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: July 14, 2022

TO: Chris Moore, Executive Director

FROM: Hannah Hart, Staff

SUBJECT: Scup Specifications for 2023

Executive Summary

This memorandum includes information to assist the Mid-Atlantic Fishery Management Council's (Council's) Scientific and Statistical Committee (SSC) and Monitoring Committee in reviewing the previously adopted 2023 catch and landings limits for scup, as well as scup commercial management measures for 2023, and recommending revisions as needed. Additional information on fishery performance and past management measures can be found in the 2022 Scup Fishery Information Document and the 2022 Summer Flounder, Scup, and Black Sea Bass Fishery Performance Report developed by advisors.[1]

The Magnuson-Stevens Act (MSA) requires that the Council's SSC provide scientific advice for fishery management decisions, including recommendations for ABCs, prevention of overfishing, and achieving maximum sustainable yield (MSY). The SSC must recommend ABCs that address scientific uncertainty. The MSA mandates that the Council's catch limit recommendations cannot exceed the ABCs recommended by the SSC.

In July 2021, the SSC recommended ABCs for 2022-2023 based on a management track stock assessment for scup using data through 2019.[2] The 2021 stock assessment update indicated that the scup stock was not overfished and overfishing was not occurring in 2019.

In August 2021, the Council and the Atlantic States Marine Fisheries Commission's (Commission's) Summer Flounder, Scup, and Black Sea Bass Board (Board) approved catch and landings limits for 2022-2023. The final 2022 specifications and projected 2023 specifications were published in the Federal Register on December 23, 2021 (86 FR 72859).

The SSC should review the previously adopted 2023 ABC to consider if changes are needed. Staff recommend no changes to the 2023 ABC of 29.67 million pounds (13,460 mt) as there is no new information to suggest a change is needed. Following the SSC's consideration of the 2023 ABCs, the Monitoring Committee should review previously adopted 2023 sector specific catch and

[1] Available at: https://www.mafmc.org/fishery-performance-reports
[2] Available at https://apps-nefsc.fisheries.noaa.gov/saw/sasi/uploads/2021_scup_MTA_report.pdf

landings limits including the commercial and recreational Annual Catch Limits (ACLs) and Annual Catch Targets (ACTs), commercial quotas, and recreational harvest limits (RHLs; Table 1). These values will require revisions based on modifications to the commercial/recreational allocation percentages approved by the Council and Board in December 2021. The Monitoring Committee could also consider whether any revisions are needed to the commercial management measures (minimum size limit, minimum mesh size, possession limits, etc.) through the annual specification process for 2023. Recreational measures for 2023 will be considered later in 2022.

As shown in table 1, staff recommend maintaining the previously adopted 2023 ABC but modifying the 2023 catch and landing limits to reflect the revised commercial/recreational allocation for scup adopted in December 2021. Staff recommend no changes to the commercial measures for the scup fishery, including the minimum size limit, mesh size requirements and associated incidental possession limits, or pot/trap gear requirements in 2023.

Table 1. Previously adopted 2022-2023 scup catch and landings limits as well as 2023 staff recommended changes. The final 2023 values may differ based on the recommendations of the SSC, Monitoring Committee, Council, and Board.

Mgmt. measure	2022 (*Previously adopted*)		2023 (*Previously adopted*)		Basis	2023 (*Staff recommendation*)		Basis
	mil lbs.	mt	mil lbs.	mt		mil lbs.	mt	
OFL	32.56	14,770	30.09	13,648	Assessment projections	30.09	13,648	Same basis as previously approved.
ABC	32.11	14,566	29.67	13,460	Assessment projections & risk policy	29.67	13,460	Same basis as previously approved.
ABC discards	5.65	2,564	6.39	2,900	Assessment projections	6.39	2,900	Same basis as previously approved.
Com. ACL	25.05	11,361	23.15	10,499	78% of ABC (per FMP)	19.29	8,749	65% of ABC (*new commercial allocation*)
Com. ACT	25.05	11,361	23.15	10,499	Set equal to com. ACL; no deduction for management uncertainty	19.29	8,749	Same basis as previously approved.
Projected com. discards	4.67	2,117	5.28	2,394	82.6% of ABC discards (avg. % of dead discards from commercial fishery, 2017-2019)	5.28	2,394	Same basis as previously approved.
Com. quota	20.38	9,245	17.87	8,105	Commercial ACT minus projected commercial discards	14.01	6,355	Same basis as previously approved.
Rec. ACL	7.06	3,205	6.53	2,961	22% of ABC (per FMP)	10.39	4,711	35% of ABC (*new recreational allocation*)
Rec. ACT	7.06	3,205	6.53	2,961	Set equal to recreational ACL; no deduction for management uncertainty	10.39	4,711	Same basis as previously approved.
Projected rec. discards	0.99	447	1.12	506	17.4% of the ABC discards (avg. % of dead discards from rec. fishery, 2017-2019)	1.12	506	Same basis as previously approved.
RHL	6.08	2,757	5.41	2,455	Recreational ACT minus projected recreational discards	9.27	4,205	Same basis as previously approved.

Stock Status and Biological Reference Points

A scup management track stock assessment was peer reviewed and accepted in June 2021. This assessment retained the model structure of the previous benchmark stock assessment, completed in 2015,[3] and incorporated fishery catch and fishery-independent survey data through 2019.

The updated fishing mortality reference point is F_{MSY} proxy = $F_{40\%}$ = 0.200 and the updated biomass reference point is SSB_{MSY} proxy = $SSB_{40\%}$ = 198.458 million pounds (90,019 mt). The minimum biomass threshold of ½ SSB_{MSY} proxy = ½ $SSB_{40\%}$ = 99.230 million pounds (45,010 mt, Table 2).

Table 2: Scup biological reference points from the 2021 management track stock assessment.

	Spawning stock biomass	**Fishing mortality rate (F)**
Terminal year estimate (2019)	388 mil lbs. (176,404 mt)	0.136
Target	198.46 mil lbs. (90,019 mt)	N/A
Threshold	99.230 mil lbs. (45,010 mt)	0.200
Status	**Not overfished**	**Not overfishing**

According to the 2021 assessment, the scup stock from Cape Hatteras, North Carolina extending north to the US-Canada border was not overfished and overfishing was not occurring in 2019.[4] Spawning stock biomass (SSB) was estimated to be about 388 million pounds (176,404 mt) in 2019, about 2 times the SSB_{MSY} proxy reference point of 198.46 million pounds (90,019 mt, Figure 1), meaning that the stock was not overfished in 2019. There was a notable increasing trend in SSB since the early 2000s; however, in recent years SSB has declined from a peak in 2013 (Figure 1).

Fishing mortality on fully selected age 4 scup was 0.136 in 2019, about 68% of the F_{MSY} proxy reference point of 0.200 (Figure 2), meaning that overfishing was not occurring in 2019. The 2015 year class is estimated to be the largest in the time series at 415 million fish, while the 2017-2019 year classes are estimated to be below average, with the 2019 year class as the smallest in the time series (Figure 1).

A data update provided by the NEFSC in July 2022 indicates that the NEFSC spring survey index of scup stock biomass increased by 34% from 2019 to 2022; the fall index increased by 132% from 2019 to 2021. The NEFSC fall survey indices suggest that a very large year class recruited to the stock in 2015 with below average recruitment since.[5]

The Northeast Regional Coordinating Council (NRCC)'s stock assessment process now has scup receiving management track updates every two years. The next management track assessment update is expected in 2023 to inform 2024-2025 catch and landings limits.

---

[3] 60th Northeast Stock Assessment Workshop (2015) assessment report and peer review summaries are available at: https://www.nefsc.noaa.gov/saw/reports.html

[4] Available at: https://repository.library.noaa.gov/view/noaa/39406

[5] Scup Data Update for 2022 provided by the Northeast Fisheries Science Center. Available at https://www.mafmc.org/ssc-meetings/2022/july-25-26

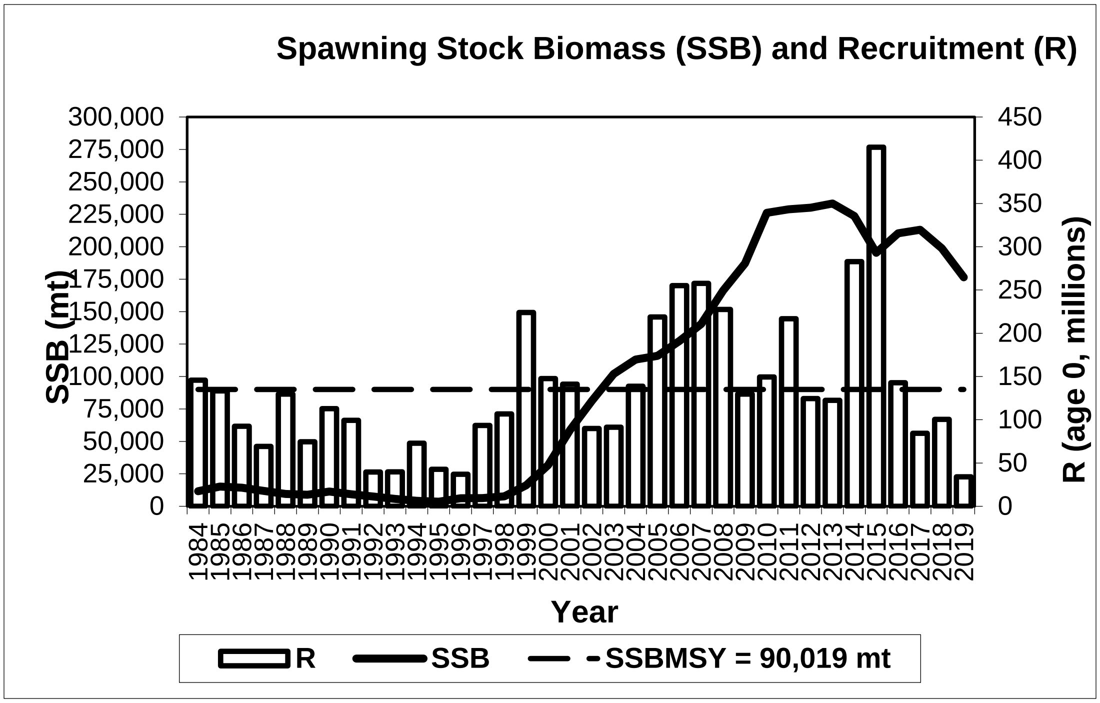


Figure 1: Scup spawning stock biomass and recruitment, 1984-2019. The horizontal dashed line is the biomass target from the 2021 management track stock assessment.

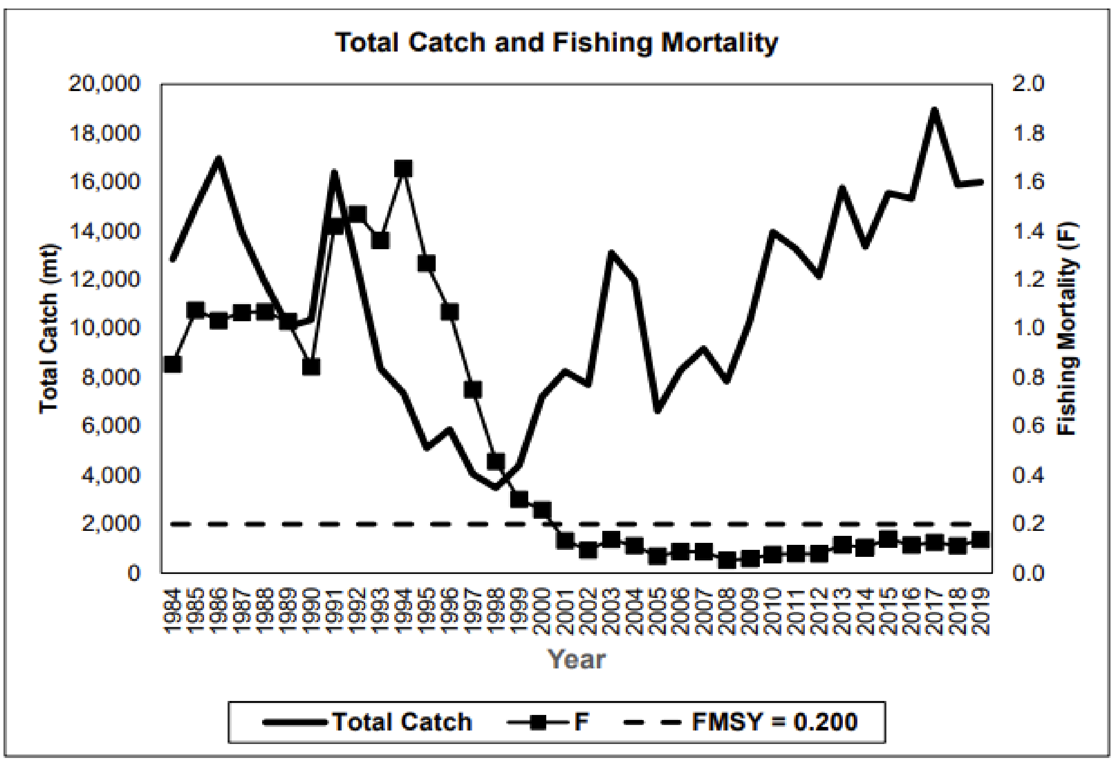


Figure 2: Total fishery catch and fishing mortality rate (F) for fully selected age 4 scup, 1984-2019. The horizontal dashed line is the fishing mortality reference point from the 2021 management track stock assessment. Overfishing is occurring when the fishing mortality rate exceeds this threshold.

Recent Catch and Fishery Performance

In 2021, the commercial fishery landed 12.93 million pounds (5,865 mt) of scup, about 63% of the 2021 commercial quota of 20.5 million pounds (9,299 mt, Table 3). Commercial dead discard estimates are not currently available for 2021 due to delays in observer data processing for 2021. As such, it is not currently possible to evaluate 2021 commercial catch against the commercial ACL.

According to MRIP estimates, recreational landings in 2021 were 16.62 million pounds (7,539 mt), 274% of the 2021 RHL of 6.07 million pounds (2,752 mt, Table 4). This is the second largest estimate of recreational harvest in the time series going back to 1981, with the highest estimate at 17.21 million pounds in 2007. Recreational dead discard estimates in weight are not available for 2021.

The commercial scup fishery has consistently underharvested their quota since 2012 (Table 3). Based on preliminary 2022 dealer data, about 33% of the total commercial scup quota had been landed thus far. Preliminary 2022 dealer data by quota period thus far shows a similar trend to 2021 commercial harvest.

In 2018, MRIP released revisions to the entire time series of recreational harvest and discard estimates. The scup recreational catch and landings limits did not account for these revisions until 2020; therefore, recreational fishery performance compared to the catch and landings limits must be evaluated using the older MRIP data through 2019 and the revised MRIP estimates starting in 2020. A performance evaluation for 2012-2021 using old or new MRIP data, depending on the year, is provided in (Table 4). Recreational performance has been variable relative to the RHLs given the difficulty in forecasting recreational effort and catch rates in any given year, as well as the lack of timely in-season data and in-season closure authority for the recreational fishery. Recreational harvest has been greater than the RHL in two of the last five years (2020-2021). Recreational catch has generally been below the recreational ACL since 2012 (calculated in old MRIP units through 2019) with the exception of a 1% overage in 2017 (Table 4).

Table 3: Scup commercial landings, dead discards, and dead catch compared to the commercial quota, projected commercial dead discards, and commercial ACL, 2012-2021. ACLs for scup were first used starting in 2012. All values are in millions of pounds.

Year	Com. landings[a]	Com. quota[b]	Quota overage/ underage	Com. dead discards[a]	Projected com. dead discards[c]	Projected dead discards overage/underage	Com. dead catch[a]	ACL	ACL overage/ underage
2012	14.88	27.91	-47%	2.21	3.98	80%	17.09	31.89	-46%
2013	17.87	23.53	-24%	2.98	6.66	124%	20.84	30.19	-31%
2014	15.96	21.95	-27%	2.16	6.12	183%	18.12	28.07	-35%
2015	17.03	21.23	-20%	3.79	5.11	35%	20.82	26.35	-21%
2016	15.76	20.47	-23%	6.12	3.79	-38%	21.88	24.26	-10%
2017	15.45	18.38	-16%	10.43	3.77	-64%	25.88	22.15	17%
2018	13.37	23.98	-44%	7.26	4.43	-39%	20.63	30.53	-32%
2019	13.78	23.98	-43%	6.13	4.43	-28%	19.91	28.42	-30%
2020	13.58	22.23	-39%	*Not available*	5.80	*TBD*	*TBD*	27.90	-51%
2021	12.93	20.50	-37%	*Not available*	6.65	*TBD*	*TBD*	27.15	-52%

[a] Based on NEFSC data as provided in 2021 management track assessment (data through 2019) and 2022 data update (2020 and 2021 values).

[b] The commercial quotas shown for 2012-2014 reflect a 3% deduction for Research Set Aside.

[c] Based on specifications calculations used to set the commercial ACL and quota.

Table 4: Scup recreational landings, dead discards, and dead catch compared to the RHL, projected recreational dead discards, and recreational ACL, 2012-2021. ACLs for scup were first used starting in 2012. Values are provided in the "old" and "new" MRIP units where available as the ACLs and RHLs did not account for the revised MRIP data until 2020. Therefore, overage/underage evaluations must be based in the old MRIP units through 2019 and the new MRIP units starting in 2020. All values are in millions of pounds.

Year	Rec. landings old MRIP units[a]	Rec. landings new MRIP units[b]	RHL[c]	RHL overage/ underage[d]	Rec. dead disc. old MRIP units[a]	Rec. dead disc. new MRIP units[b]	Projected rec. dead disc.[e]	Projected dead disc. overage/ underage[d]	Rec. dead catch old MRIP units[a]	Rec. dead catch new MRIP units[b]	ACL	ACL overage/ underage[d]
2012	4.17	8.27	8.45	-51%	0.51	1.40	0.54	-6%	4.68	9.67	8.99	-48%
2013	5.37	12.64	7.55	-29%	0.49	1.25	0.97	-49%	5.87	13.89	8.52	-31%
2014	4.43	10.27	7.03	-37%	0.50	1.06	0.89	-43%	4.93	11.33	7.92	-38%
2015	4.41	12.17	6.80	-35%	0.50	1.28	0.63	-21%	4.91	13.45	7.43	-34%
2016	4.26	10.00	6.09	-30%	0.78	1.90	0.75	4%	5.04	11.90	6.84	-26%
2017	5.42	13.53	5.50	-1%	0.90	2.38	0.75	20%	6.32	15.91	6.25	1%
2018	5.61	12.98	7.37	-24%	0.60	1.42	0.65	-8%	6.21	14.40	8.61	-28%
2019	5.41	14.12	7.37	-27%	1.23	1.23	0.65	91%	6.64	15.35	8.01	-17%
2020	*N/A*	12.91	6.51	98%	*N/A*	*Not available*	1.36	*TBD*	*N/A*	*TBD*	7.87	*TBD*
2021	*N/A*	16.62	6.07	174%	*N/A*	*Not available*	1.59	*TBD*	*N/A*	*TBD*	7.66	*TBD*

[a] Based on the data update provided by the NEFSC in 2018 (most recent data from NEFSC in "old" MRIP units). Values for 2018 and 2019 were provided by GARFO.

[b] Based on NEFSC data as provided in 2021 management track assessment (data through 2019) and 2022 data update (2020 and 2021 values).

[c] The RHLs shown for 2012-2014 reflect a 3% deduction for Research Set Aside.

[d] Based on a comparison with old MRIP data through 2018, 2019 based on comparison with values provided by the NEFSC to GARFO, and new MRIP data starting in 2020.

[e] Based on specifications calculations used to set the commercial ACL and RHL.

Review of Prior SSC Recommendations

In July 2021, the SSC recommended 2022 and 2023 ABCs for scup based on new stock status information and projections from the 2021 management track stock assessment.

The SSC recommended that a 60% coefficient of variation (CV) be applied to the overfishing limit (OFL) estimate to derive the ABC for scup. This decision came from the high data quality, as well as consistency of signals from surveys, catch at age, and model results. There was also a relatively low effect of revised MRIP estimates in the stock assessment; only minor retrospective patterns in the statistical catch-at-age model; and the unlikelihood that additional adjustments (e.g., for ecological factors or below-average recruitment in the past two years) would increase uncertainty. Several surveys show declines or low abundance in early years to record lows in the mid-1990s and increases in abundance thereafter. Age structure in surveys shows a decline or low abundance of older ages in survey catches in early years and increases in abundance of older ages in recent years. Age structure in commercial landings-at-age and recreational landings-at-age show similar trends of increasing abundance of older ages in the stock. Several large recruitment events have been indicated by survey indices. In combination, these trends are consistent with lower fishing mortality rates in recent years, and increasing stock abundance as indicated by model results. Although up to 44% of the catch weight is attributable to the recreational fishery, the increase in recreational catch related to new MRIP estimates is relatively low in comparison to other stocks. There has been no obvious or clear trend in recent recruitment over the past decade, although a declining trend in recruitment is beginning to emerge, so adjustment of projected recruitment currently appears unwarranted. There is no discernable impact of thermal habitat on interannual variation in availability, so adjustment of survey indices to account for thermal habitat effects also appears unwarranted.

Table 5 shows the SSC's previously recommended 2022-2023 OFLs, ABCs, and P* values. ABCs are based on projections that assume the ABC will be fully caught in each year; recruitment is sampled from 1984-2018. OFL total catches are catches in each year fishing at F_{MSY} = 0.200, prior to calculation of the associated annual ABC. The ABC projections were based on application of the Council's risk policy for a stock with a typical life history, resulting in an ABC P* of 49% in each year. Due to the Council's risk policy adopted in 2019, only ABCs associated with the traditional (variable) approach could be offered for 2022 and 2023.

Table 5: Previously recommended 2022 and 2023 OFLs, ABCs, and P* (Source: personal communication, Mark Terceiro, Northeast Fisheries Science Center).

Year	OFL total catch		ABC total catch		ABC P*
	mil lbs.	mt	mil lbs.	mt	
2022	32.56	14,770	32.11	14,566	0.49
2023	30.09	13,648	29.67	13,460	0.49

The SSC considered the following to be the most significant sources of scientific uncertainty with determination of the OFL and/or ABC:

- While older age scup (age 3+) are represented in the catch used in the assessment model, most indices used in the model do not include ages 3+. As a result, the dynamics of the older ages of scup are driven principally by catches and inferences regarding year class strength.
- A sizeable portion of the stock biomass is in older age classes which are assumed to have low Fs as a result of the selectivity pattern imposed in the model.
- Uncertainty exists with respect to the estimate of natural mortality (M) used in the assessment.
- Uncertainty exists as to whether the MSY proxies ($SSB_{40\%}$, $F_{40\%}$) selected and their calculated precisions are appropriate for this stock.
- The SSC assumed that OFL has a lognormal distribution with a CV = 60%, based on a meta-analysis of survey and statistical catch at age (SCAA) model accuracies.
- Survey indices are particularly sensitive to Scup availability, which results in high inter-annual and regional variability – efforts were made to address this question by weighting surveys in the SAW/SARC that should be continued.
- The projection on which the ABC was determined is based on an assumption that the 2020 and 2021 ABCs will be caught.

Staff Recommendation for 2023 ABC

Staff recommend maintaining the previously adopted 2023 ABC for scup of 29.67 million pounds (13,460 mt). The 2022 data update indicates little evidence to suggest that stock condition has changed substantially from what was indicated in the 2021 management track assessment.

Recent Management Actions

The following sections briefly summarize recent management actions that should be considered during the discussion of sector-specific catch and landings limits for 2023.

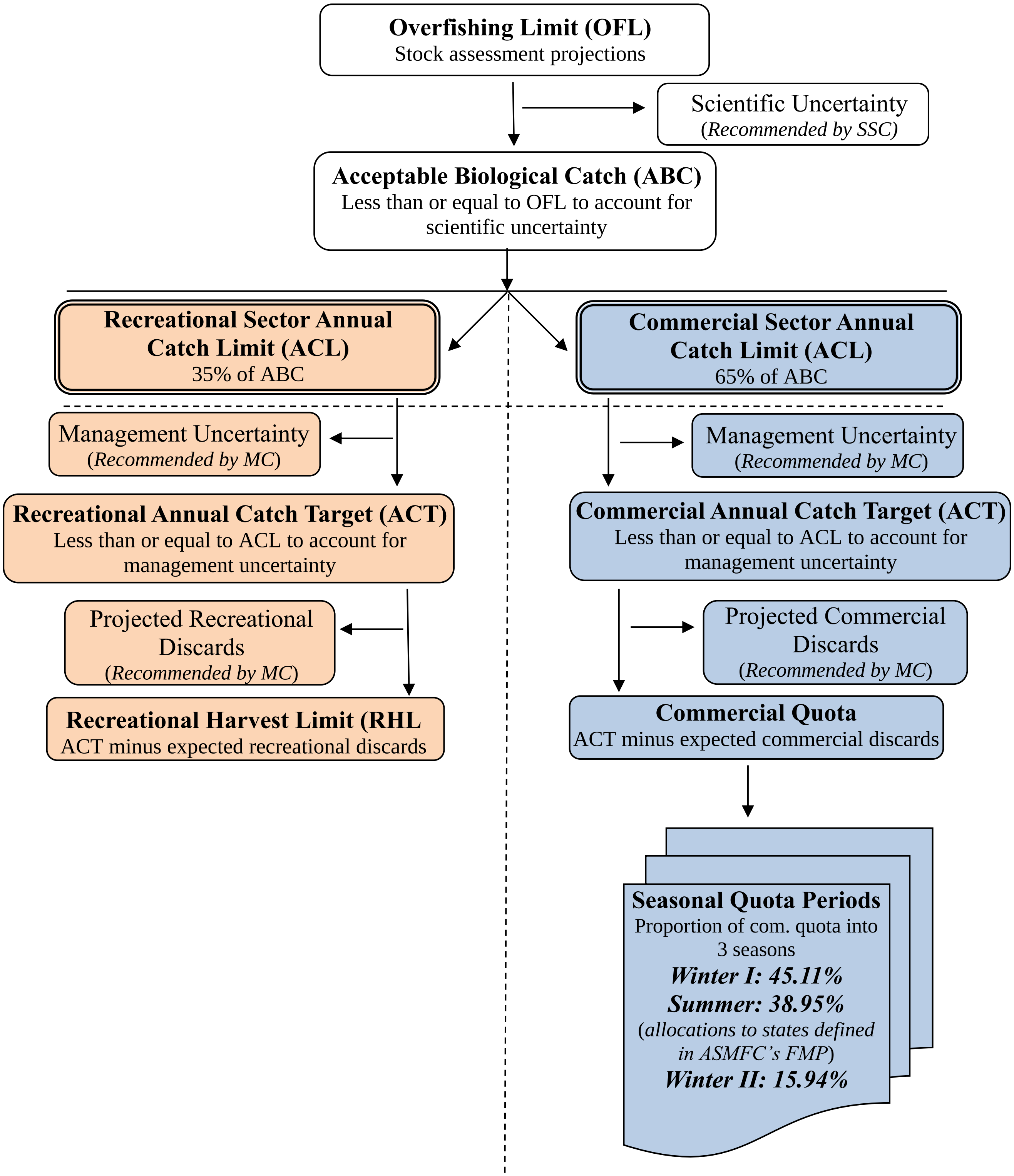
Commercial/Recreational Allocation Revisions

In December 2021, the Council and Board took final action on an amendment to revise the allocation of catch or landings between the commercial and recreational sectors for summer flounder, scup, and black sea bass.[6] For scup, the previous (through 2022) catch-based allocation specified that 78% of the ABC is allocated to the commercial fishery as a commercial ACL and 22% is allocated to the recreational fishery as a recreational ACL (Figure 3). Beginning in 2023, the revised catch-based allocations specifies that 65% of the ABC be allocated to the commercial fishery and 35% to the recreational fishery. Figure 3 illustrates how specification will be set under the revised catch-based allocation. Given previous scup allocations were already catch-based, the only change to the flowchart below is the percentage of the ABC allocated to the commercial/recreational sectors used to derive the sector-specific ACLs (figure 3).

The revised allocations are pending review by NMFS and if approved, are expected to be effective January 1, 2023. Therefore, the Monitoring Committee should recommend 2023 commercial and recreational ACLs, and other specifications that derive from the ACLs, based on the revised allocations.

[6] http://www.mafmc.org/actions/sfsbsb-allocation-amendment

Figure 3: Flowchart for scup catch and landings limits based on pending revisions to the commercial/recreational allocations. Compared to previous years (process through 2022), updates to the flowchart include the percentage of the ABC allocated to the commercial/recreational sectors.



Recreational Harvest Control Rule Framework/Addenda

In June 2022, the Council and the Commission's Interstate Fishery Management Program Policy Board took final action on the Recreational Harvest Control Rule Framework/Addenda, with the goal of using a new approach, called the Percent Change Approach, to set recreational measures for summer flounder, scup, and black sea bass starting in 2023. Under the Percent Change Approach, recreational measures will not be tied as closely to an RHL (or, by extension, an ACL) as previously required. Instead, the target harvest level will vary based on a comparison of a confidence interval around expected harvest under status quo measures to the upcoming two-year average RHL, as well as biomass compared to the biomass target. This approach will allow for RHL overages in some cases (and therefore, by extension, likely ACL overages) and underages in other cases.[7]

It is not possible to predict the target level of harvest for 2023 recreational measures because the 2023 RHL has not been set and calculations of expected harvest under status quo measures will not be finalized until later in 2022.

<u>The Monitoring Committee should consider the implications of this approach when making recommendations for 2023 recreational specifications, including considerations related to management uncertainty and projected dead discards</u>

<u>Sector-Specific Catch and Landings Limits</u>

Commercial and Recreational Annual Catch Limits

Under the revised allocations described above, the commercial and recreational ACLs will be calculated by applying the revised 65% commercial/35% recreational allocation to the 2023 ABC. If no changes are made to the previously adopted 2023 ABC of 29.67 million pounds, <u>this would result in a 2023 commercial ACL of 19.29 million pounds (8,749 mt) and a recreational ACL of 10.39 million pounds (4,711 mt; Table 1).</u>

Annual Catch Targets

The Monitoring Committee recommends ACTs for the Council and Board's consideration. ACTs may be set less than or equal to sector-specific ACLs to account for management uncertainty. Management uncertainty is comprised of two parts: uncertainty in the ability of managers to control catch and uncertainty in quantifying the true catch (i.e., estimation errors). Management uncertainty can occur because of a lack of sufficient information about the catch (e.g., due to late reporting, underreporting, and/or misreporting of landings or discards) or because of a lack of management precision (i.e., the ability to constrain catch to desired levels). The Monitoring Committee should consider all relevant sources of management uncertainty in the scup fishery when recommending ACTs.

Recreational harvest is estimated through a statistical survey design (the Marine Recreational Information Program), while commercial harvest is more census based due to mandatory vessel and dealer reporting requirements. Given these differences, the commercial fishery can be closed in-season when landings approach the quota but there is no in-season closure authority for the recreational fishery due to the timing

---

[7] For more details on the Percent Change Approach, see https://www.mafmc.org/newsfeed/2022/mafmc-amp-asmfc-take-first-step-toward-recreational-management-reform-for-bluefish-sumer-flounder-scup-and-black-sea-bass

of recreational data availability. For these reasons, recreational landings can be more difficult to constrain and predict than commercial landings.

The commercial quota monitoring system has largely been successful in preventing quota overages for scup, and as shown in 3, commercial landings have not exceeded the quota since 2012.

From 2012-2018, recreational landings were consistently below the RHL but from 2019-2021 recreational landings were consistently above the RHL. In 2020 and 2021, the Council and Board agreed to leave the recreational bag, size, and season limits unchanged in despite expected RHL overages. This was a short-term approach to prevent major negative impacts to the recreational sector while changes to management were considered through the Commercial/Recreational Allocation Amendment and the Recreational Harvest Control Rule Framework/Addenda. The temporary status quo approach could not be maintained in 2022; therefore, the Council and Board approved a 33% reduction in recreational harvest compared to the 2018-2021 average in all states and federal waters with the goal of preventing an overage of the 2022 RHL. The impacts of these restrictions on harvest in 2022 cannot be evaluated with currently available data.

As previously described, the impact of the Percent Change Approach on recreational scup measures in 2023 is not yet known; therefore, the likelihood of this approach resulting in ACL overages in 2023 cannot be accurately assessed at this time.

<u>Consistent with the previously adopted 2023 measures, staff recommend the commercial and recreational ACTs remain equal to their respective ACLs for 2023, such that no reduction in catch is taken for management uncertainty (Table 1).</u>

Projected Dead Discards, Commercial Quotas and Recreational Harvest Limits

Projected discards are removed from the sector-specific ACTs to derive landings limits, which include annual commercial quotas and RHLs (Figure 3). The methodology to calculate projected dead discards is not prescribed in the FMP and can be modified on an annual basis. The methodology can also vary by sector.

<u>Staff recommend that 2023 projected recreational and commercial dead discards be calculated using the same method as prior years.</u> In prior years, scup dead discards by sector were calculated based on a 3-year moving average of the proportion of dead discards from each sector, applied to the total projected dead discards provided by the NEFSC for the upcoming fishing year(s). The NEFSC projected total discards assume total dead catch will be equal to the ABC and also account for the recent age structure of the population and selectivity of the fisheries. The NEFSC projections can account for higher or lower than average year classes when estimating discards in future years. For example, high discards in 2017 were likely driven by the peak in recruitment seen in 2015 as shown in figure 1. This year class would not be expected to contribute to high discards in 2023 given fisheries selectivity and the likely greatly diminished size of the year class.

For the previously adopted 2022-2023 specifications, projected dead discards by sector were developed using 2017-2019 data from the management track assessment (2020 dead discards were not available). On average over these years, 82.6% of dead discards were attributable to the commercial fishery and 17.4% to the recreational fishery. These percentages applied to the total expected discards resulted in the limits shown in Table 1.

Given dead discard estimates are not available for 2020 or 2021, the most recent 3-year time frame to calculate the proportion of discards by sector remains 2017-2019. Applying these same proportions to the 2023 projected total dead discards of 6.39 million pounds (2,900 mt), results in projected commercial dead discards of 5.28 million pounds (2,394 mt) and recreational dead discards of 1.12 million pounds (506 mt). These are the same projected discards applied to the previously adopted 2023 specifications (Table 1).

These discard projections result in a staff-recommended commercial quota of 14.01 million pounds (6,355 mt) and an RHL of 9.27 million pounds (4,205 mt; Table 1).

Commercial Management Measures

The commercial measures that can be modified during specifications are discussed below, including the commercial Winter I and Winter II quota period possession limits, minimum size limit, minimum mesh sizes, and commercial pot and trap regulations. Given there is no new information to suggest changes to commercial management measure are needed, staff recommend no changes to commercial measures for 2023.

Commercial Winter I and Winter II Quota Period Possession Limits

Commercial possession limits are designed to help constrain landings to the seasonal period quotas. The Winter I possession limit is 50,000 pounds. After 80% of the Winter I quota is landed, the possession limit drops to 1,000 pounds. The Winter II possession limit is initially set at 12,000 pounds. If the Winter I quota is not fully harvested, as has been the case in recent years, the Winter II possession limit increases by 1,500 pounds for every 500,000 pounds of scup not landed during the Winter I period. There are no federal possession limits during the Summer quota period; however, there are state possession limits[8]. These quota period possession limits have not been modified since 2012.

Commercial Minimum Fish Size

The commercial minimum size limit for scup is 9 inches total length and has been in place since 1996. The minimum size limit applies to all commercial landings of scup, including landings of incidental catch. Over the years, advisors have expressed differing opinions on the commercial minimum size limit, but no changes have been adopted.

Commercial Trawl Mesh Size

Trawl vessels which possess more than 1,000 pounds of scup from October 1 through April 14, more than 2,000 pounds of scup from April 15 through June 15, and more than 200 pounds of scup from May 1 through August 31 must use a minimum mesh size of 5.0 inches.

The Council recently funded a project which analyzed the selectivity of multiple codend mesh sizes relative to summer flounder, black sea bass and scup retention in the commercial bottom trawl fishery in the Mid-Atlantic region. Results confirmed that the current minimum mesh sizes for all three species are effective at releasing most fish smaller than the commercial minimum sizes (i.e., 14 inches total length for summer flounder, 9 inches total length for scup, and 11 inches total length for black sea bass). The

[8] Prior to 2018, October was included in the summer quota period. The allocation percentages were the same as shown above.

study was not able to identify a common mesh size for all three species that would be effective at minimizing discards under the current minimum fish size limits. However, the authors concluded that a common mesh size of 4.5 or 5 inches diamond for scup and black sea bass would be effective at releasing undersized fish.

The Monitoring Committee reviewed the results of this study in 2018 and recommended no changes to the commercial minimum mesh sizes for 2021. They recommended clarification of the objectives of the Council regarding consideration the mesh sizes (e.g., establishing a common minimum mesh size, minimizing discards, and/or maintaining or increasing catches of legal-sized fish). Input from the commercial fishing industry should be sought before any minimum mesh size changes are considered.

Staff will continue to work with the Monitoring Committee and Advisory Panel to further analyze and consider potential changes to mesh size regulations. However, given other workload constraints, it is unlikely that additional work on this topic will be completed in 2022.

Commercial Pot and Trap Regulations

NMFS dealer data show that pots/traps accounted for about 3% of total commercial scup landings in 2021. Pots and traps used to commercially harvest scup must have either a circular escape vent measuring at least 3.1 inches in diameter, square escape vents with each side being at least 2.25 inches in length, or rectangle escape vents of equal or greater size.

Recreational Management Measures

The recreational bag, size, and season limits for 2023 will be considered in late 2022 after the first four waves (i.e., January - August) of preliminary 2022 recreational harvest data are available (expected October 2022). Improved statistical methods for predicting the impacts of bag, size, and season limits on recreational harvest (i.e., the Recreational Economic Demand Model and the Recreational Fleet Dynamics Model) may also be available by fall 2022. The Monitoring Committee will meet in November 2022 to review available data and model outputs and to make recommendations for recreational bag, size, and season limits for 2023. As previously described, 2023 will be the first year that recreational measures for summer flounder, scup, and black sea bass will be set using the Percent Change Approach.

Scup Data Update for 2022

National Marine Fisheries Service
Northeast Fisheries Science Center
166 Water St.
Woods Hole, MA 02543

Reported 2021 landings in the commercial fishery were 5,904 mt = 13.016 million lb, a decrease of 5% from 2020, and 63% of the 2021 commercial quota (Figure 1). Estimated 2021 landings in the recreational fishery were 7,540 mt = 16.623 million lb, an increase of 29% from 2020, and 2.74 times the 2021 recreational harvest limit (Figure 1). Total commercial and recreational landings in 2021 were 13,444 mt = 29.639 million lb, an increase of 10% from 2020. Final estimates of fishery discards for 2020-2021 are not yet available.

The NEFSC fall 2015 and spring 2016 bottom trawl survey biomass indices were record highs for the time series. No valid NEFSC bottom trawl survey indices are available for fall 2017 or spring and fall 2020. Both seasonal indices have generally decreased since the 2015-2016 record highs (Figure 2). The NEFSC spring survey index of scup stock biomass increased by 34% from 2019 to 2022; the fall index increased by 132% from 2019 to 2021. The NEFSC fall survey indices suggest that a very large year class recruited to the stock in 2015 with below average recruitment during 2016-2021 (Figure 3).

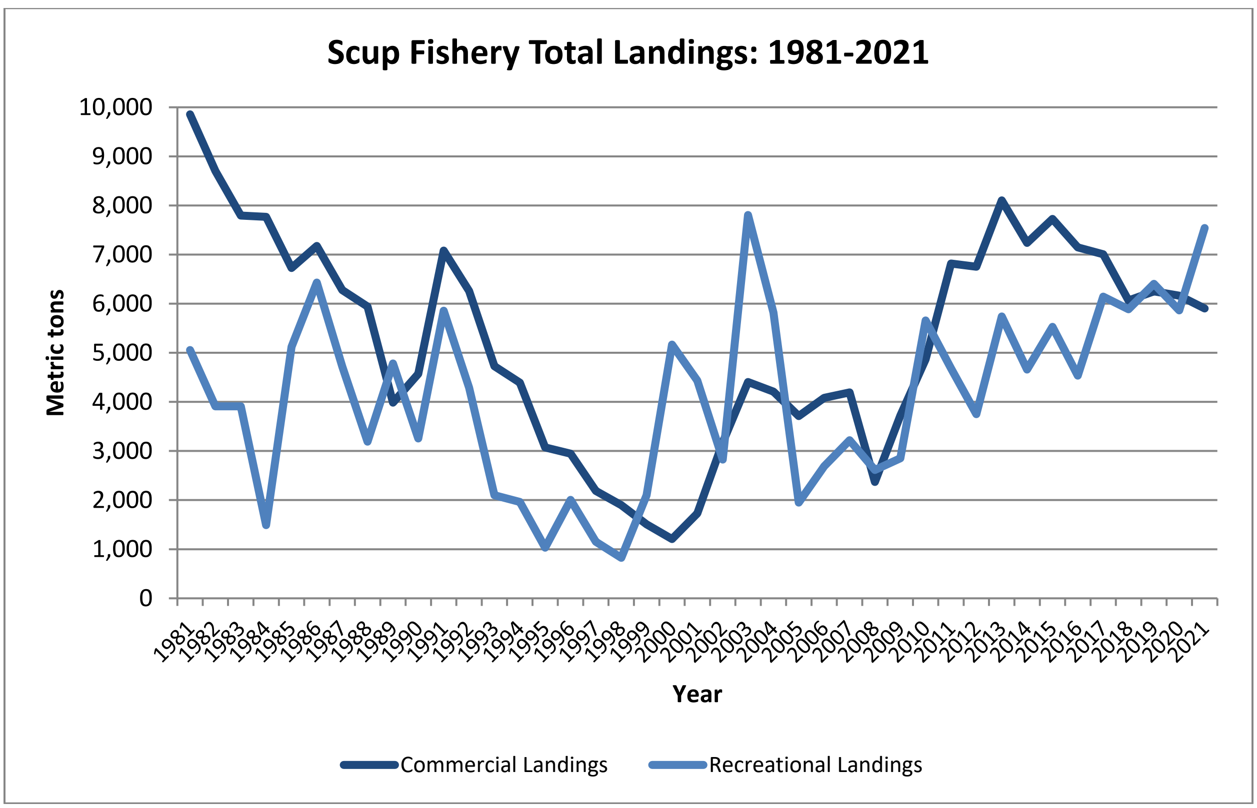


Figure 1. Scup fishery total landings.

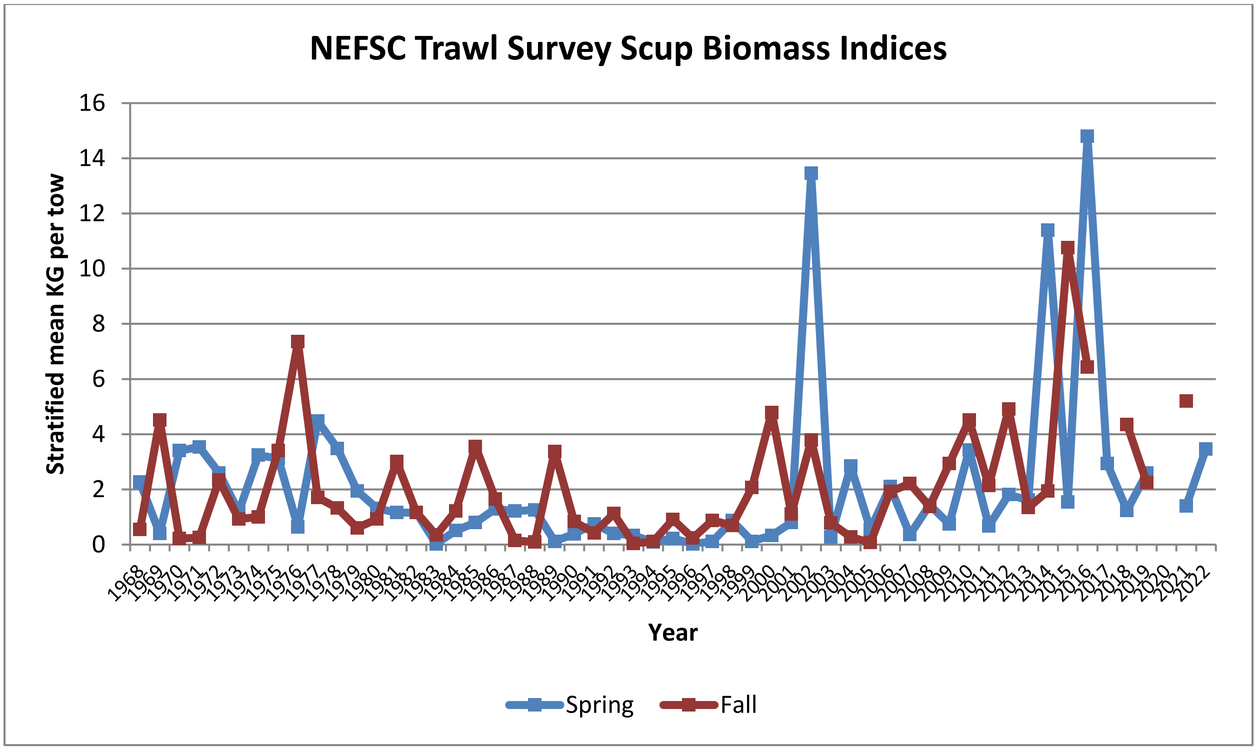


Figure 2. NEFSC bottom trawl survey biomass indices for scup. Indices are FSV Albatross IV equivalents. There are no valid fall 2017 or spring and fall 2020 indices for scup.

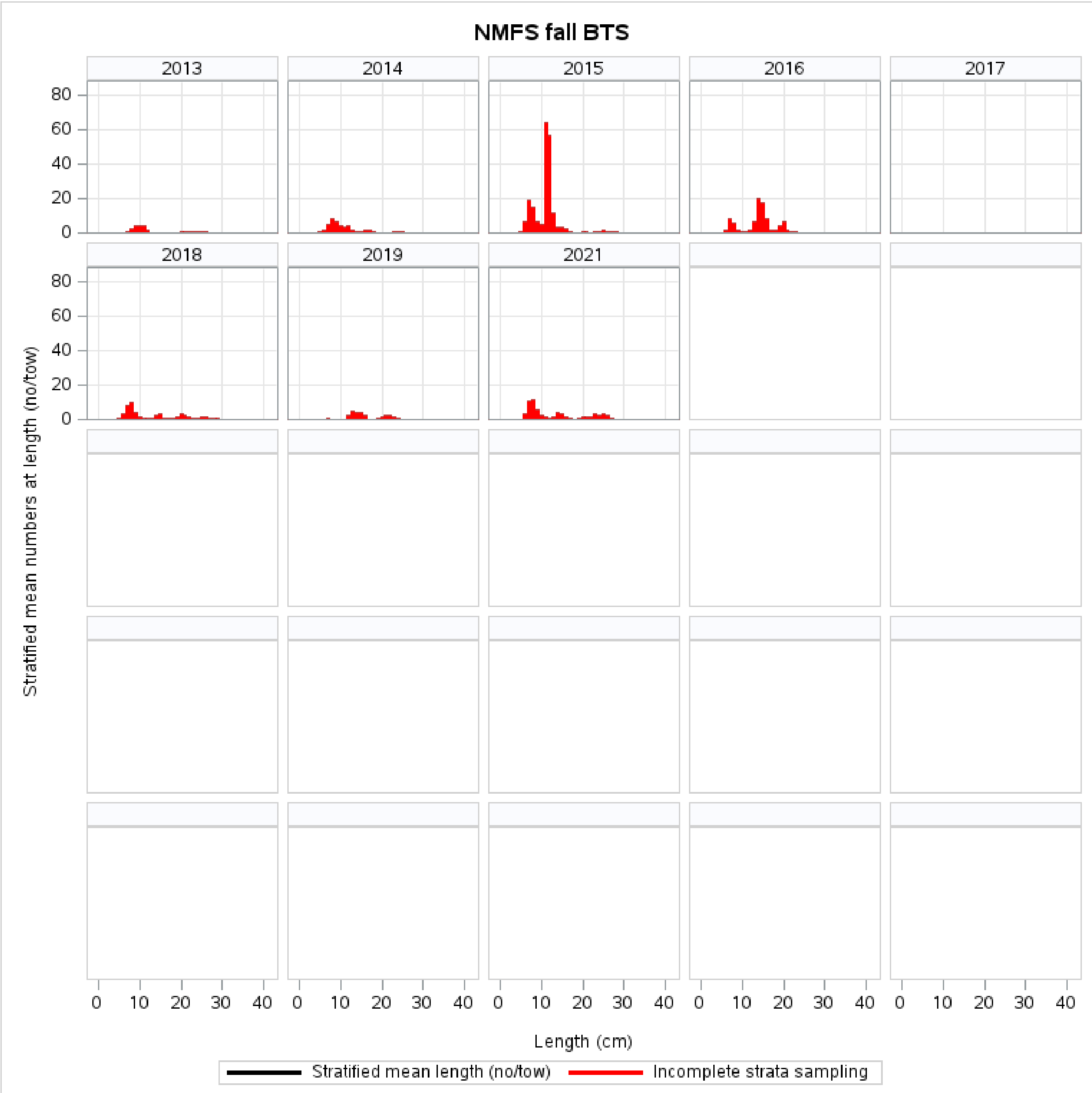


Figure 3. Northeast Fisheries Science Center (NEFSC) fall bottom trawl survey FSV HB Bigelow indices at length since 2013. There was an incomplete survey conducted in 2017 and no survey conducted in 2020.

Scup Fishery Information Document

June 2022

This Fishery Information Document provides a brief overview of the biology, stock condition, management system, and fishery performance for scup (*Stenotomus chrysops*) with an emphasis on 2021. Data Sources for Fishery Information Documents are generally from unpublished National Marine Fisheries Service (NMFS) dealer, vessel trip report (VTR), permit, and Marine Recreational Information Program (MRIP) databases and should be considered preliminary. For more resources on scup management, including previous Fishery Information Documents, please visit http://www.mafmc.org/sf-s-bsb/.

Key Facts:

- A 2021 management track assessment using data through 2019 indicated that the scup stock was not overfished, and overfishing was not occurring in 2019.
- Commercial landings decreased from 13.58 mil lbs. in 2020 to 12.93 mil lbs. in 2021.
- Price per pound and total ex-vessel value remained similar to 2020 and were $0.76 and $9.8 million in 2021.
- Recreational landings increased from 12.91 mil lbs. in 2020 to 16.62 mil lbs. in 2021. The majority of scup harvested recreationally in 2021 was caught by private vessels (73%), followed by anglers fishing from shore (18%), and anglers fishing from for-hire vessels (9%).

Basic Biology

Scup are a schooling, demersal (i.e., bottom-dwelling) species. They are found in a variety of habitats in the Mid-Atlantic. Scup essential fish habitat includes demersal waters, areas with sandy or muddy bottoms, mussel beds, and sea grass beds from the Gulf of Maine through Cape Hatteras, North Carolina. Scup undertake extensive seasonal migrations between coastal and offshore waters. They are found in estuaries and coastal waters during the spring and summer. In the fall and winter, they move offshore and to the south, to outer continental shelf waters south off New Jersey. Scup spawn once annually over weedy or sandy areas, mostly off southern New England. Spawning takes place from May through August and usually peaks in June and July.[1]

About 50% of scup are sexually mature at two years of age and about 17 cm (about 7 inches) total length. Nearly all scup older than three years of age are sexually mature. Scup reach a maximum age of at least 14 years. They may live as long as 20 years; however, few scup older than 7 years are caught in the Mid-Atlantic.[2, 3]

Adult scup are benthic feeders. They consume a variety of prey, including small crustaceans (including zooplankton), polychaetes, mollusks, small squid, vegetable detritus, insect larvae, hydroids, sand dollars, and small fish. The Northeast Fisheries Science Center's (NEFSC's) food habits database lists several predators of scup, including several shark species, skates, silver hake, bluefish, summer flounder, black sea bass, weakfish, lizardfish, king mackerel, and monkfish.[1]

Status of the Stock

In June 2021, the NEFSC provided a management track assessment for scup which used commercial and recreational fishery data and fishery-independent survey data through 2019. Given data gaps for 2020 related to COVID-19 and the time required to address those gaps where possible, 2020 data could not be incorporated into this update.

The 2021 management track assessment indicates that the scup stock was not overfished and overfishing was not occurring in 2019 (Figures 1 and 2). Spawning stock biomass (SSB) was about 2 times the target level in 2019, and there was a notable increasing trend since the early 2000s; however, in recent years stock has declined (Figure 2, Table 1).[3,4]

Overfishing was not occurring in 2019. Fishing mortality in 2019 was 32% below the threshold level that defines overfishing (Figure 1). The 2015 year class (i.e., the scup spawned in 2015) is estimated to be the largest in the time series at 415 million fish, while the 2017-2019 year classes are estimated to be below average, with 2019 year class the smallest in the time series (Figure 2).[4]

Table 1: Scup biological reference points from the 2021 management track stock assessment.

	Spawning stock biomass	**Fishing mortality rate (F)**
Terminal year estimate (2019)	388 mil lbs. (176,404 mt)	0.136
Target	198.46 mil lbs. (90,019 mt)	N/A
Threshold	99.230 mil lbs. (45,010 mt)	0.200
Status	**Not overfished**	**Not overfishing**

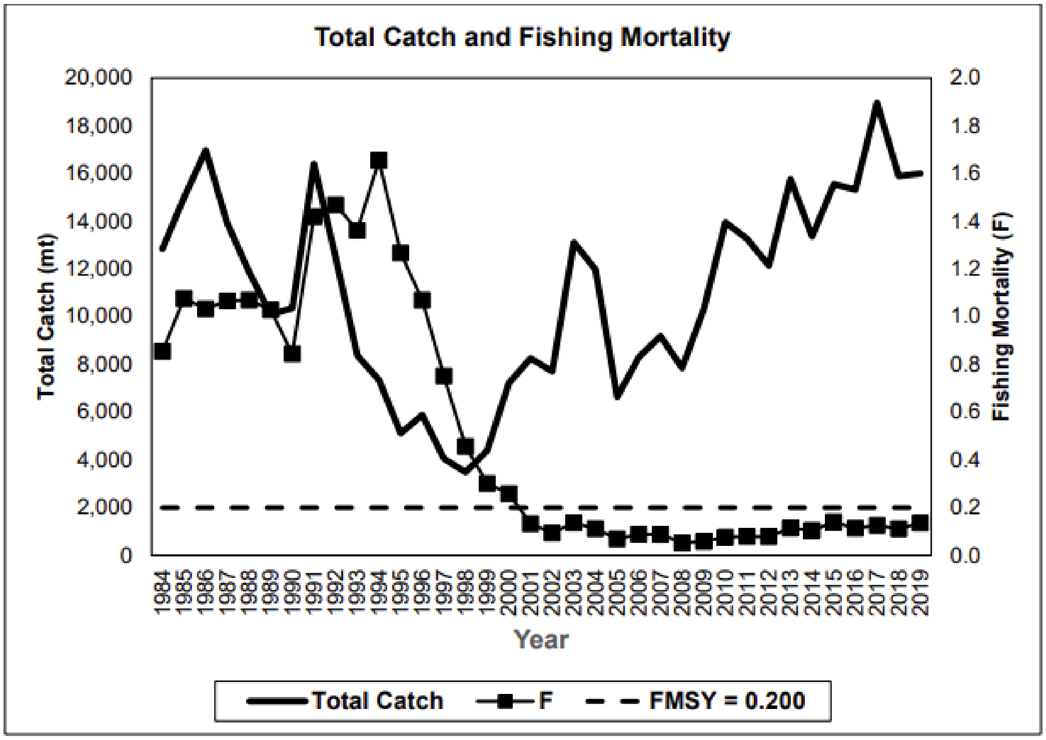


Figure 1: Total fishery catch and fishing mortality rate (F) for fully selected age 4 scup, 1984-2019. The horizontal dashed line is the fishing mortality reference point from the 2021 management track stock assessment. Overfishing is occurring when the fishing mortality rate exceeds this threshold.[4]

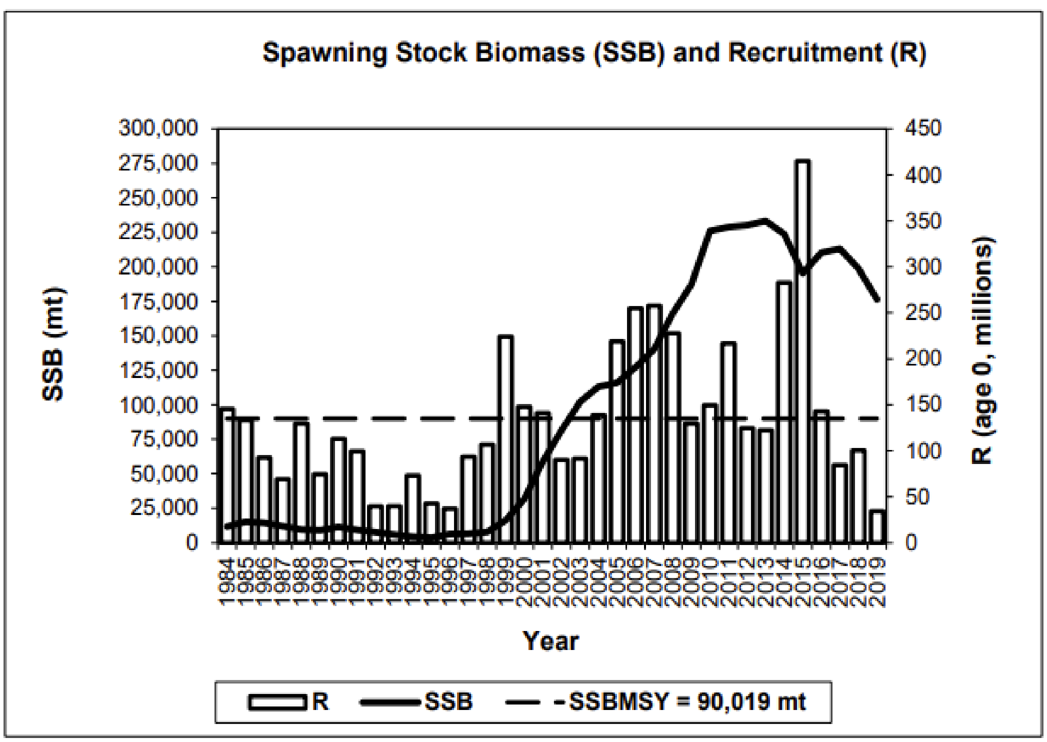


Figure 2: Scup spawning stock biomass and recruitment, 1984-2019. The horizontal dashed line is the biomass target from the from the 2021 management track stock assessment.[4]

Management System and Fishery Performance

Management

The Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission (Commission) cooperatively develop fishery regulations for scup off the east coast of the United States. The National Marine Fisheries Service (NMFS) serves as the federal implementation and enforcement entity. This cooperative management endeavor was developed because a significant portion of the catch is taken from both state waters (0-3 miles offshore) and federal waters (3-200 miles offshore). The management unit for scup includes U.S. waters from Cape Hatteras, North Carolina to the U.S./Canadian border.

The federal Fishery Management Plan (FMP) for scup has been in place since 1996, when scup were incorporated into the Summer Flounder FMP through Amendment 8. Amendment 8 established gear restrictions, reporting requirements, commercial quotas, a moratorium on new commercial scup permits, recreational possession limits, and minimum size restrictions for scup fisheries. The Council has made several adjustments to the FMP since 1996. The FMP and subsequent amendments and framework adjustments can be found at: www.mafmc.org/sf-s-bsb/.

The Council's Scientific and Statistical Committee (SSC) recommends annual Acceptable Biological Catch (ABC) levels for scup. The annual ABC is divided into commercial and recreational Annual Catch Limits (ACLs), based on the allocation percentages prescribed in the FMP. Through 2022 the allocation was 78% commercial, 22% recreational. In December 2021, the Council and Commission revised the allocations to 65% commercial and 35% recreational. These changes are pending review by NMFS and if approved, are expected to be effective January 1, 2023 (see https://www.mafmc.org/s/SFSBSB-Allocation-FAQs.pdf for more detail). Both ABCs and ACLs are catch-based limits, meaning they account for both landings and discards. Projected discards are subtracted to determine the commercial quota and recreational harvest limit (RHL), which are landings-based limits.

Fishery Landings Summary

Table 2 shows scup catch and landings limits from 2012 through 2023, as well as commercial and recreational landings through 2021. Total scup landings (commercial and recreational) from Maine to North Carolina peaked in 1981 at over 32 million pounds and reached a low of 6 million pounds in 1998. In 2021, about 29.55 million pounds of scup were landed by commercial and recreational fishermen (Figure 3).[5,6]

In July 2018, MRIP released revisions to their time series of recreational catch and landings estimates based on adjustments for a revised angler intercept methodology and a new effort estimation methodology (i.e., a transition from a telephone-based effort survey to a mail-based effort survey). The revised estimates of catch and landings are several times higher than the previous estimates for shore and private boat modes. All recreational estimates in this document reflect revised MRIP estimates except where otherwise noted.

Recreational harvest estimates for 2020 were impacted by temporary suspension of shoreside intercept surveys due to the COVID-19 pandemic. 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 2020 catch estimates using the standard estimation methodology. NMFS previously indicated that 2020 data may be revised based on potential incorporation of 2021 data into these imputation methods; as of completion of this document no updates have been made. Commercial landings reporting in 2020 continued uninterrupted; however, as of completion of this document discard data are currently unavailable due to COVID-19 related interruptions in observer coverage.

Table 2: Summary of scup catch limits, landings limits, and landings, 2012 through 2023. Values are in millions of pounds unless otherwise noted.

Measure	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023[c]
ABC	40.88	38.71	35.99	33.77	31.11	28.4	39.14	36.43	35.77	34.81	32.11	29.67
Com. ACL	31.89	30.19	28.07	26.35	24.26	22.15	30.53	28.42	27.9	27.15	25.05	23.15
Com. quota	27.91	23.53	21.95	21.23	20.47	18.38	23.98	23.98	22.23	20.5	20.38	17.87
Com. landings	14.88	17.87	15.96	17.03	15.76	15.45	13.38	13.78	13.58	12.93	--	--
% of com. quota landed	53%	76%	72%	80%	77%	84%	55%	57%	61%	63%	--	--
Rec. ACL	8.99	8.52	7.92	7.43	6.84	6.25	8.61	8.01	7.87	7.66	7.06	6.53
RHL[a]	8.45	7.55	7.03	6.8	6.09	5.5	7.37	7.37	6.51	6.07	6.08	5.41
Rec. landings, old MRIP estimates	4.17	5.37	4.43	4.41	4.26	5.42	5.61	--	--	--	--	--
Rec. landings, new MRIP estimates	8.27	12.64	10.27	12.17	10	13.53	12.98	14.12	12.91	16.62	--	--
% of RHL harvested[b] (*2012-2019 based on old MRIP estimates; 2020 and beyond based on new MRIP estimates*)	49%	71%	63%	65%	70%	98%	76%	191%	198%	274%	--	--

[a] Commercial quotas and RHLs reflect the removal of projected discards from the sector-specific ACLs. For 2012-2014, these limits were also adjusted for Research Set Aside.

[b] The percent of RHL harvested is based on a comparison of the RHL to the old MRIP estimates through 2018. The RHLs prior to 2020 did not account for the new MRIP estimates, which were released in July 2018 and were not incorporated into a stock assessment until 2019; therefore, it would be inappropriate to compare past RHLs to the revised MRIP estimates. The first year that the RHL was set using the new MRIP estimates was 2020.

[c] Previously adopted limits for 2023 will be reviewed in 2022 by the SSC, Monitoring Committee, and Council/Commission. Sector-specific limits including the commercial recreational ACLs, commercial quota, and RHL are expected to be revised given recently adopted changes to the commercial/recreational allocation, expected to be effective January 1, 2023.

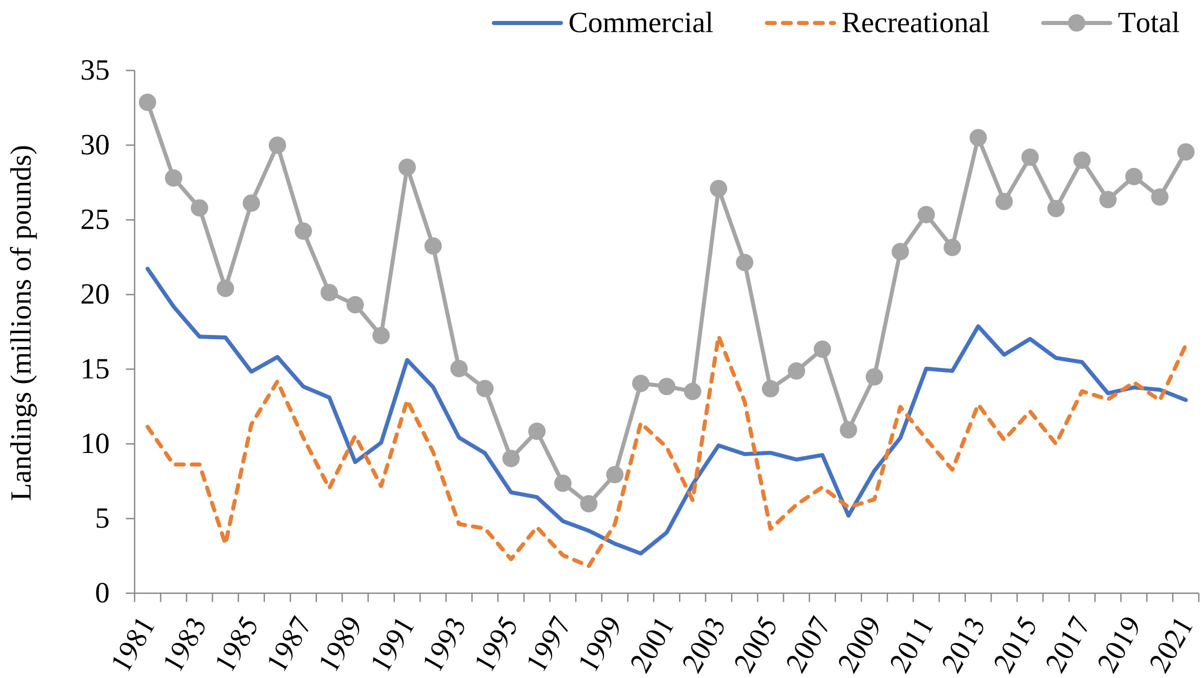


Figure 3: Commercial and recreational scup landings, Maine - North Carolina, 1981-2021.

Commercial Fishery

Commercial scup landings peaked in 1981 at 21.73 million pounds and reached a low of 2.66 million pounds in 2000 (Figure 3). In 2021, commercial fishermen landed 12.93 million pounds of scup, about 63% of the commercial quota.[5]

As previously mentioned, 2020 commercial discard data are currently unavailable due to COVID-19 related interruptions in observer coverage. In 2019, about 6.13 million pounds of scup were discarded in commercial fisheries, representing a 9% decrease from 2018. Commercial discards increased from 2014-2017, peaking at about 10.42 million pounds in 2017. This was the highest number of discards since at least 1981 and was likely mainly due to the large 2015 year class, which is the largest year class since 1984. In 2017, these scup were very abundant, but mostly too small to be landed in the commercial fishery due to the commercial minimum fish size of 9 inches total length.[5]

The commercial scup fishery operates year-round, taking place mostly in federal waters during the winter and mostly in state waters during the summer. A coast-wide commercial quota is allocated between three quota periods, known as the winter I, summer, and winter II quota periods. These seasonal quota periods were established to ensure that both smaller day boats, which typically operate near shore in the summer months, and larger vessels operating offshore in the winter months can land scup before the annual quota is reached. The dates of the summer and winter II periods were modified in 2018 (Table 3). Both winter periods are managed under a coastwide quota while the summer period quota is divided among states according to the allocation percentages outlined in the Commission’s FMP (Table 4).

Table 3: Dates, allocations, and possession limits for the commercial scup quota periods. Winter period possession limits apply in both state and federal waters.

Quota Period	Dates	Commercial quota allocated (%)	Possession limit
Winter I	January 1 – April 30	45.11%	50,000 pounds, until 80% of winter I allocation is reached, then reduced to 1,000 pounds.
Summer	May 1 – September 30[a]	38.95%	State-specific
Winter II	October 1 – December 31[a]	15.94%	12,000 pounds. If winter I quota is not reached, the winter II possession limit increases by 1,500 pounds for every 500,000 pounds of scup not landed during winter I.

[a] Prior to 2018, the summer period was May 1 - October 31 and the winter II period was November 1 - December 31, with the same allocations as shown above.

Table 4: State-by-state quotas for the commercial scup fishery during the summer quota period (May-September).

State	Share of summer quota
Maine	0.1210%
Massachusetts	21.5853%
Rhode Island	56.1894%
Connecticut	3.1537%
New York	15.8232%
New Jersey	2.9164%
Maryland	0.0119%
Virginia	0.1650%
North Carolina	0.0249%
Total	99.9908%

Once the quota for a given period is reached, the commercial fishery is closed for the remainder of that period. If the full winter I quota is not harvested, unused quota is added to the winter II period. Any quota overages during the winter I and II periods are subtracted from the quota allocated to those periods in the following year. Quota overages during the summer period are subtracted from the following year's quota only in the states where the overages occurred.

A possession limit of 50,000 pounds is in effect during the winter I quota period. A possession limit of 12,000 pounds is in effect during the winter II period. If the winter I quota is not reached, the winter II possession limit increases by 1,500 pounds for every 500,000 pounds of quota not caught during winter I. During the summer period, various state-specific possession limits are in effect.

The commercial scup fishery in federal waters is predominantly a bottom otter trawl fishery. In 2021, 97% of the commercial scup landings (by weight) reported by federal VTR data were caught with bottom otter trawls. Pots/traps accounted for about 3% of landings, while all other gear types each accounted for less than 1% of the 2021 commercial scup landings.[9]

Until 2019, trawl vessels could not possess 1,000 pounds or more of scup during October - April, or 200 pounds or more during May - September, unless they use a minimum mesh size of 5-inch diamond mesh, applied throughout the codend for at least 75 continuous meshes forward of the terminus of the net. In 2019, another threshold period was added from April 15-June 15 with a 2,000-pound possession limit to allow for higher retention in the small-mesh squid fishery. Pots and traps for scup are required to have degradable hinges and escape vents that are either circular with a 3.1-inch minimum diameter or square with a minimum length of 2.25 inches on the side.

VTR data suggest that NMFS statistical areas 613, 616, 537, 539 and 611 were responsible for the largest percentage of commercial scup catch in 2021. Statistical area 539, off Rhode Island, had the highest number of trips which caught scup (Table 5, Figure 5).9

Table 5: Statistical areas which accounted for at least 5% of the total commercial scup catch (by weight based on VTR data) in 2021, with associated number of trips.[9] Federal VTR data do not capture landings by vessels only permitted to fish in state waters.

Statistical area	% of 2021 commercial scup catch	Number of trips
613	26%	1,103
616	17%	446
537	17%	839
539	10%	1,993
611	9%	1,500

2021 Commercial Scup Catch - VTRs

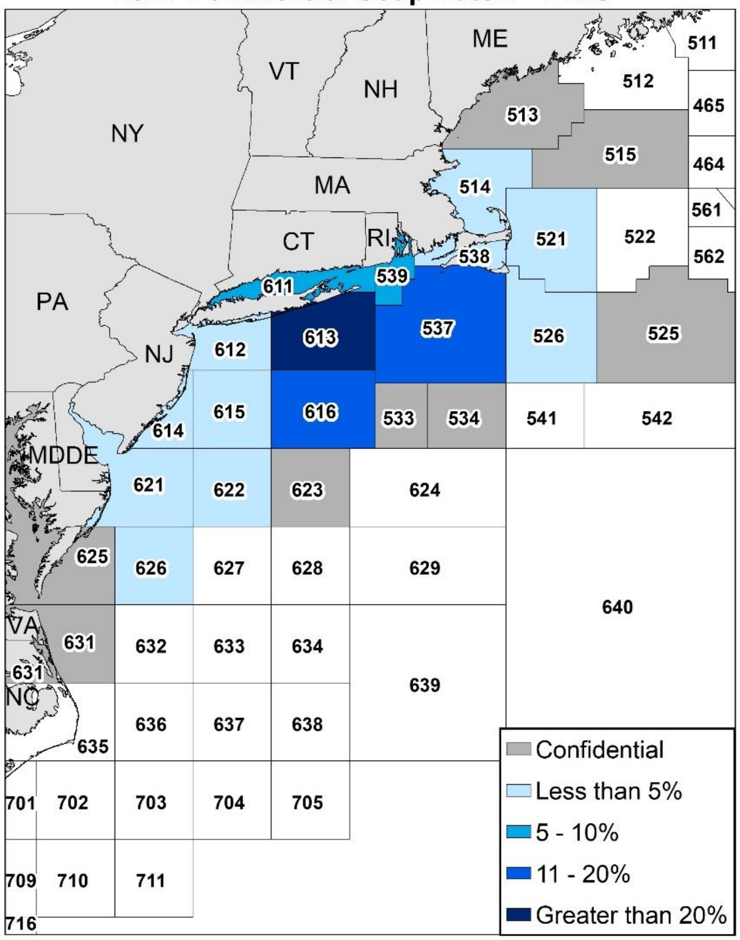


Figure 4: Proportion of scup catch by statistical area in 2021 based on federal VTR data. Statistical areas marked "confidential" are associated with fewer than three vessels and/or dealers. The amount of catch (landings and discards) that was not reported on federal VTRs (e.g., catch from vessels permitted to fish only in state waters) is unknown.

Over the past two decades, total scup ex-vessel revenue ranged from a low of $3.3 million in 2000 to a high of $11.3 million in 2015. In 2021, 12.93 million pounds of scup were landed by commercial fishermen from Maine through North Carolina. Total ex-vessel value in 2021 was $9.8 million, resulting in an average price per pound of $0.76. All revenue and price values were adjusted to 2021 dollars to account for inflation.[5]

In general, the price of scup tends to be lower when landings are higher, and vice versa (Figure 5). This relationship is not linear and many other factors besides landings also influence price. The highest average price per pound over the past two decades was $2.30 and occurred in 1998. The lowest average price per pound was $0.64 and occurred in 2013.[5]

Over 138 federally-permitted dealers from Maine through North Carolina purchased scup in 2021. More dealers in New York purchased scup than in any other state (Table 6).[5]

At least 100,000 pounds of scup were landed by commercial fishermen in 15 ports in 6 states in 2021. These ports accounted for approximately 91% of all 2021 commercial scup landings. Point Judith, Rhode Island was the leading port, both in terms of landings and number of vessels landing scup (Table 7).[5] Detailed community profiles developed by the Northeast Fisheries Science Center's Social Science Branch can be found at www.mafmc.org/communities/.

Since 1996, a moratorium permit has been required to fish commercially for scup. In 2021, 589 vessels held commercial moratorium permits for scup.[10]

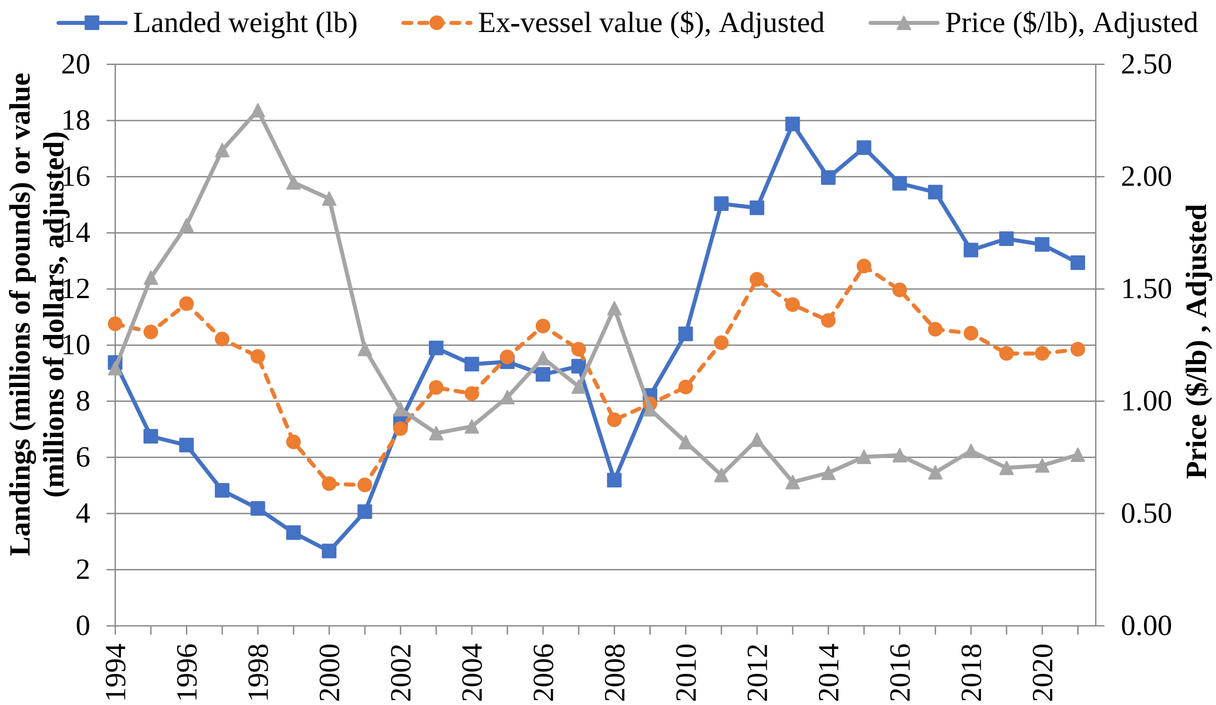


Figure 5: Landings, ex-vessel value, and price for scup from Maine through North Carolina, 1994-2021. Ex-vessel value and price are inflation-adjusted to 2021 dollars using the Gross Domestic Product Price Deflator.[5]

Table 6: Number of dealers per state which reported purchases of scup in 2021. C = Confidential.[5]

State	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC
Number of Dealers	C	27	19	12	38	17	C	5	9	9

Table 7: Ports reporting at least 100,000 pounds of scup landings in 2020, based on NMFS dealer data. C = Confidential.[5]

Port	Scup landings (lb)	% of total landings	Number of vessels
POINT JUDITH, RI	3,662,556	28.3197	128
MONTAUK, NY	2,807,098	21.7051	84
PT. PLEASANT, NJ	1,106,813	8.5581	32
CAPE MAY, NJ	1,104,045	8.5367	26
NEW BEDFORD, MA	581,622	4.4972	55
MATTITUCK, NY	538,703	4.1654	5
STONINGTON, CT	296,288	2.291	22
LITTLE COMPTON, RI	294,645	2.2783	8
NEW LONDON, CT	267,818	2.0708	4
HAMPTON, VA	262,377	2.0288	26
HAMPTON BAY, NY	250,693	1.9384	26
SHINNECOCK, NY	171,485	1.326	9
TIVERTON, RI	133,628	1.0332	5
AMMAGANSETT, NY	C	C	C

Scup Gear Restricted Areas

Two scup gear restricted areas (GRAs) were first implemented in 2000 with the goal of reducing scup discards in small-mesh fisheries. The GRA boundaries have been modified multiple times since their initial implementation. The current boundaries are shown in Figure 6. Trawl vessels may not fish for or possess longfin squid, black sea bass, or silver hake in the Northern GRA from November 1 – December 31 and in the Southern GRA from January 1 – March 15 unless they use mesh which is at least 5 inches in diameter. The GRAs are thought to have contributed to the recovery of the scup population in the mid- to late-2000s.[8] As previously stated, commercial scup discards increased by 71% between 2016 and 2017, likely due to the large 2015 year class.[4] Although discards decreased by about 41% in 2019 compared with the record high discards in 2017, they still remain well above average. Commercial discard data for 2020 and 2021 are not yet available for analysis. Further analysis is needed to evaluate the impact of the GRA modification on commercial scup discards in 2017-2021.

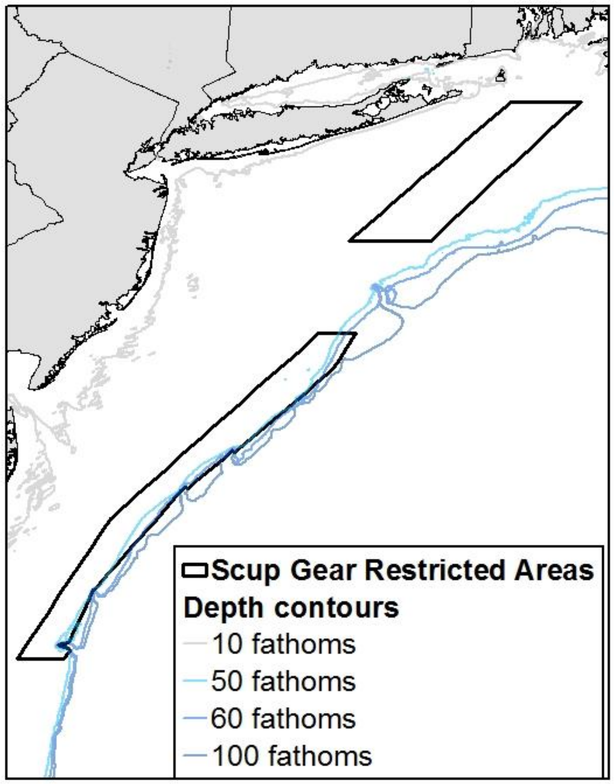


Figure 6: The Scup Gear Restricted Areas.

Recreational Fishery

The recreational scup fishery is managed on a coast-wide basis in federal waters. Federal waters measures remained unchanged from 2015-2021 (Table 8). For the 2022 fishing year, the Council and Commission proposed a 1-inch increase to the scup recreational minimum size in state and federal waters. In federal waters, this results in a 10-inch total length minimum size limit. Collectively, the increased size limits in state and federal waters is expected to achieve an approximate 33% reduction in harvest for 2022 compared to the 2019-2021 average. The 2021 RHL overage will be discussed in development of 2023 recreational measures but is unlikely to impact the 2023 RHL and ACL given recent biomass estimates and the Council's Accountability Measures.[7]

Table 8: Federal recreational measures for scup, 2005-2022.

Regulation	2005-2007	2008-2009	2010-2011	2012	2013	2014	2015-2021	2022[a]
Minimum size (total length)	10 in.	10.5 in.	10.5 in.	10.5 in.	10 in.	9 in.	9 in.	10 in.
Possession limit	50	15	10	20	30	30	50	50
Open season	Jan 1 – Feb 28 & Sept 18 –Nov 30	Jan 1 – Feb 28 & Oct 1– Oct 31	Jun 6 – Sept 26	Jan 1 – Dec 31	Jan 1 – Dec 31	Jan 1 – Dec 31	Jan 1 – Dec 31	Jan 1 – Dec 31

[a] Revised based on publication of final rule (2022-12450) on June 8, 2022.

The Commission applies a regional management approach to recreational scup fisheries in state waters, where New York, Rhode Island, Connecticut, and Massachusetts develop regulations intended to achieve 97% of the RHL. The minimum fish size, possession limit, and open season for recreational scup fisheries in state waters vary by state. State waters measures remained unchanged from 2015 through 2017. Massachusetts through New Jersey liberalized their minimum size limits and/or seasons in 2018 compared to 2017, there were very minor changes in the state regulations from 2018 to 2019, and no changes to state measures from 2019 to 2021. In 2022, due to the Council and Commission’s proposed 1-inch increase in scup recreational minimum size limits, as of the completion of this document, most states updated the minimum size limits in state waters (Table 9).

Table 9: State recreational fishing measures for scup in 2021 and 2022. Note: the minimum size limit was the only regulation updated in 2022 and timing of implementation varied by state.

State	2021 Minimum Size (inches)	2022 Minimum Size (inches)	Possession Limit	Open Season
MA (private & shore)	9	10	30 fish; 150 fish/vessel with 5+ anglers on board	April 13-December 31
MA (party/charter)	9	10	30 fish	April 13-April 30; July 1-December 31
			50 fish	May 1-June 30
RI (private & shore)	9	10	30 fish	January 1-December 31
RI shore program (7 designated shore sites)	8	9		
RI (party/charter)	9	10	30 fish	January 1-August 31; November 1-December 31
			50 fish	September 1-October 31
CT (private & shore)	9	10	30 fish	January 1-December 31
CT shore program (45 designed shore sites)	8	9		
CT (party/charter)	9	10	30 fish	January 1-August 31; November 1-December 31
			50 fish	September 1-October 31
NY (private & shore)	9	9	30 fish	January 1-December 31
NY (party/charter)	9	9	30 fish	January 1-August 31; November 1-December 31
			50 fish	September 1- October 31
NJ	9	10	50 fish	January 1- December 31
DE	8	9	50 fish	January 1-December 31
MD	8	9	50 fish	January 1-December 31
VA	8	9	30 fish	January 1-December 31
NC, North of Cape Hatteras (N of 35° 15'N)	8	9	50 fish	January 1-December 31

Recreational data are available from MRIP. In July 2018, MRIP released revisions to their time series of recreational catch and landings 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. The RHLs and other management measures through 2019 were based on the old MRIP estimates. The new estimates of catch and landings are several times higher than the previous estimates for shore and private boat modes, substantially raising the overall scup catch and harvest estimates. Information presented in this section is based on the new estimates.

From 1981-2020, recreational catch of scup (in number of fish) peaked in 2017 at 41.20 million scup and landings peaked in 1986 with an estimated 30.43 million scup landed by recreational fishermen from Maine through North Carolina. Recreational catch was lowest in 1998 when an estimated 6.86 million scup were caught and 2.74 million scup were landed. Recreational anglers from Maine through North Carolina caught an estimated 31.70 million scup and landed 16.56 million scup (about 16.62 million pounds) in 2021 (Figure 7).[6]

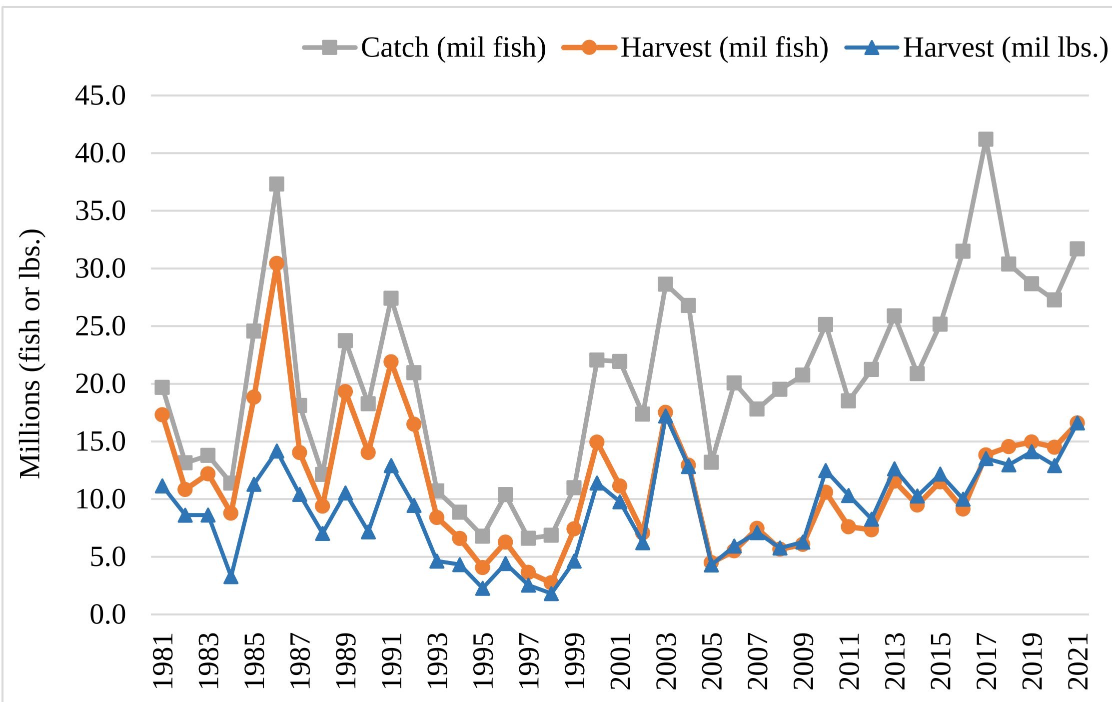


Figure 7: MRIP estimates of recreational scup harvest in numbers of fish and pounds and catch in numbers of fish, ME - NC, 1981-2021.

Vessels carrying passengers for hire in federal waters must obtain a federal party/charter permit. In 2021, 780 vessels held scup federal party/charter permits. Many of these vessels also held party/charter permits for summer flounder and black sea bass.[10]

Most recreational scup catch occurs in state waters during the warmer months when the fish migrate inshore. Between 2019 and 2021, on average 92.9% of recreational scup catch (in numbers of fish) occurred in state waters and about 7.1% occurred in federal waters (Table 10). New York, Connecticut, Rhode Island, Massachusetts, and New Jersey accounted for over 99% of recreational scup harvest in 2021 (Table 11).[6]

About 73% of recreational scup landings (in numbers of fish) in 2021 were from anglers who fished on private or rental boats and about 18% were from anglers fishing from shore. Additionally, about 9% were from anglers fishing on party or charter boats (Table 12).[6]

Table 10: Estimated percent of scup caught by recreational fishermen in state and federal waters, Maine - North Carolina, 2012 – 2021. Percentages calculated based on numbers of fish[6]

Year	State waters	Federal waters
2012	99.7%	0.3%
2013	96.3%	3.7%
2014	96.5%	3.5%
2015	98.9%	1.1%
2016	93.5%	6.5%
2017	95.9%	4.1%
2018	96.2%	3.8%
2019	95.5%	4.5%
2020	88.6%	11.4%
2021	94.4%	5.6%
2012-2021 average	**95.6%**	**4.4%**
2019-2021 average	**92.9%**	**7.1%**

Table 11: Estimated percent of scup harvested by state, 2019 – 2021. Percentages calculated based on numbers of fish.[6]

State	2019	2020	2021	2019-2021 average
Maine	0%	0%	0%	0%
New Hampshire	0%	0%	0%	0%
Massachusetts	14%	9%	23%	15%
Rhode Island	20%	10%	15%	15%
Connecticut	16%	23%	17%	19%
New York	49%	48%	43%	47%
New Jersey	1%	9%	1%	4%
Delaware	0%	0%	0%	0%
Maryland	0%	0%	0%	0%
Virginia	0%	0%	1%	0%
North Carolina	0%	0%	0%	0%

Table 12: Scup harvest (in numbers of fish) by recreational fishing mode, Maine - North Carolina, 2012 – 2021. Note: percentages may not sum to 100% due to rounding.[6]

Year	Private/rental	Shore	Party/charter	Total number
2012	69%	14%	16%	7,334,831
2013	51%	34%	15%	11,547,030
2014	65%	20%	15%	9,488,947
2015	76%	17%	8%	11,498,780
2016	56%	34%	10%	9,143,579
2017	65%	24%	11%	13,820,610
2018	48%	43%	9%	14,545,489
2019	56%	29%	15%	14,954,157
2020	62%	28%	10%	14,493,250
2021	73%	18%	9%	16,595,455
2012-2021 average	**62%**	**26%**	**12%**	**12,342,213**
2019-2021 average	**64%**	**25%**	**11%**	**15,347,621**

References

[1] Steimle, F.W, C. A. Zetlin, P. L. Berrien, D. L. Johnson, S. Chang. 1999. Essential Fish Habitat source document: Scup, *Stenotomus chrysops*, life history and habitat characteristics. NOAA Technical Memorandum NMFS-NE-149; 39 p.

[2] Northeast Data Poor Stocks Working Group. 2009. The northeast data poor stocks working group report, part A: skate species complex, deep sea red crab, Atlantic wolf fish, scup, and black sea bass. Northeast Fish Science Center Reference Document 09-02; 496 p. Available at: http://www.nefsc.noaa.gov/publications/crd/crd0902/.

[3] Northeast Fisheries Science Center. 2015. 60th Northeast Regional Stock Assessment (60th SAW) assessment report. Northeast Fisheries Science Center Reference Document 15-08. Available at: http://www.nefsc.noaa.gov/publications/.

[4] Northeast Fisheries Science Center. 2021. Prepublication copy of the 2021 management track stock assessment report prepared for the Council and the SSC. Available at: https://www.mafmc.org/ssc-meetings/2021/july21-23

[5] Unpublished NMFS commercial fish dealer data (i.e., "DERS"), which include both state and federal dealer data).

[6] Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division. Accessed May 3, 2022. Available at: http://www.st.nmfs.noaa.gov/recreational-fisheries/index.

[7] Accountability Measures for Summer Flounder, Scup, and Black Sea Bass. Available at: https://www.mafmc.org/s/AMs-description_SF_scup-BSB_Dec2020.pdf

[8] Terceiro, M., A. Miller. 2014. Commercial fishery scup discarding and the Gear Restricted Areas (GRAs). White paper for the Mid-Atlantic Fishery Management Council. 30 p.

[9] Unpublished NMFS Vessel Trip Report data as of February 1, 2022.

[10] Unpublished NMFS permit data as of February 1, 2022.

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: July 29, 2022

To: Council and Board

From: Julia Beaty, Staff

Subject: 2023 Black Sea Bass Specifications

On Tuesday, August 9, the Council and Board will review previously adopted 2023 black sea bass specifications and recommend revisions as needed. Measures to be considered include 2023 commercial and recreational catch and landings limits, the February recreational opening, as well as any changes to the commercial management measures for 2023. As described in the staff memo, previously approved 2023 commercial and recreational catch and landings limits will require revisions based on recent modifications to the commercial/recreational allocation percentages.

Materials listed below are provided for the Council and Board's consideration of this agenda item. As noted below, some materials are behind other tabs, and some will be available on the August 2022 Meeting Page at a later date.

1) Monitoring Committee meeting summary from July 28, 2022 (*behind Tab 3*)
2) July 2022 Scientific and Statistical Committee meeting report *(Tab 15)*
3) Staff memo on 2023 black sea bass specifications dated July 14, 2022
4) June 2022 Advisory Panel Fishery Performance Report and additional AP email comments received through July 8, 2021 *(behind Tab 3)*
5) 2022 Black Sea Bass Data Update
6) 2022 Black Sea Bass Fishery Information Document

The following document is also posted on the August 2022 Meeting Page as a supplemental briefing document:

1) Black Sea Bass Management Track Assessment for 2021

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: July 14, 2022

To: Chris Moore, Executive Director

From: Julia Beaty, staff

Subject: 2023 Black Sea Bass Specifications

Revised 7/21/2022 to correct a typo in Table 3.

Executive Summary

This memorandum includes information to assist the Mid-Atlantic Fishery Management Council's (Council's) Scientific and Statistical Committee (SSC) and Monitoring Committee in reviewing previously adopted 2023 commercial and recreational catch and landings limits and commercial management measures for black sea bass, and recommending revisions as needed.

The black sea bass stock from Maine through Cape Hatteras, North Carolina is jointly managed by the Council and the Atlantic States Fishery Management (Commission). Additional information on fishery performance and past management measures can be found in the 2022 Black Sea Bass Fishery Information Document and the 2022 Summer Flounder, Scup, and Black Sea Bass Fishery Performance Report developed by advisors.[1]

The Magnuson-Stevens Fishery Conservation and Management Act requires the Council's SSC to provide scientific advice for fishery management decisions, including recommendations for Acceptable Biological Catch limits (ABCs), prevention of overfishing, and achieving maximum sustainable yield. The Council's catch limit recommendations for the upcoming fishing year(s) cannot exceed the ABCs recommended by the SSC.

According to the 2021 management track stock assessment, the black sea bass stock north of Cape Hatteras, North Carolina was not overfished and overfishing was not occurring in 2019.[2] ABCs, commercial and recreational annual catch limits (ACLs) and annual catch targets (ACTs), commercial quotas, and Recreational Harvest Limits (RHLs) for 2022-2023 were set in 2021 based on the results of this assessment (Table 1).

In July 2022, the SSC will review their previously recommended 2023 ABC and consider if revisions are needed. <u>Council staff recommend no revisions to the ABC</u> as there is no new information to suggest a change is needed.

---

[1] Available at: https://www.mafmc.org/fishery-performance-reports
[2] Northeast Fisheries Science Center. 2022. Management Track Assessment June 2021. Northeast Fisheries Science Center reference document; 22-10. DOI: https://doi.org/10.25923/4m8f-2g46

Following the SSC meeting, the Monitoring Committee will review the 2023 commercial and recreational ACLs and ACTs, commercial quota, and RHLs, which are derived from the ABC. The ACLs, ACTs, quota, and RHL account for the commercial/recreational allocation defined in the FMP. In December 2021 Council and the Commission's Summer Flounder, Scup, and Black Sea Bass Management Board (Board) revised the commercial/recreational allocation for black sea bass; therefore, the 2023 ACLs, ACTs, commercial quota, and RHL should be modified to account for the revised allocation.

Table 1 lists the staff recommended revisions to the 2023 ACLs, ACTs, commercial quota, and RHL based on the revised commercial/recreational allocation, no deduction for management uncertainty in either sector, and the discards projection methods described later in this memo. The final resulting values may differ based on the recommendations of the Monitoring Committee, the Council, and the Board.

The Monitoring Committee will also review the commercial management measures which can be modified through the specifications process, including the federal waters minimum fish size, minimum mesh size, and mesh exemption programs. Council staff recommend no revisions to these commercial management measures as there is no new information to suggest a change is needed.

The Monitoring Committee will also consider if changes are needed to the February recreational black sea bass opening which has been in place since 2018. As described in more detail later in this memo, changes are required to the non-preferred coastwide measures to allow this opening to occur in 2023. Other recreational management measures will be considered later in 2022.

The Council will meet jointly with the Board in August 2022 to review the recommendations of the SSC and Monitoring Committee, as well as input from the Advisory Panel, before reviewing commercial and recreational catch and landings limits and commercial management measures for 2023 and recommending revisions as needed. Recreational bag limits, size restrictions, and open/closed seasons for 2023 will be considered in late 2022 after preliminary recreational harvest estimates through August 2022 are available.

In summary, the staff recommendations for SSC and Monitoring Committee consideration are as follows:

- Maintain the previously recommended 2023 ABC.
- Set the commercial and recreational ACLs based on the revised commercial/recreational allocation.
- Take no deduction from the commercial and recreational ACLs to the ACTs for management uncertainty.
- Calculate 2023 projected commercial dead discards based on the method used for black sea bass during 2021-2022.
- Calculate 2023 projected recreational dead discards based on a simple three-year average of the most recent recreational dead discard estimates.
- Make no changes to the commercial management measures which can be modified through specifications.
- Modify the 2022 recreational non-preferred coastwide measures (which were waived in favor of state waters measures) to allow states to retain the ability to participate in the optional February recreational opening.

Table 1: Previously approved 2022-2023 catch and landings limits for black sea bass as well as staff recommended revisions for 2023. The final 2023 values may differ based on the recommendations of the SSC, Monitoring Committee, Council, and Board. Italicized text indicates a change in methodology for calculating the associated measure.

Measure	Previously Approved					Staff Recommended Revisions		
	2022		2023		Basis	2023		
	mil lb	mt	mil lb	mt		mil lb	mt	Basis
OFL	19.26	8,735	17.01	7,716	SSC recommendation based on stock assessment projections.	17.01	7,716	Same basis as previously approved.
ABC	18.86	8,555	16.66	7,557	SSC recommendations based on stock assessment projections and Council risk policy.	16.66	7,557	Same basis as previously approved.
ABC landings	13.20	5,990	11.66	5,291	ABC - expected com. and rec. dead discards	NA	NA	Not needed under new catch-based allocation.
Com. ACL	10.10	4,583	8.93	4,048	49% of ABC landings portion (com. allocation) + expected com. disc.	7.50	3,401	*45% of ABC (commercial allocation)*
Com. ACT	10.10	4,583	8.93	4,048	Equal to the ACL; no deduction for management uncertainty	7.50	3,401	Same basis as previously approved.
Expected com. dead discards	3.63	1,649	3.21	1,456	Com. dead disc. = 36% of com. catch (2017-2019 avg.)	2.70	1,224	Same basis as previously approved but accounting for allocation change.
Com. quota	6.47	2,934	5.71	2,592	Com. ACT minus expected com. dead discards	4.80	2,177	Same basis as previously approved.
Rec. ACL	8.76	3,972	7.74	3,509	51% of ABC landings portion (rec. allocation) + expected rec. disc.	9.16	4,156	*55% of ABC (recreational allocation)*
Rec. ACT	8.76	3,972	7.74	3,509	Equal to the ACL; no deduction for management uncertainty	9.16	4,156	Same basis as previously approved.
Expected rec. dead discards	2.02	917	1.79	810	Rec. dead disc. = 23% of rec. catch (2017-2019 avg)	3.04	1,378	*Three-year avg. of most recent discard estimates available (2017-2019)*
RHL	6.74	3,055	5.95	2,699	Rec. ACT minus expected rec. dead discards	6.12	2,778	Same basis as previously approved.

Stock Status and Biological Reference Points

A black sea bass management track stock assessment was peer reviewed and accepted in June 2021. This assessment retained the model structure of the 2016 benchmark stock assessment and incorporated fishery data and fishery-independent survey data through 2019. Data from 2020 were not incorporated due to significant gaps in some data sets due to the COVID-19 pandemic and the time required to consider how to best address those gaps. As with the 2016 benchmark and subsequent updates, terminal year estimates of spawning stock biomass, fishing mortality, and recruitment were adjusted for internal model retrospective error. The retrospectively adjusted values are compared against the reference points and used in management.

Due to the lack of a stock/recruit relationship, a direct calculation of maximum sustainable yield (MSY) and associated reference points (F and SSB) is not feasible and proxy reference points were used. SSB calculations and SSB reference points account for mature males and females.

The 2021 management track assessment indicates that the black sea bass stock was not overfished and overfishing was not occurring in 2019. Spawning stock biomass in 2019 was estimated at about 2.1 times the target level. Fishing mortality in 2019 was estimated to be 15% below the threshold level that defines overfishing (Table 2, Figure 1 - Figure 3).

The 2021 management track assessment indicates that the 2011 year class (i.e., fish spawned in 2011) was the largest in the time series and the 2015 year class was the second largest. The 2017 year class was well below the 1989-2018 average, but the 2018 year class was above average at (Figure 2). The 2018 year class is the most recent year class for which estimates are currently available.

A data update provided by the Northeast Fisheries Science Center (NEFSC) in July 2022 indicates that relative abundance from the NEFSC spring bottom trawl survey has steadily increased since 2015 (however, note that the 2020 index is based on an incomplete survey). Age composition data show evidence of the large 2011 year class, as well as above average 2015, 2016, and 2019 year classes.[3]

A black sea bass research track stock assessment is currently in development and is expected to be peer reviewed in February 2023. The research track assessment is not intended to provide outputs that will be used directly in management. Rather, the research track assessment model will be used in a management track assessment in the summer of 2023, which will incorporate the most recent data available and will provide outputs for use in management. Updated black sea bass management track assessments are expected to be available every other year.

[3] Black Sea Bass Data Update for 2022 provided by the Northeast Fisheries Science Center. Available at https://www.mafmc.org/ssc-meetings/2022/july-25-26

Table 2: Black sea bass biological reference points from the 2021 management track stock assessment.

	Spawning stock biomass	Fishing mortality rate (F)
Target	31.84 mil lb (14,441 mt)	N/A
Threshold	15.92 mil lb (7,221 mt)	0.46
Terminal year estimate (2019)	65.53 mil lb (29,769 mt) [a] 2.1 times target level	0.39[a] 15% below threshold level
Status	**Not overfished**	**Overfishing not occurring**

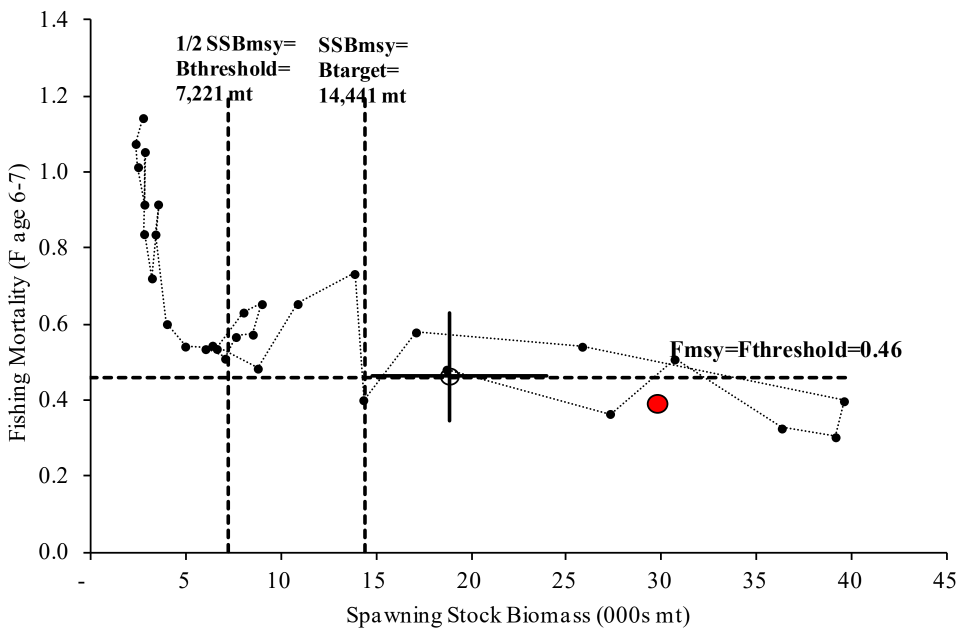


Figure 1: Estimates of black sea bass spawning stock biomass (SSB) and fully-recruited fishing mortality (F, peak at ages 6-7) relative to biological reference points. Open circle with 90% confidence intervals shows the assessment point estimates. The filled circle shows the retrospectively adjusted estimates which are used in management. Source: 2021 management track assessment.

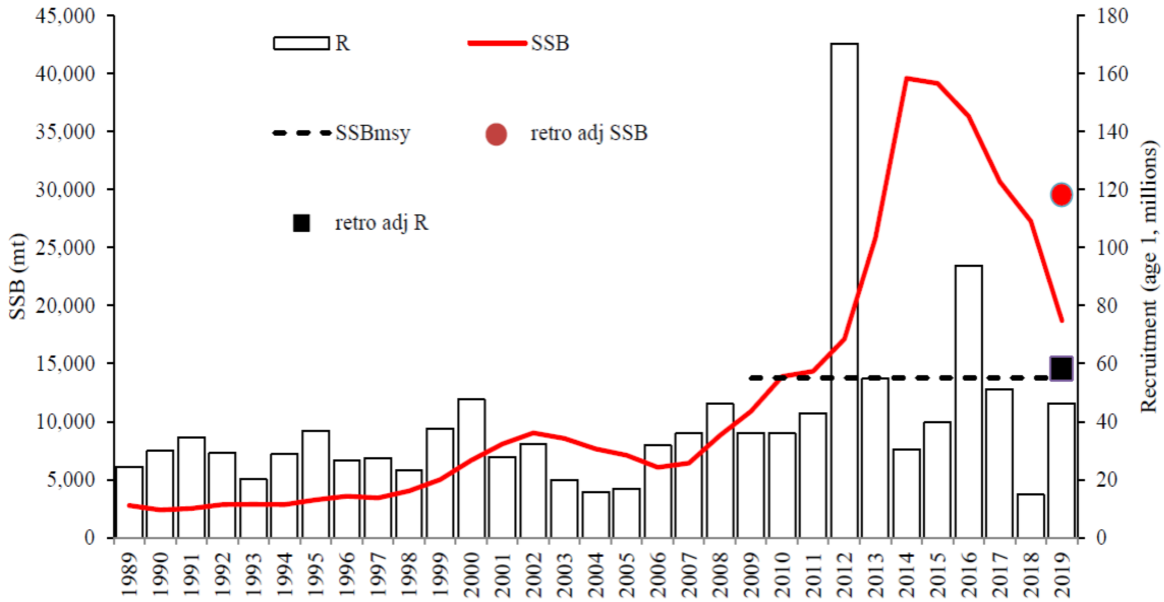


Figure 2: Black sea bass spawning stock biomass (SSB; solid line) and recruitment at age 1 (R; vertical bars), 1989-2019. The horizontal dashed line is the updated SSB_{MSY} proxy = $SSB_{40\%}$ =14,441 mt. SSB and recruitment estimates for 2019 were adjusted for a retrospective pattern in the stock assessment (red circle and black square, respectively). Adjusted values are used in management. Source: 2021 management track assessment.

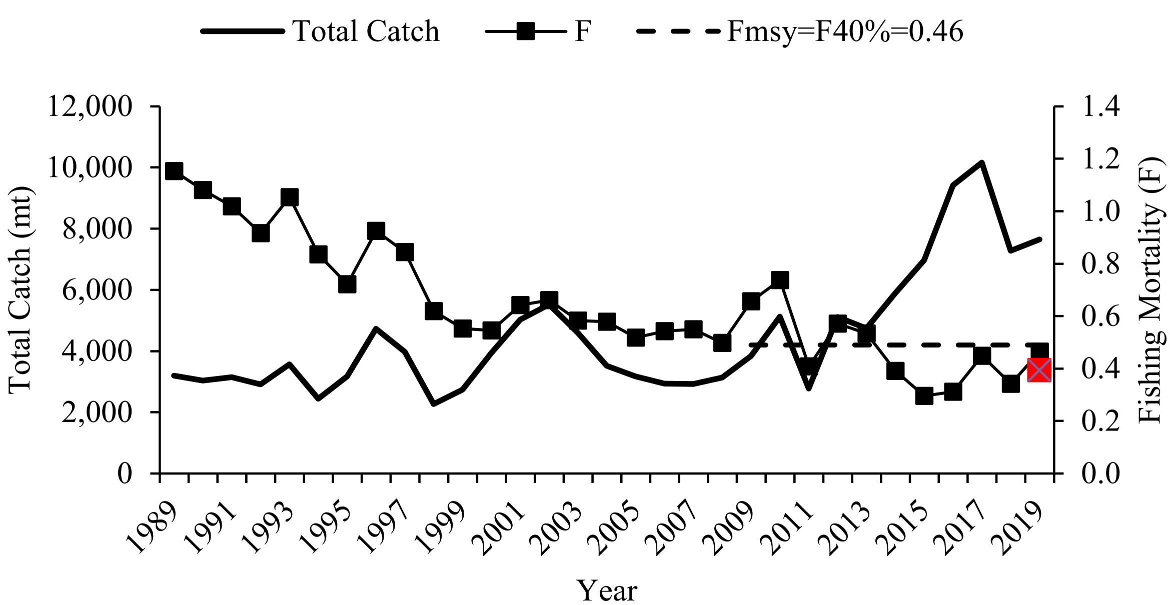


Figure 3: Total fishery catch (metric tons; mt; solid line) and fishing mortality (F, peak at age 6-7; squares) for black sea bass. The horizontal dashed line is the updated F_{MSY} proxy = $F_{40\%}$ = 0.46. The red square is the retrospectively adjusted fishing mortality value for 2019. The adjusted value is used in management. Source: 2021 management track assessment.

Recent Catch and Fishery Performance

Commercial landings in 2021 were the highest in the entire time series of data back to 1989 and landings in 2020 were the second highest in the time series. Commercial landings during 2012-2019 were within 11% of the quota each year, with a 13% quota underage in 2020 and a 30% underage in 2021.[4] The commercial quota during 2020 and 2021 was notably higher than previous years (Table 3).

Based on data reported through July 6, 2022, 2.28 million pounds of black sea bass have been landed by commercial fishermen from Maine through Cape Hatteras, NC in 2022, corresponding to 35% of the 2022 commercial quota of 6.47 million pounds. Throughout 2022 to date, commercial landings have been slightly lower than 2021 landings.[5]

Commercial ACL overages occurred each year during 2013-2019 based on higher than expected discards. The method for calculating projected dead discards was revised starting with the 2021 specifications in an attempt to address this issue. Discard data for 2021 are not currently available; therefore, performance of the revised method cannot yet be evaluated.

In 2018, the Marine Recreational Information Program (MRIP) released revisions to the entire time series of recreational harvest and discard estimates. The black sea bass recreational catch and landings limits did not account for these revisions until 2020; therefore, recreational fishery performance compared to the catch and landings limits must be evaluated using the older MRIP data through 2019 and the revised MRIP estimates starting in 2020. As shown in Table 4, recreational harvest exceeded the RHL and recreational discards also exceeded the expected amount in most years since 2012, with a 56% RHL overage in 2020 and an 89% RHL overage in 2021. The Council and Board agreed to leave the recreational bag, size, and season limits unchanged in 2020 and 2021 despite anticipated RHL overages. This was viewed as a temporary solution to allow more time to consider how to fully transition the management system to use of the revised MRIP data through the Commercial/Recreational Allocation Amendment and the Recreational Harvest Control Rule Framework/Addenda. Final action has been taken on both actions, which will have implications for 2023 recreational specifications, as described in more detail later in this document. The temporary status quo approach could not be maintained in 2022; therefore, the Council and Board approved a 20.7% reduction in recreational harvest compared to the 2018-2021 average in all states and federal waters with the goal of preventing an overage of the 2022 RHL. The impacts of these restrictions cannot yet be evaluated as preliminary estimates of recreational harvest and discards for 2022 are currently only available through wave 2 (March/April). These data do not provide meaningful insights into the 2022 recreational black sea bass fishery given that the recreational black sea bass fishery was closed through at least May 15 in all states except New Hampshire.

---

[4] Based on NEFSC data for landings, which may differ slightly from data used by the NOAA Fisheries Greater Atlantic Regional Fisheries Office.

[5] Based on data available at https://www.fisheries.noaa.gov/new-england-mid-atlantic/commercial-fishing/quota-monitoring-greater-atlantic-region

Table 3: Black sea bass commercial landings, dead discards, and dead catch compared to the commercial quota, projected commercial dead discards, and commercial ACL, 2012-2021. ACLs for black sea bass were first used starting in 2012. All values are in millions of pounds.

Year	Com. landings[a]	Com. quota[b]	Quota overage/ underage	Com. dead discards[a]	Projected com. dead discards[c]	Projected dead discards overage/underage	Com. dead catch[a]	ACL	ACL overage/ underage
2012	1.72	1.71	+1%	0.26	0.22	+18%	1.98	1.98	0%
2013	2.26	2.17	+4%	0.61	0.36	+69%	2.87	2.6	+10%
2014	2.40	2.17	+11%	1.01	0.36	+181%	3.41	2.6	+31%
2015	2.45	2.21	+11%	0.93	0.39	+138%	3.38	2.6	+30%
2016	2.50	2.71	-8%	1.67	0.44	+280%	4.17	3.15	+32%
2017	3.99	4.12	-3%	2.26	0.97	+133%	6.25	5.09	+23%
2018	3.34	3.52	-5%	1.59	0.83	+92%	4.93	4.35	+13%
2019	3.48	3.52	-1%	2.26	0.83	+172%	5.74	4.35	+32%
2020	4.29	5.58	-23%	Not currently available	1.4	TBD	TBD	6.98	TBD
2021	4.87	6.09	-20%	Not currently available	3.43	TBD	TBD	9.52	TBD

[a] Based on NEFSC data as provided in 2021 management track assessment (data through 2019) and 2022 data update (2020 and 2021 values).

[b] The commercial quotas shown for 2012-2014 reflect a 3% deduction for Research Set Aside.

[c] Based on specifications calculations used to set the commercial ACL and quota.

Table 4: Black sea bass recreational landings, dead discards, and dead catch compared to the RHL, projected recreational dead discards, and recreational ACL, 2012-2021. ACLs for black sea bass were first used starting in 2012. Values are provided in the "old" and "new" MRIP units where available as the ACLs and RHLs did not account for the revised MRIP data until 2020. Therefore, overage/underage evaluations must be based in the old MRIP units through 2019 and the new MRIP units starting in 2020. All values are in millions of pounds.

Year	Rec. land. old MRIP units[a]	Rec. land. new MRIP units[b]	RHL[c]	RHL overage/ underage[d]	Rec. dead disc. old MRIP units[a]	Rec. dead disc. new MRIP units[b]	Projected rec. dead disc.[e]	Projected dead disc. overage/ underage[d]	Rec. dead catch old MRIP units[a]	Rec. dead catch new MRIP units[b]	ACL	ACL overage/ underage[d]
2012	3.26	6.97	1.32	+147%	0.80	2.31	0.50	+60%	4.07	9.28	1.86	119%
2013	2.64	5.92	2.26	+17%	0.65	1.65	0.57	+14%	3.29	7.57	2.9	13%
2014	3.85	7.74	2.26	+70%	0.84	1.85	0.57	+47%	4.69	9.59	2.9	62%
2015	4.11	9.81	2.33	+76%	0.82	2.17	0.57	+44%	4.93	11.98	2.9	70%
2016	5.19	13.52	2.82	+84%	1.21	3.07	0.7	+73%	6.40	16.59	3.52	82%
2017	4.50	12.55	4.29	+5%	1.27	3.60	1.09	+17%	5.77	16.15	5.38	7%
2018	3.82	8.84	3.66	+4%	1.1	2.28	0.93	+18%	4.92	11.12	4.59	7%
2019	3.46	8.63	3.66	-5%	0.5	3.24	0.93	-46%	3.96	11.87	4.59	-14%
2020	NA	9.06	5.81	+56%	NA	Not currently available	2.28	TBD	NA	TBD	8.09	TBD
2021	NA	11.98	6.34	+89%	NA	Not currently available	1.59	TBD	NA	TBD	7.93	TBD

[a] Based on the data update provided by the NEFSC in 2018 (most recent data from NEFSC in "old" MRIP units). Values for 2018 and 2019 were provided by GARFO.

[b] Based on NEFSC data as provided in 2021 management track assessment (data through 2019) and 2022 data update (2020 and 2021 values).

[c] The RHLs shown for 2012-2014 reflect a 3% deduction for Research Set Aside.

[d] Based on a comparison with old MRIP data through 2019 and new MRIP data starting in 2020.

[e] Based on specifications calculations used to set the recreational ACL and RHL.

Review of Prior SSC Recommendations

In July 2021, the SSC recommended 2022 and 2023 ABCs for black sea bass based the Council's ABC control rule and risk policy, using stock status information and projections provided with the 2021 management track assessment.

The SSC maintained use of a 100% coefficient of variance (CV) applied to the overfishing limit (OFL) when developing their ABC recommendations for 2022-2023. The following text was copied directly from the SSC's July 2021 meeting summary[6] and describes their rationale for applying a 100% OFL CV:

- There is a strong retrospective bias present in the assessment results and this pattern differs between the two spatial sub-areas.
- The fishery has a large recreational component (~60-80% of total harvest in recent years), and thus a substantial reliance on MRIP. Updated MRIP numbers differ substantially from the old estimates, and the updated estimate for one year (2016) was considered implausible owing to high variance in wave-specific data.
- Spatially explicit models were implemented in the 2016 benchmark assessment, and there were detailed efforts to explore the consequences of the misspecification of the spatial
- resolution of these models on perceptions of stock status.
- There were broadly consistent patterns in the fishery independent indices.

The SSC also noted that retrospective bias had increased since the 2019 management track assessment and uncertainty in the 2020 recreational harvest and dead discards are high because of COVID-related disruptions to the MRIP survey in 2020.

The projections used by the SSC to calcuate the 2022-2023 OFLs and ABCs assumed that recreational harvest in 2021 would be the same as in 2020. This resulted in an expected RHL overage. The projections also assumed that the comercial sector would catch their full ACL without overages. Therefore, the assumed RHL overage resulted in an assumed 2021 ABC overage. The SSC agreed that this was an appropriate assumption given recent trends in recreaitonal harvest and given that the Council and Board maintained status quo recreational measures in 2020 and 2021 despite expected RHL overages.

The SSC recommended variable ABCs across 2022-2023 because the revisions to the Council's risk policy adopted in 2019 resulted in a greater than 50% probability of overfishing in one year when averaged ABCs were used. The ABCs recommended by the SSC are shown in Table 5.

The SSC determined the following to be the most significant sources of scientific uncertainty associated with determination of the 2022-2023 OFLs and ABCs in July 2021:

- The retrospective pattern was large enough to need the corrections (outside the 90% confidence intervals), and the additional uncertainty caused by applying the correction is unclear. The model for the northern sub-area has a larger retrospective pattern than the model for the southern sub-area.
- The natural mortality rate (M) used in the assessment — because of the unusual life history strategy, the current assumption of an equal M in the assessment model for both sexes — may not adequately capture potential sex-based differences in M.
- The spatial distribution of productivity within the stock range.

[6] Available at: https://www.mafmc.org/ssc-meetings/2021/july21-23

- The level, temporal pattern, and spatial distribution of recreational catches.
- The nature of exchanges between the spatial regions defined in the assessment model.
- The extent to which the spatial structure imposed reflects the dynamics within the stock.
- The combination of the values from the northern and southern sub-areas is conducted without weighting based on landings or biomass. It is unclear whether or how the uncertainty should be treated when the biological reference points are combined using simple addition.
- Future effects of temperature on stock productivity and range are highly uncertain.
- Estimates of 2020 harvest and dead discards in both the recreational and commercial sectors are highly uncertain because of COVID-related pauses in observer coverage and MRIP intercept surveys.

Table 5: 2022-2023 black sea bass OFLs and ABCs recommended by the SSC in July 2021, as well as associated fishing mortality rates (F), probability of overfishing (p*), spawning stock biomass (SSB), and projected biomass compared to target level (SSB/SSB_{MSY}).

Year	OFL		ABC		ABC F	ABC p*	SSB		SSB/ SSB_{MSY}
	MT	Mil. lb	MT	Mil. lb			MT	Mil. lb	
2022	8,735	19.56	8,555	18.86	0.41	0.49	22,637	49.91	1.57
2023	7,716	17.01	7,557	16.66	0.41	0.49	19,538	43.07	1.35

Staff Recommendations for 2023 ABC

Staff recommend no change to the previously adopted 2023 ABC of 16.66 million pounds (7,5571 mt). Available information, including the 2022 data update provided by the NEFSC, suggest that stock condition has not notably changed compared to the information considered when the SSC recommended this ABC in July 2022.

Recent Management Actions

The following sections briefly summarize recent management actions that should be considered during discussions of sector-specific catch and landings limits for 2023.

Commercial/Recreational Allocation Amendment

In December 2021, the Council and Commission revised the black sea bass commercial/ recreational allocation such that 45% of the ABC will now be allocated to the commercial fishery and 55% to the recreational fishery. Under the previous allocation, 49% of the amount of the ABC that was expected to be landed was allocated to the commercial fishery and 51% to the recreational fishery. This represents a change from a landings-based allocation to a catch-based allocation. The allocation will now be applied directly to the ABC. Figure 4 illustrates the differences in how specifications will be set under the revised catch-based allocation compared to the previous landings-based allocation.

The revised and previous allocations are not directly comparable due to the change from a landings-based to a catch-based allocation. However, the allocation revisions are expected to increase the recreational ACL and RHL and decrease the commercial ACL and quota compared to the previous allocation (e.g., Table 1).

The revised allocations are pending review by NMFS and if approved, are expected to be effective January 1, 2023. Therefore, the Monitoring Committee should recommend 2023 commercial and recreational ACLs, and other specifications that derive from the ACLs, based on the revised allocations.

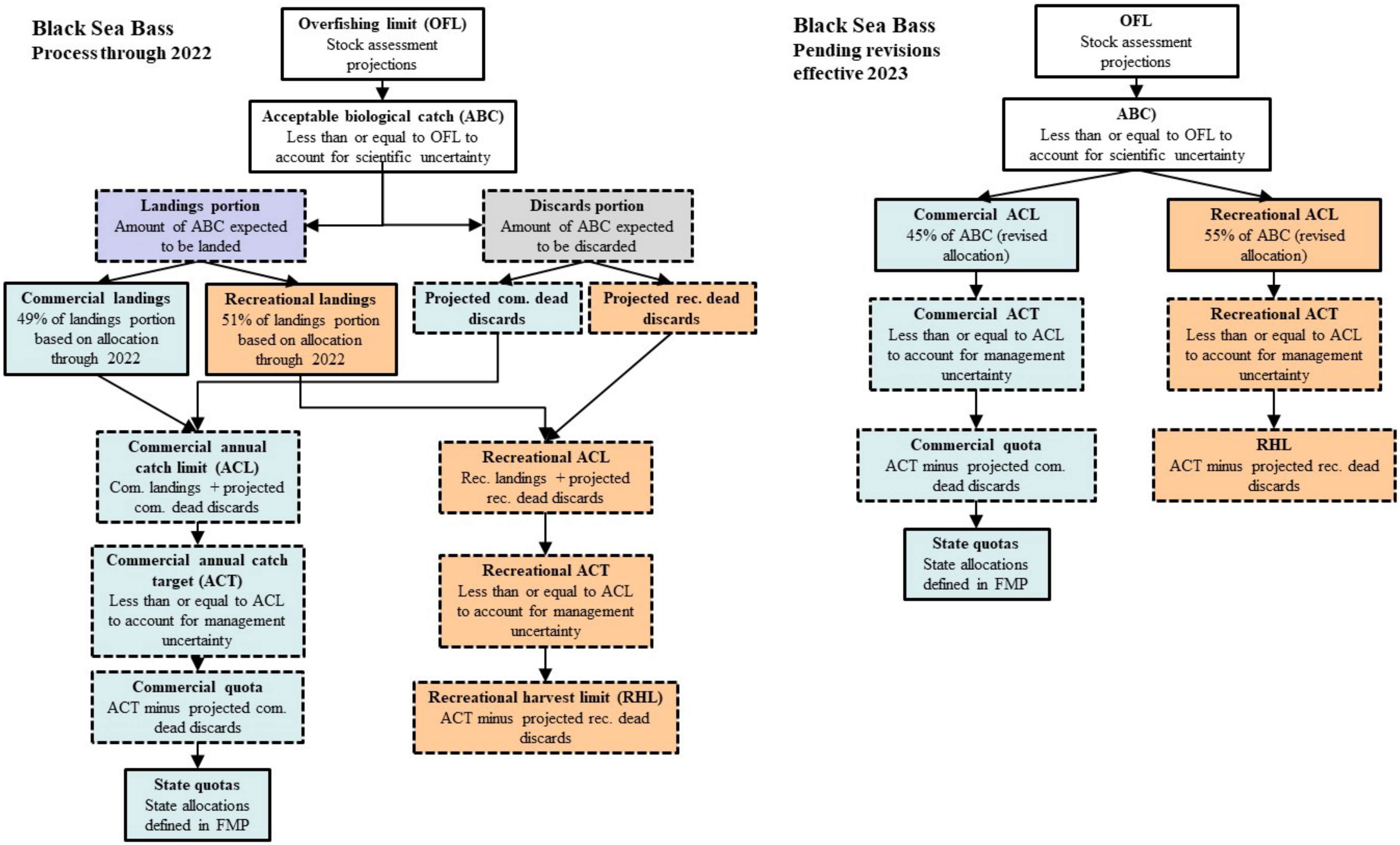


Figure 4: Process for setting black sea bass catch and landings limits through 2022 (left) and starting in 2023 (right). Dashed lines indicate where values are set based on Monitoring Committee recommendations through the annual specifications process.

Recreational Harvest Control Rule Framework/Addenda

In June 2022, the Council and the Commission's Interstate Fishery Management Program Policy Board took final action on the Recreational Harvest Control Rule Framework/Addenda, with the goal of using a new approach, called the Percent Change Approach, to set recreational measures for summer flounder, scup, and black sea bass starting in 2023. Under the Percent Change Approach, recreational measures will not be tied as closely to an RHL (or, by extension, an ACL) as previously required. Instead, the target harvest level will vary based on a comparison of a confidence interval around expected harvest under status quo measures to the upcoming two-year average RHL, as well as biomass compared to the biomass target. This approach will allow for RHL overages in some cases (and therefore, by extension, likely ACL overages) and underages in other cases.[7]

It is not possible to predict the target level of harvest for 2023 recreational measures because the 2023 RHL has not been set and calculations of expected harvest under status quo measures will not be finalized until later in 2022.

The Monitoring Committee should consider the implications of this approach when making recommendations for 2023 recreational specifications, including considerations related to management uncertainty and projected dead discards.

<u>**Sector Specific Catch and Landings Limits**</u>

Recreational and Commercial ACLs

Under the revised catch-based allocations described above, the commercial and recreational ACLs will be calculated by applying the 45% commercial/55% recreational allocation to the 2023 ABC. If no changes are made to the previously adopted 2023 ABC, <u>this would result in a 2023 commercial ACL of 7.50 million pounds (3,401 mt) and a recreational ACL of 9.61 million pounds (4,156 mt; Table 1).</u>

Recreational and Commercial ACTs

ACTs are set less than or equal to the sector-specific ACLs to account for management uncertainty (Figure 4). Management uncertainty is comprised of two parts: uncertainty in the ability of managers to control catch and uncertainty in quantifying the true catch (i.e., estimation errors). Management uncertainty can occur because of a lack of sufficient information about catch (e.g., due to late reporting, underreporting, and/or misreporting of landings or discards) or due to a lack of management precision (i.e., the ability to constrain catch to desired levels). The Monitoring Committee should consider all relevant sources of management uncertainty in the black sea bass fishery when recommending ACTs.

Recreational harvest is estimated through a statistical survey design (i.e., the MRIP program), as opposed to mandatory vessel and dealer reporting in the commercial fishery which is more of a census of the entire commercial fishery. The commercial fisheries are also mostly limited access (with some exceptions at the state level) and the commercial fisheries can be closed in-season when landings approach the quota. The recreational fisheries for these species are all open access and there is no in-season closure authority due to the timing of recreational data availability. For

[7] For more details on the Percent Change Approach, see https://www.mafmc.org/newsfeed/2022/mafmc-amp-asmfc-take-first-step-toward-recreational-management-reform-for-bluefish-sumer-flounder-scup-and-black-sea-bass

these reasons, recreational landings can be more difficult to constrain and predict than commercial landings.

The commercial quota monitoring system has largely been successful in preventing quota overages. As shown in Table 3, commercial landings have not exceeded the quota since 2015. Commercial ACL overages during 2016 through 2019 were the result of higher than expected commercial dead discards. Revisions to the projected discard methodology were made starting with the 2021 specifications to address this issue.

When considering the scale of the RHL overages and underages shown in Table 4, it is important to note that the catch and landings limits for both sectors were not set based on a peer reviewed and accepted stock assessment until 2017. Previous RHLs were likely lower than they could have been had an approved stock assessment been available to set catch and landings limits that were reflective of biomass levels at that time. In addition, as previously described, the notable 2020 and 2021 RHL overages were the result of the Council and Board leaving the bag, size, and season limits unchanged despite expected overages. This was a short-term approach to prevent major negative impacts to the recreational sector while changes to management were considered through the Commercial/Recreational Allocation Amendment and the Recreational Harvest Control Rule Framework/Addenda. The temporary status quo approach could not be maintained in 2022; therefore, the Council and Board approved a 20.7% reduction in recreational harvest compared to the 2018-2021 average in all states and federal waters with the goal of preventing an overage of the 2022 RHL. The impacts of these restrictions on harvest in 2022 cannot be evaluated with currently available data.

As previously described, the impact of the Percent Change Approach on recreational black sea bass measures in 2023 is not yet known; therefore, the likelihood of this approach resulting in an ACL overage in 2023 cannot be accurately assessed at this point in time.

Based on the considerations described above for each sector, staff recommend no deduction from the 2023 commercial and recreational ACLs to the ACTs to account for management uncertainty.

Projected Dead Discards, Commercial Quota, and Recreational Harvest Limit

Projected dead discards by sector are subtracted from the ACTs to derive the commercial quota and RHL. The methodology to calculate projected dead discards is not prescribed in the FMP and can be modified on an annual basis. The methodology can vary by sector.

As described below, staff recommend continued use of the 2021-2022 discard projection method for the commercial fishery and a simple three-year average of discards for the recreational fishery when setting the 2023 quota and RHL.

For 2021-2022 specifications, black sea bass projected dead discards were calculated based on an assumption that dead discards as a proportion of total dead catch in each sector would be equal to the average sector-specific proportions during the most recent three years of available data. These calculations also accounted for the required 49% commercial, 51% recreational allocation of the amount of the ABC that was expected to be landed. This method could be adapted for 2023 specifications under the revised catch-based allocation by applying the 3-year average sector-specific proportions of landings and dead discards to the respective ACLs. As previously stated, 2019 is the most recent year for which dead discard estimates are currently available. Data provided with the 2021 management track assessment indicate that on average during 2017-2019, 36% of commercial dead catch was discarded and 23% of recreational dead catch was discarded (Table 3, Table 4). Applying these percentages to the 2023 ACLs described above results in 2.70 million pounds of projected commercial dead discards and 2.14 million pounds of projected recreational dead discards. For the reasons described below, this could be a reasonable assumption for the commercial fishery in 2023; however, staff recommend consideration of a different approach for the recreational fishery.

Projected commercial dead discards under this method (i.e., 2.70 million pounds) exceed estimated commercial dead discards during 2012-2019; however, currently available discard data do not capture recent years of higher commercial quotas (Table 3). In addition, the 2023 commercial ACL is expected to exceed all commercial ACLs prior to 2021, even under the revised allocation (though it will decrease compared to 2021 and 2022). This discard projection method relies on an assumption that total commercial dead catch will equal the ACL. This may be a reasonable assumption for the commercial fishery as commercial landings are generally close to the quota and the discards overages shown in Table 3 occurred in years when a different method was used to project discards. The method used for 2021-2022, and recommended for use for the commercial fishery in 2023, aimed to address the issue of past under-prediction and to reduce the likelihood of future ACL overages due to discards. Performance of this method cannot be evaluated at this time as discard estimates for 2020-2021 are not currently available.

Black sea bass recreational bag, size, and season limits in state and federal waters remained virtually unchanged during 2018-2021. Measures were restricted in 2022 with the goal of achieving a 20.7% reduction in harvest in all states compared to 2018-2021 average harvest. The impacts of these restrictions on recreational discards are not yet known.

As previously stated, under the Percentage Change Approach, which will be used to set recreational measures starting in 2023, the recreational bag, size, and season limits will be less closely tied to an RHL (and by extension, an ACL) than in previous years. At this stage, it is not possible to accurately predict how recreational measures will change in 2023 as this will be determined based on analyses and further discussions which will occur later in 2022.

Given these uncertainties, the Monitoring Committee should consider whether it is appropriate to assume that recreational dead catch in 2023 will be equal to the ACL. As previously stated, the discard projection method described above relies on an assumption that catch in each sector will be equal the respective ACL.

For these reasons, staff recommend setting projected 2023 recreational dead discards to a simple three-year average based on the most recent data available. This does not require an assumption that recreational dead catch will be similar to the ACL. Based on currently available data (i.e., 2017-2019), this would result in 3.04 million pounds of projected recreational dead discards (Table 4).

Applying the staff-recommended dead discard projections to the recommended ACTs described above results in a 2023 commercial quota of 4.80 million pounds (2,177 mt) and a 2023 RHL of 6.12 million pounds (2,778 mt).

Commercial Management Measures

Federal regulations include several commercial management measures which can be modified through the annual specifications process. These measures are summarized below. Council staff recommend no changes to these measures for 2023 as there is no new information to suggest changes are needed.

The commercial minimum fish size in federal waters is 11 inches. This measure has remained unchanged since 2002.

Trawl vessels which possess 500 pounds or more of black sea bass from January 1 through March 31, or 100 pounds or more from April 1 through December 31, must fish with nets that have a minimum mesh size of 4.5-inch diamond mesh throughout the codend for at least 75 continuous meshes forward of the terminus of the net. For codends with less than 75 meshes, the entire net must have a minimum mesh size of 4.5-inch diamond mesh. These measures have been unchanged since 2002.

Pot/trap regulations include minimum vent sizes of 2.5 inches in diameter if circular, 1.375 inches x 5.75 inches for rectangular vents, and 2 inches for square vents remained unchanged. In addition, two vents are required in the parlor portion of the pot/trap. These regulations have been unchanged since 2007.

In the fall of 2015, the Monitoring Committee conducted a thorough review of the commercial management measures which can be modified through specifications.[8] This review indicated that further exploration of potential modifications to some measures may be justified. Specifically, for black sea bass, this included assessing the feasibility of a common trawl minimum mesh size with summer flounder and scup. Stemming from this discussion, the Council funded a project which analyzed the selectivity of multiple codend mesh sizes relative to retention of these three species in the commercial bottom trawl fisheries. Results confirmed that the current minimum mesh sizes for all three species are effective at releasing most fish smaller than the commercial minimum sizes (i.e., 14 inches total length for summer flounder, 9 inches total length for scup, and 11 inches total length for black sea bass). The study was not able to identify a common mesh size for all three species that would be effective at minimizing discards under the current minimum fish size limits. However, the authors concluded that a common mesh size of 4.5 or 5 inches diamond for scup and black sea bass would be effective at releasing undersized fish.[9]

The Monitoring Committee reviewed the results of this study in 2018 and recommended no changes to the commercial minimum mesh sizes for 2019. They recommended clarification of the Council's objectives regarding consideration the mesh sizes (e.g., establishing a common minimum mesh size, minimizing discards, and/or maintaining or increasing catches of legal-sized fish). A few advisors have requested continued consideration of a standardized minimum mesh size across two or more of the species.

Staff will continue to work with the Monitoring Committee and Advisory Panel to further analyze and consider potential changes to mesh size regulations. However, given other workload constraints, it is not likely that additional work on this topic can be done in 2022.

Recreational Management Measures

Starting in 2018, the Council and Commission provided states the opportunity to open their recreational black sea bass fisheries during the month of February under specific conditions. States must opt into this fishery. Participating states are required to match the federal recreational measures during the February opening. Participating states may need to adjust their measures during March-December to help ensure that participation in this optional opening does not

[8] The summary report is available at: http://www.mafmc.org/s/Tab11_SF-S-BSB-Commercial-Measures.pdf.

[9] Hasbrouck, E., S. Curatolo-Wagemann, T. Froelich, K. Gerbino, D. Kuehn, P. Sullivan, J. Knight. 2018. Determining Selectivity and Optimum Mesh Size to Harvest Three Commercially Important Mid-Atlantic Species - A Report to the Mid-Atlantic Fishery Management Council and the Atlantic States Marine Fisheries Commission. Available at: http://www.mafmc.org/s/Tab08_SFSBSB-Mesh-Selectivity-Study-Apr2018.pdf

increase the likelihood of coastwide harvest increasing beyond the target level.[10] If changes are desired to the overall February recreational opening as described in the Council and Commission FMPs, those changes must be considered during the summer of the prior year to ensure sufficient time for federal rulemaking, if necessary. Considerations for individual states participating in this opening will occur separately through the Commission process.

If the Council and Board wish to maintain the February recreational opening in 2023, the current non-preferred coastwide measures must be revised. The non-preferred coastwide measures are used under the conservation equivalency process for waiving federal waters recreational black sea bass measures in favor of state waters measures. This federal conservation equivalency process was used for black sea bass for the first time in 2022. This process is separate from, but has implications for, the February recreational fishery.

The non-preferred coastwide measures are implemented in the federal regulations but waived in favor of state waters measures if it can be demonstrated that the combination of state measures will have the same impact on harvest as the non-preferred coastwide measures. Federal waters measures cannot remain waived from one year to the next. A rulemaking process is required each year to waive federal waters measures Due to the time needed for rulemaking, the non-preferred coastwide measures from the previous year are in place from January 1 until they are waived through the federal rulemaking process, usually in the spring.

The 2022 non-preferred measures include a season of May 15 – October 8, a minimum fish size of 14 inches, and a 5 fish possession limit. For these reasons, <u>if the Council and Board wish to maintain the ability of states to participate in the optional February opening in 2023, the 2022 non-preferred coastwide measures should be modified to February 1-28, May 15-October 8, 14 inches, and 5 fish</u>. This change is not intended to allow for any liberalizations in 2023. This change should only be used to allow continuation of the February opening under the same conditions as in previous years. The approach for other aspects of 2023 recreational management, including additional revisions to the non-preferred measures for 2023, if necessary, will be considered later in 2022.

The recreational bag, size, and season limits for March - December 2023 will be considered in late 2022 after the first four waves (i.e., January - August) of preliminary 2022 recreational harvest data are available (expected October 2022). Improved statistical methods for predicting the impacts of bag, size, and season limits on recreational harvest (i.e., the Recreational Economic Demand Model and the Recreational Fleet Dynamics Model) may also be available by fall 2022. The Monitoring Committee will meet in November 2022 to review available data and model outputs and to make recommendations for recreational bag, size, and season limits for 2023. As previously described, 2023 will be the first year that recreational measures for summer flounder, scup, and black sea bass will be set using the Percent Change Approach.

[10] Through 2022, the target level for coastwide harvest was the RHL. Starting in 2023, the target level of coastwide harvest will be defined based on the Percent Change Approach, as previously described.

Black Sea Bass Data Update for 2022

National Marine Fisheries Service
Northeast Fisheries Science Center
166 Water St.
Woods Hole, MA 02543

Reported 2021 landings in the commercial fishery were 2,211 mt, an increase of 14% from 2020 (1,945 mt) and 80% of the 2021 commercial quota (2,764 mt). Estimated 2021 landings in the recreational fishery were 5,436 mt, an increase of 32% from 2020 (4,110 mt) and 189% of the 2021 recreational harvest limit (2,877 mt). Total commercial and recreational landings in 2021 were 7,646 mt, an increase of 26% from 2020 (6,055 mt) (Figure 1).

Relative abundance derived from the NEFSC spring bottom trawl survey has steadily increased since 2015 (note that the 2020 index is based on an incomplete survey) (Figure 2). The large 2011 cohort was apparent in the 2013 aggregate index as well as age compositions from 2012-2017 (Figure 3). Age composition data also show above average 2015, 2016 and 2019 cohorts (Figure 3).

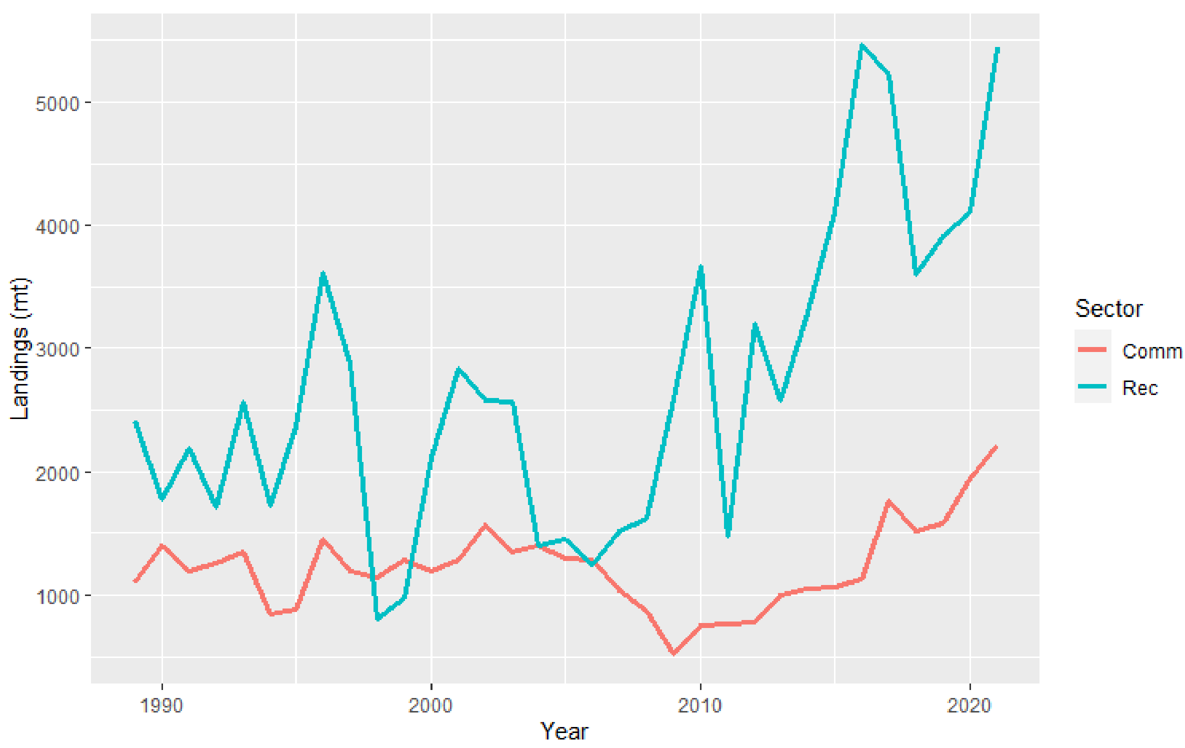
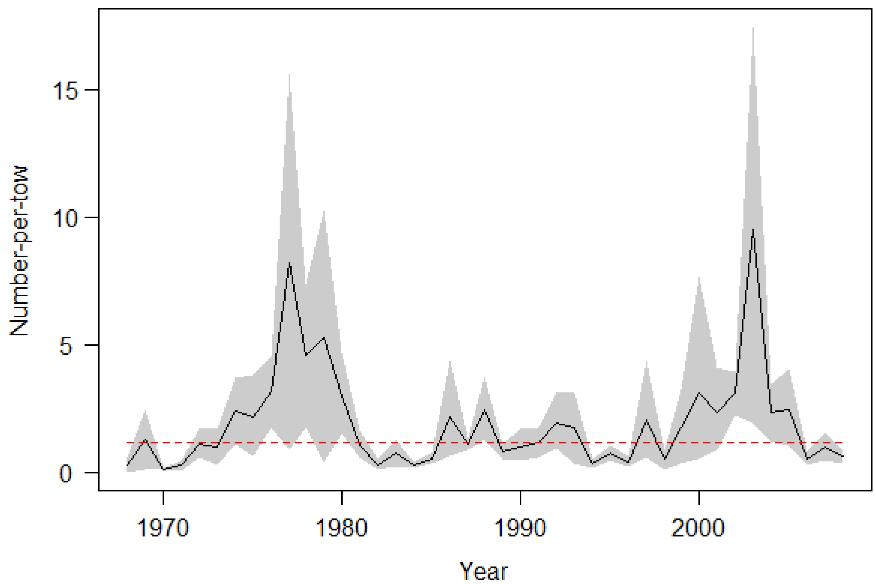


Figure 1. Black Sea Bass total fishery landings for 1989-2021.

a)



b)

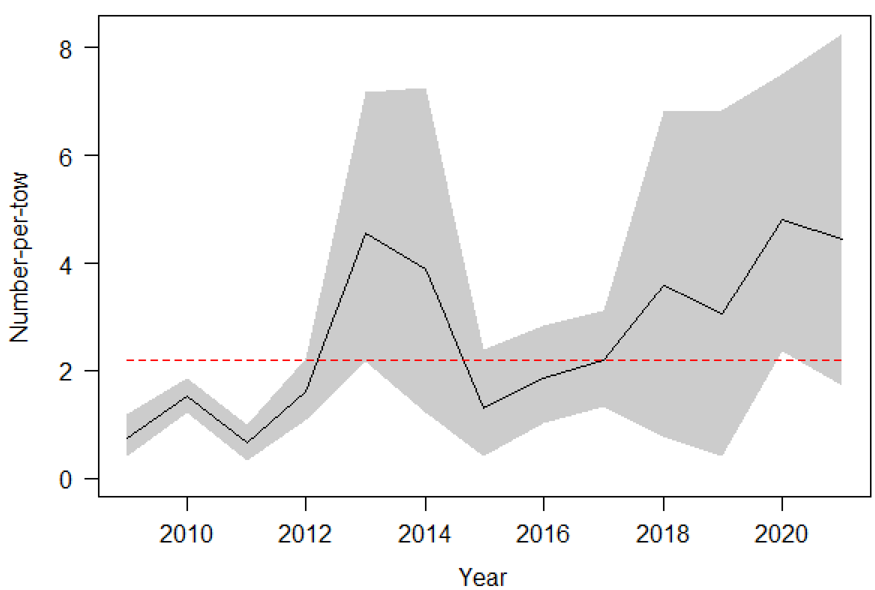


Figure 2. Black sea bass relative abundance (stratified mean number-per-tow ± 90% CI) derived from the NEFSC spring bottom trawl survey for the SV Albatross IV years of 1968-2008 (a) and the H. B. Bigelow years of 2009-2021 (b). The 2020 index is based on an incomplete survey. The red dotted line represents the median number-per-tow of each time series.

a)

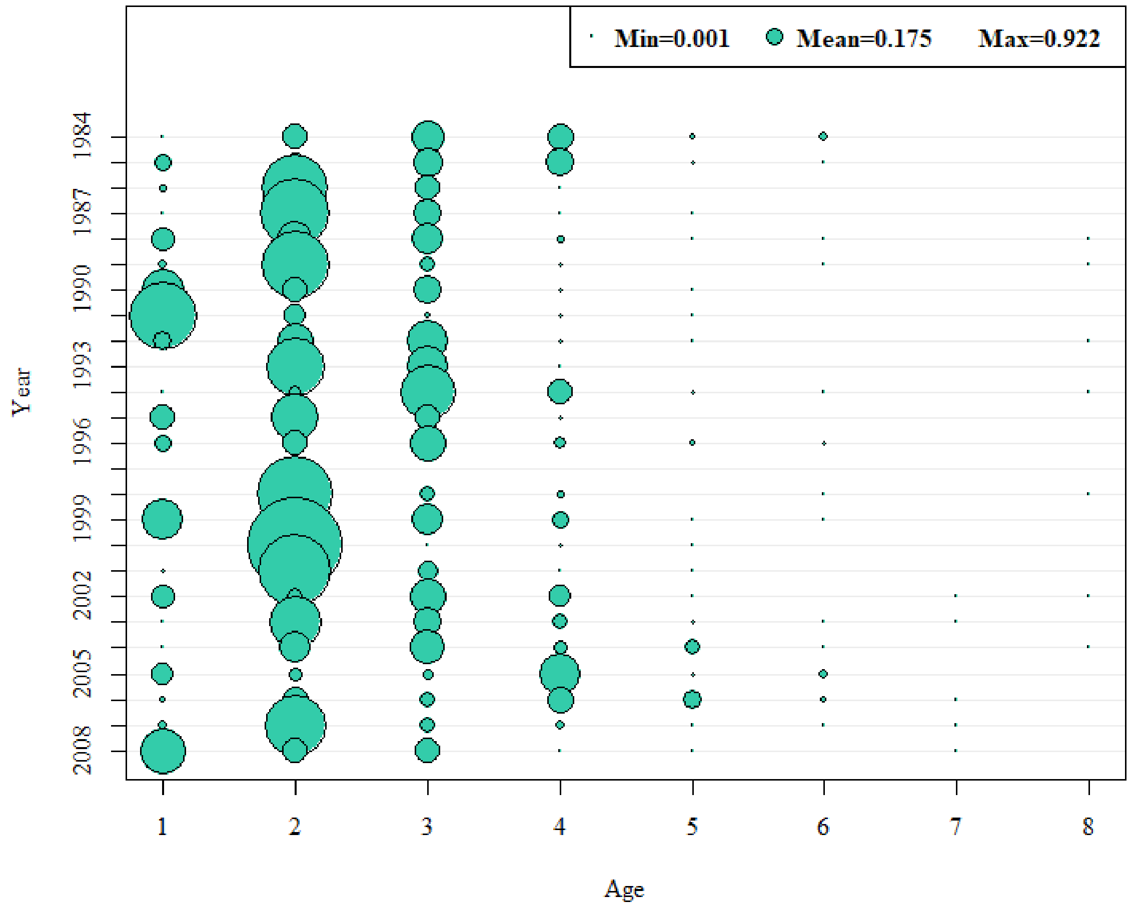


Figure 3: Black sea bass age composition (proportion-at-age) from the NEFSC spring bottom trawl survey for the Albatross IV years of 1984-2008 (a) and the H. B. Bigelow years of 2009-2021 (b).

b)

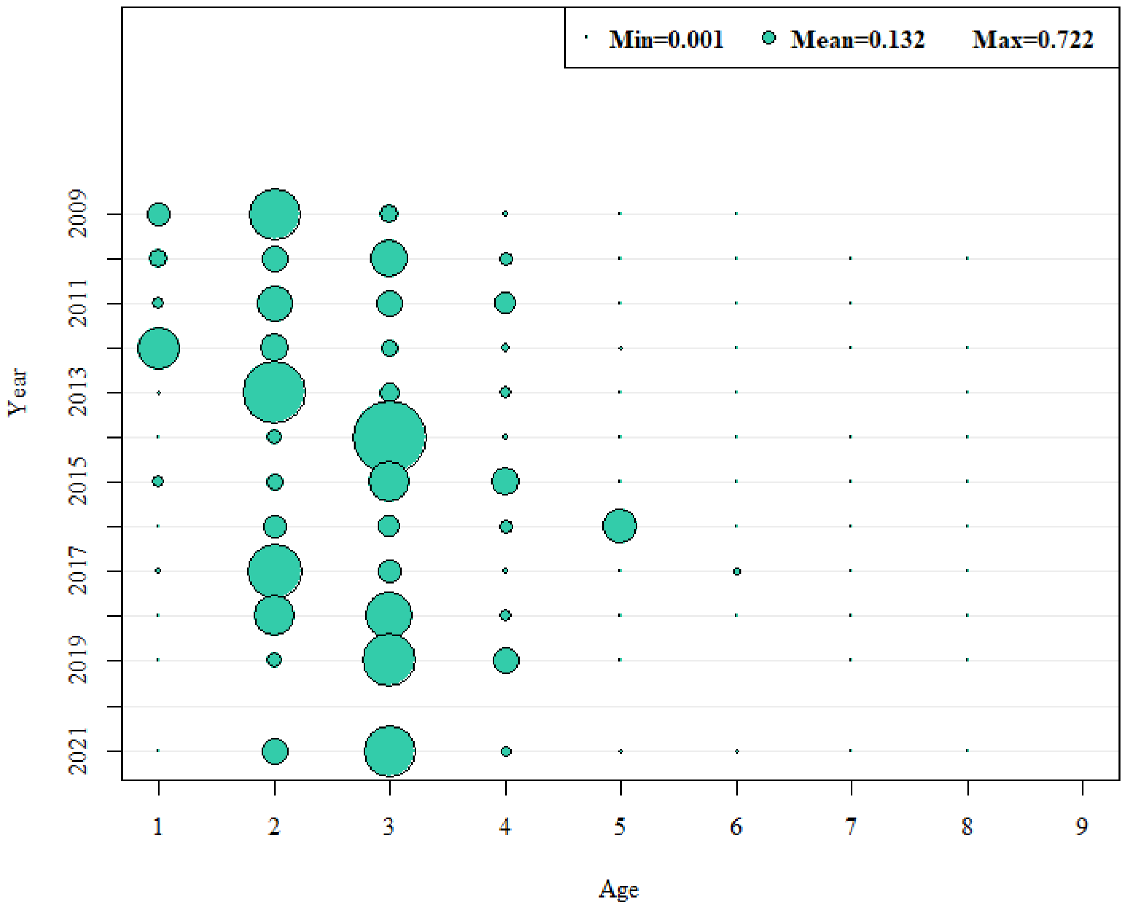


Figure 3, contd.: Black sea bass age composition (proportion-at-age) from the NEFSC spring bottom trawl survey for the Albatross IV years of 1984-2008 (a) and the H. B. Bigelow years of 2009-2021 (b).

Black Sea Bass Fishery Information Document

June 2022

This document provides a brief overview of the biology, stock condition, management system, and fishery performance for black sea bass (*Centropristis striata*) with an emphasis on 2021. Data sources include unpublished National Marine Fisheries Service (NMFS) commercial fish dealer reports, vessel trip reports (VTRs), permit data, as well as Marine Recreational Information Program (MRIP) data and stock assessment information. All 2021 data should be considered preliminary. For more information on black sea bass management, including previous Fishery Information Documents, visit http://www.mafmc.org/sf-s-bsb.

Key Facts

- Black sea bass are not overfished and overfishing is not occurring, according to the most recent stock assessment. Spawning stock biomass in 2019 was estimated to be about 2.1 times the target level and fishing mortality was 15% below the threshold level.
- In 2021, about 4.52 million pounds of black sea bass were landed by commercial fishermen, the highest commercial landings in the time series going back to 1981.
- Commercial fish dealers paid an average of $2.76 per pound of black sea bass, an increase from the 2020 average price of $2.50, but below the 2012-2021 average of $3.52 per pound (all values adjusted to 2021 dollars). Recent prices reflect impacts of the COVID-19 pandemic on market demand.
- Recreational fishermen harvested an estimated 11.97 million pounds of black sea bass in 2021, a 32% increase from 2020 and the second highest landings in the time series going back to 1981.
- Anglers fishing from private/rental vessels accounted for 84% of recreational black sea bass harvest (in numbers of fish) in 2021.

Basic Biology

Black sea bass are distributed from the Gulf of Maine through the Gulf of Mexico. Genetic studies have identified three stocks within that region. This document focuses on the stock from the Gulf of Maine through Cape Hatteras, North Carolina.

Adult and juvenile black sea bass are mostly found on the continental shelf. Young of the year (i.e., fish less than one year old) can be found in estuaries. Adults show strong site fidelity during the summer and prefer to be near structures such as rocky reefs, coral patches, cobble and rock fields, mussel beds, and shipwrecks. Black sea bass migrate to offshore wintering areas starting in the fall. During the winter, young of the year are distributed across the shelf and adults and juveniles are found near the shelf edge. During the fall, adults and juveniles off New York and north move offshore and travel along the shelf edge to as far south as Virginia. Most return to northern inshore areas by May. Black sea bass off New Jersey to Maryland travel southeast to the shelf edge during the late fall. Black sea bass off Virginia and Maryland travel a shorter distance due east to the shelf edge, which is closer to shore than in areas to the north.[1,2]

Black sea bass are protogynous hermaphrodites, meaning they are born female and some later transition to males, usually around 2-5 years of age. Male black sea bass are either of the dominant or subordinate type. Dominant males are larger than subordinate males and develop a bright blue nuccal hump during the spawning season. About 25% of black sea bass are male at 15 cm (about 6 inches), with increasing proportions of males at larger sizes until about 50 cm, when about 70-80% of black sea bass are male. Results from a simulation model highlight the importance of subordinate males in spawning success. This increases the resiliency of the population to exploitation compared to other species with a more typical protogynous life history. About half of black sea bass are sexually mature by 2 years of age and 21 cm (about 8 inches) in length. Black sea bass reach a maximum size of about 60 cm (about 24 inches) and a maximum age of about 12 years.[2, 3]

Black sea bass in the Mid-Atlantic spawn in nearshore continental shelf areas at depths of 20-50 meters. Spawning usually takes place between April and October. During the summer, adult black sea bass share habitats with tautog, hakes, conger eel, sea robins and other migratory fish species. Essential fish habitat for black sea bass consists of pelagic waters, structured habitat, rough bottom, shellfish, sand, and shell, from the Gulf of Maine through Cape Hatteras, North Carolina. Juveniles and adults mostly feed on crustaceans, small fish, and squid. The Northeast Fisheries Science Center (NEFSC) food habits database lists spiny dogfish, Atlantic angel shark, skates, spotted hake, summer flounder, windowpane flounder, and monkfish as predators of black sea bass.[1]

Status of the Stock

A black sea bass management track stock assessment was peer reviewed and accepted in June 2021.[4] This assessment retained the model structure of the 2016 benchmark stock assessment[2] and incorporated fishery data and fishery-independent survey data through 2019. Data from 2020 were not incorporated due to significant gaps in some data sets due to the COVID-19 pandemic and the time required to consider how to best address those gaps.

The 2021 management track assessment indicates that the black sea bass stock was not overfished and overfishing was not occurring in 2019. Spawning stock biomass in 2019 was estimated at about 2.1 times the target level. Fishing mortality in 2019 was estimated to be 15% below the threshold level that defines overfishing (Table 1, Figure 1 - Figure 3).[4]

The 2011 year class (i.e., fish spawned in 2011) was estimated to be the largest in the time series and the 2015 year class was the second largest. The 2017 year class was well below the 1989-2018 average, but the 2018 year class was above average at (Figure 2). The 2018 year class is the most recent year class for which estimates are currently available.[4]

Table 1: Black sea bass biological reference points from the 2021 management track stock assessment.[4]

	Spawning stock biomass	Fishing mortality rate (F)
Target	31.84 mil lb (14,441 mt)	N/A
Threshold	15.92 mil lb (7,221 mt)	0.46
Terminal year estimate (2019)	65.53 mil lb (29,769 mt) [a] 2.1 times target level	0.39[a] 15% below threshold level
Status	**Not overfished**	**Overfishing not occurring**

[a] Adjusted for retrospective bias

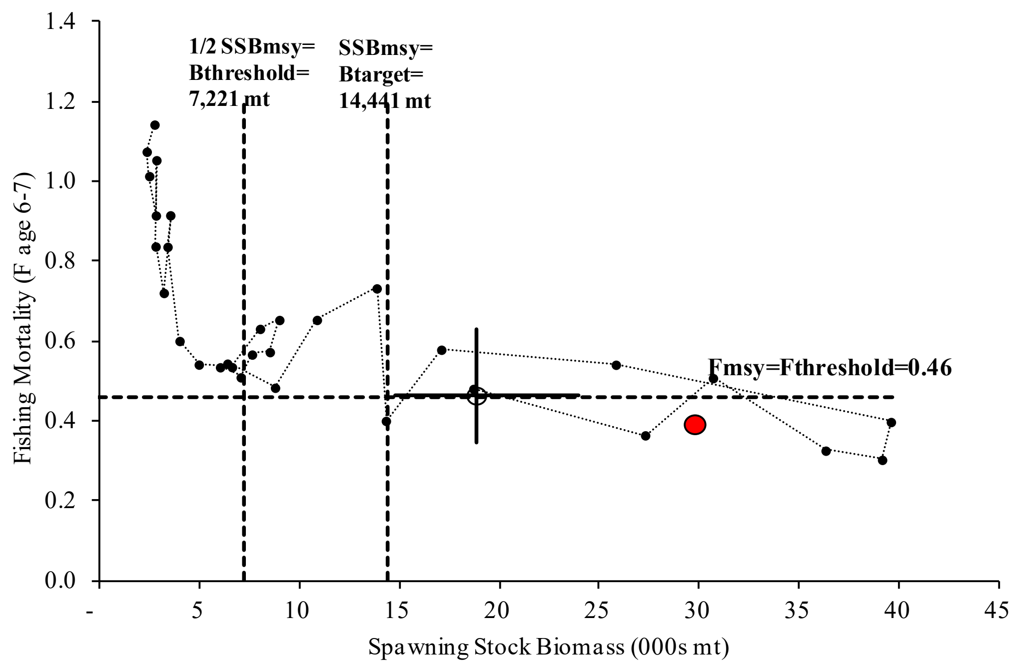


Figure 1: Estimates of black sea bass spawning stock biomass (SSB) and fully-recruited fishing mortality (F, peak at ages 6-7) relative to biological reference points. Open circle with 90% confidence intervals shows the assessment point estimates. The filled circle shows the retrospectively adjusted estimates which are used in management. Source: 2021 management track assessment.[4]

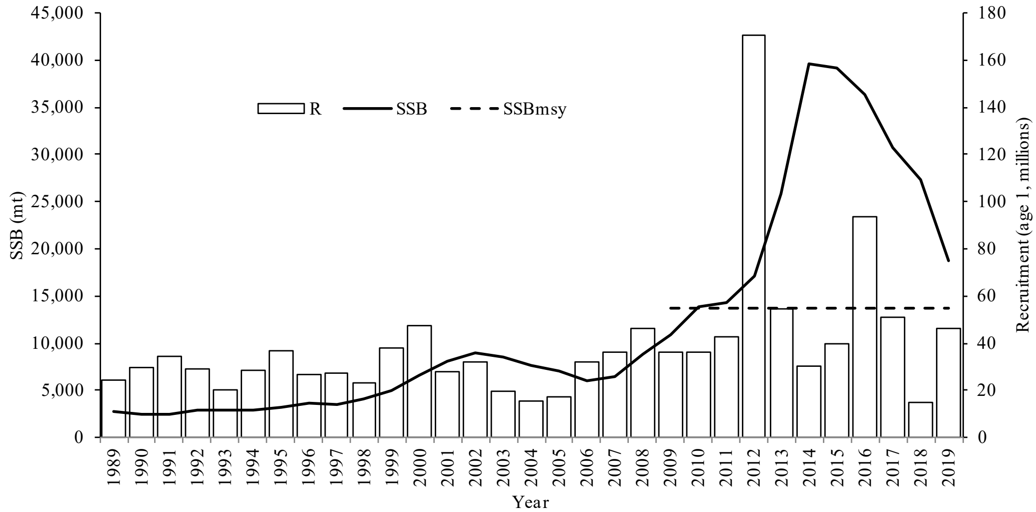


Figure 2: Black sea bass spawning stock biomass (SSB; solid line) and recruitment at age 1 (R; vertical bars), 1989-2019. The horizontal dashed line is the updated SSB_{MSY} proxy = $SSB_{40\%}$ =14,441 mt. SSB and recruitment estimates for 2019 were adjusted for a retrospective pattern in the stock assessment. The un-adjusted values are shown in this figure. Adjusted SSB in 2019 for comparison against the SSB_{MSY} proxy reference point is 29,769 mt. The adjusted recruitment value for 2019 is 79.4 million. Adjusted values are used in management. Source: 2021 management track assessment.[4]

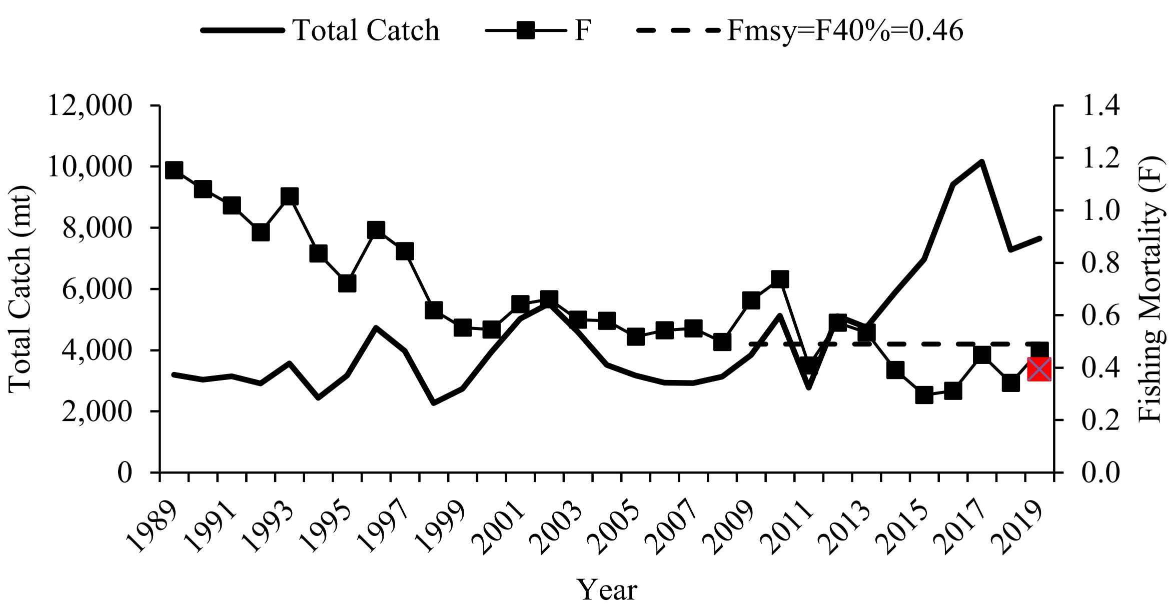


Figure 3: Total fishery catch (metric tons; mt; solid line) and fishing mortality (F, peak at age 6-7; squares) for black sea bass. The horizontal dashed line is the updated F_{MSY} proxy = $F_{40\%}$ = 0.46. The red square is the retrospectively adjusted fishing mortality value for 2019. The adjusted value is used in management. Source: 2021 management track assessment.[4]

Management System and Fishery Performance

Management

The Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission (Commission) work cooperatively to develop commercial and recreational fishery regulations for black sea bass from Maine through Cape Hatteras, North Carolina. The Council and Commission work in conjunction with NMFS, which serves as the federal implementation and enforcement entity. This cooperative management system was developed because a significant portion of the catch is taken from both state waters (0-3 miles offshore) and federal waters (3-200 miles offshore). The joint management program began in 1996 with the approval of amendment 9 to the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan (FMP). The original FMP and subsequent amendments and framework adjustments are available at: www.mafmc.org/fisheries/fmp/sf-s-bsb.

Commercial and recreational black sea bass fisheries are managed using catch and landings limits, minimum fish sizes, open and closed seasons, gear regulations, permit requirements, and other regulations.

The Council's Scientific and Statistical Committee (SSC) recommends annual Acceptable Biological Catch (ABC) levels for black sea bass. The Council must either approve the ABC recommended by the SSC or a lower ABC. Currently, 49% of the total allowable landings (calculated by subtracting total expected dead discards from the ABC) are allocated to the commercial fishery as a commercial quota and 51% allocated to the recreational fishery as an RHL. In December 2021, the Council and Commission revised the commercial/recreational allocation such that 45% of the ABC will be allocated to the commercial fishery and 55% to the recreational fishery. This represents a change from a landings-based allocation to a catch-based allocation, such that the allocation will be applied directly to the ABC instead of to the total allowable landings. These changes are pending review by NMFS and if approved, are expected to be effective January 1, 2023.[5]

The Council and Commission also approve commercial and recreational annual catch targets (ACTs), which are set equal to or less than the respective ACLs to account for management uncertainty. To date, the black sea bass ACTs have always been set equal to the ACLs. The ABC, ACLs, and ACTs are catch limits which account for both landings and discards, while the commercial quota and recreational harvest limit (RHL) are landing limits. The commercial quota and RHL are calculated by subtracting expected discards from the respective ACTs (Table 2).

Fishery Landings Summary

Table 2 shows black sea bass catch and landings limits from 2012 through 2023, as well as commercial and recreational landings through 2021. Total landings (commercial and recreational) in 2021 totaled 16.48 million pounds and were the highest in the time series going back to 1981 (Figure 4).[6,7]

In July 2018, MRIP released revisions to their time series of recreational catch and harvest estimates based on adjustments for a revised angler intercept methodology and a new effort estimation methodology (i.e., a transition from a telephone-based effort survey to a mail-based effort survey). The revised estimates of catch and harvest are several times higher than the previous estimates for shore and private boat modes. All recreational estimates in this document reflect revised MRIP estimates except where otherwise noted.

Recreational harvest estimates for 2020 were impacted by temporary suspension of shoreside intercept surveys due to the COVID-19 pandemic. 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 2020 catch estimates using the standard estimation methodology. Commercial landings reporting in 2020 continued uninterrupted; however, as of completion of this document commercial discard data for 2020 and 2021 are currently unavailable due to COVID-19 related interruptions in observer coverage.

Table 2: Summary of catch and landings limits, and landings for commercial and recreational black sea bass fisheries from Maine through Cape Hatteras, NC 2012 through 2023. All values are in millions of pounds unless otherwise noted. 2023 catch and landings limits are pending review by the SSC, Monitoring Committee, Council, and Commission and may be revised.[6,7]

Management measure	2012[a]	2013[a]	2014[a]	2015[a]	2016[b]	2017[c]	2018[c]	2019[c]	2020[c]	2021[c,d]	2022[c,d]	2023[c, d,e]
ABC	4.50	5.50	5.50	5.50	6.67	10.47	8.94	8.94	15.07	17.45	19.26	17.01
Com. ACL & ACT	1.98	2.60	2.60	2.60	3.15	5.09	4.35	4.35	6.98	9.52	10.10	8.93
Commercial quota[e]	1.71	2.17	2.17	2.21	2.71	4.12	3.52	3.52	5.58	6.09	6.47	5.71
Commercial landings	1.72	2.26	2.40	2.38	2.59	4.01	3.46	3.52	4.24	4.52	--	--
% of com. quota landed	101%	104%	111%	108%	96%	97%	98%	100%	76%	74%	--	--
Rec. ACL & ACT	1.86	2.90	2.90	2.90	3.52	5.38	4.59	4.59	8.09	7.93	8.76	7.74
RHL[f]	1.32	2.26	2.26	2.33	2.82	4.29	3.66	3.66	5.81	6.34	6.74	5.95
Recreational landings, old MRIP estimates	3.18	2.46	3.67	3.79	5.19	4.16	3.82	3.46[g]	--	--	--	--
Recreational landings, revised MRIP estimates	7.04	5.69	7.24	9.06	12.05	11.50	7.92	8.61	9.05	11.97	--	--
% of RHL harvested (based on old MRIP estimates through 2018; new MRIP estimates for 2020-2021)[h]	241%	109%	162%	163%	184%	97%	104%	95%	156%	189%	--	--

[a] Catch and landings limits for 2010-2015 were based on a constant catch approach used by the Council's SSC to set the ABC.

[b] Catch and landings limits for 2016 were based on ABC that was set using a data poor management strategy evaluation approach.

[c] Catch and landings limits for 2017-2023 were set based on a peer reviewed and approved stock assessment. Starting with 2020, these catch and landings limits are based on a stock assessment that incorporates the revised time series of MRIP data.

[d] The catch and landings limits for 2021 and beyond account for revisions to the Council's risk policy.

[e] Previously adopted limits for 2023 will be reviewed in 2022 by the SSC, Monitoring Committee, and Council/Commission. The commercial and recreational ACLs, ACTs, RHL, and commercial quota are expected to be revised based on recently adopted changes to the commercial/recreational allocation.

[f] The commercial quotas and RHLs for 2006-2014 account for deductions for the Research Set Aside program.

[g] Provided to the NMFS Greater Atlantic Regional Fisheries Office by the Northeast Fisheries Science Center.

[h] The percent of RHL harvested is based on a comparison of the RHL to the previous or old MRIP estimates. The RHLs through 2019 did not account for the new MRIP estimates; therefore, it would be inappropriate to compare RHLs through 2019 to the revised MRIP estimates.

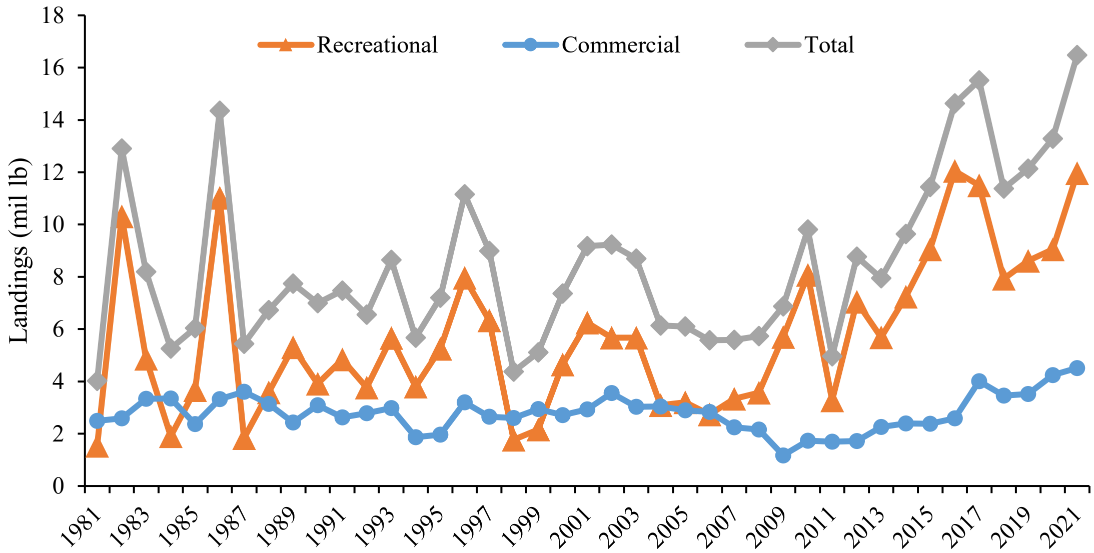


Figure 4: Commercial and recreational black sea bass landings in millions of pounds from Maine through Cape Hatteras, North Carolina, 1981-2021. [6,7]

Commercial Fishery

In 2021, about 4.52 million pounds of black sea bass were landed in the commercial fishery, the highest commercial landings in the time series of available data from 1981 through 2021. Commercial black sea bass landings generally follow the coastwide quota and the 2021 quota of 6.09 million pounds was higher than any previous quota (Table 2, Figure 3). The 2020 quota was not fully harvested in large part due to impacts of the COVID-19 pandemic on market demand. Some COVID-19 impacts likely continued into 2021. Commercial black sea bass landings were lowest in 2009, when 1.18 million pounds were landed and the lowest quota in the time series was implemented (1.09 million pounds).[7]

Black sea bass are a valuable commercial species. Total ex-vessel value averaged $11.91 million per year during 2019-2021. Landings and average price per pound (adjusted to 2021 dollars) were generally stable from 2010 through 2016. Landings increased in 2017 with an increase in the quota. On an annual coastwide level, the average price per pound tended to decrease with increases in landings since 2016 (Figure 5).[7] Prices are impacted by many factors in addition to landings. The relationship between landings and price varies at the regional, state, and sometimes port level based on market demand, state-specific regulations (e.g., seasonal openings), or individual trawl trips with high landings, all of which can be inter-related.

A total of 183 federally-permitted dealers from Maine through North Carolina purchased black sea bass in 2021. More dealers bought black sea bass in New York than in any other state (Table 3).[7]

According to federal VTR data, statistical area 616, which includes important fishing areas near Hudson Canyon, was responsible for the largest percentage (29%) of commercial black sea bass catch (landings and live and dead discards, as reported by captains) in 2021. Statistical area 615, off southern New Jersey accounted for the second highest proportion of catch (14%), followed by statistical area 621, off southern New Jersey, Delaware, and Maryland (11%); statistical area 613, south of Long Island (8%); statistical area 537, south of Massachusetts and Rhode Island (5%); and statistical area 631, off Virginia (5%; Table 4, Figure 6). Statistical area 613 had the highest number of trips which reported black sea bass catch on federal VTRs in 2021 (1,230 trips), followed by statistical area 537 (1,016 trips).[8]

In 2021, most commercial black sea bass landings from state and federally-permitted vessels occurred in New York (50%), followed by New Jersey (32%), Massachusetts (29%), Rhode Island (22%), North Carolina (17%), and Virginia (12%).[7] The percentage of landings by state is generally driven by and closely matches the state-by-state commercial quota allocations. States set measures to achieve their state-specific commercial quotas. These allocations were first implemented in 2003. The Council and Commission recently revised these allocations such that they now are based partially on the original state allocations and partially on recent biomass distribution information. The revised allocations were first implemented in 2022.[9]

At least 100,000 pounds of black sea bass were landed in 11 ports in 9 states from Maine through North Carolina in 2021. These 11 ports collectively accounted for over 66% of all commercial black sea bass landings in 2021 (Table 5).[7]

Since 1997, a moratorium permit has been required to fish commercially for black sea bass in federal waters. In 2021, 645 of these permits were issued.[10]

A minimum commercial black sea bass size limit of 11 inches total length has been in place in federal waters since 2002. There is no federal waters black sea bass possession limit; however, many states have set possession limits for state waters.

About 65% of commercial black sea bass landings reported on federal VTRs in 2021 were caught with bottom otter trawl gear, 32% with pots/traps, and 3% with hand lines. Other gear types each accounted for less than 1% of total commercial landings reported on VTRs in 2021.[8] It is important to note that federal VTR data do not account for landings of black sea bass by vessels that are only permitted to fish in state waters. Some gear types (e.g., handlines) are more prevalent in state waters than in federal waters.

Any federally-permitted vessel which uses otter trawl gear and catches more than 500 pounds of black sea bass from January through March, or more than 100 pounds from April through December, must use nets with a minimum mesh size of 4.5-inch diamond mesh applied throughout the codend for at least 75 continuous meshes forward of the end of the net. Pots and traps used to commercially harvest black sea bass must have two escape vents with degradable hinges in the parlor. The escape vents must measure 1.375 inches by 5.75 inches if rectangular, 2 inches by 2 inches if square, or have a diameter of 2.5 inches if circular.

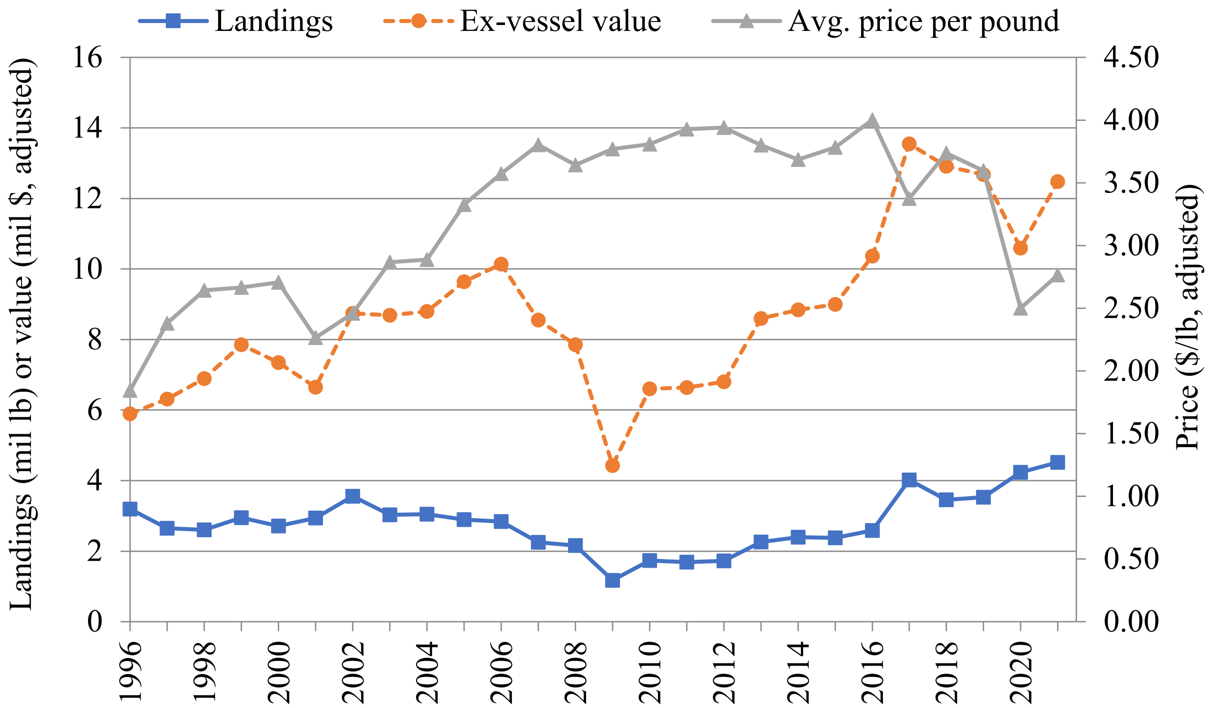


Figure 5: Landings, ex-vessel value, and average price for black sea bass, ME-NC, 1996-2021. Ex-vessel value and price are inflation-adjusted to 2021 dollars using the Gross Domestic Product Price Deflator.[7]

Table 3: Number of dealers, by state, reporting purchases of black sea bass in 2021.[7]

State	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC
Number of dealers	0	0	29	22	10	50	32	3	8	12	17

Table 4: Statistical areas that accounted for at least 5% of the total commercial black sea bass catch (landings and dead discards) in 2021 based on federal VTRs, with associated number of trips.[8] Federal VTR data do not capture landings by vessels only permitted to fish in state waters.

Statistical Area	Percent of 2021 Commercial Black Sea Bass Catch	Number of Trips
616	29%	518
615	14%	198
621	11%	319
613	8%	1,230
537	5%	1,016
631	5%	80

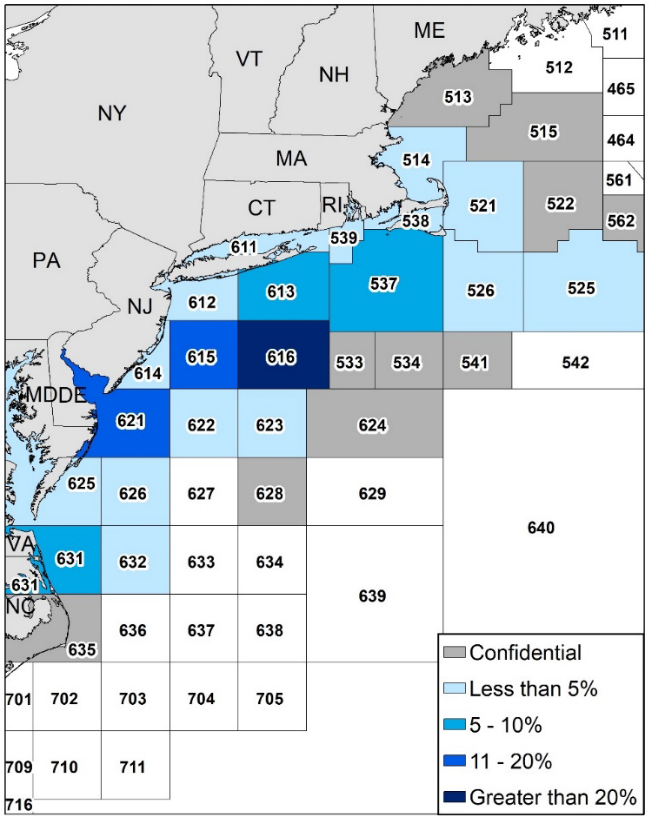


Figure 6: Proportion of black sea bass catch (landings and dead discards) by statistical area in 2021 based on federal VTR data. Confidential areas are associated with fewer than three vessels and/or dealers. The amount of catch not reported on federal VTRs (e.g., catch from vessels permitted to fish only in state waters) is unknown.[8]

Table 5: Ports reporting at least 100,000 pounds of black sea bass landings in 2021, associated number of vessels, and percentage of total commercial landings. C = confidential.[7]

Port name	Pounds of black sea bass landed	% of total commercial black sea bass landed	Number of vessels landing black sea bass
Point Pleasant, NJ	578,285	13%	44
Point Judith, RI	502,419	11%	148
Ocean City, MD	482,005	11%	11
New Bedford, MA	292,178	6%	57
Cape May, NJ	277,670	6%	22
Montauk, NY	256,303	6%	108
Hampton, VA	197,356	4%	21
Sea Isle City, NJ	151,400	3%	8
Beaufort, NC	148,156	3%	38
Norfolk, VA	136,004	3%	5
Lewes, DE	C	C	C

Recreational Fishery

State and federal waters recreational management measures remained virtually unchanged from 2018-2021 (Table 6, Table 7). In 2022, state measures were modified with the goal of achieving a 20.7% reduction in harvest compared to the 2018-2021 average (Table 8). The Council and Commission agreed to use the federal conservation equivalency process to waive federal waters measures for black sea bass for the first time in 2022.

According to the most recent MRIP data, between 1981 and 2021, recreational catch (landings and live and dead discards) of black sea bass from Maine through Cape Hatteras, NC was lowest in 1984 at 4.73 million fish and was highest in 2021 at 42.67 million fish. Recreational harvest in weight was highest in 2016 at 12.05 million pounds; however, harvest in numbers of fish was highest in 1986 at 19.28 million fish. Recreational harvest in weight was lowest in 1981 at 1.53 million pounds, while harvest in numbers of fish was lowest in 1998 at 1.56 million fish (Figure 4, Table 10).[6]

It should be noted that the coastwide 2016 and 2017 MRIP estimates for black sea bass are viewed as outliers by the Monitoring and Technical Committees and the Scientific and Statistical Committee due to the influence of very high estimates in individual states and waves (i.e., New York 2016 wave 6 for all modes and New Jersey 2017 wave 3 for the private/rental mode). Steps have been taken to address uncertainty in these specific estimates in the stock assessment and in management.

Recreational harvest exceeded the 2020 RHL by 56% and the 2021 RHL by 89% (Table 2). The Council and Board agreed to leave the recreational bag, size, and season limits unchanged in 2020 and 2021 despite expected RHL overages. This was viewed as a temporary solution to allow more time to consider how to fully transition the management system to use of the revised MRIP data, including ongoing considerations related to the commercial/recreational allocation and the Recreational Reform Initiative. The 2020 and 2021 RHL overages will be discussed in development of 2023 recreational measures but is unlikely to impact the 2023 RHL and ACL given recent biomass estimates and the Council's Accountability Measures.[11]

In 2021, 52% of black sea bass harvested by recreational fishermen from Maine through Cape Hatteras, North Carolina (in numbers of fish) were caught in state waters and 48% in federal waters (Table 10). Most of the recreational harvest in numbers of fish in 2021 was landed in New Jersey (30%), followed by Massachusetts (19%), New York (14%), and Connecticut (13%; Table 11).[6]

For-hire vessels carrying passengers in federal waters must obtain a federal party/charter permit. In 2021, 895 vessels held a federal party/charter permit.[10]

About 84% of the recreational black sea bass harvest in numbers of fish in 2021 came from anglers fishing on private or rental boats, about 12% from anglers aboard party or charter boats, and 4% from anglers fishing from shore (Table 12).[6]

Table 6: Federal black sea bass recreational measures, Maine - Cape Hatteras, NC, 2007 - 2022.

Year	Min. size	Bag limit	Open season
2007-2008	12”	25	Jan 1 - Dec 31
2009	12.5”	25	Jan 1 - Oct 5
2010-2011	12.5”	25	May 22 - Oct 11; Nov 1 - Dec 31
2012	12.5”	25	May 19 - Oct 14; Nov 1 - Dec 31
2013	12.5”	20	Jan 1 - Feb 28; May 19 - Oct 14; Nov 1 - Dec 31
2014	12.5”	15	May 19 - Sept 18; Oct 18 - Dec 31
2015-2017	12.5”	15	May 15 - Sept 21; Oct 22 - Dec 31
2018-2021	12.5”	15	Feb 1 - 28; May 15 - Dec 31
2022	Federal waters measures waived in favor of state measures		

Table 7: State waters black sea bass recreational measures in 2018-2021. The only changes made during these years were to maintain a Saturday opening (Massachusetts) or to account for harvest in the February opening (Virginia and North Carolina).

State	Min. Size	Bag Limit	Open Season
Maine	13”	10	May 19 - Sept 21; Oct 18 - Dec 31
New Hampshire	13”	10	Jan 1 - Dec 31
Massachusetts	15”	5	2018: May 19 - Sept 12
			2019 & 2020: May 18 - Sept 8
			2021: May 18 – Sept 8
Rhode Island	15”	3	Jun 24 - Aug 31
		7	Sept 1 - Dec 31
Connecticut private & shore	15”	5	May 19 - Dec 31
CT authorized party/charter monitoring program vessels	15”	5	May 19 - Aug 31
		7	Sept 1- Dec 31
New York	15”	3	Jun 23 - Aug 31
		7	Sept 1- Dec 31
New Jersey	12.5”	10	May 15 - Jun 22
		2	Jul 1- Aug 31
		10	Oct 8 - Oct 31
	13”	15	Nov 1 - Dec 31
Delaware	12.5”	15	May 15 - Dec 31
Maryland	12.5”	15	May 15 - Dec 31
Virginia	12.5”	15	2018: Feb 1 - 28; May 15 - Dec 31
			2019: Feb 1-28; May 15-31; June 22-Dec 31
			2020: Feb 1 - 29; May 29 - Dec 31
			2021: Feb 1-28; May 15-May 31; Jun 16-Dec 31
North Carolina, North of Cape Hatteras (35° 15’N)	12.5	15	2018: Feb 1 - 28; May 15 - Dec 31
			2019: Feb 1 - 28; May 17 - Dec 31
			2020: Feb 1 - 29; May 17 - Nov 30
			2021: May 15 - Dec 31

Table 8: State waters black sea bass recreational measures in 2022.

State	Min. Size	Bag Limit	Open Season
Maine	13"	10 fish	May 19-Sept 21; Oct 18-Dec 31
New Hampshire	13"	10 fish	Jan-Dec 31
Massachusetts	16"	4 fish	May 21-Sept4
Rhode Island private & shore	16"	2 fish	May 22-Aug 31
		3 fish	Sept 1-Dec31
Rhode Island for-hire		2 fish	June 18-Aug 31
		6 fish	Sept 1-Dec 31
Connecticut private & shore	16"	5 fish	May 19-Dec 1
CT authorized for-hire monitoring program vessels		5 fish	May 19-Aug 31
		7 fish	Sept 1-Dec 31
New York	16"	3 fish	June 23-Aug 31
		6 fish	Sept 1-Dec 31
New Jersey	13"	10 fish	May 17-Jun 19
		2 fish	July 1-Aug 31
		10 fish	Oct 7-Oct 26
		15 fish	Nov 1-Dec 31
Delaware	13"	15 fish	May 15-Dec 11
Maryland			
Virginia			
North Carolina North of Cape Hatteras (35° 15'N)			

Table 9: Estimated recreational black sea bass catch (harvest and live and dead discards) and harvest from Maine through Cape Hatteras, North Carolina, 2012-2021.[6]

Year	Catch (millions of fish)	Harvest (millions of fish)	Harvest (millions of pounds)	% of catch retained
2012	34.95	3.69	7.04	11%
2013	25.78	3.02	5.69	12%
2014	23.91	3.97	7.24	17%
2015	24.11	4.94	9.06	20%
2016	35.81	5.84	12.05	16%
2017	41.19	5.70	11.50	14%
2018	24.99	3.99	7.92	16%
2019	32.32	4.38	8.61	14%
2020	34.11	4.23	9.05	12%
2021	42.67	6.44	11.97	15%

Table 10: Estimated percentage of black sea bass recreational harvest (in numbers of fish) in state and federal waters, from Maine through Cape Hatteras, North Carolina, 2012-2021.[6]

Year	State waters	Federal waters
2012	71%	29%
2013	69%	31%
2014	72%	28%
2015	73%	27%
2016	61%	39%
2017	42%	58%
2018	61%	39%
2019	64%	36%
2020	57%	43%
2021	52%	48%
2012-2021 avg	62%	38%

Table 11: State-by-state contribution to total recreational harvest of black sea bass (in number of fish), Maine through Cape Hatteras, North Carolina, 2019 - 2021.[6]

State	2019	2020	2021	2019-2021 average
Maine	0.0%	0.0%	0.0%	0.0%
New Hampshire	0.0%	0.0%	0.0%	0.0%
Massachusetts	12.0%	13.6%	18.8%	14.8%
Rhode Island	11.8%	14.6%	7.9%	11.4%
Connecticut	11.8%	9.6%	13.0%	11.5%
New York	36.0%	30.1%	14.4%	26.9%
New Jersey	19.0%	19.2%	30.0%	22.7%
Delaware	1.0%	3.3%	5.5%	3.3%
Maryland	3.0%	1.9%	3.3%	2.7%
Virginia	5.3%	6.5%	6.9%	6.2%
North Carolina	0.1%	1.1%	0.1%	0.4%

Table 12: Percent of total recreational black sea bass harvest (in numbers of fish) by recreational fishing mode, Maine through North Carolina, 2012-2021.[6]

Year	Shore	Party/charter	Private/rental	Total number of fish (millions)
2012	1%	19%	80%	3.82
2013	2%	9%	89%	3.10
2014	3%	18%	79%	4.31
2015	0%	20%	79%	5.26
2016	4%	8%	88%	6.03
2017	1%	9%	90%	6.00
2018	2%	12%	86%	4.07
2019	3%	17%	79%	4.52
2020	2%	11%[a]	87%	4.32
2021	4%	12%	84%	6.48
2012-2021 avg	**2%**	**14%**	**84%**	**4.79**

[a] Party and charter fishing was restricted in all states for part of 2020 due to the COVID-19 pandemic.

References

[1] Drohan, A.F., J. P. Manderson, D. B. Packer. 2007. Essential fish habitat source document: black sea bass, *Centropristis striata*, life history and habitat characteristics, 2nd edition. NOAA Technical Memorandum NMFS NE 200.

[2] Northeast Fisheries Science Center. 2017. 62nd Northeast Regional Stock Assessment Workshop (62nd SAW) Assessment Report. Northeast Fisheries Science Center Reference Doc. 17-03. 822 p. Available at: https://www.nefsc.noaa.gov/publications/crd/crd1703/

[3] Blaylock, J. and G.R. Shepherd. 2016. Evaluating the vulnerability of an atypical protogynous hermaphrodite to fishery exploitation: results from a population model for black sea bass (*Centropristis striata*). *Fishery Bulletin* 114(4): 476-489.

[4] Northeast Fisheries Science Center. 2022. Management Track Assessment June 2021. Northeast Fisheries Science Center reference document; 22-10. DOI: https://doi.org/10.25923/4m8f-2g46

[5] For more information on the commercial/recreational allocation revisions, see the fact sheet at: https://www.mafmc.org/s/SFSBSB-Allocation-FAQs.pdf.

[6] Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division. Accessed June 2022. Available at: https://www.fisheries.noaa.gov/data-tools/recreational-fisheries-statistics-queries

[7] Unpublished NMFS commercial fish dealer data (i.e., "DERS"), which include both state and federal dealer data).

[8] Unpublished NMFS VTR data.

[9] More information on the Black Sea Bass Commercial State Allocation Amendment/Addendum is available at: https://www.mafmc.org/actions/bsb-commercial-allocation.

[10] Unpublished NMFS permit data.

[11] A summary of the accountability measures is available at: https://www.mafmc.org/s/AMs-description_SF_scup-BSB_Dec2020.pdf

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: August 29, 2022

To: Council

From: Julia Beaty, staff

Subject: BOEM Draft Guidance for Mitigating Impacts to Commercial and Recreational Fisheries from Offshore Wind Energy Development

During the Council meeting on Wednesday August 10, 2022, staff from the Bureau of Ocean Energy Management (BOEM) will present draft guidance for mitigating impacts to commercial and recreational fisheries from offshore wind energy development.

BOEM is accepting comments on this draft guidance through August 22, 2022. Mid-Atlantic, New England, and South Atlantic Fishery Management Council staff are working on a joint comment letter. Mid-Atlantic Council staff will present a brief overview of draft comments during the August 10, 2022 Mid-Atlantic Council meeting.

The following documents are provided behind this tab.

1. Overview – Guidance for Mitigating Impacts to Commercial and Recreational Fisheries from Offshore Wind Energy Development.
2. Draft Guidelines for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR Part 585.
3. Appendix A. Data and Methodology for Developing Revenue Exposure Estimates in the Northeast Atlantic.

Although not part of this agenda item, the Council should also be aware that BOEM recently published a Notice of Intent to prepare a Programmatic Environmental Impact Statement to analyze potential impacts from offshore wind energy development activities in the six areas off New York and New Jersey which were leased earlier in 2022. Virtual public meetings will be held on August 2 and 4, 2022. A comment period is open through August 15, 2022. More information is available at https://www.boem.gov/renewable-energy/state-activities/new-york-bight.

Bureau of Ocean Energy Management

Overview – Guidance for Mitigating Impacts to Commercial and Recreational Fisheries from Offshore Wind Energy Development

This document introduces and provides a high-level overview of BOEM's draft guidance for mitigating impacts to commercial and recreational fisheries from offshore wind development and the process to solicit input on the guidance development. The draft guidance is available for review on BOEM's website at https://www.boem.gov/renewable-energy/request-information-reducing-or-avoiding-impacts-offshore-wind-energy-fisheries.

The Bureau of Ocean Energy Management (BOEM), in consultation with the National Marine Fisheries Service (NMFS) and affected coastal States, developed draft guidance for the mitigation of impacts from offshore wind energy projects on commercial and recreational fishing communities. The guidance provides detailed processes and methodologies to the offshore wind industry and lessees to mitigate impacts to fisheries in the areas of project siting, design, navigation, access, safety, and financial compensation.

Why is Fisheries Mitigation Guidance Needed?

BOEM developed guidance to provide greater consistency between projects in mitigating impacts and for equitable treatment of commercial and recreational fisheries regardless of home or landing port.

For its offshore renewable energy program, BOEM is taking a national level approach to mitigating the impacts to social and economic conditions of the fishing industry. As part of its process to approve plans to site renewable energy facilities and their components on the Outer Continental Shelf, BOEM requires information from the lessee on social and economic conditions, including "recreational and commercial fishing (including typical fishing seasons, location, and type)," that could be affected by a lessee's proposed activities. This information assists BOEM in determining mitigation measures and complying with various regulations and laws prior to approving a lessee's proposed plans. Complying with mitigation measures may be a condition of plan approval.

BOEM must consider potential impacts and mitigation measures on a project-by-project basis. While such an approach ensures an evaluation based upon the unique conditions affecting a project, it also creates risk for inconsistency across both projects and regions. BOEM and other regulators developed this guidance to reduce the likelihood of inconsistencies in compensatory mitigation that could not be explained by unique, local conditions.

Overview of the Guidance Development Process

BOEM issued a request for information in late 2021 and conducted a 45-day public comment period to obtain input on what to include in the fisheries mitigation guidance.

During the comment period, BOEM hosted seven, 2-hour workshops to present the process for developing draft guidance to key stakeholders, answer questions, provide information on how to submit comments during the public comment process, and receive comments on key issues. BOEM also invited written comments via regulations.gov and by mail.

Over the course of the comment period, 95 individuals provided oral comments, and 95 individuals and organizations submitted written comments. BOEM also convened the Northeast Fisheries Compensatory Mitigation Data and Methodologies Technical Working Group (TWG) to exchange facts and information around fisheries compensatory mitigation as part of the draft guidance development. The TWG comprised representatives from Federal and State coastal management agencies, including BOEM, NMFS, the Greater Atlantic Regional Fisheries Office, the Northeast Fisheries Science Center, and relevant agencies from Maine, Massachusetts, Rhode Island, New York, New Jersey, and Virginia. To accomplish the goal of building consensus amongst parties and to comply with the Federal Committee Advisory Act (FACA), TWG membership was limited to State and Federal government employees, but the group invited technical speakers from academia, consulting firms, and associations to present information and answer TWG queries. Despite FACA, the TWG acknowledged the limitations of not having fishing industry members in the working group.

Guidance Overview

The guidance outlines measures to potentially mitigate the impacts of a proposed project to commercial and recreational fisheries. Key measures include a recommendation that the lessee use existing tools to identify commercial and recreational fishing communities to engage and then engage with them prior to any activity on the lease itself. BOEM encourages the lessee to respect and record the views of the fishing communities in these meetings and to develop a publicly available document that describes the substance of those interactions as well as how the lessee will or will not adopt mitigation measures identified by the fishing communities.

The draft guidance provides recommendations related to project siting, design, navigation, access, safety measures, and financial compensation.

- **Project siting, design, navigation, and access**: Possible design considerations for the wind turbine foundations, mooring systems (if applicable), inter-array cable, and export cables should be built into the process through consultation with fisheries stakeholders. BOEM recognizes that there is not a standard facility design that will mitigate potential impacts to all fisheries in all regions, but the guidance outlines design elements to consider.

- **Safety**: BOEM recommends that the lessee consider incorporating safety measures in their plans regarding facility charting and marking, minimizing disruption to fishing activities during construction, monitoring, providing training on safe operations within a facility, and employing the commercial fishing industry as safety liaison vessels during construction, and upgrading automatic identification systems on vessels engaged in offshore wind energy activities.

- **Financial compensation**: BOEM's guidance document recommends that the lessee consider establishing a process to compensate commercial and recreational fisheries if a project is likely to result in lost income to commercial and recreational fishing industries. The scope of impacts or losses addressed by compensatory mitigation should be based on the impacts identified in the lessee's plans and assessments where the lessee has analyzed the potential effects of its actions. BOEM recommends that compensation extend through the construction, operations, and decommissioning phases of a development.

What BOEM's Guidance Can Do

- Recommend fisheries mitigation processes (including processes for filing claims and timing of initial mitigation plan proposals).
- Recommend methodology to determine the sufficiency of funds to compensate fishing communities for negative economic impacts arising from offshore wind energy development activities approved by BOEM.
- Propose measures that could result in fair, equitable, and predictable methodologies used by developers for mitigating impacts of offshore wind energy on fishing communities.
- Enforce compliance with contributions proposed by the lessee that were part of the approved plan or other appropriate plan approval, whether or not such contributions are required by a State.

What BOEM's Guidance Can't Do

- Create a central fund. BOEM lacks legal authority to create or oversee a central funding mechanism for compensatory mitigation. BOEM also lacks authority to require contributions to a particular compensation fund, absent a previous commitment or obligation for the lessee to do so.
- Administer funds. BOEM lacks the legal authority to receive or hold funds or to assess industry fees for mitigation.
- Require regional mitigation. BOEM cannot require a lessee to mitigate regional impacts as part of a plan approval, unless BOEM's environmental impact analysis demonstrates the regional impacts of the specific project.

Where to Find More Information

The draft fisheries mitigation guidance is being shared with the public for review and input for a 45-day comment period. Guidelines developed through this process may be updated periodically based upon public feedback and evaluation by BOEM staff.

The draft guidance, background information, comments received during the public comment period, and ways to comment are available here: https://www.boem.gov/renewable-energy/request-information-reducing-or-avoiding-impacts-offshore-wind-energy-fisheries

UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Ocean Energy Management
Office of Renewable Energy Programs

June 23, 2022

Guidelines for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR Part 585

Guidance Disclaimer

Except to the extent that the contents of this document derive from requirements established by statute, regulation, lease, contract, or other binding legal authority, the contents of this document do not have the force and effect of law and are not meant to bind the public in any way. This document is intended only to provide clarity to the public regarding legal requirements, related agency policies, and technical issues.

I. Introduction to Guidelines

As part of its approval of plans for the siting of renewable energy facilities and their components[1] on the Outer Continental Shelf (OCS), the U.S. Department of the Interior, Bureau of Ocean Energy Management (BOEM) requires lessees to submit information on social and economic conditions, including “recreational and commercial fishing (including typical fishing seasons, location, and type)” that could be affected by the lessee’s proposed activities (see: 30 CFR 585.611(b)(7) for a Site Assessment Plan (SAP); 30 CFR 585.627(a)(7) for a Construction and Operations Plan (COP); and 30 CFR 585.646(b)(7) for a General Activities Plan (GAP)). In Addition, 30 CFR 585.610(a)(8) and 585.626(b)(15) requires that the SAP and COP, respectively, include project-specific information, including proposed mitigation measures for avoiding, minimizing, reducing, eliminating, and monitoring environmental impacts.

The information required in the regulations assists BOEM in complying with the Outer Continental Shelf Lands Act (OCSLA) (43 U.S.C. § 1337p)), the National Environmental Policy Act (NEPA) and other relevant laws. Failure to submit the necessary information in a SAP, COP, or GAP may result in delay, disapproval of a plan, or approval of a plan with additional terms and conditions. See also 30 C.F.R. 585.633(a), 585.633(b)(2), and 585.628(f)).

Between 2013 and 2014, BOEM held a series of workshops from Maine to North Carolina to identify best management practices (BMP) and mitigation measures to reduce

[1] [1]See definition of “Facility” in 30 C.F.R. 585.112

potential impacts to commercial and recreational fisheries.[2] These workshops resulted in five BMP areas:

1. Fisheries communication and outreach
2. Project siting, design, navigation, and access
3. Safety
4. Environmental monitoring
5. Financial compensation

BOEM issued guidance on fisheries communication and outreach in an October 20, 2015, document entitled, *Guidelines for Providing Information on Fisheries Social and Economic Conditions for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585*[3]. These guidelines were modified and reissued on May 27, 2020.

The guidelines in this document discuss the remaining BMPs and provide suggestions for complying with information requirements in the regulatory provisions listed above. These guidelines may be updated periodically based upon public feedback and evaluation by BOEM staff.

II. Authority and Regulations

Under subsection 8(p)(4) of OCSLA, BOEM must ensure that any activity under this subsection is carried out in a manner that provides for, among other goals, safety, protection of the environment, conservation of the natural resources of the OCS, prevention of interference with reasonable uses (as determined by the Secretary) of the [U.S.] exclusive economic zone, the high seas, and the territorial seas, and consideration of any other use of the sea or seabed, including use for a fishery. BOEM also has statutory obligations under NEPA (42 U.S.C. §§ 4321 *et seq*.) to evaluate social and economic impacts of a potential project. Under BOEM's regulations, BOEM must coordinate with relevant Federal agencies, including those agencies involved in planning activities that are undertaken to avoid conflicts among users and to maximize the economic and ecological benefits of the OCS (30 CFR 585.102(a)(5)).

For BOEM to evaluate potential impacts to social and economic conditions of the fishing industry, a lessee's SAP, COP, or GAP should provide the necessary information to assist BOEM in determining whether the proposed activities could result in unreasonable interference with other uses of the OCS or could cause undue harm to the environment (see 30 CFR 585.606, 621, 641). Also, the lessee's plans should provide proposed measures for avoiding, minimizing, reducing, eliminating, and monitoring environmental impacts (see 30 CFR 585.610(a)(8) and 626(b)(15)). BOEM will review the submitted SAP, COP, or GAP and any relevant supporting information to determine if the plan contains the information necessary to conduct BOEM's technical and environmental reviews. Upon

[2] "Development of Mitigation Measures to Address Potential Use Conflicts between Commercial Wind Energy Lessees/Grantees and Commercial Fishermen on the Atlantic Outer Continental Shelf" (Ecology and Environment, Inc. 2014), *available at* http://www.boem.gov/OCS-Study-BOEM-2014-654/.
[3] https://www.boem.gov/Social-and-Economic-Conditions-Fishery-Communication-Guidelines/

completion of BOEM's technical and environmental reviews and other reviews required by Federal laws, BOEM may approve, disapprove, or approve with modifications the lessee's SAP, COP, or GAP.

Relevant regulatory provisions for lessees within 30 CFR Part 585 Subpart F include the following:

	Information Requirement	**Type of Plan**	**Regulatory Citation**
1.	Your plans must demonstrate that you have planned and are prepared to conduct the proposed activities in a manner that does not unreasonably interfere with other uses of the OCS and uses best management practices.	SAP, COP, and GAP	30 CFR 585.606(a)(3) & (6) (SAP); 30 CFR 585.621(c) & (f) (COP); and 30 CFR 585.641(c) & (f) (GAP).
2.	You must submit with your plans a list of agencies and persons with whom you have communicated, or with whom you will communicate, regarding potential impacts associated with you proposed activities. This description must contain the contact information and the issues discussed.	SAP, COP, and GAP	30 CFR 585.610(a)(13) (SAP), 30 CFR 585.626(b)(17) (COP), 30 CFR 585.645(b)(14) (GAP)
3.	You must submit additional information requested by BOEM.	SAP, COP, and GAP	30 CFR 585.610(a) (16) (SAP), 30 CFR 585.626(b)(23) (COP), and 30 CFR 585.645(b)(16) (GAP)
4.	You must provide a description of the social and economic conditions of commercial and recreational fisheries that could be affected by the activities proposed in the plan.	SAP, COP, and GAP	30 CFR 585.611(b)(7) (SAP); 30 CFR 585.627(a)(7) (COP); and 30 CFR 585.646(b)(7) (GAP)
5.	BOEM may require additional information during the review of the plans and failure to provide the information may result in the disapproval of the plan.	SAP, COP, and GAP	30 CFR 585.613(d) (SAP); 30 CFR 585.628(e) (COP); 30 CFR 585.648(d) (GAP)
6.	You must provide proposed measures for avoiding, minimizing, reducing, eliminating, and monitoring environmental impacts	SAP, COP	30 CFR 585.610(a)(8) 30 CFR 585.626(b)(15)

Some of the actions described in these guidelines may be required for lessees under the terms and conditions of a specificlease or grant. A lease or grant may also have requirements for lessees that differ from or add to regulatory requirements and recommendations discussed in these guidelines. To the extent that there is a conflict between the terms of the lease or grant and these guidelines, the terms of the lease or grant would control. If there is a conflict between the lease or grant and the applicable regulations the regulations would control.

Recommended Practices for Mitigating Impacts to Commercial and Recreational Fisheries

Per the Council of Environmental Quality (CEQ) regulations (40 CFR 1508.1(s)), mitigation includes:

1. Avoiding the impact altogether by not taking a certain action or parts of an action.
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
5. Compensating for the impact by replacing or providing substitute resources or environments.

The following measures may mitigate the impacts of a proposed project, as identified in environmental analyses and public feedback, to commercial and recreational fisheries. These measures may work in tandem with additional mitigation measures that are directed at the overall health of a fishery or community (e.g., marketing/seafood promotion initiatives, gear development, and support programs that ensure safe and profitable fishing alongside offshore wind energy development).

A. General Approach to Developing Mitigation Measures

As reflected in the *Guidelines for Providing Information on Fisheries Social and Economic Conditions for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585*, BOEM recommends that the lessee engage with commercial and recreational fishing communities prior to engaging in any activity in support of a plan. Several planning tools may help lessees identify communities to engage including the NOAA and BOEM Ocean Reports tool, the Northeast Region Ocean Council's (NROC) Northeast Data Portal, the Mid-Atlantic Region Council on the Ocean's (MARCO) Mid-Atlantic Data Portal, the South Atlantic Fish Management Council (SAFMC) Digital Dashboard in the Atlantic, the Gulf of Mexico Alliance in the Gulf, the California Offshore Wind Energy Gateway, and the Oregon Offshore Wind Mapping Tool (OROWindMap) on the Pacific Coast. In some cases, additional community outreach may be necessary to identify potentially affected communities.

This pre-activity engagement should be respectful of the views of the fishing communities consulted. The engagement should result in a public document describing the nature of the engagement and how the lessee has addressed the measures identified by the fishing communities to mitigate the impacts of the proposed activity. The intent of this recommendation is to improve lessee communication, transparency, and accountability with fishing communities that may be impacted by a project's OCS activities. As a result the lessee's project design should reflect the current and future uses of the project area and mitigate potential adverse effects if necessary. The lessee should make reasonable efforts to implement the project in a manner that minimizes, mitigates, or redresses any adverse project effects on commercial and recreational fisheries. Early engagement with fishing communities can promote equity and encourage participation in the development of mitigation plans for the entire fishing community.

B. Project Siting, Design, Navigation, and Access

As described in section A above, BOEM recommends that offshore wind lessees meet with commercial and recreational fishing groups at the earliest stages of the facility design process. These meetings should occur before a lessee conducts site-specific data collection surveys to best account for design considerations relating to the wind turbine foundations, mooring systems (if applicable), inter-array cable, and export cables. BOEM recognizes that there is not a standard facility design that will mitigate potential impacts to all fisheries in all regions. However, the lessee should consider design elements described below in consultation with fisheries stakeholders.

Recommended static cable design elements:

1. All static cables should be buried to a minimum depth of 6 feet below the seabed where technically feasible. Technical feasibility constraints include seabed conditions that preclude burial, such as telecommunication cable crossings.
2. Lessees should avoid installation techniques that raise the profile of the seabed, such as the ejection of large, previously buried rocks or boulders onto the surface. The ejection of this material may damage fishing gear.
3. If needed, cable protection measures should reflect the pre-existing conditions at the site. This mitigation measure chiefly ensures that seafloor cable protection does not introduce new obstructions for mobile fishing gear. Thus, the cable protection measures should be trawl-friendly with tapered or sloped edges. If cable protection is necessary in "non-trawlable" habitat, such as rocky habitat, then the lessee should consider using materials that mirror the benthic environment.

Recommended dynamic cable design elements:

1. Dynamic cables should be suspended at a depth that minimizes interactions with fishing operations.
2. Where feasible, cables should share corridors and minimize the total cable footprint.

Recommended facility design elements:

1. The facility design should maximize access to fisheries, including by consideration of:
    a. Transit within the project area and traditional fishing activities within the project area.
    b. Consolidation of infrastructure, where practicable, to reduce space-use conflicts.

c. Consideration of larger turbine sizes to reduce total project footprint and meet energy production commitments.
d. Coordination of turbine and substation array layouts between and among neighboring lease areas to allow safe fishing operations and transit through multiple projects. In instances where layout design cannot accommodate two common lines of orientation across adjacent leases, the lessee should consider incorporating a 1 nautical mile setback, within which no surface structures may be constructed. See Navigation and Vessel Inspection Circular 10-19[4] for more details.

2. Turbine locations should be sited to avoid known sensitive benthic features, such as natural and artificial reefs.
3. Facility planning should use nature inclusive designs[5], where applicable, to maximize available habitat for fish.

C. Safety Measures

To improve safety at sea in and around offshore wind facilities, BOEM recommends that lessees consider the following measures in their plan submittals.

1. Charting all facilities and obstructions resulting from construction and operations of an offshore wind energy facility and providing that information to NOAA, U.S. Coast Guard (USCG), and navigational software companies.
2. Considering installation techniques and time windows that minimize disruption to fishing activities (e.g., simultaneous lay and burial, or conducting activity during the appropriate time of year).
3. Employing liaisons from the commercial fishing industry to provide safety and communication services during construction.
4. Monitoring cable burial in real-time and report all potential hazard events to the USCG as soon as possible.
5. Using digital information technology platforms (e.g., smartphone applications) to bring together survey and construction schedules and locations in addition to standard local notices to mariners via the USCG.
6. Marking facilities and appurtenances with permanent identification of the project and company.
7. Providing training opportunities for the commercial fishing industry to simulate safe navigation through a wind facility in various weather conditions and at various speeds.
8. Monitoring safety threats (e.g., radar disruption, ice shedding, vessel allisions and collisions, security threats, and impacts on search and rescue efforts) throughout the life of a project.
9. Consulting with the fishing industry and the USCG to identify which structures would be most appropriate for Automatic Identification System (AIS) transponders

---

[4] https://www.dco.uscg.mil/Our-Organization/NVIC/
[5] See "Evaluating the Effectiveness of Nature Inclusive Design Materials" here: https://www.boem.gov/sites/default/files/documents/environment/environmental-studies/SDP_2022-2023.pdf

consistent with BOEM's Lighting and Marking Guidelines[6].

10. Considering lessee-funded radar system upgrades for commercial and for-hire recreational fishing vessels (e.g. solid state Doppler-based marine vessel radar systems[7]).

D. Environmental Monitoring

BOEM recommends that lessees work with State and Federal fisheries management agencies to explore the need and methods to monitor changes in fishing activity as a result of proposed offshore wind energy development. Separately, BOEM provides recommendations for conducting and reporting the results of baseline collection studies in separate guidelines: https://www.boem.gov/Survey-Guidelines/. In 2021 the Responsible Offshore Science Alliance (rosascience.org) worked with State, Federal, and fisheries constituents to develop the Offshore Wind Monitoring Framework and Guidelines document (https://www.rosascience.org/_files/ugd/99421e_b8932042e6e140ee84c5f8531c2530ab.pdf). This document is an important resource in understanding necessary considerations in developing pre-construction, construction, and post-construction fisheries monitoring surveys.

E. Financial Compensation

General Approach

BOEM recommends that the lessee consider establishing a compensation process if a project is likely to result in lost income to commercial and recreational fisheries. The compensation process should be equitable and fair across fisheries and fishing communities and consider best practices and consistency across other offshore wind energy projects. The scope of impacts or losses that should be addressed by compensatory mitigation should be based on the impacts identified in the various environmental documents including the lessee's COP and BOEM's assessments analyzing the potential effects of the lessee's submitted plans. BOEM recommends that a lessee accept valid claims from fishing interests (see Eligible Entities below).

Compensation for Gear Loss and Damage

BOEM recommends following the minimum standards for gear loss that exist for the Fisheries Contingency Fund (FCF) claims process[8]. The lessee should consider reimbursements for fisheries gear loss and damage resulting from lessee's actions (e.g., a lessee-contracted survey vessel damaging fishing gear during survey operations). The lessee should also consider compensation for damaged gear resulting from interactions between the fishing industry and non-marked and/or non-charted obstructions that are the property of the lessee. A lessee may elect to reimburse damage to fishing gear from marked and charted obstructions in order to limit interactions with lessee property. The

[6] https://www.boem.gov/sites/default/files/documents/renewable-energy/2021-Lighting-and-Marking-Guidelines.pdf

[7] National Academies of Science Engineering and Medicine. 2022. *Wind Turbine Generator Impacts to Marine Vessel Radar*. Washington, D.C.: The National Academies Press. https://doi.org/10.17226/26430.

[8] https://www.fisheries.noaa.gov/national/funding-and-financial-services/fishermens-contingency-fund-program

lessee should review claims filed within 90 days after the date of first discovery of the incident. The lessee should consider fully compensating for the repair or replacement of the damaged gear and up to 50-percent of gross income loss during the period from the discovery of the lost or damaged gear to when the gear is repaired or replaced. The lessee should also consider compensating for reasonable fees paid to an attorney, certified public accountant, or other consultant for the preparation of the claim.

Compensation for Lost Fishing Income

BOEM recommends the following minimum standards when determining compensation for lost fishing income. The lessee should consider establishing adequate reserve funds (see below) to compensate for lost income as a direct result of the lessee's actions.

Determining Adequate Reserve Funds for Compensation

Revenue Exposure

In the U.S. offshore energy sector, claims for financial loss by fisheries have primarily focused on claims associated with lost gear and income associated with actual interactions between fishing gear and property of offshore energy companies. There are no existing Federal policies or laws explicitly and specifically requiring compensation of economic loss from displacement attributed to offshore energy installations. Thus, there is a no history of claims for such loss that might be referenced to determine adequate reserve funds for such compensation. BOEM recommends that lessees consider using fishing revenue exposure (i.e., the amount of ex-vessel revenue[9] generated from the project area of potential displacement) for the purposes of determining the value of reserve funds to set aside for compensation.

As a general matter, BOEM considers the following to be a reasonable definition of revenue exposure: the total ex-vessel value of the fish landed, usually presented in an annualized format. This measurement is not the direct estimate of net income loss (revenue exposure minus expenses) to the business, nor representative of the actual duration for which an impact may have occurred. Under this definition, BOEM generally expects that lost income is a portion of the total revenue exposure. In many cases this over-estimation, if utilized by the lessee, is likely to be sufficient to cover shoreside income loss and potentially under-reported landings (See Appendix A for more discussion of shoreside revenue estimation). However, in some localities it may be appropriate to apply a multiplier (previous projects estimated at approximately 1-2 percent) to the total revenue exposure to ensure that shoreside income loss is adequately covered (See Appendix A for more details on appropriate multipliers in the northeast United States). Similarly, some localities may have a sector of fishing activity for which accurate revenue exposure data is unavailable. In those cases, the lessee should consider developing an additional multiplier for the missing information to ensure the adequacy of compensation funds. Revenue exposure analyses included in plans should use the GDP Implicit Price Deflator for standardizing dollar amounts across years. The GDP Implicit Price Deflator is also the standard used by NMFS in fisheries management analyses.

[9] A measure of the dollar value of commercial landings, usually calculated as the price per pound at first purchase of the commercial landings multiplied by the total pounds landed. (NOAA Sustainable Fisheries Glossary)

Duration of Compensatory Mitigation Period

Construction

For purposes of determining voluntary compensation for losses to commercial and recreational fisheries, lessees should consider the proportion of the project area that is rendered unavailable to fishing during active construction on the OCS and should specifically consider whether the entirety of the project area is unavailable. In that event, lessees should consider compensation for lost income for the duration of foundation and submarine cable installation where exclusion from fishing grounds is necessary for safety or for the activity that has resulted in the behavior of target fish species such that they are no longer available to the fishery (e.g., where the fish are not biting at hooks during elevated acoustic exposure).

Operations

As discussed above, the scope of impacts or losses addressed by compensatory mitigation should be based on the impacts identified in various environmental documents analyzing the potential effects of the action proposed in the lessee's submitted plans. Generally, and as a minimum standard it should be assumed that there is an adjustment period for fisheries post construction. BOEM recommends that, at minimum, lessees consider the following payment structure be available for claimants: 100 percent of revenue exposure for the first year after construction, 80 percent of revenue exposure 2 years after construction, 70 percent of revenue exposure 3 years after construction, 60 percent after four years, and 50 percent after five years post construction. Compensatory mitigation beyond 5 years post-construction may be necessary and should be evaluated based on the activities proposed in the COP.

Decommissioning

Since BOEM evaluates only conceptual decommissioning during COP approval, BOEM recommends that the lessee's decommissioning application required under 30 CFR 585.906 include the measures to mitigate impacts to commercial and recreational fishing. In general, the same principles as described under construction, above, should apply.

Management of Funds

BOEM recommends that lessees consider contracting with a neutral third-party to process claims, manage, and disburse funds, and handle appeals. Funds may be established at the project level, company level (multiple projects), or regional multi-lessee level.

Eligible Entities

Lessees should consider the propriety of permitting claims from entities other than vessel owners, operators, and crew including shoreside businesses, such as seafood processors and bait dealers, that can demonstrate in a claim that their business experienced a loss of income due to unrecovered economic activity resulting from displaced fisheries. Lessees may consider a pre-application process to identify all eligible entities as early in the compensation development process as practicable. This pre-application process could facilitate more efficient claims processing.

Claims Process

As described above, BOEM recommends lessees establish a neutral third party to administer mitigation funds, process claims, and handle appeals or adjustments. The lessee or the neutral third party should honor verified claims from eligible entities as described above. A variety of compensation models may mitigate project impacts, including programs that provide funds more directly to an impacted community to improve overall financial health of the fishing community for disbursement by community members, as mentioned in the introduction. However, BOEM's suggested model is based on individual claims and directs funds to impacted businesses. This mechanism ensures that claims are commensurate with the impacts to the claimant rather than pooled into a more general fund that may benefit the fishing industry more broadly.

Claims should be honored for up to 2 years after the income loss was experienced. Income loss due to displacement might not be realized until the end of a fishing season, or able to be substantiated until State or Federal landings records are made publicly available, thus necessitating a longer period for the claim to be submitted.

The lessee should consider establishing a claims appeal or adjustment process. Appeals or adjustment claims should be considered if filed within 6 months of the original decision on the claim. BOEM recommends that lessees or its neutral party consider paying validated claims within 1 month of receipt of a complete claim. BOEM encourages lessees to make any claims process as simple as possible and to accommodate a variety of different business records.

Review of Information Resources

In developing a fisheries mitigation plan, lessees may find the following information helpful:

- Ecology and Environment, Inc. 2014. Development of Mitigation Measures to Address Potential Use Conflicts between Commercial Wind Energy Lessees/Grantees and Commercial Fishermen on the Atlantic Outer Continental Shelf Report on Best Management Practices and Mitigation Measures. A final report for the U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewal Energy Programs, Herndon, VA. OCS Study BOEM 2014-654. Available at http://www.boem.gov/OCS-Study-BOEM-2014-654.

- National Marine Fisheries Service's (NMFS) Office of Science and Technology, provides a baseline understanding of fishery social and economic conditions which is available at https://www.st.nmfs.noaa.gov. Their Human Dimensions Program maintains community profiles, social indicators, and social and cultural studies.

- In 2015, BOEM and NMFS completed an assessment of fisheries revenue from BOEM's wind energy areas and potential impacts from fishing disruption in those areas. This report, published in February 2017 and entitled "Socio-Economic Impact of Outer Continental Shelf Wind Energy Development on Fisheries in the U.S. Atlantic," is posted on BOEM's renewable energy study webpage: http://www.boem.gov/Renewable-Energy-Completed-Studies/.

BOEM Guidance Document Statement

This guidance document sets forth BOEM's general policy to provide the public with additional information regarding the agency's approach to managing its renewable energy program. This guidance does not have the force and effect of law and does not bind the public or BOEM in any way. Lessees are encouraged to contact BOEM with questions or concerns related to the guidance or to site-specific permitting.

Paperwork Reduction Act Statement

These guidelines provide clarification, description, or interpretation of requirements contained in 30 CFR 585, Subpart F. An agency may not conduct or sponsor a collection of information unless it displays a currently valid OMB Control Number. OMB has approved the information collection requirements in the 30 CFR 585, Subpart F regulations under OMB Control Number 1010-0176. These guidelines do not impose additional information collection requirements subject to the Paperwork Reduction Act of 1995.

Appendix A. Data and Methodology for Developing Compensatory Mitigation in the Northeast Atlantic

Appendix A. Data and Methodology for Developing Revenue Exposure Estimates in the Northeast Atlantic

This appendix has been developed to specifically aid lessees with offshore wind energy leases in the Northeast Atlantic, from Cape Hatteras to the Gulf of Maine, to develop revenue exposure estimates for compensatory mitigation of lost income to fisheries as a result of offshore wind energy development. The datasets discussed are exclusive to Northeast states and the National Marine Fisheries Service (NMFS) Greater Atlantic Regional Fisheries Office (GARFO). Guidance for revenue exposure data and methodologies for other regions may be developed at a later time.

BOEM has developed this guidance in consultation with state and Federal partners, including the National Marine Fisheries Service. However, this guidance is wholly the product of BOEM. Fisheries science and identification of past, current, and future fishing activity in the northeast, is highly dynamic and influenced by several factors, including but not limited to fisheries management, market conditions, potential biological impacts from offshore wind development, and changing conditions brought about by climate change. Thus, data representing fishing operations are inherently variable and complex, increasing the uncertainty when evaluating economic exposure and potential compensation estimates for individual wind energy projects.

Commercial Fisheries

As discussed in the National guidance, BOEM recommends that analyses of fisheries compensation plans begin with assessing the revenue exposure of actions proposed in the COP that may disrupt or displace fishing activity. Revenue exposure is the total amount of fishery revenue generated within a defined area (e.g., an offshore wind energy project area) and based on historical data that could be foregone if vessel operators no longer fish within that area due to offshore wind energy construction and operation activity. In the northeast U.S., the primary means of determining revenue exposure is from the NMFS/GARFO fishery footprint and related socioeconomic impacts of Atlantic offshore wind development (see link in Table 1 below). BOEM believes there is a high degree of confidence in revenue exposure for those derived data products for the following fisheries[1]:

- Atlantic Herring
- Bluefish
- Golden Tilefish
- Mackerel/Squid/Butterfish
- Monkfish

[1] A full glossary of fisheries terms used in this appendix is found here: https://repository.library.noaa.gov/view/noaa/12856

- Multispecies Large Mesh (American plaice, Atlantic cod, Atlantic halibut, Atlantic wolffish, Haddock, Ocean pout, Offshore hake, Pollock, Redfish, Red hake, Silver hake (whiting), White hake, Windowpane flounder, Winter flounder, Witch flounder, Yellowtail flounder)
- Multispecies Small Mesh (silver hake, offshore hake, and red hake)
- Red Crab
- Sea Scallop
- Skate
- Spiny Dogfish
- Summer Flounder/Scup/Black Sea Bass
- Surfclam/Ocean Quahog

While NMFS reports other species in its fishery revenue exposure data product, the ones listed above are the most complete and accurate. It is the responsibility of the lessee to ensure that the spatial footprint available on the NMFS webpage accurately reflects the proposed action in the lessees' COP. If the information is not correct the lessee should work with BOEM and NMFS to request an analysis based on the proposed action. Data requests should include all years of data from 2008 up to the current available year be used to calculate the annualized revenue exposure. This request should occur prior to the COP being submitted to BOEM. Considerations for "data-limited" species and recreational fishing are described separately below.

While the revenue exposure calculations are a great resource, BOEM recommends that lessees also evaluate data derived from vessel monitoring systems to better understand finer scale vessel activity, annual variation in fishing activity, and transit routes to fishing locations.

Within the NMFS/GARFO region, individual federal Fishery Management Plans (FMP) required federal permit holders to use VMS over time. The following list includes the year in which each FMP required federally permitted vessels to begin using VMS. There are publicly available VMS data products listed in Table 1 below.

- Monkfish: optional and elective on a yearly basis
- Atlantic Herring: 2005
- Northeast Multispecies (groundfish): 2006
- Atlantic Scallops: 2006
- Surfclam/Ocean quahogs: 2008
- Atlantic Mackerel: 2014
- Longfin Squid/Butterfish: 2016
- Illex Squid: 2017

It should be noted that there are some limitations to VMS. Not all federal FMPs require VMS and some fisheries are not covered by VMS at all (note what is covered above). If a vessel is issued a permit in another federal FMP that requires VMS, trips taken in non-VMS fisheries are mostly represented by a "DOF-COM" VMS trip declaration (e.g., a commercial fishing trip that is declared out of an FMP managed by days-at-sea effort controls). This activity cannot be assigned to a specific FMP or target species (e.g., summer flounder) unless each trip is corroborated with a VTR or other reported information. Additionally, a vessel can "target" one species and catch another—even in greater amounts—on any trip, limiting the utility of VMS trip declarations of vessel intent. Data from VMS can be difficult to link to dealer reports. Other limitations to VMS are related to assumptions used when analyzing the data. Fishing time/location can be misestimated by operational assumptions (speed and direction) that are affected by externalities (weather, sea state, mechanical issues) and fishing practices (e.g., drifting to repair gear, sort/shuck catch, and store product). Further, differentiating harvesting activity from vessel transit must be inferred using vessel speed and course adjustment, while vessel speed and different position ping rates (30-60 minutes) can limit the area. Vessel course changes can be influenced by several factors. Harvesting speeds vary by fishery, and transiting speed depends on the vessel, weather, sea state, and other factors.

Table 1. Derived Fishery Revenue Exposure Products	
Derived Fishery Revenue Exposure Products	
SOURCE	**TITLE**
NOAA NMFS	Fishing Footprints for the New England/Mid-Atlantic Region, https://apps-nefsc.fisheries.noaa.gov/read/socialsci/fishing-footprints.php
NOAA NMFS	Socioeconomic Impacts of Atlantic Offshore Wind Development, https://www.fisheries.noaa.gov/resource/data/socioeconomic-impacts-atlantic-offshore-wind-development?utm_medium=email&utm_source=govdelivery
BOEM	*Socio-Economic Impact of Outer Continental Shelf Wind Energy Development on Fisheries in the U.S. Atlantic*: OCS Study BOEM 2017-012, Kirkpatrick, et.al. [2], https://espis.boem.gov/final%20reports/5580.pdf
RIDEM (2017)	Spatiotemporal and economic analysis of vessel monitoring system data within wind energy areas in the greater North Atlantic, http://www.crmc.ri.gov/windenergy/vineyardwind/VW_EconExposureCommFisheries.pdf
RIDEM (2018)	Addendum: Spatiotemporal and economic analysis of vessel monitoring system data within wind energy areas in the greater North Atlantic, http://www.crmc.ri.gov/windenergy/vineyardwind/RIDEM_VWFishValue_20190114.pdf
Original Fishery Data Sources	
NOAA/NMFS	Vessel Monitoring System data (aggregated data available on NROC and MARCO data portals, trip level data not publicly available)
NOAA/NMFS	Federal fishing vessel trip reports and dealer reports
ASMFC	Atlantic Coastal Cooperative Statistics Program (public data warehouse accessible via sign up)

[2] Please note that this study is similar to the NMFS Fishing Footprints product, but its methodology is different and would require significant additional work for what NMFS is able to do currently in its Footprints product.

Data-Limited Commercial Fisheries

There are several species where there are substantial limitations to existing data sets for calculating revenue exposure. These data-limited species include, but are not limited to, American lobster, Jonah crab, whelk, Atlantic menhaden, Atlantic croaker, and highly migratory species (HMS). These species may be captured in the NMFS/GARFO fishery footprint data sets, however, they may not fully represent the actual revenue exposure for that fishery. For example, species like whelk/conch, horseshoe crab, and tautog are likely to have less than 50% of their landings captured in the NMFS/GARFO fishery footprint dataset. Species like Jonah crab and lobster may have good representation in the NMFS/GARFO data in Southern New England but less so for inshore areas in the Gulf of Maine. The lessee is advised to evaluate data sources including fisheries stock assessments, Atlantic Coastal Cooperative Statistics Program (ACCSP), federal and state fishery independent and dependent surveys, industry owned data and knowledge (that ensures proper use of proprietary information e.g., Fisheries Knowledge Trust), and/or high-resolution bathymetry/habitat mapping. From this information, it is possible to apply a multiplier based on what is in the NMFS/GARFO data and what is captured in other data sources. This concept is visualized in Figure A2 of Attachment 1, which provides an estimate of representativeness of NMFS/GARFO VTR landings data when compared to total landings. Attachment 1 to this Appendix describes the limits of some of these species. Ultimately, BOEM recommends working collaboratively with state and Federal fisheries management agencies regarding all revenue exposure data, but this is especially important for data-limited species.

Recreational Fisheries

Recreational fishing sectors in the northeast U.S. include NMFS/GARFO permitted charter and party vessels, highly migratory species (HMS) charter vessels, and private recreational angling. Of these three categories of recreational fishing, only the NMFS/GARFO permitted charter and party vessels are included in the socio-economic assessments developed by NMFS for each project area (See Table 1). Since there is no dealer sale for recreational fisheries, NMFS uses the results from industry surveys to assign a for-hire passenger fee per reported trip (https://www.fisheries.noaa.gov/resource/data/socioeconomic-impacts-atlantic-offshore-wind-development) to determine the revenue exposure for this sector. NMFS does not use the fishery footprint method for party/charter vessels. Party/charter data reflects only the point locations identified by the vessel operator and there is no independent data source to verify and model fishing location as available for commercial trips (i.e., there are no observers on party/charter trips).

For recreational fishing sectors other than NMFS/GARFO charter and party vessels, BOEM recommends conducting similar exposure estimates to Kirkpatrick et al.[3]) with the most recently available data and using at least 5 years of data. The exposure is calculated by using the average

[3] https://espis.boem.gov/final%20reports/5580.pdf

annual percent of those trips from each state that occurred in federal waters. It should be noted that this method may also not be inclusive of all vessels as some (e.g., HMS) may be traveling further to fishing grounds than the suggested 30 miles used in Kirkpatrick et al. The recreational fishing industry should be consulted on these methods.

Shoreside Seafood Businesses

As described in the National guidance, there may be impacts not only to harvesters, but also indirect costs to shoreside businesses. Shoreside businesses can generally be categorized as upstream (e.g., bait suppliers, ice suppliers, and other provisioning for harvest trips) and downstream (e.g., seafood dealers and processors). BOEM recommends using the Seafood Industry Impacts tool[4] (using state-specific economic impact tables based on the Fishery Economics of the United States report (2018)) and IMPLAN software model (2004). However, there are other sources and methods, including fishery-specific methods, that may be applicable and should be considered.[5] Each method has constraints and possible methodological biases. For instance, IMPLAN[6] / input-output type models may overestimate downstream revenue impacts given they do not allow input substitution (e.g., a processing company may substitute imports in instances of reduced landings, which would reduce the magnitude of downstream losses/revenue impacts). Previously approved COPs have used these tools to identify a multiplier (approximately 1-2%) to be used against the revenue exposure calculation for determining sufficient funds for claims of income loss. Lessees should discuss methods to calculate indirect revenue exposure with state and NMFS/GARFO staff.

Standards for Reporting and Forecasting Revenue Exposure

When developing statistics on past fishery revenue exposure to forecast future revenue exposure and potential impacts from the proposed project, the lessee should consider information such as stock assessments, fisheries management actions, market conditions, and other factors that may influence revenue and landings over the period of the data analysis. For example, are fishery landings on an increasing or declining trend? What conditions are driving the trend? Are there old or new management measures that may result in a changed distribution of fishing effort? It is important to understand the data to accurately assess future revenue exposure and impacts.

[4] https://www.st.nmfs.noaa.gov/data-and-tools/FEUS/explore-the-data

[5] King, et.al., Economic Exposure of Rhode Island Commercial Fisheries to the Vineyard Wind Project, 2019; Rhode Island Department of Environmental Management, Rhode Island Fishing Value in the Vineyard Wind Construction and Operations Plan Area, 2019; Sproul letter, 31 May 2019 and King response, 14 November 2019, in Vineyard Wind's Construction and Operations Plan, volume 3, appendix 3. https://www.boem.gov/sites/default/files/documents/renewable-energy/Vineyard-Wind-COP-Volume-III-Appendix-III-P_0.pdf

[6] https://www.st.nmfs.noaa.gov/documents/Commercial%20Fishing%20IO%20Model.pdf

Revenue exposure analyses included in plans should use the GDP Implicit Price Deflator for standardizing dollar amounts across years. The GDP Implicit Price Deflator is also the standard used by NMFS in fisheries management analyses.

Attachment 1: Data-Limited Species Snapshots[7]

Whelk

Commercial Fishery: The whelk commercial fishery exists along the US Atlantic Coast and is mainly targeted by pots. Knobbed and channeled whelk are the primary species landed for most states, with lightning whelk also occurring in lesser amounts from Virginia to Georgia.

Where: US Atlantic Coast from Massachusetts to Georgia, with most of the commercial fishing occurring in the mid-Atlantic and New England regions.

Management: Whelk, sometimes called conch, is managed state by state, with minimum legal sizes (MLS) and reporting requirements varying by state. There is no FMP or federal permit required.

Harvest and Data Reporting: Harvest occurs in both state and federal waters, but no federal reporting requirements exist. VTRs are submitted only by vessels that carry federal permits for other species. Whelk is included in federal VTRs as bycatch when targeting other species, and federal VTR, dealer data, or fishing footprints should not be considered definitive sources of whelk catch and effort information.

All states have mandatory landings reports for whelk harvested in state waters. However, not all whelk landings are reported by species, dealer reporting is not mandatory among all states, gear type is not always reported, and not every state conducts biological sampling. The minimum landing size is not consistent among states, with some states lacking any kind of size regulation, which biases landings towards states with preferable regulations. Landings data are inconsistent among states (varies with type of gear used, average landings by pound, and recent landings trends).

Value of Commercial Fishery: Unspecified

Data Snapshot: Years of available data are unknown. A multi-state working group was established in 2021 to collect current information on the status of whelk along the coast, with the goal of producing a summary white paper in 2022.

Summary: Whelk data primarily reside within state-specific data programs and is unlikely to contain consistent location information. When the white paper is available in 2022, data summary should be reassessed.

---

[7] This list is not comprehensive of all data-limited species with the potential for OSW interaction such as shrimp, smooth dogfish, spot, and others.

Jonah Crab (*Cancer borealis)*

Commercial Fishery: Jonah crab were initially taken as bycatch in the lobster fishery along the Atlantic coast. Over the last two decades, landings have increased to a directed fishery in Southern New England, primarily using trap gear. In some areas, such as Maine, reports for Jonah crab may also include rock crab. The Jonah crab harvest in Maine is still a bycatch fishery. Note: The magnitude of the Jonah crab recreational fishery is unknown at this time but is believed to be quite small compared to the commercial fishery.

Where: Atlantic coast, with MA and RI the largest reported landings.

Management: Cooperatively managed by states and NOAA through the ASMFC. An FMP exists for Jonah crab, however, there are no stock assessments or established biological reference points for this stock. A stock assessment is planned for 2022.

Harvest and Data Reporting: At the federal level, Jonah crab landings are reported on VTRs only if a vessel has a federal permit for another species. There are no federal report requirements specific to Jonah crab. Based on a preliminary evaluation, Federal VTRs capture most of the total annual Jonah crab harvest from 2014-2019. Federal VTR coverage is higher offshore, and lower closer to shore, and most landings are from offshore areas.

States have a variety of reporting requirements. Most harvesters targeting Jonah crab that are not required to fill out federal VTRs, are required to file state harvester reports which include inshore State Statistical Reporting Area, or NMFS sub areas, NMFS Statistical Areas in federal waters, and/or LCMA. Like lobster (see Lobster section, below), this changed in 2021 to report by ten-minute squares. The state harvester reports from Maine have the same subsampled limitations as lobster.

Value of Commercial Fishery: In the early 2000's landings began to increase. In 2019, landings totaled approximately 16 million pounds of Jonah crab, representing $13.1 million in ex-vessel value (https://media.fisheries.noaa.gov/2021-05/FUS2019-FINAL-webready-2.3.pdf?null=). Note that this is likely an underestimate of Jonah crab landings because of the species identification issues in Maine, but also that most landings are happening in southern New England. This could be underestimated as much as 1-2 million pounds in recent years, and as such would not be reflected by VTR's.

Data Snapshot: Data is available for ≥ 10 years, although data prior to 2008 may not be useful for assessing the current status. Federal VTRs likely capture most of the total Jonah crab harvest in recent years. NMFS statistical area data is consistently available across all states and federal reports, with some latitude/longitude information available through VTRs.

Summary: Federal VTR coverage is reasonably good for harvest information. State data can supplement if needed in areas of lower VTR coverage.

Atlantic Menhaden (*Brevoortia tyranus)*

Commercial Fishery: Atlantic menhaden is the largest east coast fishery by volume and is executed primarily in both federal and state waters using purse seines. The fishery includes commercial bait and reduction harvest and operates from Maine through North Carolina, with state regulations varying down the coast. Note: Menhaden are also important bait in many recreational fisheries and are captured by cast nets or hook-and-line for recreational use.

Where: Commercial harvest occurs from Maine through North Carolina, with the highest commercial bait landings in NJ, ME, and MA. Reduction landings only occur in VA.

Management: ASMFC regulated the fishery and leads the stock assessments, but reduction harvest information is submitted to the NMFS Southeast Fishery Science Center (SFSC).

Harvest and Data Reporting: At the federal level, bait landings are reported on VTRs, and dealer reports only if a vessel has a federal permit for another species. There are currently no federal permits for the menhaden fishing. Atlantic menhaden catch is included in federal VTRs as bycatch when targeting other species and federal VTRs and dealer reports should not be considered the primary source of Atlantic menhaden catch and effort data.

States have a variety of reporting requirements. Approximately 50% of landings from 2018-2020 are captured on state-level VTRs, which include latitude/longitude fishing location information. The remaining bait harvest reported at the state level does not include fishing location information. Reduction landings, which only occur in VA, are reported through Captain's Daily Fishing Reports (CDFRs) that include detailed location and harvest information for each purse seine net set. CDFRs are submitted to the SFSC, but access to detailed information is limited due to data confidentiality. Most commercial menhaden landings in the Atlantic occur within 3 miles of shore (154,362 mt to 42,192 mt respectively).[8]

Value of Commercial Fishery: From 2011-2020, the total commercial landings average approximately 192,000 mt annually, of which about 142,300 mt are reduction and 49,600 mt are bait harvest. Monetary value of this fishery is unspecified. Note: Estimated recreational harvest in 2020 is approximately 1,157 mt, and monetary value is unspecified.

Data Snapshot: Data is available for ≥10 years. Federal VTRs capture about 7.5% of the total harvest. From 2018-2020, approximately 50% of bait landings are captured in state VTRs. The remaining bait landings are reported at the state level and are unlikely to include location information

Summary: State-specific harvest reports may be the best source for locationally linked data

[8] https://media.fisheries.noaa.gov/2021-05/FUS2019-FINAL-webready-2.3.pdf?null= page 16

(depending on the state), but federal VTRs should also be integrated because they have location data for every trip. Some sort of correction or extrapolation may be needed to fill gaps.

Atlantic Croaker *(Micropogonias undulatus)*

Commercial and Recreational Fisheries: Atlantic croaker can be found from the Gulf of Maine to Argentina, but along the US Atlantic coast, they are most abundant from the Chesapeake Bay to northern Florida. Croaker is targeted by commercial and recreational fishers. The primary commercial gear in North Carolina and Virginia is gillnets, although trawls have been historically used. Atlantic coast commercial landings of Atlantic croaker exhibit a cyclical pattern, with low harvests in the 1960s/1970s and the 1980s/1990s, and high harvests in the mid-to-late 1970s, mid-1990s to early 2000s. Recreational fishing landings have also been variable over the last four decades.

Where: Atlantic coast, although Virginia harvests the majority of recreational croaker while North Carolina lands the majority of commercial croaker, followed closely by Virginia.

Management: Managed by ASMFC using a traffic light approach.

Harvest and Data Reporting: Spatial data is not consistently available through VTR reports as croaker is not a federally managed species. Federal VTR coverage is higher offshore, and lower closer to shore. North Carolina harvest is tracked through the state's trip ticket system which has spatial data categorized as either ocean waters 0-3 miles or greater than 3 miles and north or south of Cape Hatteras. Virginia Ocean spatial data can only be categorized between state waters and federal waters. Nearly all recreational harvest occurs within 3 miles of shore. Commercial harvest has more landings greater than 3 miles from shore than less than 3 miles from shore (https://media.fisheries.noaa.gov/2021-05/FUS2019-FINAL-webready-2.3.pdf?null=)

Value of Commercial and Recreational Fisheries: An estimated 5 million pounds of croaker were landed in 2020, with approximately 16% landed by the commercial sector and 84% harvested by recreational anglers. The monetary value of these fisheries is unspecified.

Data Snapshot: Data is available for ≥10 years. States have different levels of spatial categorization.

Summary: State harvest data may be the best source but is unlikely to contain latitude/longitude data.

Highly Migratory Species (HMS)- commercial and recreational fisheries

Fishery: Highly migratory species, such as tunas, sharks, swordfish, and billfish, travel long distances and cross domestic and international boundaries. They are targeted commercially and recreationally, using a variety of gears (longlines, seines, gillnets, and hand gear). HMS commercial fisheries are mostly offshore, while recreational fisheries may tend to overlap potential wind energy call areas. Tournaments and for-hire fisheries occur for HMS in the Atlantic

Where: US Atlantic Coast and Gulf of Mexico

Management: Atlantic HMS are managed by NOAA and require different permits for different activities.

Harvest and Data Reporting: Commercial VTR data is limited for HMS in the northeast. Commercial reports for HMS are in logbooks, including location and landings, with fishing efforts generally offshore of wind call areas. Dealer reports may be able to be matched with logbooks but would require a deep dive.

Recreational fishing may occur more in areas that can be impacted by wind energy. In 2018, over 20,000 HMS permits were issued and there were more than 200 HMS tournaments. Some recreational catches are reported at the federal level, and some are reported at the state level (e.g., NC and MD).

Value of Fishery: Atlantic HMS recreational fishing is worth approximately $510 million. Although not readily available at the regional level and aggregated for all HMS species, in 2019 landings of tuna species alone by U.S. fishermen at ports in the United States, American Samoa, other U.S. territories, and foreign ports were 526.1 million pounds valued at $407 million. These tunas were also largely captured greater than 3 miles from shore.[9]

Data Snapshot: Years of available data are unknown.

Summary: Locational data may be difficult to determine from permits and reports. Landings and logbook data may contain some locational information, especially from commercial and tournament fishers. Pelagic survey and tagging could provide a proxy for species' distribution but aggregating that data to draw conclusions about impact may be difficult.

---

[9] https://media.fisheries.noaa.gov/2021-05/FUS2019-FINAL-webready-2.3.pdf?null=

American Lobster (*Homarus americanus)*

Commercial Fishery: The lobster commercial fishery is one of the most valuable fisheries along the US Atlantic Coast and is targeted primarily by pots. Historic stock numbers have fluctuated along the coast, but total commercial landings have steadily increased over the last three decades. Currently, Gulf of Maine/Georges Bank stock is at record high abundance, whereas Southern New England stock is depleted. Note: Lobster is harvested recreationally by pots and SCUBA, but overall recreational harvest is unknown and believed to be negligible compared to the commercial fishery.

Where: ME to NC, with most landings occurring in ME and northern New England.

Management: Cooperatively managed by the states and NOAA through the ASMFC. There are seven lobster conservation management areas (LMCA).

Harvest and Data Reporting: Federal VTR data varies by LCMA and NMFS Statistical Areas because VTRs were not historically required for vessels that did not hold other federal permits.

Since 2008, 100% dealer reporting at the trip level has been required in all states. State and federal dealer data includes statistics for value, landings, number of transactions, and port but generally cannot provide spatial data for where the lobsters were caught. For Maine, assumptions can be made for NMFS Statistical Area where lobsters were caught using dealer reported ports. Landings in other states cannot use the port as an approximation of area fished given the proximity of important ports to multiple areas, however, NMFS Statistical Areas, or smaller sub-areas, are reported in harvester reports to those states.

Since the early 2010s, 100% harvester logbook reporting has been required in all states except Maine. In most cases outside of Maine, this requirement to report to the state also applied to federal permit holders exempt from VTR reporting. In most states, these harvester logbooks can be used to characterize the spatial footprint of the fishery, including activity occurring in federal waters conducted by permit holders landing in that state, though it is generally limited to the large NMFS Statistical Area definitions. Spatial information was collected at the inshore State Statistical Reporting Area and/or NMFS Statistical Areas and LCMAs through 2020 and beginning in 2021, ten-minute square reporting, in addition to the traditional area reporting, became mandatory through ASMFC Addendum XXVI. This first year of higher resolution spatial data will become available for analysis later in 2022. For Maine, from 2008-2018, a randomly selected 10% of each zone and each license class were required to report via harvester logbooks. This changed to an optimized random selection in 2019. All states will require 100% harvester logbook reporting by 2023. A currently pending ASMFC Addendum XXIX may make vessel tracking mandatory for federal permits in the coming years.

For several states including Connecticut, Massachusetts, and New York, state harvester logbooks reported inshore State Statistical Reporting Areas, which in many cases are equivalent to NMFS sub-areas, and/or NMFS Statistical Areas as spatial units prior to 2021. Others solely required NMFS Statistical Areas. In Maine, the available harvester logbooks provide a coarse resolution of reports by Maine Lobster Management Zone and distance from shore (0-3nm, 3-12nm, and 12nm+). To offer a gross characterization of the Maine lobster fishery, a spatial layer has been developed using a combination of the Maine dealer and harvester logbook data to extrapolate the landings, trips, and value by zone and distance from shore. As noted above, selection of the 10% sub-sample of the Maine fleet, prior to 2019, was not based on activity, so the number of licenses reported annually within each zone, especially outside of 12 nautical miles, varies from few to none so multiple years are necessary to estimate the offshore areas. This creates a patchwork of polygons that can characterize the intensity of annual landings, value, or trips per square mile, but is unable to describe the importance of some habitats over others. This assumption of equal distribution of the resource over large areas provides uncertainty around the extrapolation in Maine and nuanced or detailed spatial analyses beyond the NMFS Statistical Areas or sub-areas are not feasible in any region.

Value of Commercial Fishery: In 2021, the ex-vessel value for Maine alone was estimated to be $725 million lbs. In 2019, approximately 126 million lbs. were landed coastwide, representing $630 million in ex-vessel value. In 2016, landings peaked at 159 million pounds coastwide.

Data Snapshot: Data is available for ≥10 years. For most states (excluding Maine), 100% dealer and 100% logbook reporting have been required since 2010, but spatial information may be variable prior to 2021. For Maine, a spatial analysis tool using dealer and harvester logbooks can extrapolate some landing, value, and trips by zone and distance from shore, but has some uncertainty about habitat importance and equal distribution.

Summary: Federal VTR coverage is higher offshore, but lowest where the highest landings occur inshore (See figures A1 and A2 below). Dealer and harvest logbooks may provide some spatial coverage for most states. Maine's analysis tool can be useful but has some caveats.

Figure A1. Percentage Combined 2014-2018 Lobster Landings by Statistical Area. The landings by Statistical Area were estimated by states through the ASMFC Lobster Assessment process. The Lobster Conservation Management Area (LCMA) lines are included for reference.

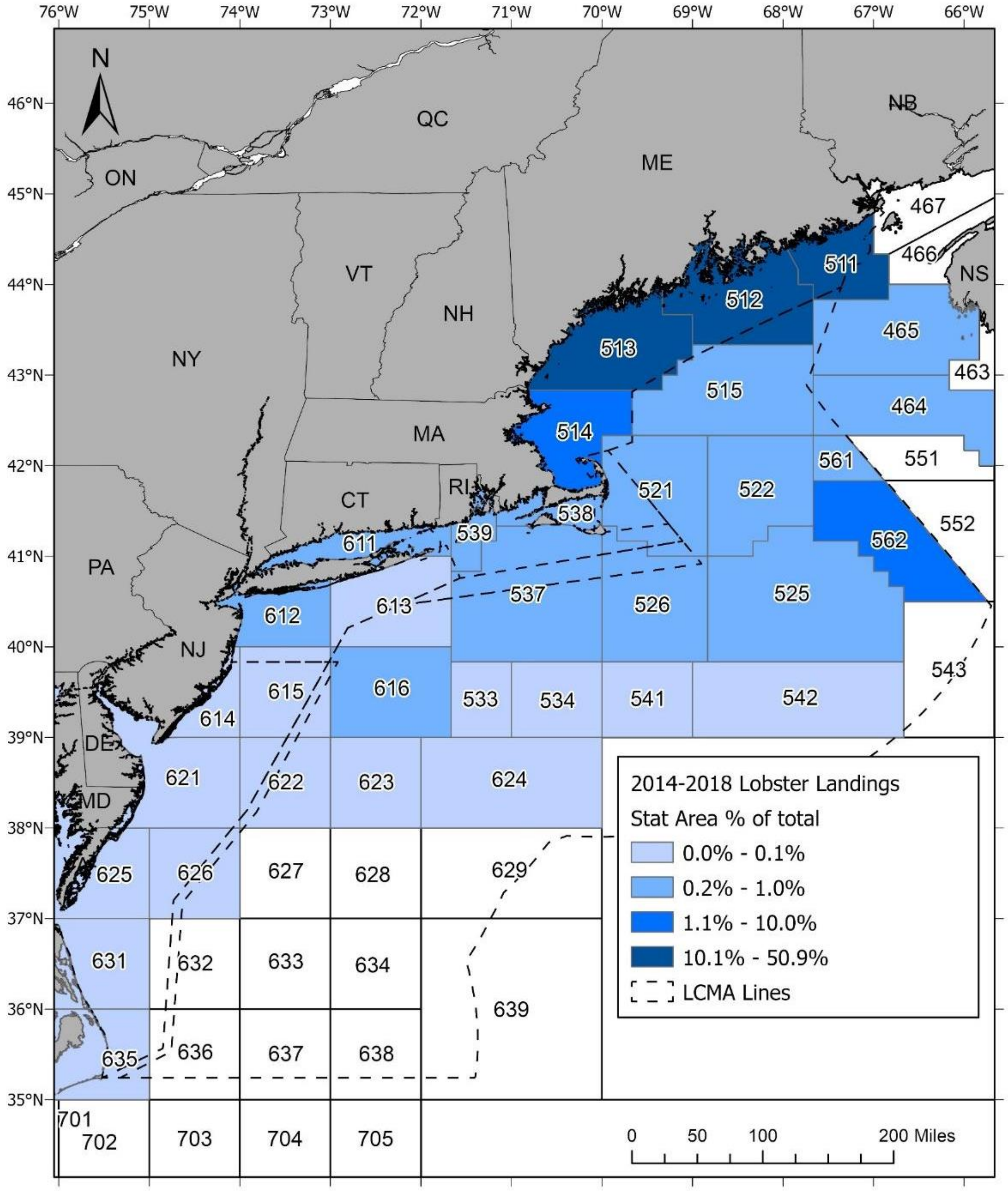
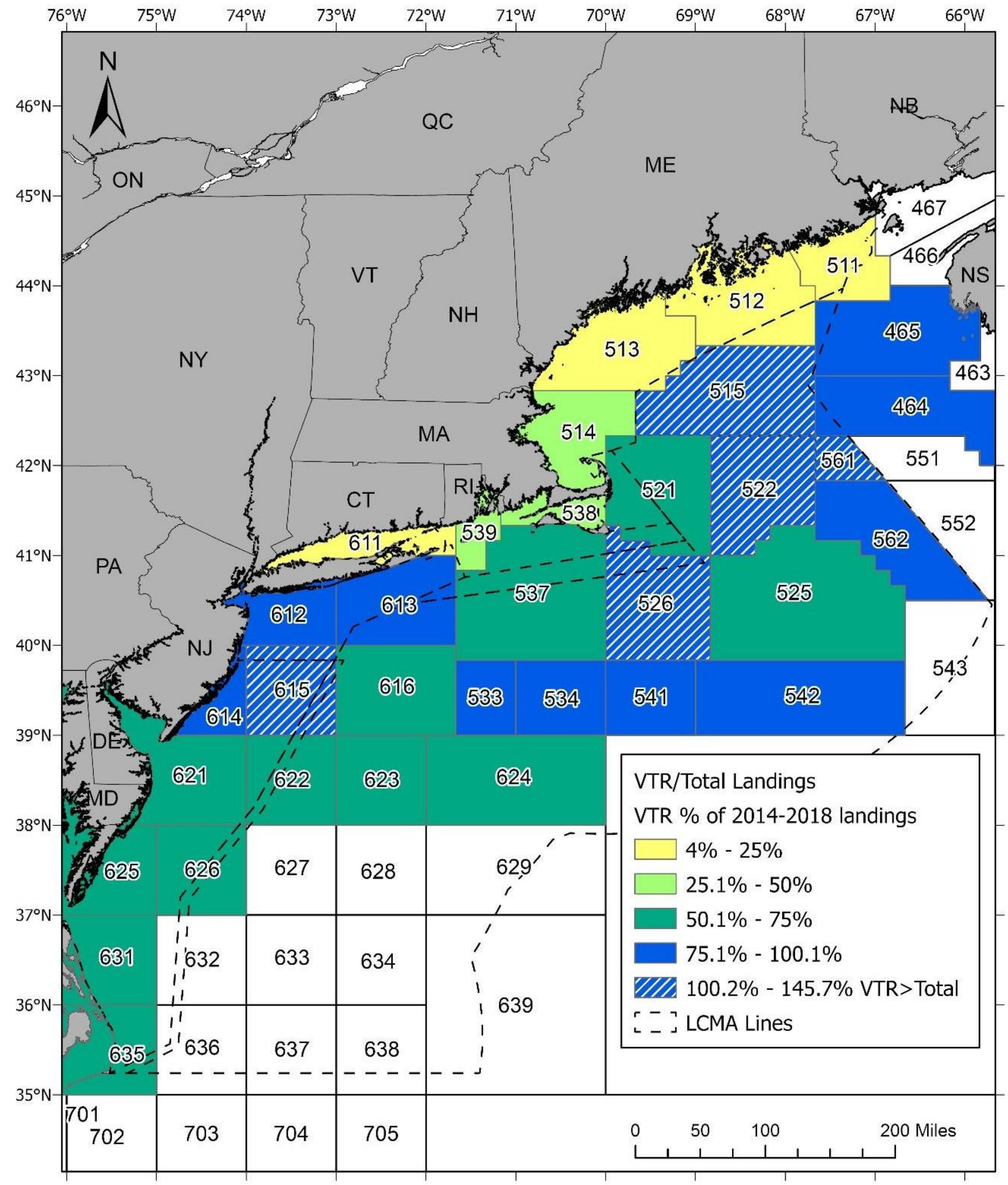


Figure A2. 2014-2018 combined VTR Landings/Total Landings by Statistical Area. Some areas were grouped: 533/534/541/542 and 620's/630's. Areas in hatched blue have VTR landings that are greater than the assigned total landings for those statistical areas and should be used with caution. LCMA lines are overlayed for reference.



WHO IS COMMUNITY OFFSHORE WIND?

Community Offshore Wind, the joint venture between **RWE Renewables and National Grid**, will bring clean energy from offshore wind to the Northeast. Community Offshore Wind's awarded seabed is the largest parcel in the New York Bight with the potential to host 3 gigawatts (GW) of capacity, which is enough to power over one million U.S. homes. The project is expected to be in operation by 2030. RWE and National Grid share a common goal of enabling the clean energy future and offshore wind will be critical for the U.S., particularly in the Northeast, to reduce carbon emissions and meet climate goals. New York has a target of bringing 9,000 MW of offshore wind online by 2035 and New Jersey has a goal of delivering 7,500 MW of offshore wind by 2035.

As the two companies develop offshore wind in the seabed area between New York and New Jersey, they are dedicated to investing in local communities by bringing clean energy jobs to the region and growing the local economy. Community Offshore Wind will deliver sustainable energy safely, reliably and efficiently to the communities they serve. It is important that everyone enjoys the benefits of the clean energy transition, which is why they are committed to **"local, clean energy for all."**

Key Facts	
Lease Size	125,964 acres/197 sq. mi.
Estimated Capacity	3 GW
Estimated Homes Served	1.1 million
Distance to New York	103 km/64 miles
Distance to New Jersey	59 km/37 miles

COMMUNITY offshore wind
believes in local, clean energy for all.

OUR WORKFORCE We prioritize hiring local, diverse talent. We are partnering with workforce training facilities across New York and New Jersey to reach diverse candidates and provide them with the education, training and access they need. We will be working with trade associations and local unions to guarantee a diverse and represented workforce.

OUR SUPPLY CHAIN We are working with local suppliers and women and minority-owned businesses to create an environmentally-conscious, regional supply chain. We will bring the opportunities from manufacturing, installation, operation and maintenance to these businesses.

OUR IMPACT We are committed to serving the underserved. We are working with local, non-profit organizations to provide educational, economic, and environmental benefits to build strong, sustainable communities for the future.

communityoffshorewind.com

ABOUT RWE RENEWABLES

RWE is one of the world's leading companies in offshore wind, active across the entire value chain, from project conception and development, to construction, operation, maintenance, and commercialization. The unparalleled expertise the company has earned over the last 20 years has resulted in 17 wind farms in operation and they are currently constructing one of the largest offshore wind farms in the world. The company recently successfully finished the installation of all turbines of the 857- megawatt offshore wind farm Triton Knoll off the English Coast. Two more projects, the 342-megawatt project Kaskasi, off the German island Heligoland, and the 1.4 GW project Sofia, one of the largest offshore wind farms in the world, are currently under construction.

ABOUT NATIONAL GRID

Serving the needs of more than 20 million people throughout New York and New England, National Grid will bring local expertise in the Northeast along with its experience developing large-scale infrastructure projects across the US and UK. National Grid Ventures (NGV), the unregulated arm of the business, recently launched the world's longest subsea interconnector, North Sea Link, connecting the UK and Norway, and develops and operates onshore wind and solar assets in the US via its National Grid Renewables unit.

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: July 25, 2022

To: Chris Moore, Executive Director

From: Kiley Dancy, Staff

Subject: East Coast Climate Change Scenario Planning Update

On Wednesday, August 10, the Council will receive an update on East Coast Climate Change Scenario Planning, including 1) a recap of the June 2022 scenario creation workshop and 2) a summary of plans for upcoming scenario deepening webinars and management group discussion sessions.

June 2022 Scenario Creation Workshop

A scenario creation workshop was held on June 21-23, 2022 in Arlington, VA, bringing together approximately 65 stakeholders from various disciplines to explore the possibilities of what climate change might mean for the future of fisheries. A summary of the scenario creation workshop, including draft descriptions of the initial scenarios, is in development and will be posted to the meeting page as supplemental material for this agenda item. Workshop materials are available at: https://www.mafmc.org/council-events/scenario-creation-workshop.

Next Steps

The next step in the scenario planning process will include two "scenario deepening" webinars will be held in August 2022. These webinars will offer all interested stakeholders an opportunity to review, validate, and add details to the draft scenarios. These webinars will be held on Wednesday, August 17 from 3:00 – 5:00 p.m. and on Tuesday, August 23 from 10:00 a.m.-12:00 p.m. These 2-hour sessions will begin with an overview of the outputs and stories from the draft scenarios. Participants will then have an opportunity to add comments and suggestions to make the scenarios more plausible, challenging, relevant, memorable, and divergent. For each scenario, participants will be encouraged to imagine specific examples about impacts to particular species, regions, and communities. Participants only need to attend one of the two webinars. The outcome of the two webinars will be a more detailed set of scenarios that will be used as a platform for later stages of the process. Registration information will be posted to: https://www.mafmc.org/climate-change-scenario-planning.

Following the scenario deepening webinars, the core team intends to hold three fishery manager brainstorming working sessions bringing together a cross section of representatives from participating management organizations. The purpose of these webinar sessions would be to have these small groups identify the issues, ideas and options that should be discussed at later scenario planning conversations at Council & Commission meetings during Fall 2022, and subsequently at a Summit Meeting in early 2023. The output from these manager working sessions will ensure that the Councils & Commission will not be starting from a blank slate, but will instead have specific issues to consider and ideas to build on, setting the stage for the later summit meeting.

At their respective November and December meetings, the ASFMC, MAFMC, SAMFC, and NEFMC will set time aside on their agenda for more in-depth discussions of the scenarios, and to develop ideas and recommendations from each management body to support the summit.

An in person summit meeting is tentatively planned for February or March 2023, targeting approximately 50 participants from the participating management organizations. The summit meeting will serve as a venue to discuss the input from manager sub-group and individual management body sessions, with the goal of developing a final set of governance, management, and monitoring recommendations from the scenario planning process.

Additional updates will be posted to the scenario planning website as they are available, at: https://www.mafmc.org/climate-change-scenario-planning.

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: July 28, 2022

To: Chris Moore, Executive Director

From: Kiley Dancy, Staff

Subject: Ecosystem and Ocean Planning Committee Report: Proposed Designation of Hudson Canyon National Marine Sanctuary

On Thursday, July 21, 2022, the Mid-Atlantic Fishery Management Council's Ecosystems and Ocean Planning (EOP) Committee and Advisory Panel met jointly to provide input to the Council to inform scoping comments on the proposed designation of Hudson Canyon National Marine Sanctuary. The materials for this meeting are available at: https://www.mafmc.org/council-events/2022/ecosystem-and-ocean-planning-eop-committee-and-advisory-panel-meeting.

Based on the input received during this meeting, a scoping comment letter is being drafted and distributed to the Council for review prior to the August 8 comment deadline. Once submitted, the Council's scoping comment letter will be posted to the materials for the August meeting at https://www.mafmc.org/briefing/august-2022.

Some relevant next steps for the designation process for the Council to be aware of include:

- **Potential formation of a pre-designation Sanctuary Advisory Council (SAC):** As noted in the briefing materials for the EOP meeting, NOAA's Office of National Marine Sanctuaries (ONMS) may choose to form a pre-designation Sanctuary Advisory Council which would provide input into the designation process. If this occurs, a Federal Register notice would be published seeking comments on the seats that should be represented on the SAC.
- **Council consultation on fishing regulations within the potential sanctuary:** Separate from the public scoping process, the National Marine Sanctuaries Act requires that NOAA consult with the relevant Regional Fishery Management Councils during the designation process for a sanctuary. The Councils are to be provided with the opportunity to prepare draft regulations for fishing within the Exclusive Economic Zone, if the Council deems necessary, to implement the proposed designation. Alternatively, the Council can explain why no additional fishing regulations associated with the sanctuary are necessary. The

Council has been requested to share their recommendations for fishing regulations by **December 31, 2022**.

- **Development of sanctuary designation documents:** Sanctuary designation is a highly participatory process that typically takes 3-5 years. Following conclusion of the scoping process, ONMS will begin development of draft sanctuary designation documents, including a draft EIS with a range of alternatives, proposed regulations and proposed boundaries. These documents will eventually go through a public review and input process.

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

New England Update

August 2022 Council Meeting

Prepared By: Jason Didden, Council Staff

Overview

Several issues under consideration at the New England Fishery Management Council (NEFMC) may affect the Mid-Atlantic. Among these include: Monkfish Framework/2023-2025 Specifications, potential winter flounder accountability measures for the squid fishery, New England's response to the Sturgeon Draft Action Plan, and next steps regarding the surfclam and ocean quahog fishery and Nantucket Shoals.

Monkfish Framework (FW) / 2023-2025 specifications

Pending results of the monkfish "assessment" (calculates the recent survey trend as an adjustment factor) and the NEFMC's Scientific and Statistical Committee's (SSC) setting of an Acceptable Biological Catch (ABC) in October 2022, the Councils will need to set 2023-2025 specifications. Changes to trip limits and/or days at sea limitations are also being considered to reduce discards and increase landings, particularly in the Southern Monkfish Management Area. The action may also adjust minimum gillnet mesh size. The NEFMC has discontinued considering alternatives that would have required use of Vessel Monitoring System (VMS) across the fishery. The NEFMC is expected to take final action at its December 2022 meeting, with the Mid-Atlantic Fishery Management Council (MAFMC) taking final action the following week. The Plan Development Team (PDT) and Monkfish Committee have been developing ranges of options for the various measures, but until the assessment results are better known (i.e. will 2023-2025 ABCs/landings limits be higher or lower?), it is challenging to contextualize the impacts from changes to fishery measures. Variability in discards has historically made it difficult to set aside an appropriate amount of catch for discards, and the PDT continues to explore the performance of various approaches. The Monkfish Committee (Mid members include P Hughes, D Farnham, D Hemilright, P Risi, D Stormer) and Advisory Panel will meet again on August 30, 2022.

Staff recommendation: Stay tuned for further developments. Staff and Committee members will remain engaged.

Potential winter flounder accountability measures for the squid fishery

Amendment 16 to the Groundfish Plan stated that: "for the category described as 'other non-specified', catches will be monitored and if the catch rises above five percent accountability measures will be developed to prevent the overall ACL from being exceeded." Per the attached letter, the NEFMC may consider a Southern New England/Mid-Atlantic winter flounder sub-ACL for small mesh fisheries via FW 65 to the Groundfish Plan. The NEFMC has invited the MAFMC to "consult with us on establishing the AM for small mesh fisheries under their purview."

NMFS/PDT analyses have noted relatively substantial winter flounder catch in the "Squid" fishery. Staff understands that the PDT is further investigating the nature of that catch. Based on previous analyses (e.g. Squid Amendment 20) Mid-Atlantic staff believes that the overall catch estimate is reasonable, that the "Squid" winter flounder catch is almost exclusively in the longfin squid fishery, and mostly during Trimester 2 in southern New England. Those previous analyses were based on 2007-2015 data and will need to be refocused and updated to identify the current discard patterns. The Groundfish Committee will discuss this issue on September 15, 2022.

Staff recommendation: Stay tuned for further developments. Because it appears possible that the NEFMC will set up a sub-ACL for winter flounder that will impact the longfin squid fishery, ongoing engagement through the Committee and PDT processes appears warranted. Depending on the outcome of pending late August 2022 ABC-setting for winter flounder, setting aside enough winter flounder in the "other" category could also prevent the overall ACL from being exceeded.

NEFMC's response to the Sturgeon Draft Action Plan

There was substantial discussion at the last NEFMC meeting on what action might need to be considered by the Councils once the Sturgeon Action Plan is finalized. Some reduction in sturgeon bycatch will be necessary, but it is not currently clear how much reduction will be required, and the Final Action Plan (expected September 2022) may or may not specify an exact needed reduction. The Councils can either initiate an action for 2023 to address sturgeon bycatch reduction, or NMFS will, and the implementation deadline is May 2024. It is not clear what, if any, impact there might be from the recent Court invalidation of the 2021 Biological Opinion due to right whale issues. (See Executive Director's tab for additional information on ongoing protected resource issues.)

Staff recommendation: Stay tuned for further developments.

Next steps regarding the surfclam and ocean quahog fishery, and Nantucket Shoals

This item is in reference to the Great South Channel Habitat Management Area, which, overlaps Nantucket Shoals. The NEFMC's Habitat Committee will meet Thursday, August 18, 2022 to discuss related analyses and PDT input. The NEFMC will discuss in September, and this issue could factor into the NEFMC's 2023 work priorities discussions.

Staff recommendation: Stay tuned for further developments.

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
Eric Reid, *Chair* | Thomas A. Nies, *Executive Director*

July 22, 2022

Dr. Christopher Moore
Executive Director
Mid-Atlantic Fishery Management Council
Suite 201, 800 N. State Street
Dover, DE 19901

Dear Chris:

The Council initiated Framework Adjustment 65 (FW65) to the Northeast Multispecies (Groundfish) fishery management plan at its April 2022 meeting. As part of the framework, the Council is considering adopting additional measures to promote rebuilding of Southern New England/Mid-Atlantic (SNE/MA) winter flounder. The Council may develop a sub-annual catch limit (ACL) and establish an accountability measure (AM) for other federal fisheries catching SNE/MA winter flounder.

At its meeting on June 29, 2022, the Council agreed by consensus to the following motion:

> *That the Council write a letter to the Mid-Atlantic Fishery Management Council informing them of our intention to consider a Southern New England/Mid-Atlantic (SNE/MA) winter flounder sub-ACL for the small mesh fisheries and inquire if they would like to consult on establishing the AM for those small mesh fisheries under their purview.*

The recent 2022 management track assessment of this stock suggests it may not be overfished, but its official status has not yet been changed. Even if it is, Amendment 16 states that: *for the category described as "other non-specified", catches will be monitored and if the catch rises above five percent accountability measures will be developed to prevent the overall ACL from being exceeded*. GARFO's year-end catch reports indicate catches of SNE/MA winter flounder from the squid fishery have exceeded 5% of total catches in recent years, FY2017-FY2020, and increased over this time period (Table 1 and Table 2).

Table 1- SNE/MA winter flounder catch (mt) in the squid and squid/whiting categories of the other federal fisheries sub-component. Groundfish fishery catch shown for comparison. Source: GARFO year-end catch reports FY2017-FY2020.

Fishing Year	Groundfish Fishery	SQUID	SQUID/ WHITING
2017	409.3	35.2	2.9
2018	250.7	47.9	3.2
2019	143.8	66.4	4.8
2020	103.2	57.2	4.8

Table 2- SNE/MA winter flounder percentage of total catch (%) in the squid and squid/whiting categories of the other federal fisheries sub-component. Groundfish fishery shown for comparison. Source: GARFO year-end catch reports FY2017-FY2020

Fishing Year	Groundfish Fishery	SQUID	SQUID/ WHITING
2017	74.3	6.4	0.5
2018	63.0	12.0	0.8
2019	48.7	22.5	1.6
2020	44.2	24.5	2.1

Based on this information, the Council may consider a SNE/MA winter flounder sub-ACL for small mesh fisheries in FW65. If a sub-ACL is established, an AM will also be necessary. As a result, we would like to invite the MAFMC to consult with us on establishing the AM for small mesh fisheries under their purview.

Please contact me if you have questions.

Sincerely,

Thomas A. Nies

Thomas A. Nies
Executive Director

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: July 29, 2022

To: Council

From: Jason Didden, Council Staff

Subject: 2023-2024 Butterfish Specifications

The Council will set 2023-2024 butterfish specifications at the August 2022 meeting. The Monitoring Committee reached consensus on recommendations for butterfish specifications – please see the Monitoring Committee summary (and other supporting documents) attached below:

-Monitoring Committee Summary

-SSC Report – See Committee Reports Tab

-2022 Management Track Assessment available via July 2022 SSC meeting page: https://www.mafmc.org/ssc-meetings/2022/july-25-26

-Staff ABC Recommendation Memo to Chris Moore

-Fishery Performance Report

-Fishery Information Document

MSB Monitoring Committee Meeting Summary - Butterfish

July 28, 2022
Webinar

The Mid-Atlantic Fishery Management Council's (Council) Mackerel, Squid, and Butterfish (MSB) Monitoring Committee met on July 28, 2022. The purposes were to develop recommendations regarding 2023-2024 butterfish specifications and 2023 *Illex* specifications. Given the different topics, two summaries were created – this summary is for butterfish.

Monitoring Committee Attendees: Jason Didden, Aly Pitts, Lisa Hendrickson, and Chuck Adams.

Other Attendees: Greg DiDomenico, Meghan Lapp, and Melanie Griffin.

The MSB Monitoring Committee developed 2023-2024 butterfish specifications recommendations in light of the Scientific and Statistical Committee's (SSC) Acceptable Biological Catch (ABC) recommendations. The Monitoring Committee's recommendations are summarized below (all numbers are metric tons (MT); 1 MT equals about 2,205 pounds):

	Specification	2023	2024	Rationale Summary
	OFL	17,631	16,096	from projections
a	ABC	17,267	15,764	from SSC, scientific uncertainty
b	ACT Buffer %	5%	5%	for management uncertainty
c	ACT Buffer	863	788	a times b
d	ACT (a-c)	16,404	14,976	a-c
e	Butterfish Cap (longfin discards)	3,884	3,884	set by Council
f	Assumed other discards	1,248	1,248	2013-2021 average plus 1 SD
g	Total discard set-aside	5,132	5,132	e+f
h	Landings or "Domestic Annual Harvest" (DAH)	11,271	9,844	d-g
i	Close primary directed at this amount, i.e. with 1,000 mt left; go to 5,000 pound trip limit	10,271	8,844	h-1000

The Monitoring Committee did not see the need for substantial changes given recent fishery performance and the similarity of the new ABCs to the current 2022 ABC (17,854 MT). The recommendations likely set aside more than enough catch for discards, which should maintain fishery stability by avoiding ABC overages (ABC also equals the Annual Catch Limit or ACL). Two previous discard categories have been consolidated into one "other" category, but the outcome is similar. The Annual Catch Target (ACT) buffer should also help avoid ABC/ACL overages. The closure approach, while untested, should balance achievement of optimum yield, avoidance of overages, and avoidance of excessive regulatory discarding from low trip limits. Maintaining the current butterfish cap on the longfin squid fishery should continue to control butterfish discards without creating an unreasonable burden on the longfin squid fishery.

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: July 15, 2022

To: Chris Moore, Executive Director

From: Jason Didden, staff

Subject: 2023-2024 specifications for Atlantic butterfish

Executive Summary

Based on the 2022 Management Track Assessment, as of 2021, butterfish are neither overfished nor experiencing overfishing.

The current 2022 Acceptable Biological Catch (ABC) for butterfish is 17,854 MT. For 2023-2024, staff recommends using the 2/3 M value as a starting point for P* calculations, along with a 100% C.V. The resulting ABCs would be 17,267 MT for 2023 and 15,764 MT for 2024.

Additional information on fishery performance and past management measures can be found in the 2022 Butterfish Fishery Information Document created by staff and the 2022 Butterfish Fishery Performance Report developed by the Mackerel-Squid-Butterfish (MSB) Advisory Panel (AP).

The Council will meet in August 2022 to review the recommendations of the AP, the SSC, the MSB Monitoring Committee, as well as receive input from the public. The Council will then recommend catch and landings limits and other management measures for 2023-2024.

Current Measures and Review of Prior SSC Recommendations

The last setting of butterfish specifications occurred in 2020 and the SSC utilized a 100% C.V. when calculating an ABC. From the 17,854 MT ABC for 2022, a 5% management uncertainty buffer is set aside, potential discards are set aside, and the remaining catch constitutes the quota of 11,495 MT. Approximately 1/3 of the annual catch target is set aside for potential discards. A discard cap on the longfin squid fishery ensures that annual discards are unlikely to exceed what had been set aside.

The directed fishery operates under limited access, and open access/incidental permits are limited to 600 pounds per trip. Vessels fishing with otter trawl gear that possess 5,000 pounds or more of butterfish, must use nets that have a minimum codend mesh of 3 inches. The directed limited access fishery does not otherwise start with trip limits, but the fishery is slowed with a 5,000-pound trip limit for all limited access permits once landings approach 1,000 MT of the quota. Once 100% of the quota is reached, all federally-permitted vessels are subject to a 600-pound trip limit.

Recent Catch and Landings

Since the resumption of directed fishing in 2013, catch has varied between about 1,500 MT and 5,000 MT, and since the substantial increase in quota in 2015, landings have been well below the quotas. See Figure 2 in the Butterfish Information Document. The Fishery Performance Report documents industry perspectives on why recent landings have been low.

Stock Status and Biological Reference Points

There are new research track and management track assessments for butterfish that indicate that, as of 2021, butterfish are neither overfished nor experiencing overfishing. However, there was concern by the research track peer reviewers about the reference point developed through the research track working group. The peer review suggested that a fishing mortality ("F") reference point equal to 2/3 of the assumed natural mortality (M) "may be more appropriate." Taking 2/3 of M = 0.85 and would still be substantially higher than recent realized Fs.

Staff Recommendation

The 2/3 M approach appears to be reasonable recently given the assessment results. Staff recommends its continued use, along with a 100% C.V. While there is considerable variability with the butterfish stock from year to year and thus considerable uncertainty in projections, the stock's apparent resiliency and lack of any negative long term trends suggests that a 100% C.V. is reasonable. Staff also notes the consistency in projected 2022/2023 ABCs across the previous and current assessments. The resulting ABCs would be 17,267 MT for 2023 and 15,764 MT for 2024.

Butterfish
Fishery Performance Report and

Addendum to the *Illex*
Fishery Performance Report

July 2022

The Mid-Atlantic Fishery Management Council's (Council) Mackerel-Squid-Butterfish (MSB) Advisory Panel (AP) provided input via a webform and/or email in July 2022 regarding butterfish and *Illex*. The questions focused mostly on butterfish because the AP already developed a [2022 *Illex* Fishery Performance Report](https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/62266e163deb785057c50968/1646685718710/d_2022+Illex-Mack_FPR.pdf) [1] earlier in 2022. A question was also added for early input on 2022 *Illex* fishing. The Council dealt with longfin squid, chub mackerel, and Atlantic mackerel earlier in the year.

Advisors who provided input included Eleanor Bochenek, Gus Lovgren, Meghan Lapp, Gerry O'Neill, Jeff Kaelin, Pam Lyons Gromen, Greg DiDomenico, and Katie Almeida (8 out of 16 advisors). The questions and a summary of responses follow. The summary captures the individual responses and does not indicate a consensus from the AP.

1. What factors have influenced recent butterfish catch (general, markets, environment, regulations, other, etc.)?

In 2021, longfin squid was a more attractive option than butterfish for vessels.

COVID is still problematic overall. The cargo company Ocean Alliance stopped shipping out of Boston for 4 months. Containers were hard to come by. Chinese ports were backed up/delayed because of a lack of port workers. China was also requiring that US exporters indemnify them if they couldn't receive the shipment once it reached China; they wanted to ship back to the US at no penalty to themselves.

In 2022 so far, high fuel prices and a "tremendous" longfin squid fishery have reduced effort toward butterfish.

---

[1] https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/62266e163deb785057c50968/1646685718710/d_2022+Illex-Mack_FPR.pdf

2. Are the current butterfish fishery regulations appropriate? How could they be improved?

No recommendations were provided regarding current regulations, but there remains concern that imprecise butterfish biomass estimates may cause shutdowns in the longfin squid fishery if a low butterfish acceptable biological catch (ABC), and then a low butterfish cap on the longfin squid fishery, cause shutdowns of the longfin squid fishery (as occurred in the past).

3. What would you recommend as butterfish research priorities?

Recommendations included:

- -Windfarm impacts (on both butterfish and the fishery);
- -More accurate biomass estimates; directed surveys to obtain biomass estimates of butterfish;
- -More precise techniques (e.g. molecular) for identifying butterfish in fish stomach contents as even minor amounts of digestion can render small individuals difficult to identify macroscopically (see Brian Smith's "Consumption of butterfish at various life stages by fishes of the Northeast US continental shelf.");
- -Re-evaluating natural mortality (“M”); and
- -Re-evaluating survey catchability (as the assessment report recommends).

4. What else is important for the Council to know about butterfish?

Although the butterfish fishery is small, it does affect other major fisheries like longfin squid. Newer Council members should know that though NMFS declared the stock overfished (in 2005) and closed the directed fishery for a decade, it was later discovered that the stock had never been overfished in the first place and the fishery suffered for no reason.

A State of the Ecosystem Report product should be developed that provides ecosystem-level advice/information for Councils to consider as specifications and other management measures are established for individual stocks. For example, a state of the ecosystem report summary page for each managed species could be created. It is very concerning that the biomass (and availability to predators) of Atlantic herring and Atlantic mackerel is so low and that both stocks are in low recruitment regimes. A number of studies (for example, see Overholtz and Link 2000[2]) describe how consumption data track prey abundance closely. In the Northeast shelf, butterfish may be rising in importance to predators. The Council (SSC) has used the 1992 Patterson advice (F=2/3M) for the last 10 years to set the butterfish OFL. Since the M estimate for butterfish is much higher than for most other forage species, it is questionable whether this is the best strategy. Since it has been 10 years since this strategy was first employed, it would seem to warrant a re-evaluation, especially given uncertainties around estimating M.

[2] Overholtz, W. J., Link, J. S., and Suslowicz, L. E. 2000. Consumption of important pelagic fish and squid by predatory fish in the northeastern USA shelf ecosystem with some fishery comparisons. – ICES Journal of Marine Science, 57: 1147–1159.

5. The Illex Fishery Performance Report for the 2021 fishery was completed earlier this year and can be found in the documents linked above [on the original webform]**. This report will be provided to the SSC as it sets a preliminary 2023 *Illex* quota in July. We don't have much more information now compared to when the SSC set the 2022 ABC back in March 2022, but we will have the research track peer review summary and some information about the 2022 *Illex* fishery, which has started slowly. The plan is that in March 2023 the SSC will review an update of the various indirect methods developed through the assessment (and used to set the 2022 ABC at 40,000 MT), and then set a final 2023 *Illex* ABC at that time. If there's anything you'd like to add regarding the 2021 or 2022 *Illex* fisheries, or anything else for the SSC to consider as it sets a preliminary 2023 *Illex* ABC, please do so here.**

The 2022 landings to date are minimal because many *Illex* fisherman have been focused on longfin squid. The summer longfin fishery has been strong, and most fresh harvest ("wet boat") vessels with both *Illex* and longfin permits have been engaging in the longfin fishery, especially since the fish are abundant and available close to port (which is important given high fuel costs). *Illex* are further offshore which would entail higher fuel costs. Freezer vessels still target *Illex* all summer regardless of what longfin are doing because that's what they were designed for, and since they can hold product indefinitely, tend to stay out on longer trips, with less running back and forth to port. (They can only freeze so fast also.)

Water temperatures have been pretty cold until recently and could be why we have seen such a slow start to the 2022 *Illex* season. It would be good for the SSC to touch base with the Squid Squad out of Woods Hole (Anna Mercer can provide contact information for that group). They are looking into oceanographic conditions that might be affecting the movement of *Illex* onto and off the shelf. They noted the lack of warm core rings this year as compared to the past.

To put the *Illex* ABC discussion in context, skates have almost the same ABC as *Illex*. Skates are caught by every single fishery in the GARFO region, whether directed or as bycatch, by every kind of gear, and they live on the shelf year-round. Skates have an ABC of 37,236 MT. But for an *Illex* fishery that is seasonal, only caught by a relatively small number of vessels, with only one type of gear, and where the majority of the stock range is out of reach of the fishery, the ABC is 40,000 MT. Last year it was 33,000 MT - a smaller ABC than skates. The comparison of risk of overfishing from the skate fishery vs the *Illex* fishery is much higher regarding skates than *Illex*. Yet, this is not reflected in the quota. Understanding that the *Illex* stock does not have a defined OFL, neither do skates. At the March SSC meeting, the methodology used evaluated a range of *Illex* quotas from 24,000 MT to 64,000 MT. A value of 47,000 MT was found to be consistent with the Council's Risk Policy with an escapement threshold of 50%. All other squid species given as comparable fisheries manage to an escapement of 40%. As using an escapement threshold of 50% is even more conservative than that, it is recommended that the SSC consider a 2023 ABC of 47,000 mt.

The research goal of 'real-time management' should be removed as operationally unlikely and with the potential to reduce the fishery's productivity. For example, a pre-fishery survey may miss the body of fish that could become available later in the fishing season.

Butterfish Fishery Information Document

June 2022

This Fishery Information Document provides a brief overview of the biology, stock condition, management system, and fishery performance for butterfish, 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

- Landings have generally been variable and well below the quota in recent years. 2021 landings and revenues were down compared to 2020. The average ex-vessel price for butterfish increased.
- The recently completed research track and management track assessments found that butterfish was neither overfished nor experiencing overfishing, and biomass in 2021 was above the target.
- Considerable variability is expected in abundance, availability, and landings due to butterfish's relatively short lifespan, environmental factors, and market conditions.

Basic Biology

Atlantic butterfish is a semi-pelagic/semi-demersal schooling fish species primarily distributed between Nova Scotia, Canada and Florida. They are most abundant from the Gulf of Maine to Cape Hatteras and form loose schools. They winter near the edge of the continental shelf and migrate inshore in the spring and offshore in the fall.

Butterfish are relatively short-lived and grow rapidly; few individuals live beyond 3 years. The maximum age reported is 6 years. The recent assessment reevaluated median length (L50) at maturity and median age at maturity (A50) using NEFSC spring bottom trawl survey data for 5,686 females and 5,089 males (1985–2019). For both females and males, the median length at maturity was just over 11cm and the median age at maturity was about 3/4 of one year.

See the 2022 Research Track Assessment report (long version) for more life history information at: https://apps-nefsc.fisheries.noaa.gov/saw/sasi/sasi_report_options.php.

Status of the Stock

Based on the 2022 management track assessment (MTA), the status of butterfish in 2021 was not overfished, with no overfishing occurring, and the stock size was above the target (available at https://apps-nefsc.fisheries.noaa.gov/saw/sasi/sasi_report_options.php). (Figure 1).

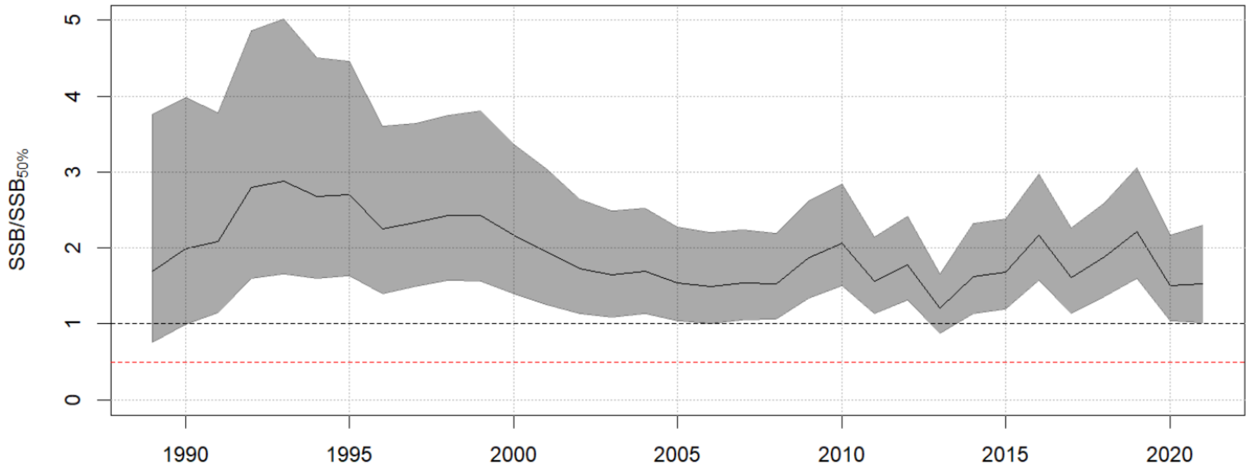


Figure 1. Butterfish stock status, 1989–2021, relative to the 2021 MTA's revised biological reference points, biomass target = "1" or 39,436 MT (upper horizontal dashed line) and overfished threshold = 0.5 or 19,718 MT (lower horizontal dashed line).

Management System and Fishery Performance

Management

The Mid-Atlantic Fishery Management Council (the Council or MAFMC) established management of butterfish in 1978 and the management unit includes all federal East Coast waters.

Limited access commercial vessels can fish year-round until quotas are achieved, subject to applicable gear requirements. Incidental permits are limited to 600 pounds per trip. The ABC for 2022 is 17,854 MT, with a commercial quota of 11,495 MT. If landings get within 1,000 MT of the quota, a 5,000-pound trip limit is implemented to slow the fishery and avoid having to go to the lower 600-pound trip limit that is implemented once the full quota is reached. Additional summary regulatory information is available at https://www.fisheries.noaa.gov/region/new-england-mid-atlantic.

Recreational landings are negligible. There are no recreational regulations except for party/charter vessel permits to catch butterfish, and any vessel that has any Mid-Atlantic party/charter permits must report ALL catch on ALL trips.

Commercial Fishery

Figure 2 below, from the 2022 MTA, describes U.S. butterfish catch 1965-2021. Following, Figures 3-4 describe domestic landings, ex-vessel revenues and prices (inflation adjusted) since 1996. The Gross Domestic Product Implicit Price Deflator was used to report revenues/prices as "2021 dollars." Table 1 describes 2021 butterfish landings by state, and Table 2 describes 2021 butterfish landings by gear type. Table 3 describes 2021 butterfish landings by NMFS Statistical Area as reported in Vessel Trip Reports (Figure 5 at the end shows where the NMFS Statistical Areas are located).

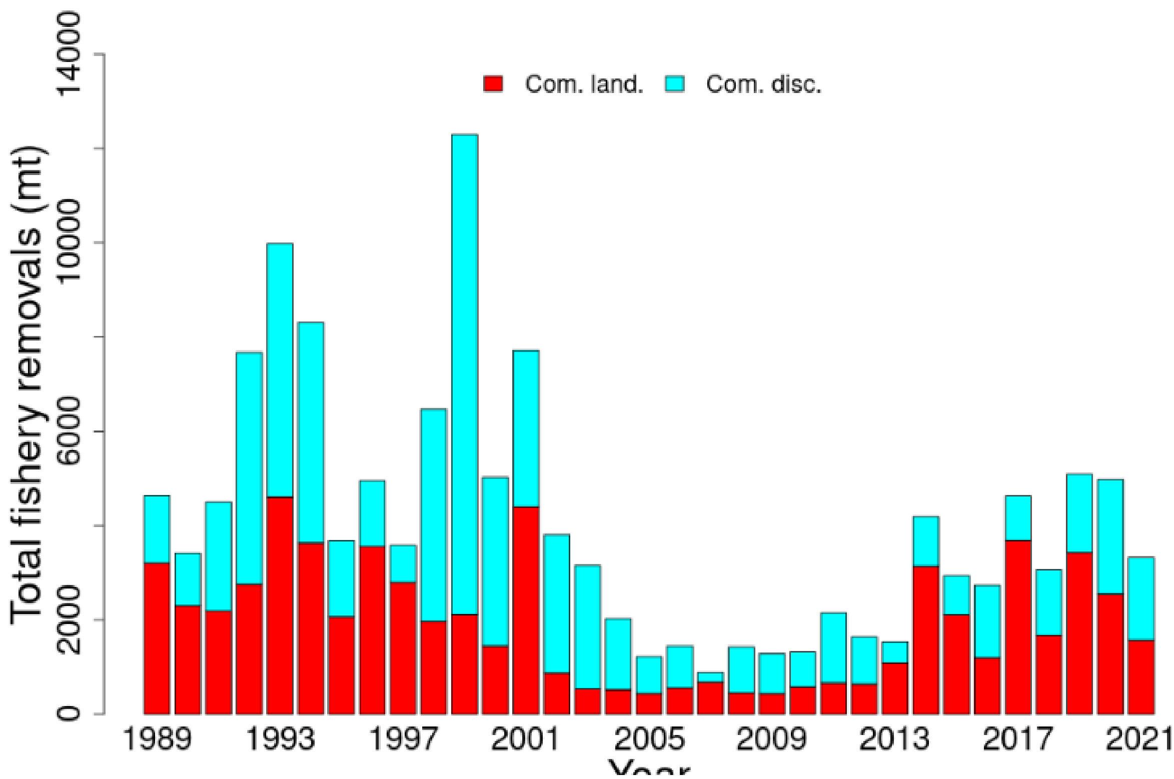


Figure 2. Total commercial catch of butterfish between 1989 and 2021 (landings and discards).

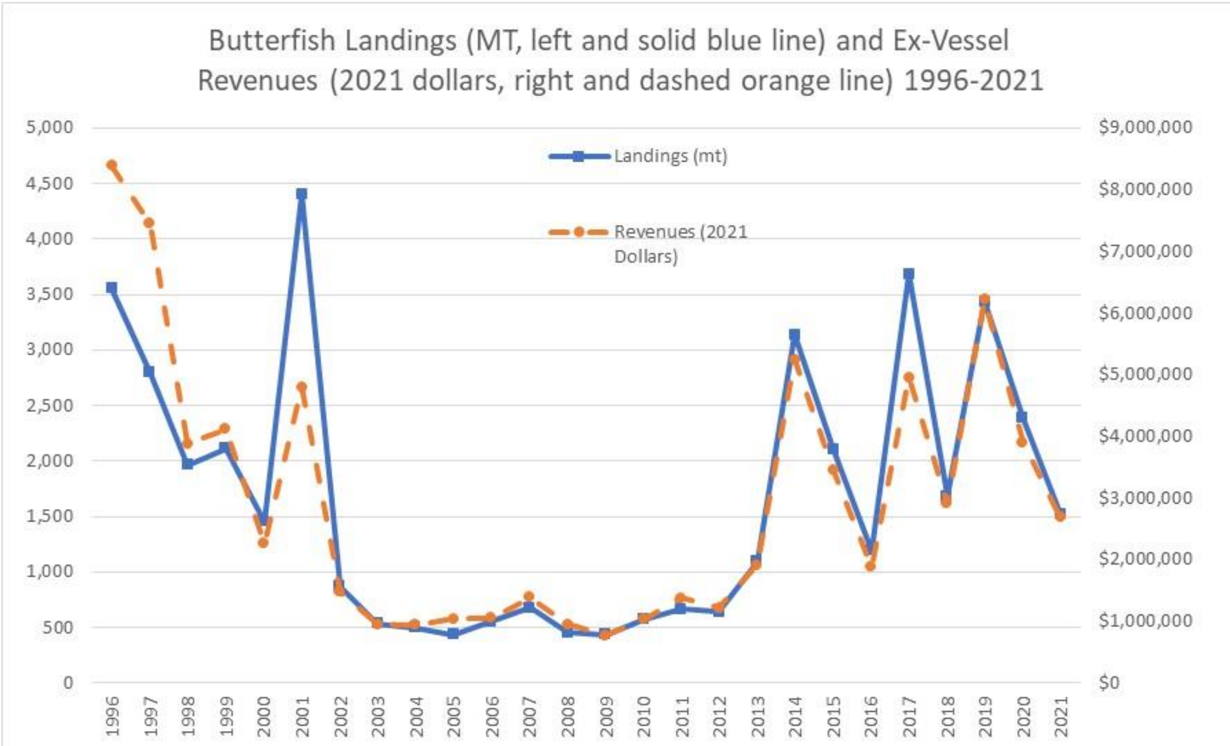


Figure 3. U.S. Butterfish Landings and Butterfish Ex-Vessel Values 1996-2021. Source: NMFS unpublished dealer data.

THIS SPACE INTENTIONALLY LEFT BLANK

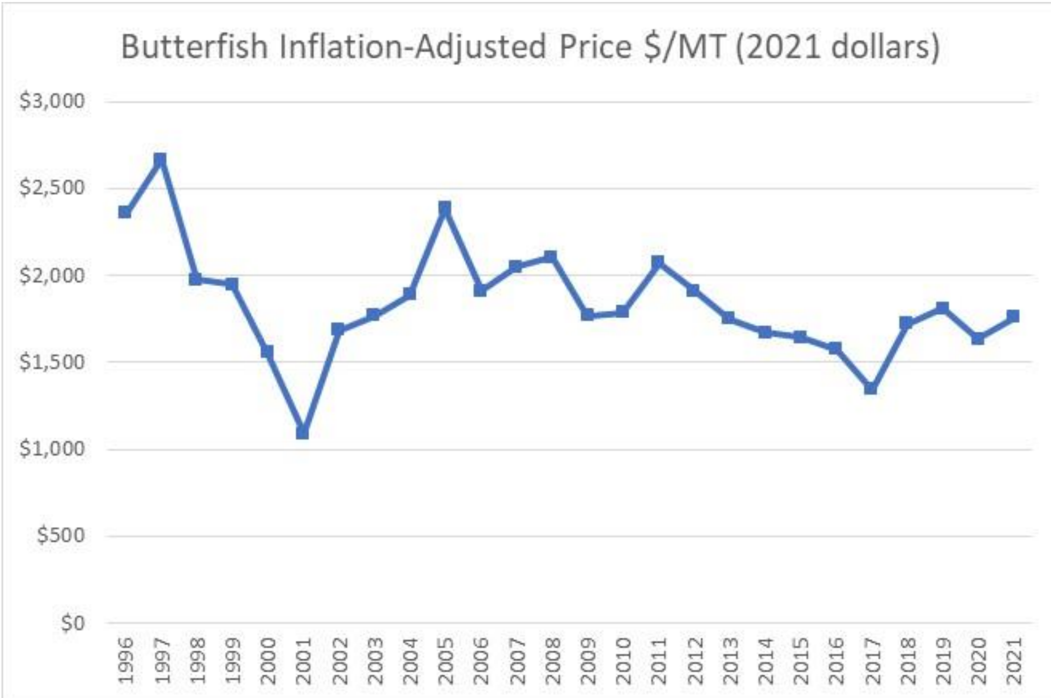


Figure 4. Ex-Vessel Butterfish Prices 1996-2021 Adjusted to 2021 Dollars Source: NMFS unpublished dealer data.

Table 1. Commercial Butterfish landings by state in 2021. Source: NMFS unpublished dealer data.

State	Metric Tons
RI	1,207
NY	180
MA	61
CT	48
NJ	27
Other	2
Total	1,524

Table 2. Commercial Butterfish landings by gear in 2021. Source: NMFS unpublished dealer data.

GEAR	Metric Tons
TRAWL,OTTER,BOTTOM,FISH	1,399
UNKNOWN	100
TRAWL,OTTER,BOTTOM,OTHER	15
POUND NET, OTHER	5
Other	5
Total	1,524

Table 3. Commercial butterfish landings by statistical area in 2021. Source: NMFS unpublished VTR data.

Stat Area	Metric Tons
526	773
537	233
539	139
534	80
616	57
611	56
613	53
525	22
562	17
Other	57
Total	1,486

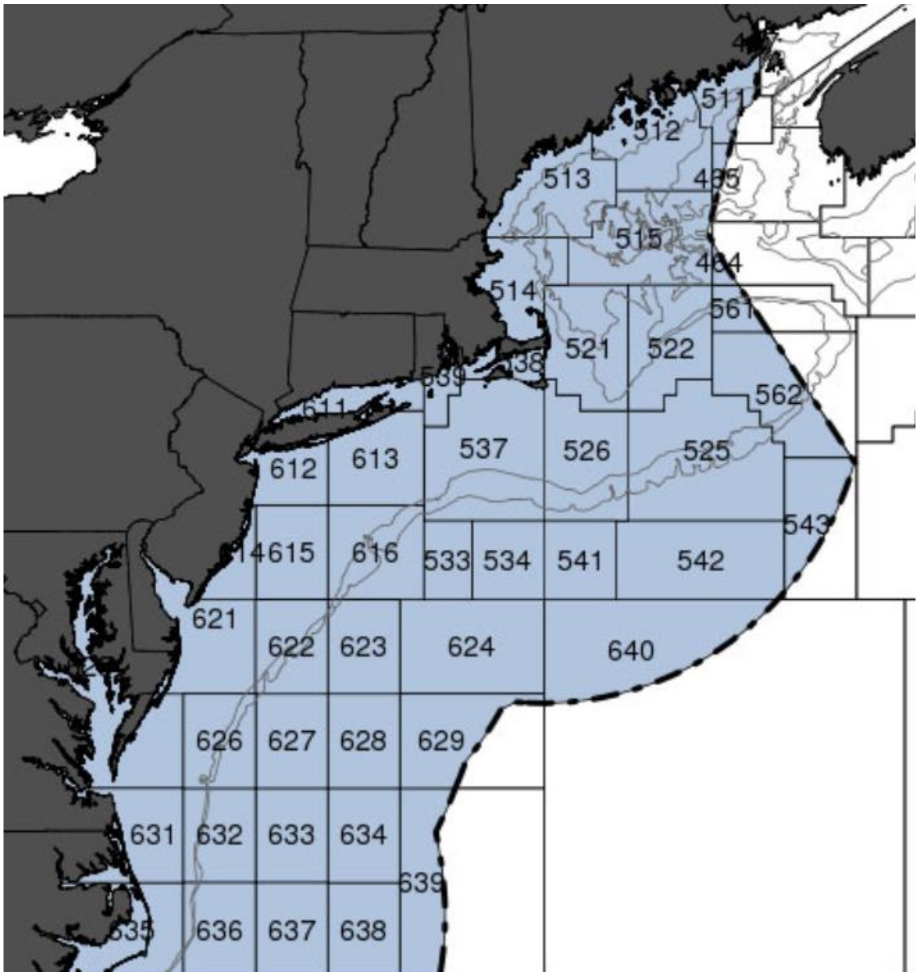


Figure 5. NMFS Statistical Areas

THIS IS THE END OF THE DOCUMENT

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: July 29, 2022

To: Council

From: Jason Didden, Staff

Subject: *Illex* Assessment Process Review

In this briefing book tab, please find the Review of the *Illex* Research Track Assessment Process conducted by Consensus Building Institute staff, and several email exchanges that industry participants in the process requested be included in briefing materials when the Council receives the Review. The Review was conducted under a Council contract in consultation with the NMFS Northeast Fisheries Science Center.

Consensus Building Institute
100 CambridgePark Drive, Suite 302
Cambridge, MA 02140

TEL: 617.492.1414
EMAIL: inquire@cbi.org

Illex Research Track Process Assessment (RTA)

Evaluation

Prepared by
Consensus Building Institute

For the
Mid-Atlantic Fishery Management Council (MAFMC or "Council")

July 12, 2022

Patrick Field – pfield@cbi.org
Dorit Price-Levine – dorit@cbi.org

Table of Contents

I. Background

An initial kickoff meeting for the Research Track Assessment (RTA) for *Illex illecebrosus* (Northern shortfin squid, hereafter *Illex*) was held in January 2021. In March 2021, the RTA commenced. The Working Group (WG) was an interdisciplinary group assembled by the National Marine Fisheries Service's Northeast Fisheries Science Center (NEFSC), and which met frequently into 2022 to discuss data, concepts, modeling results, and research recommendations for the *Illex* stock assessment. Meetings were virtual due to COVID.

The general goals of the RTA process were to generate new research products that could either be used in the *Illex* stock assessment or to inform the assessment and to prepare a stock assessment report for external peer review. While the WG produced models and findings, the process did not unfold as expected because of challenges including:

- non-federal WG members' access to federal data;
- the complexity of assessing the species in question and long-standing disagreement about which models and tools are appropriate and what data and how much is available or necessary;
- disagreement about the assessment WG process and the roles of participants;
- interpersonal obstacles and group dynamics; and
- task performance issues.

These challenges hindered both research progress and consensus building.

The Mid-Atlantic Fishery Management Council (MAFMC), in consultation with the NEFSC, initially contracted with the Consensus Building Institute (CBI) to facilitate the WG because of some of the challenges that became apparent during the RTA. The contract was extended to undertake an evaluation of the *Illex* RTA, to ascertain the nature of the challenges faced by the *Illex* RTA WG, and to provide recommendations to improve future working groups.

Please note the following caveats to this evaluation:

- CBI facilitated the group, so CBI brings its experience and observations, but also potentially its own biases, into the evaluation.
- CBI was not tasked to evaluate management or personnel, although these factors affected the operation of the WG in conducting the RTA.
- This evaluation is not intended to evaluate the full administrative record nor be an exhaustive accounting of all elements, emails, memos, and documents that the process generated. The evaluation process is described below.
- These recommendations were based solely on the assessment of the RTA for *Illex*, not any other RTAs. Therefore, it is unknown whether these recommendations would apply to RTAs overall.

All errors and omissions are the sole responsibility of CBI. When this evaluation uses "we" is it intended to reference the CBI evaluators, the two authors of this evaluation.

II. Evaluation Process

CBI conducted sixteen, one-hour-long virtual interviews with stakeholders in April 2022. Interviewees were primarily WG members, but also included stock assessment process personnel and industry representatives who had attended and participated in WG meetings.

Interviewees were told that their statements would remain anonymous and that they should speak freely. Interviews were conducted by two CBI staff facilitators; one who had been brought onto the WG to facilitate meetings in the Fall of 2021, and the other who possessed no prior firsthand knowledge of the process or people involved to provide for a fresh and outside perspective on the findings. See Appendix A for interview questions. Our findings are primarily based on the interviews, but also consider our observations as a facilitator of the RTA Work Group.

III. Findings

Accomplishments

Strides were made around aging and sequence of cohorts and understanding species growth. Two methods for assessing the stock were advanced, including initial testing of a generalized depletion model that considered ingress and egress. An alternative CPUE model with economic factors was completed. Exploratory work around the species and oceanographic and environmental factors was advanced and holds promise for future research. More research does remain to be done in these areas. The Work Group chair, working under difficult circumstances, was able to bring the group to consensus on several issues. Overall, however, interviewees suggested that there were not as many successes in terms of research gains as would have been expected, considering the scope and purpose of the RTA process.

Challenges

CBI understands that *Illex* is a difficult species to assess, due to its ephemeral presence on and off the shelf, its short and complex life-history, and because most assessment models have been built for finfish. It also appears that over the years, *Illex* has not drawn more resources or attention when compared to traditionally high-value species like scallops or depleted stocks like some groundfish. *In the best of circumstances, this stock assessment was going to be highly challenging.*

Access to Data

Several WG members who were not employed with the NEFSC faced obstacles in accessing federal data sets because they needed to wait on security clearances to meet federal data release requirements to the "public." The process of obtaining that clearance felt obscure and was time-consuming. The barrier to data access slowed down the process by hindering the ability of these scientists to do their work. Further, access to specific sets of data were granted, rather than generally relevant data sources, so the process had to be frustratingly initiated multiple times.

The difficulties in gaining security clearance and accessing data not only prevented WG members from conducting research in a timely manner, but also reduced trust in the group.

Unequal data access among WG members contributed to a perceived dynamic that certain scientists were holding onto key data to prevent other scientists from being able to contribute to advancing research.

Terms of Reference (ToRs)

The development of ToRs is a NRCC iterative process. To begin the RTA, key staff from the NEFSC drafted Terms of Reference (ToRs). The ToRs were then reviewed and approved by the NRCC as well as MAFMC (staff and SSC members) in September 2020. After the ToRs were finalized, some members of the public contended that there should have been an additional ToR for ecosystem considerations. However, because the ToRs had already been "finalized," it proved quite challenging to add a new ToR later in the process.

The history of the ToRs remains contested. We won't try to capture the full history here. We, the CBI evaluators, do note the following as requested by commenters of an earlier draft of this evaluation. Industry raised two ToR concerns in an email to the CBI facilitator 4 March 2022 that had been previously raised in 2020: 1) "A refusal to pursue an explicit Ecosystem-based Term of Reference (TOR), for a stock whose distribution and productivity are thought to be primarily environmentally driven;" 2) "TOR's were edited and debated in a manner such that the final results were created more out of frustration than through an open and deliberative process; this concerns us specifically because the pursuit of data needs activities discussed in TOR 6 will require a strong and healthy industry/science collaboration." The Population Dynamics Branch submitted a memo to the MAFMC *Illex* WG Members and MAFMC Mackerel Squid Butterfish Advisory Panel Members on October 8, 2020, explaining the ToR process and addressing these concerns as the NEFSC saw it. "As one specific example, the terms of reference did not explicitly list availability as a variable to be considered. However, we expect the *Illex* Research Track Working Group to consider availability and environmental influences on availability as part of the evaluation of abundance and biomass indices in TOR#2 and as part of the consideration of environmental factors for possible integration into the eventual assessment model in ToR#4."

In short, the difficulty in adding that additional ToR frustrated members of the public, primarily industry representatives, who felt that ecosystem considerations were essential and deserved an explicit ToR. The long and somewhat adversarial process regarding this ToR issue contributed to the sense of antipathy with the process and lack of transparency.

Delays

There were many delays throughout the process, which meant that the primary generalized depletion model (GDM) was not run until quite late, and therefore the RTA did not provide much 'breathing room' before review or before managers needed upcoming quota advice. Delays were due to lack of data access, the barrier for one WG affiliate to enter the U.S. due to COVID restrictions (causing the assessment lead to have to conduct portions of this person's work as well as their own stock assessment work), performance issues on specific tasks, debate around the applicability of the Falkland's fishery and lack of effective, constructive collaboration between WG members throughout the process. It should be noted that the WG had to work under the difficult and unusual conditions of COVID, the stresses the pandemic put on people's personal and professional lives, and distance engagement, all particularly challenging for a contentious fishery. However, a commenter noted that other RTAs were able to proceed remotely with less difficulty.

Workplans, Milestones, and Clear Agendas

Some interviewees expressed frustration that there was not a clear work plan, even in later stages of the process, that there were not milestones set and accountability if/when they were missed, and that agendas lacked clear, specific, timed topics and objectives. Others recalled that work plans, milestones, and agendas were clear at the outset, but became diluted as some working group members vied for oversight and management, creating an atmosphere of "too many cooks in the kitchen." Some interviewees reflected delays in getting work of various kinds done and the challenges of operating remotely via webinars. At least as some remembered it, the process seemed amorphous, with limited expectations setting at the outset or later around how the group would be moving from beginning to end.

Composition of the Working Group (WG) and Group Dynamics

The WG composition contributed to significant challenges, in that some WG members had long and conflicted histories of working with one another in the past. The members of the group were assigned with full knowledge of these difficult past working relationships. The WG Chair and lead scientist were regularly challenged by other members of the WG and by members of the public. This contributed to a tense environment that discouraged participation by some. As a result of sub-optimal group dynamics, a few WG members tended to dominate the discussion, as well as the discord. This resulted in several WG members remaining largely quiet, passive participants throughout the process, which meant that the WG did not reap the full benefit of the multidisciplinary team that was the WG membership.

Some noted that the interest of some individuals in pursuing publishing as an outcome as well as development of technology not directly relevant to the ToRs seemed to potentially take away from the primary focus of the WG. Some stated that some members of the WG repeated and second-guessed other's work with the intended goal of reaching a higher quota for the fishery. Some interviewees noted that they did not believe all members stated facts clearly, accurately, or consistently.

The WG had numerous skilled and able members. However, it was missing certain kinds of expertise shared among multiple members including additional species expertise and more modeling expertise when compared to other WGs. This posed several challenges. Only a smaller subset of the WG could engage deeply in model development and evaluation due to the complexities of stock assessment modeling, especially methods considered in this WG. Because there was only one lead scientist with substantial *Illex* experience, the scientist was often placed in the crosshairs of debate about the features and nature of the species. This in turn led to contentious discussions, lack of trust, and the inability of the group to have expertise be derived from at least a few, rather than one, person.

Difficulty in Collaborating

Due to the challenges above, the group struggled in full WG meetings to accomplish tasks. In turn, individual members formed smaller cohorts to get the work done – this included the oceanographic work, the aging and sampling of *Illex*, the standardization of the CPUE model with economic factors, and the development and advancement of the models and tools under consideration. While these smaller groups were successful in advancing their work, and some of this smaller group work was likely necessary, the "stove piped" approach inhibited fuller collaboration, inhibited more WG members from contributing more meaningfully, and likely led to missed opportunities to collectively advance a better understanding of this complex species. Furthermore, some noted that participant offers to collaborate on some of the smaller working group topics were not always acknowledged or accommodated.

Industry Involvement

Industry interviewees noted that collaborative involvement in previous stock assessments was more productive and lacked the contention of the *Illex* RTA. Perhaps the combination of lack of clear procedures governing public participation in the WG, and an unusually high degree of interest on the part of the industry to be involved in the RTA led to excessive contention and difficulty. Public comment rules and expectations were not clearly established; at times, the industry felt shut out or not listened to; and at times, members of the WG felt that the industry exchange was hostile, interrogating, and did not advance the science, but rather sought to protect or advance economic interests.

IV. Recommendations

Group Composition and Management Clarity

The composition of the Working Group is one of the most important factors controlling whether the WG can produce a successful stock assessment product that it accepted by the assessment review panel.

Leadership should more carefully consider the combination of personalities, interests, and skill sets of members when evaluating applicants for positions on the WG. Leadership should make the hard decisions early about who is on a work group and who is not. Leadership should pay close attention not only to individual skill sets, but also to how the WG as a whole entity is likely to function in a group process. Members must possess the requisite technical and process skills to be able to contribute successfully to the RTA, which demands an ability to be collaborative, interdisciplinary, and to work in larger groups with industry engagement.

Where possible, there should be more than one species expert in the WG, to increase the spirit of collaboration and sources of knowledge. For the same reason, there should either be more modelers in the WG than was the case with this RTA, or meaningful pre-WG training, for all WG members to better understand the relevant statistical approaches. There should be enough diversity of skill set so that no one individual is holding too much of the responsibility to perform work on their own (which was the case with this RTA). Without these pertinent skill sets on the WG, an RTA seems unlikely to be successful, regardless of how much generalized scientific knowledge or collaboration exists on the team.

Terms of Reference Development

There should be an opportunity for WG members and the public to comment on and influence ToRs at the earliest stage of the RTA. CBI evaluators recognize and commend that the NEFSC has developed generic ToRs in part to avoid past problems and a Work Group can now petition the NRCC for a change in the ToRs. We, the CBI evaluators, do suggest the RTA include additional ToR development steps. This could be achieved through a multi-stakeholder workshop prior to launching an RTA, where experts and industry are invited to discuss the stock, assessment challenges and opportunities, and either develop or respond to a draft set of ToRs. The NEFSC may then refine and hone the ToRs. After approval, the species-specific ToRs, built from the generic ones, could be posted for a public comment period of two weeks before being finalized and re-approved by the NRCC for use in the RTA. The TORs are or could be reviewed by the species' Advisory Panel prior to moving ahead with both management track and research track assessments, to reduce the potential for conflict and misunderstanding with the industry going forward

Streamline Data Clearance and Access

After applicants have been selected for WG, all prospective WG members should be placed through a streamlined clearance process to enable all members to access all potentially relevant data during the RTA. This clearance process should take place before the first meeting of the WG. We, the CBI evaluators, recognize the importance of protecting confidential data as required by law and to the protection of individual businesses and boats. At the same time, without access to relevant fisheries' independent and dependent data, a WG cannot successfully accomplish its tasks.

All WG members should have equal access to data throughout the RTA. Ideally, any data that are not accessible directly by all WG members should not be considered or used in the stock assessment. This would enable efficiency, collaboration, and optimal advancement of research. It is important for maintaining transparency and an equal opportunity to participate in the research process for all WG members.

However, we as the CBI evaluators recognize that there are on-going legal hurdles to making data more accessible to non-federal WG members. Preferably once the RTA has commenced, if it is discovered that additional data that was not previously cleared for access is necessary for the RTA, WG members with access should wait to commence work until that additional clearance is granted, find ways to track the work so others can follow it once their access is available, or find ways to work that instills credibility and trust with others without current access to data. For instance, depending on the specificity of data needed, a WG may be able to use NEFSC staff as proxies to undertake some work in a trusted fashion considering these constraints. Because this waiting for access was a major cause for delay during the *Illex* working group process, perhaps proceeding with data treated for confidentiality for preliminary analysis can keep the process moving while waiting for universal clearance for the more detailed data sets.

This evaluation team is neither expert nor experienced in how government institutions handle data for individual staff's publication and professional advancement needs. However, in addition, the NEFSC should put in place and/or clarify and/or communicate and/or enforce internal protocols that make clear that NEFSC data, however developed, does not belong to any one individual or group of researchers.

Planning, Process, and Communication around Norms and Group Procedures

A clear timeline with milestones along the way should be presented at an initial WG meeting by the WG Chairperson. The timeline will need to be reevaluated over the course of the RTA. However, beginning with the intended goals and sequencing of milestones is crucial for WG members to know what is expected of them, so they can perform to the best of their abilities. While the ToR is the core guiding document of any WG, the ToRs alone are not a process map. The NEFSC should develop means and tools to help Chairs and WG members map those ToRs onto process plans and meeting agendas.

If original research is an objective of the RTA, the timeline must consider the requisite time required to accomplish those elements of the work. Because original research can be unpredictable, care should be taken in tying original research to RTAs. In other words, the RTA operational period should consider the length of time required to complete the planned research products. We do note that the *Illex* WG process was unique in that the pandemic created unavoidable time delays in producing the WG research products.

Meeting agendas should be distributed prior to each meeting, and meeting summaries, as mostly occurred with this WG, should be distributed after each meeting in addition to adding to shared files. This is important for WG members who must miss meetings and for concretizing into institutional memory what took place during the previous WG meetings.

Communication norms should be presented to the WG at the outset of the process and enforced. It should be made clear that personal attacks, and disrespectful language and tone will not be tolerated in the WG. This can be achieved by naming undesirable behavior, ending meetings early, and speaking with individuals between meetings. There should be a commitment to shared education and a prioritization of hearing from a diversity of viewpoints. Leadership should support the WG in achieving these norms, including stepping in to adjust course as needed. The first Working Group meeting should involve the Division Chief or other leadership to clearly lay out expectations for all, in both substance and process.

Roles should be clarified early on, so that all WG members are clear on who is the primary decision maker, as well as on how to best deliver input in the process. The roles of both the Chairperson as well as the Assessment Lead must be made clear to WG members from the start. Clarity around roles will enable further collaboration, knowledge sharing, and flexible thinking. How decisions are made in WG's and what happens if agreement is not reached need to be described in more detail in writing and shared with WG members. This should include clarity around the role played by the WG Chair if there is an impasse (the decider, broker, elevate to leadership, other?), how disagreement should be communicated to other bodies, and what is the obligation of NEFSC staff to reflect the will of the group even if they are uncomfortable with the results in sharing out results.

Work Group Leadership

The WG chair has a difficult and sometimes thankless job of organizing agendas, running meetings, managing group dynamics, project managing to ensure progress is made, undertaking some of the technical work, and helping draft and oversee various reports and final products. The *Illex* Chair was able to help the group reach conclusion through assuming many of these roles as well as drafting the majority of the final report and deserves credit for doing so under difficult circumstances.

We, the CBI evaluators, encourage the NEFSC to think about ways to ensure the Chair can be successful on behalf of the group and have they support they need to be successful. Research Track Assessment workings groups require strong technical, project management, and facilitation skills. NEFSC could include providing additional training for NEFSC staff, developing a particular facilitation skill set within NEFSC staff, or from time to time, if needed, as was done for this effort, bringing in an outside facilitator. It should be noted that we indeed found stock assessment to be a complicated endeavor, so some reasonable measure of stock assessment, fisheries, and modeling is necessary for anyone playing the facilitative role to be effective. We would encourage NEFSC to build internal facilitative capacity first and foremost.

Rules for Industry (or others) Participation

Industry is an essential stakeholder in stock assessments. Not only do they engage with the ocean and the species day-to-day and year-to-year, not only are they potentially directly affected by conclusions drawn from assessments, but industry also collects, reports, and holds enormous amounts of data and information. As an example, industry had provided individual length and size data for many years to the stock assessor and began to provide this information electronically directly into the Science Center recently.

Because RTAs lead ultimately to management decisions through the Management Track Assessments that update RTAs, industry is economically exposed to the implications of the RTA. Therefore, the RTA must balance industry and perhaps other stakeholder involvement with rigorous, independent science. We, the CBI evaluators, suggest that industry should have a meaningful role in helping shape ToRs, providing, and analyzing data, and questioning and debating models, choices, and conclusions. At the same time, if industry wishes to be part of the process, it also bears certain responsibilities: industry representatives should respect the scientific process and the technical skillsets needed to advance assessment and follow the same ground rules as the WG members of listening, engaging in respectful dialogue, and avoiding personal attacks.

Separate Research Track Assessments (RTAs) and Management Track Assessments (MTAs) Sufficiently

For the RTA to achieve its intended goal, there should be sufficient time for brainstorming, experimentation, making mistakes, and returning to the drawing board. Science rarely takes a straight and linear path. Performing under unrealistic time pressure without sufficient resources or data reduces the ability to think creatively and flexibly. Thus, we, the CBI evaluators, encourage the NEFSC to think about further ways to separate out and sequence MTAs from RTAs. Whether that is achieved by deciding that RTA findings cannot be used until the following year, or that the management track and considerations must be separated by at least six months, or by some other means, we do not know, but we encourage the NEFSC and management partners to explore this further.

Recommendations in Summary

To conclude and summarize our key recommendations, please note the below:

1. NEFSC leadership should carefully consider the combination of personalities, interests, and skill sets of members when evaluating applicants for positions on the WG.
2. Where possible, there should be more than one species expert in the WG to increase the spirit of collaboration and sources of knowledge.
3. There should be sufficient modelers on Work Groups to set up, run, debate, and evaluate models given models' inherent complexity.
4. There should be an opportunity for WG members and the public to comment on and influence ToRs at the earliest stage of the RTA.
5. WG members should be put through a streamlined clearance process to enable all members to access all relevant data during the RTA.
6. All WG members should have equal access to data throughout the RTA, whenever possible.
7. NEFSC should put in place or clarify and enforce internal protocols that make clear that NEFSC data, however developed, does not belong to any one individual or group of researchers.

8. A clear timeline with milestones along the way should be presented at any initial WG meeting and be kept up to date and revised as needed for a clear roadmap for the work's beginning, middle, and end.
9. If original research is an objective of the RTA, the timeline must consider the requisite time required to accomplish those elements of that work.
10. Communication norms should be presented to the WG at the outset of the process, supported by leadership, and enforced.
11. Roles should be clarified early on, so that all WG members are clear on who is the primary decision maker, as well as on how to best deliver input in the process.
12. The NEFSC should help ensure that the Chair can be successful on behalf of the group by providing the resources, support, and training needed for success.
13. NEFSC should ensure that the industry has a meaningful role in helping shape ToRs, providing, and analyzing data, and questioning and debating models, choices, and conclusions. At the same time, NEFSC should make clear that the industry also has responsibilities for supporting the scientific and group process in a constructive manner.
14. The NEFSC should think about further ways to separate out and sequence MTAs from RTAs.

Appendix A: Evaluation Interview Questions

1. In what ways has the *Illex* research track assessment advanced our understanding of the species and its abundance and distribution?
2. Please name the three to four biggest challenges or obstacles that the WG faced in completing its tasks?
3. Please comment on the process for developing the Terms of Reference (ToRs)? What did you like about that process? What would you have done differently?
4. Regarding the ToRs, in retrospect, knowing now what you did not know then, what would you adjust or change to those ToRs?
5. How did the process of this research track assessment different from previous stock assessments you have worked on, if any? What worked better? What worked less well?
6. The Research Track is intended to bring in additional and more interdisciplinary expertise into stock assessments:
   a. For *Illex*, what value did this more diverse WG provide?
   b. For *Illex*, what challenges did this more diverse WG create?
7. The research track process is intended to provide some "breathing room" between standard stock assessment and management to explore new methods, approaches, and tools. In your view for this *Illex* assessment, did the process provide that? If not, why not?
8. The research track is intended to provide more transparency and openness into the art and science of stock assessment. In your view for this *Illex* assessment, did the process provide that? If not, why not?
9. MAFMC and the NEFSC sought to support the process, including, for example, answering questions, seeking to address data releases, and bringing in a facilitator. What else could have they done to better support the process and its participants?
10. Please name the two to three changes (or more) that you would recommend making to similar processes in the future to make them more effective. First, define "effective" then describe those recommended changes.
11. How well were the WG's recommendations communicated to and explained to forums such as the Peer Review and AOP?
12. Anything else we didn't talk about that you want to add?

Appendix B: Interviewees

1. Anna Mercer, NOAA Federal
2. Brooke Lowman, Virginia Marine Resources Commission
3. Carly Bari, GARFO
4. Jason T Didden, MAFMC
5. John Manderson, Consultant, Open Ocean Research
6. Lisa Hendrickson, NOAA Federal
7. Mark Terceiro, NOAA Federal
8. Michele Traver, NOAA Federal
9. Paul Rago, Chairman, MAFMC Scientific and Statistical Committee
10. Rob Vincent MIT Sea Grant
11. Sarah Salois, Postdoctoral Fellow NOAA NEFSC (CINAR Affiliate)
12. Russell Brown, NOAA Federal
13. Katie Almeida, The Town Dock
14. Meghan, Lapp, Sea Freeze, LTD and Seafreeze Shoreside
15. Jeff Kaelin, Lund's Fisheries
16. Greg DiDomenico, Lund's Fisheries

From: Greg DiDomenico
Sent: Friday, March 4, 2022 11:11 AM
To: Pat Field <pfield@cbi.org>
Cc: Katie Almeida <kalmeida@towndock.com>; 'Meghan Lapp' <Meghan@seafreezeltd.com>; Jeff Kaelin <jKaelin@lundsfish.com>
Subject: Industry concerns about upcoming Research Track Assessment Peer Review Meeting for Illex next week.

Dear Pat:

We respectfully request you send this to the Working Group upon receiving this email.

On behalf of Lund's Fisheries, Inc., Sea Freeze, Ltd., and The Town Dock we are writing to express our serious concerns about the potential outcomes of the upcoming Research Track Assessment Peer Review Meeting for Illex next week.

Our concerns originate from the highly irregular assessment process that has just been concluded. While the working group allowed for industry participation it started off in controversy and became so unproductive that a facilitator had to be hired. To our knowledge that has never happened before.

We have documented this situation throughout the entire 13-month process with the facilitator, and to NEFSC staff, through personal communications, emails and correspondence.

We feel it is important to a list of a few of these irregularities as follows:

1. A refusal to pursue an explicit Ecosystem-based Term of Reference (TOR), for a stock whose distribution and productivity are thought to be primarily environmentally driven.
2. A modeling approach that was supposed to be fundamental to the final assessment was admitted being of no value, but not before January 2022.
3. A crucial data component for this species, individual weights, remains unresolved. We have known that individual weights are crucial for the Illex assessment, but we are not confident this is collected sufficiently.
4. TOR's were edited and debated in a manner such that the final results were created more out of frustration than through an open and deliberative process; this concerns us specifically because the pursuit of data needs activities discussed in TOR 6 will require a strong and healthy industry/science collaboration.
5. There was an 8-month delay in the provision of essential data to working group members pursuing approaches representing alternatives to the lead assessment scientist's approach. Some of these data requests were not met at all. This delay eliminated time required to thoroughly explore data and methods to the degree necessary to produce accurate and precise results required by the fishery management process.

A thorough response of each of these situations is warranted and for that reason we highlight our concerns for you.

We have given this situation careful consideration and have arrived at one very simple question we would like the peer review to debate and decide.

Based on the all the scientific evidence developed over the 13 months of the 2021 research track assessment is there any evidence that the Illex stock is or has been overfished over the last decade?

We realize that during the peer review, stock status will likely not be determined and that no OFL or MSY will be identified. However, the peer review will have models before them that contribute to an understanding that the fishery foot print is small and that the fishery is limited in duration, thereby creating the opportunity for the escapement of most of the available stock each year. This understanding could lead to the development of a proxy for MSY, setting aside any overfishing concerns.

Sincerely,

Katie Almeida, The Town Dock
Greg DiDomenico, Lund's Fisheries
Jeff Kaelin, Lund's Fisheries
Meghan Lapp, Sea Freeze Ltd.

From: Meghan Lapp
Sent: Monday, July 12, 2021 5:51 PM
To: 'jon.hare@noaa.gov' <jon.hare@noaa.gov>
Cc: gregdidomenico@gmail.com
Subject: FW: Illex Squid Assessment Stakeholder Session Reminder

Hi Jon,

I'm writing this because although I have been trying to think about the best way to address it, I have been extremely busy running a fish plant at the same time. I want to draw the below notice, which went out over the NOAA listserve on Friday, to your attention. I am actually incredulous this happened. Because the illex industry has been attempting to work collaboratively with the NEFSC, the MAFMC SSC, the MAFMC's Illex WG, folks in GARFO, academia, etc., for the past two years in order to get a good solid science and management approach for this stock, and because we keep getting rebutted in various ways by NEFSC staff, I am now writing you as the NEFSC director to express my frustration. We are currently still attempting to work collaboratively with the NEFSC Cooperative Research staff, which we desire to continue doing, but continued non-collaborative behavior from other NEFSC staff will put this in jeopardy.

This is a brief rundown of how we got to where we are now:

1. There is no illex assessment that has passed peer review; therefore management of this stock has always been based off historic catches rather than science. The illex industry at its own

expense organized, hosted, and helped prepare scientific data for an "Illex Summit" in 2019, where we invited scientific and regulatory folks from the NEFSC, GARFO, MAFMC, MAFMC SSC, MAFMC Illex WG, academia, WHOI, RI DEM, in order to share industry expertise/knowledge and try to prepare collaboratively for the upcoming illex assessment and MAFMC management. Out of this effort, various scientific products were developed, and presented to the MAFMC SSC, with positive results. The summit was not attended by the lead assessment scientist despite an invite.

2. The illex industry has attempted to collaborate and engage in the current illex research track assessment, particularly through continuing to develop products that came out of the illex summit through the RTA. Because some of these useful products were ecosystem focused, we specifically asked that ecosystem TORs be included in the assessment TORs, similar to the butterfish and other assessments. Since ecosystem TORs are now pretty standard in assessments, we were surprised when Science Center staff refused the request. We were told the ecosystem TORs were "implied" rather than explicit, which is concerning if peer reviewers are unaware that they are "implied" since peer reviewers stick to the TORs in their review.

3. At the very first assessment meeting, a highly data hungry maturity at age model was discussed by the lead assessment scientist. It was noted that such an approach would require information, funding, and resources that do not exist to use for future implementation of this type of approach. It was never discussed again, until recently. The WG worked for 6 more months on the assessment, during which time the lead assessment scientist refused to provide other WG members with information necessary to perform their tasks on further refining alternative approaches other than the one discussed at the first meeting.

4. The next time the data hungry approach was discussed was at the last WG meeting in June, after 6 months of no discussion or work on it. At this meeting, the lead assessment scientist put forward a more detailed form of the approach and it seems to have now become the major focus of the assessment, potentially to the detriment of the other alternative approaches that have been worked on for the entire time and which would be useful from a management perspective. It was noted at this meeting that even if the approach were to pass peer review, which is unlikely since it has failed multiple times in the past, it would require the MAFMC to actually initiate a management action to implement the approach for management. This could take years, which in the meantime would leave the MAFMC SSC with nothing to work with for setting management measures. Essentially, we as an industry would be right where we are now, with ad hoc, year by year measures.

5. Therefore, industry members requested a call/meeting with assessment WG members to voice these concerns and discuss. The WG chair sent out a Doodle poll to see what people's availability was. The next thing we know, the initiative has been taken on by other NEFSC staff and there is a giant public announcement that is sent out to the entire NOAA regional listserve. Not that we are trying to keep anything a secret, but WG meetings are not even noticed via this medium. To know what dates the WG is meeting, you have to go to the NOAA assessment website- nobody sends out an email blast to thousands of people across the country. Additionally, we don't even now know who will be there, since only like 4 out of 9 assessment WG members even responded to the original Doodle poll. However, NEFSC has now arranged an "outreach" team to handle the meeting, which seems like this will not be a productive session regarding the assessment but more of a PR stunt. My most recent email conversation with Russ

Brown clarified that – although this entire fiasco came about because industry requested to have a meeting to ask the assessment WG questions-this is not anything to do with the WG (even though the Doodle poll sent out was titled "Industry Q&A with the Illex RTA WG"). It is now apparently a "listening session" being led by NEFSC staff not even a part of the WG. This is insulting considering the collaboration we have attempted to maintain for years throughout this process. It is the WG members we requested to talk with to ask questions and raise concerns. Not Center staff who have not been involved up until this point who are trying to "catch up" on illex science.

6. I should also mention that there has been a lack of scientific integrity by the lead assessment scientist during this process which has been especially frustrating. I will give two examples. The first is that during one of the first assessment WG meetings, one of the WG members unfamiliar with the stock asked her what the current state of Canadian productivity was for this stock. She responded "low". However, she was the co-author of the most recent NAFO assessment which stated that the current status of the stock in Canadian waters appeared to be a high productivity state. I actually had to quote the exact document, with references, in the chat box because the lead assessment scientist blatantly misled WG members. The second example is that the lead assessment scientist last year developed a research proposal related to the assessment that multiple industry entities requested a copy of. NEFSC staff refused to share the proposal, responding that it was proprietary/intellectual property. However, the proposal was shared with other industry entities. This proposal is in fact what the new data hungry stock assessment approach is based on. It does not even conform to basic scientific requirements. For example, the proposal states that it obtains samples from as few vessels as possible to reduce bias. This is ludicrous; to reduce bias you need as many samples from as many vessels as possible to get a good representation of reality and reduce bias. That's science 101. Additionally, the samples were taken from smaller vessels from the fleet which have limited geographic range; the assessment scientist's own work details that maturity at age varies from the southern to northern range of the stock, so a limited geographic range of samples actually works against this dynamic and biases the results. This is not scientific integrity. It is a desire for a specific result or approach regardless of fact.

I am extremely disappointed at all of the above, given that we as an industry and Seafreeze in particular has always been collaborative with the NEFSC. We in particular have voluntarily shared our proprietary grading data with the NEFSC for decades, hoping to create better science (despite the lead assessment scientist asserting at SSC meetings that no industry data had been provided). However, this continued behavior by NEFSC staff and agency response does not give us any reason to want to continue to do so. It is in the best interests for all if good science can be produced, particularly science that can be used successfully in management. But in order for that to happen, behavior needs to change.

Meghan Lapp
General Manager Seafreeze Shoreside
Office: (401) 267-4470
Cell: (401) 218-8658
Email: Meghan@seafreezeltd.com

From: Northeast Fisheries Science Center <nefsc.noaafisheries@public.govdelivery.com>
Sent: Friday, July 9, 2021 10:03 AM
To: Meghan Lapp <Meghan@seafreezeltd.com>
Subject: Illex Squid Assessment Stakeholder Session Reminder

Having trouble viewing this email? View it as a Web page.

July 9, 2021

Illex Squid Stakeholder Session July 13

The Research Track stock assessment for *Illex* (shortfin) squid, includes a virtual stakeholder listening session on July 13th, from 1:00 p.m. to 3:00 p.m.

Agenda:

1. Welcome, introductions, meeting purpose
2. Brief overview of the assessment, key Terms of Reference, and an update on where the Working Group is in the process
3. Questions/ideas regarding progress already made, or work yet to be done
4. Additional input and/or broader questions
5. Wrap-up and next steps

To join this session, please register using this RSVP link no later than **July 12th**. If you are unable to attend but would like to add a question or comment, you can submit one in the RSVP link.

Once you have registered, a WebEx meeting link will be sent to the email address you provide.

Additional information can be found on the Illex Working Group webpage

We hope that you can join us.

Questions?

Contact: Michele Traver, NEFSC assessment process lead

Northeast Fisheries Science Center (508) 495-2239

SUBSCRIBER SERVICES:
Manage Subscriptions | Help

From: Paul Rago <paulrago22@gmail.com>
Sent: Tuesday, June 1, 2021 11:04 PM
To: Greg DiDomenico <gDiDomenico@lundsfish.com>
Cc: wilberg@umces.edu; miller@umces.edu; Jason Didden <jdidden@mafmc.org>; Chris Moore <cmoore@mafmc.org>;michael.luisi@maryland.gov; pakafish1@yahoo.com; Peter Hughes <phughes@atlanticcapes.com>; John Manderson <john.manderson@openoceanresearch.com>; jon.hare@noaa.gov; michael.simpkins@noaa.gov; russell .brown@noaa.gov;Lisa.Hendrickson@noaa.gov; Jeff Kaelin <jKaelin@lundsfish.com>; Wayne Reichle <wreichle@lundsfish.com>; Jeffrey Reichle <jreichle@lundsfish.com>; Katie Almeida <kalmeida@towndock.com>; Brendan Mitchell <bpm@norpel.com>; Meghan Lapp <Meghan@seafreezeltd.com>; Gerry O'Neill <gerryjr@capeseafoods.com>; Muffley, Brandon <bmuffley@mafmc.org>
Subject: Re: Illex Industry / SSC Comments

Hi Greg,
Attached please find my response to your email of May 21. As noted in the attached, this response relies heavily on the discussions by the SSC but it is not a formal response of the SCC. I believe many of the concerns you raised are addressed in the SSC report to the

Council. For other questions, I offer some perspectives on how the scientific advice is crafted and the prospects of the Research Track Assessment for future advice.
Please let me know if I can be of further assistance.
Best regards,
Paul

On Fri, May 21, 2021 at 4:35 PM Greg DiDomenico <gDiDomenico@lundsfish.com> wrote:

Dear Dr. Rago,

One behalf of Lund's Fisheries, Cape Seafoods, The Town Dock, NORPEL and Seafreeze we offer the following comments and questions and respectfully request a response.

During the May 10th and 11th SSC meeting a determination was made of the most important **"sources of uncertainty"**associated with the illex assessment.

They are the following:

1. The extent, distribution and magnitude of the illex stock remains poorly defined.
2. We lack biomass and exploitation rate estimates for this species.
3. The extent to which the catch is driven by variation in availability to the fishery as opposed to variation in underlying abundance remains largely unknown.
4. The reliability of the F 40% Fmsy proxy as a foundation for decision making is.
5. The level, extent and inter – annual variability in immigration into, emigration from and recruitment to the stock.

The industry respectfully requests that the SSC determines a similar list entitled **"sources of certainty".**

We thought we would offer a few for your consideration:

1. According to the most recent NAFO assessment, since 2017 Fishery catches have been relatively high in all NAFO regions since 2017 . At the same time abundance indices from fisheries independent have also been high in all NAFO regions. The indices are at levels that have not been observed since 2006 and in some cases they are higher. The fact that fisheries catches and fisheries independent survey indices of abundance for Illex are at high values throughout the northwest Atlantic suggests that the stock is in a high productivity state.
2. Significant portions of the species range serve as a refuge from fishing mortality and serve as areas of "escapement". The US fishery occurs primarily in 2 small areas of the outer edge of the continental shelf in Southern New England and Mid Atlantic Bight that is estimated to be only about 900 square nautical miles. Areas that are not fished includes the shelf slope sea where the squid are known and documented to be abundant.
3. In addition to the refuge from fishing provided to the squid in the shelf slope sea, and by their pelagic lifestyle, fishery regulations, including the Frank R. Lautenberg Deep-Sea Coral Protection Area, the Northeast Canyons , the tilefish and lobster gear restricted areas, and other regulated mesh areas in Southern New England and the Mid Atlantic Bight that prohibit

the use of small mesh trawls. Industrial scale fishing for squid is also limited by fishery regulations in Canadian waters including the Scotian shelf. A recent analysis by members of the Illex Working Group indicated that less than 1.2% of the species range that could be documented using routine fishery independent surveys of the continental shelf was accessed by the US fishery. In that analysis 98.2% of the area occupied by the species on the shelf is not fished and are undisturbed.

4. As a result a large portion of the species range is therefor not fished and thus provides for fishery escapement for Illex population which appears to be in a high productivity state on the basis of available data fishery dependent and idependent data.

In addition to this we ask the SSC to answer the following in regards to their list of "uncertainties".

1. Which sources of uncertainty could be evaluated by our current knowledge of the species?
2. Which sources of uncertainty cannot be evaluated in a way that satisfies SSC standards?
3. Why have these sources of uncertainty remained uncertain, unidentified, unpursued or unknown?

Thank you.

Greg DiDomenico
Lund's Fisheries

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NOAA FISHERIES SERVICE
166 Water Street
Woods Hole, MA 02543-1026

October 8, 2020

TO: MAFMC Illex Working Group Members
MAFMC Mackerel Squid Butterfish Advisory Panel Members

FROM: Russell W. Brown, Chief
Population Dynamics Branch

Michele Traver *Michele Traver*
Assessment Process Lead

SUBJECT: Terms of Reference (TORs) for the Illex Research Track Stock Assessment

As the Northeast Region Coordinating Council (NRCC) initiates the Illex and Butterfish Research Track assessments, we've received questions about the overall assessment process and the process for developing terms-of-reference. Several questions and concerns were raised at the recent meeting of the Mid-Atlantic Fisheries Management Council (MAFMC) Illex Working Group, particularly around how the Research Track and MAFMC Illex Working Groups relate and consideration of availability in the terms-of-reference.

As to how the two groups relate, the research track is intended to ensure that stock assessments are improved based on consideration of the full suite of data, ideas, and questions. Thus, our intent is to ensure that the relevant work, ideas, and recommendations of the MAFMC Illex Working Group inform the Illex Research Track Working Group. There may also be overlap in membership, although the Research Track Working Group is still being formed.

As to the terms-of-reference, the NRCC assessment process involves review of terms-of-reference by NRCC members, including the MAFMC, Northeast Fisheries Science Center (NEFSC), Greater Atlantic Regional Fisheries Office, New England Fisheries Management Council, and Atlantic States Marine Fisheries Commission. Since the NRCC assessment process is new, starting in 2020, research track terms-of-reference for the first few research track assessments follow the traditional benchmark terms-of-reference process, where NEFSC staff propose terms-of-reference, which are then reviewed by NRCC members and revised through an iterative process. In the future, we anticipate forming research track steering committees ahead of time to consider scientific issues and develop or refine the terms-of-reference for the eventual research track assessment.

For the Illex Research Track assessment, the terms-of-reference have been finalized through the NRCC iterative process. Terms-of-reference are designed to guide research track working group's efforts and are not intended to mention every data stream, variable, or analytical technique to be considered. Terms-of-reference are intended to be broad and can incorporate a range of ideas and recommendations of the MAFMC Illex Working Group. We expect the Illex Research Track Working Group to consider outputs of the MAFMC Illex Working Group as the Research Track assessment begins. The NEFSC will convey this expectation to the Illex Research Track Working Group Chair, once the working group is formed. As one specific example, the terms of reference do not explicitly list availability as a variable to be considered. However, we expect the Illex Research Track Working Group to consider availability and environmental influences on availability as part of the evaluation of abundance and biomass indices in TOR#2 and as part of the consideration of environmental factors for possible integration into the eventual assessment model in TOR#4.

For those interested in more information on the NRCC stock assessment process, a description is available at https://s3.amazonaws.com/nefmc.org/Stock-assessment-process-June2020.pdf. If you have any further questions or concerns, please feel free to contact Michele Traver (Assessment Process Lead) or Russell Brown (Population Dynamics Chief) at the NEFSC.

cc
B. Muffley
J. Didden
C. Moore
M. Simpkins
J. Hare

From: Gregory DiDomenico <gregdidomenico@gmail.com>
Date: September 25, 2020 at 2:17:39 PM EDT
To: "Muffley, Brandon" <bmuffley@mafmc.org>
Cc: Jeff Kaelin <jKaelin@lundsfish.com>, Jeffrey Reichle <jreichle@lundsfish.com>, Wayne Reichle <wreichle@lundsfish.com>, Meghan Lapp <Meghan@seafreezeltd.com>, Katie Almeida <kalmeida@towndock.com>, Paul Rago <paulrago22@gmail.com>, "Miller, Thomas" <miller@umces.edu>, John Manderson <john.manderson@openoceanresearch.com>
Subject: Fishing Industry Working Group Recommendations for Illex TOR's

Dear Brandon:

As members of the Fishing Industry Working Group we offer the following suggestions for terms of reference in the November 2021 research track assessment for *Illex illecebrosus.*

In addition to the standard TORs for assessments related to catch, fishery dependent data, stock status and estimates of vital rates, including fishing mortality, we respectfully request you also consider:

A two - part Ecosystem TOR

TOR 1. Spatial and ecosystem influences on stock dynamics:

a) Evaluate information related to the geographic & habitat range of Illex and the availability of the population to US and Canadian fishery independent surveys and US and Canadian fisheries. Review impacts of stock range and population availability on the interpretation of fishery independent and dependent indices of abundance and stock condition including age and growth and mortality, including fishing mortality.

b) Evaluate whether changes in population productivity, shifts in species distribution or both processes underlie the persistent changes in fishery catch since 2015. Include an examination of possible ecological mechanisms including changes in oceanic habitat dynamics.

We would also like the following TOR to be included, prior to that which typically asks for recommendations for future research:

TOR # ? Develop a "Plan B" approach for use if the assessment model fails. In the event that a "Plan B" approach is not possible, develop explicit guidance on the type of scientific and management advice that can be derived from information available for the stock.

We also feel strongly that the lessons learned from our Illex Summit, and the information developed in the working papers submitted to the SSC for the 2020 specifications process, should inform the upcoming research track assessment.

Thank you for the opportunity to comment.

Greg DiDomenico
Lund's Fisheries

Meghan Lapp
Seafreeze

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: July 29, 2022

To: Council

From: Jason Didden, Staff

Subject: 2023 *Illex* Specifications

The Council will set 2023 *Illex* specifications at the August 2022 meeting. These will be preliminary specifications in that the Scientific and Statistical Committee (SSC) may recommend changes in March 2023. The Monitoring Committee reached consensus on recommendations for *Illex* specifications – please see the Monitoring Committee summary (and other supporting documents) attached below:

- Monitoring Committee Summary
- SSC Report – See Committee Reports Tab
- 2022 Research Track Assessment available via July 2022 SSC meeting page: https://www.mafmc.org/ssc-meetings/2022/july-25-26
- Staff ABC Recommendation Memo to Chris Moore
- Fishery Performance Report (see also question on *Illex* at end of Butterfish Fishery Performance Report in Butterfish Specifications Tab)
- Fishery Information Document

MSB Monitoring Committee Meeting Summary - *Illex*

July 28, 2022
Webinar

The Mid-Atlantic Fishery Management Council's (Council) Mackerel, Squid, and Butterfish (MSB) Monitoring Committee met on July 28, 2022. The purposes were to develop recommendations regarding 2023-2024 butterfish specifications and 2023 *Illex* specifications. Given the different topics, two summaries were created – this summary is for *Illex*.

Monitoring Committee Attendees: Jason Didden, Aly Pitts, Lisa Hendrickson, and Chuck Adams.

Other Attendees: Greg DiDomenico, Meghan Lapp, and Melanie Griffin.

The MSB Monitoring Committee developed 2023 *Illex* specifications recommendations in light of the Scientific and Statistical Committee's (SSC) 40,000 metric ton (MT) Acceptable Biological Catch (ABC) recommendation for 2023.

The Monitoring Committee noted that based on action earlier in 2022, an adjustment to the 2022 *Illex* specifications is anticipated soon, which would set an ABC of 40,000 MT and a quota of 38,156 MT after discards are accounted for. The adjustment should also change the closure threshold from 94% to 96%.

Given the SSC did not change the ABC at this time, and considering recent fishery performance, the Monitoring Committee recommended that the likely soon to be adjusted specifications be maintained.

The Monitoring Committee noted the plans for the SSC to review the 2023 *Illex* ABC in March 2023 and consider any ABC modifications once a series of analyses considering reasonable *Illex* escapement bounds are updated with 2022 data. Staff plans to include an expanded range of ABCs and quotas in the standard specifications Environmental Assessment so that any appropriate early 2023 adjustments (up or down) can be implemented relatively quickly.

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: July 15, 2022

To: Chris Moore, Executive Director

From: Jason Didden, staff

Subject: 2023 preliminary specifications for *Illex* squid

Executive Summary

The 2022 Research Track Assessment peer reviewers concurred with the *Illex* working group that the *Illex* stock "was lightly fished in 2019."

The 2022 Acceptable Biological Catch (ABC) for *Illex* recommended by the SSC and the Council was 40,000 MT. Staff recommends a preliminary ABC of 40,000 MT for 2023 to be revisited in March 2023 after the NMFS Northeast Fisheries Science Center updates relevant analyses.

Additional information on fishery performance and past management measures can be found in the 2022 *Illex* Fishery Information Document created by staff and the 2022 *Illex* Fishery Performance Report developed by the Mackerel-Squid-Butterfish (MSB) Advisory Panel (AP). There is also additional input on *Illex* from the MSB AP for early 2022 at the end of the 2022 Butterfish Fishery Performance Report.

The Council will meet in August 2022 to review the recommendations of the AP, the SSC, the MSB Monitoring Committee, as well as receive input from the public. The Council will then recommend catch and landings limits and other management measures for 2023, which would be preliminary and subject to an in-season adjustment in early 2023.

Current Measures and Review of Prior SSC Recommendations

The last setting of *Illex* specifications occurred early in 2022, and the SSC utilized a series of analyses to recommend a 40,000 MT ABC for 2022. From the 40,000 MT ABC for 2022, 4.52% would be set aside for potential discards, and the remaining catch constitutes a quota of 38,156 MT.

The directed fishery operates under limited access, and open access/incidental permits are limited to 10,000 pounds per trip. The directed limited access fishery does not start with trip limits, but the fishery is slowed with a 10,000-pound trip limit for all permits once 94% of landings are projected to have occurred. This threshold has been recommended by the Council to increase to 96% this year (NMFS decision/rule pending).

Recent Catch and Landings

Landings have been high and quotas were reached from 2017-2021. See Figure 1 in the *Illex* Fishery Information Document for additional information. The 2022 *Illex* Fishery Performance Report documents industry perspectives on why recent landings have been high. In addition, the 2022 Butterfish Fishery Performance Report (see *Illex* section near end) documents industry perspectives on why 2022 *Illex* landings have been lower to date compared to recent years.

Stock Status and Biological Reference Points

The 2022 Research Track Assessment peer reviewers concurred with the *Illex* working group that the *Illex* stock "was lightly fished in 2019." The reviewers noted that "the term 'lightly fished' needs to be interpreted with caution since it has no specific definition relating to sustainable exploitation."

Staff Recommendation

There is not much new information regarding *Illex* compared to March 2022 when the SSC set the 40,000 MT *Illex* ABC for 2022. Staff recommends maintaining 40,000 MT as a preliminary 2023 ABC, and then revisiting the *Illex* ABC for 2023 in March 2023, after 2022 data can be used to update relevant analyses. As part of the 2023 specifications for *Illex*, staff plans a broadened range of ABCs in associated National Environmental Policy Act (NEPA) documents, which should facilitate rapid modification of the 2023 *Illex* specifications if appropriate.

Illex and Atlantic Mackerel
Fishery Performance Reports
February 2022

The Mid-Atlantic Fishery Management Council's (Council) Mackerel-Squid-Butterfish (MSB) Advisory Panel (AP) met via webinar on February 22, 2022 to review the *Illex* squid and Atlantic mackerel Fishery Information Documents and develop the following Fishery Performance Reports. The primary purpose of these reports 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: Eleanor Bochenek, Katie Almeida, Emerson Hasbrouck, Gerry O' Neill, Meghan Lapp, Pam Lyons Gromen, Sam Martin, Zack Greenberg, Dan Farnham Jr, and Greg DiDomenico.

Others present: Jason Didden, Mark Holliday, Will Poston, Purcie Bennett-Nickerson, Mary Beth Tooley, Peter Hughes, Alan Bianchi, Carly Bari, Alissa Wilson, Mike Waine, Tom Miller, and Dave Secor.

Trigger 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?

For organizational purposes, the summary is broken down by species. Each species discussion began by reviewing the species' "fishery information document."

1.2 *Illex* Squid

Market/Economic Conditions

Market conditions/prices seemed relatively similar in 2021 as 2020 - "stable." Staff noted price increase in 2021 was 7% - an AP member noted that can be just a few cents per pound difference. Seafood in general has seen recent price increases or at least stability.

U.S. suppliers continue to invest in infrastructure to regularly produce quality product. Steady supply from U.S. producers has helped with marketing. Can also get price increases through season as squid get bigger (higher prices for bigger squid) if fishery stays open.

U.S. *Illex* catches do not drive the price of *Illex* – Argentinian *Illex* and Japanese flying squid affect prices. Argentinian *Illex* are in international waters and Chinese fleet catches high volumes – world market dominates price. U.S. landings are a small component. Mark Holliday noted could be useful to have information on scale of other squid species to put U.S. fishery into more definitive context. After the meeting staff queried FAO databases and the 2019 catch of Argentine shortfin squid was listed as about 250,000 metric tons with an "E" noted by Chinese catch, possibly indicating that it is more of an estimate than others.

Environmental Conditions

Work is ongoing to understand environmental drivers – high availably persists. Fishery participants have been working with scientists to better understand how environmental conditions are affecting availability/abundance – it is critical to continue to involve fishermen in related work to understand environmental linkages.

Management Issues

Management should consider ways to achieve 100% of the quota – reconsider the 95% closure threshold. The reporting that exists will not allow substantial overages. The availability/abundance of *Illex* should be taken into account, as abundance appears to be considered when dealing with potential overages in other fisheries such as black sea bass. *Illex* should not be treated differently.

Other Issues

An advisor highlighted the HMS diet study looking at chub mackerel identified *Illex* as important HMS prey in recent years – SSC/Council should be mindful of those results and role of *Illex* in the food web as related to the strategic plan and Ecosystem Approaches to Fishery Management Guidance Document – need to be aware of how prey are, and are not, taken into account. Other advisors opposed delving further into the forage issue as relates to *Illex* and consumption by predators especially given lack of control over those predators' fisheries. It was noted that for the HMS fisheries that were looked at, they are overfished with overfishing occurring. The low impacts of the fishery on the stock per working group findings, including that the fishery operates on a small part of the *Illex* stock, should make this a non-issue

Research Priorities

See environmental considerations section above.

Additional Public Input - NA

1.3 Mackerel

Market/Economic Conditions

Demand has been strong for years – markets have not been a limiting factor. U.S. mackerel have been filling a reliable niche – generally smaller sized fish than European mackerel. U.S. fishery is a small part of overall mackerel trade, but persistent inability to supply will eventually lead to market problems – overseas participants would laugh at our mackerel quantities. After the meeting staff queried FAO databases and the 2019 European catch of Atlantic mackerel was listed as about 825,000 metric tons.

Environmental Conditions

Nothing particularly unusual observed. Few reports of fish from more southern areas.

Management Issues

Early 2021 catches were good near-shore, but once the buffer zone (mid-water trawl/herring) went into effect February 10, 2021 we lost access to those fish. Near-shore fish were also historically helpful given poor winter weather. Would have likely caught the quota in 2021 if access had remained.

There are fish near-shore now (early 2022) also, but again can't access them in 2022. The majority of areas where limited access participants landing with Gerry O'Neill have fished in last 5 years are no longer accessible due to 12-mile herring mid-water trawl restrictions. Herring restrictions affect mackerel. Would like to get more info across the fleet to confirm, but general sense that in 2021/2022 management (buffers) is severely curtailing landings.

Lack of herring RSA inhibits fall mackerel landings in Area 1A.

Horsepower restrictions, and resulting speed limitations, may be affecting the size of the fish that the commercial fishery can catch. Larger fish are faster. Could be an issue to further investigate.

Other Issues/Rebuilding

Need to consider the impact of recreational catch on rebuilding especially given some of the options being considered – can't have unrestricted recreational fishing when there's no commercial quota.

Given management constraints and data collection, need to make sure that sampling (that feeds into the assessment in terms of ages) that is occurring will be representative – across fishery sectors and components of each sector. Also may extend to selectivity assumptions.

Discussion with SSC members attending and AP members highlighted additional uncertainties that may be introduced by how management constraints and data collection may be affecting the fishery-dependent data used by the assessment. How will we know if we are rebuilding given lack of fishery access from management and thus lack of data?

Worth re-considering about whether size-limit measures (like Canada) could benefit mackerel rebuilding. Worth additionally considering how the two (Canada and U.S.) rebuilding approaches may complement each other (or not).

Research Priorities

Refer to above issues identified with rebuilding.

Additional Public Input - NA

Illex Fishery Information Document

February 2022

This Fishery Information Document provides a brief overview of the biology, stock condition, management system, and fishery performance for *Illex* squid 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 was the fifth banner year in a row for *Illex*. 2017-2021 represent a unique sequence in the history of the fishery of consecutive "boom" *Illex* years.
- Price and landings, and therefore revenues, were up in 2021 compared to 2020.
- Substantial variability is to be expected with any squid species.
- A soon-to-be-reviewed stock assessment should provide guidance for 2023 – in March 2022 the SSC will be considering if any adjustments are appropriate for just 2022, based on previous analyses but with an expanded range.

Basic Biology

Illex is a semi-pelagic/semi-demersal schooling cephalopod species distributed between Newfoundland and the Florida Straits, and lives less than one year. *Illex* is a semelparous, terminal spawner whereby spawning and death occur within several days of mating. The northern stock component, located north of the USA-Canada border in NAFO Subareas 3 and 4, is assessed annually and is managed by the Northwest Atlantic Fisheries Organization (NAFO), though landings have been relatively low in recent years and staff has questioned the usefulness of the recent NAFO assessments (https://www.mafmc.org/s/g_NAFO_Didden.pdf). The southern/U.S. stock component is located in NAFO Subareas 5 and 6 between the Gulf of Maine and Cape Hatteras, NC and is managed by the Mid-Atlantic Fishery Management Council (the Council or MAFMC). 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

The status of *Illex* is unknown with respect to being overfished or not, and unknown with respect to experiencing overfishing or not. Results from the NEFSC Trawl surveys are highly variable and without apparent long-term trend. Analysis reviewed by the Council's SSC have supported quota increases in recent years, in 2021 finding: "Based on evidence presented to it, including patterns that suggest an increase in abundance, low levels of exploitation, and catches that have been constrained by existing ABCs for the last four years, the SSC continues to believe that the *Illex* stock is at a high level of abundance and experiencing a low exploitation rate." https://www.mafmc.org/ssc-meetings/2021/may-11-12

An *Illex* research track assessment is pending review and may provide additional guidance for setting quotas in 2023 and beyond.

Management System and Fishery Performance

Management

The Council established management of *Illex* in 1978 and the management unit includes all federal East Coast waters.

Access is limited with moratorium permits. Trip limits are triggered when the quota is approached. Incidental permits are limited to 10,000 pounds per trip. Additional summary regulatory information is available at https://www.fisheries.noaa.gov/new-england-mid-atlantic/resources-fishing/resources-fishing-greater-atlantic-region. A 2020 action to change *Illex* permitting is in the rulemaking process and a proposed rule is expected in 2022 – see https://www.mafmc.org/newsfeed/2020/council-approves-changes-to-management-of-illex-fishery.

The current quota is 31,478 MT, based on a 33,000 MT Acceptable Biological Catch (ABC) and a 4.52% discard rate (the mean plus one standard deviation of the most recent 10 years of observed discard rates in the last assessment). Recent SBRM discard rates have been similar, though are not based on calendar years. The fishery closes when 95% of the quota is projected to be landed and in 2021 closed effective 0001 hour August 30, 2021. In 2021 97.6% of the quota was landed.

Recreational catch of *Illex* is believed to be negligible. There are no recreational regulations except for party/charter vessel permits and reporting.

Commercial Fishery

Figure 1, from a previous Science Center data update, describes *Illex* catch 1963-2019 and highlights the early foreign fishery and then domestication of the fishery. Figures 2-3 describe domestic landings, ex-vessel revenues, and prices (inflation adjusted) since 1996. Figure 4 illustrates preliminary weekly 2020 (yellow-orange) and 2021 (blue) landings through the year.

Table 1 describes 2021 *Illex* landings by state, and Table 2 describes 2021 *Illex* landings by gear type. Table 3 provides preliminary information on *Illex* landings by statistical area for 2021. Table 4 describes vessel participation over time.

The Gross Domestic Product Implicit Price Deflator was used to report revenues/prices as "2021 dollars."

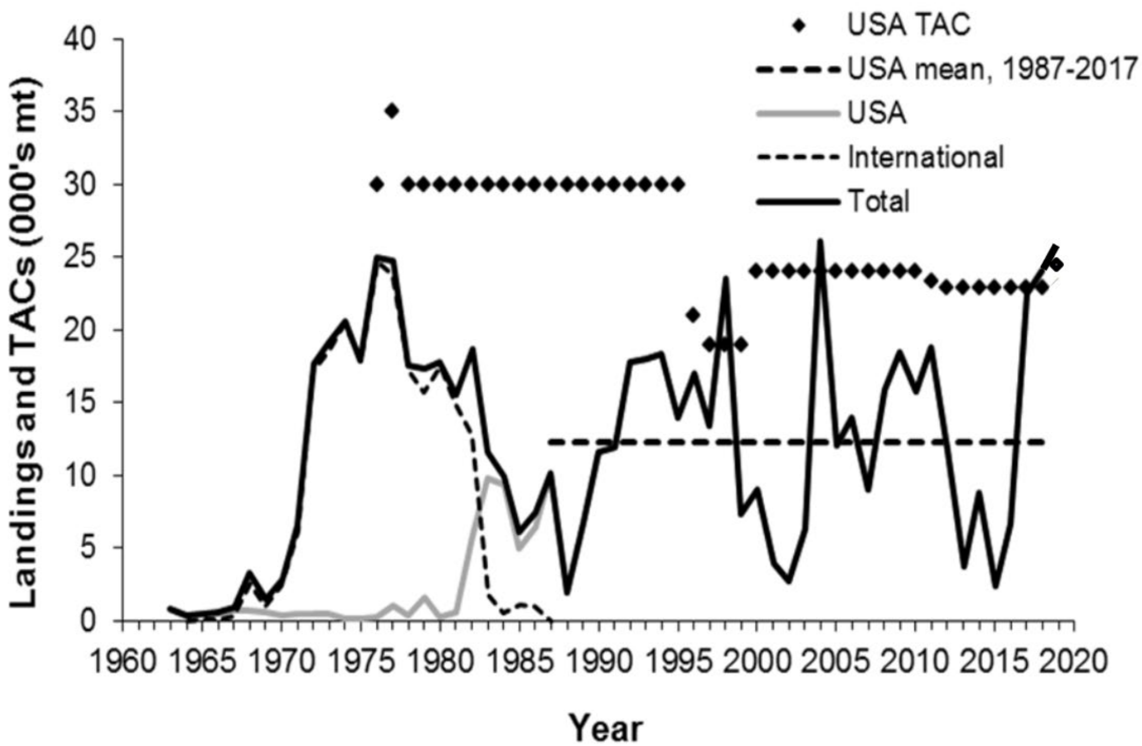


Figure 1. Total annual *Illex* landings (mt) by the U.S. and other countries for 1963-2019. Sources: NEFSC *Illex* Data update, available at http://www.mafmc.org/ssc-meetings/2018/may-8-9 and NMFS unpublished dealer data.

THIS SPACE INTENTIONALLY LEFT BLANK

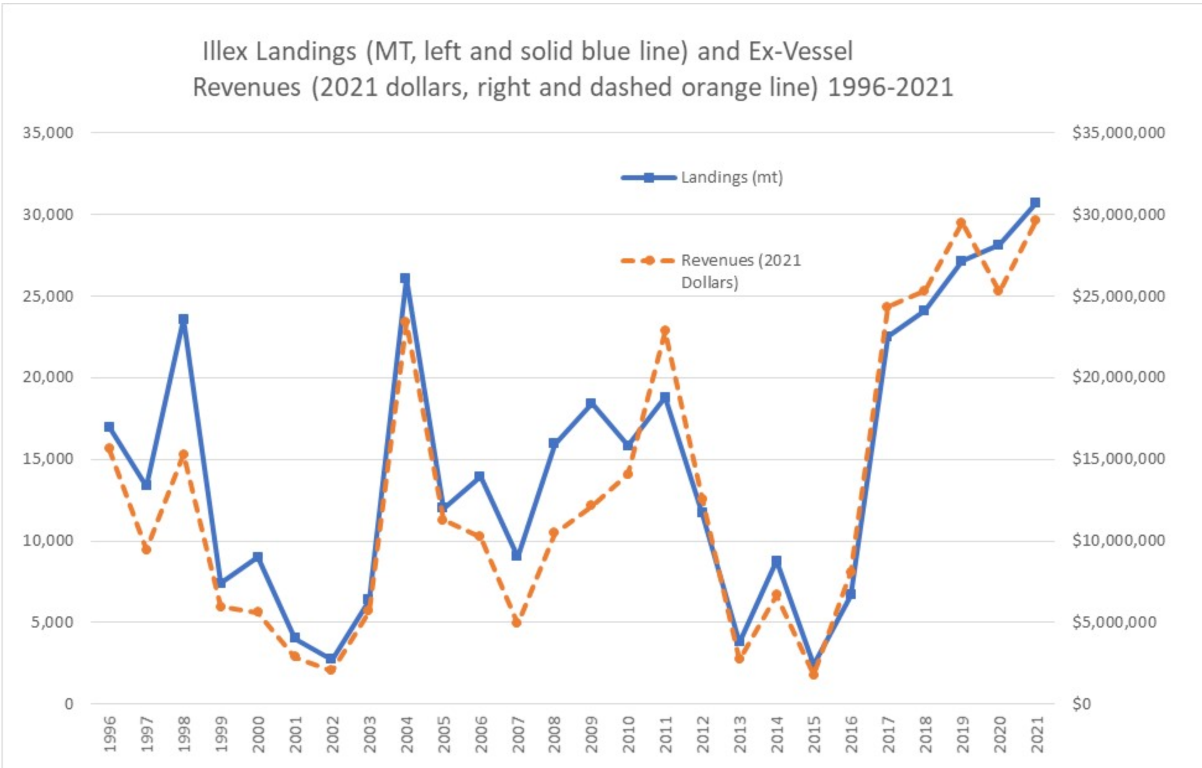


Figure 2. U.S. *Illex* Landings and Ex-Vessel Values 1996-2021. Source: NMFS unpublished dealer data.

THIS SPACE INTENTIONALLY LEFT BLANK

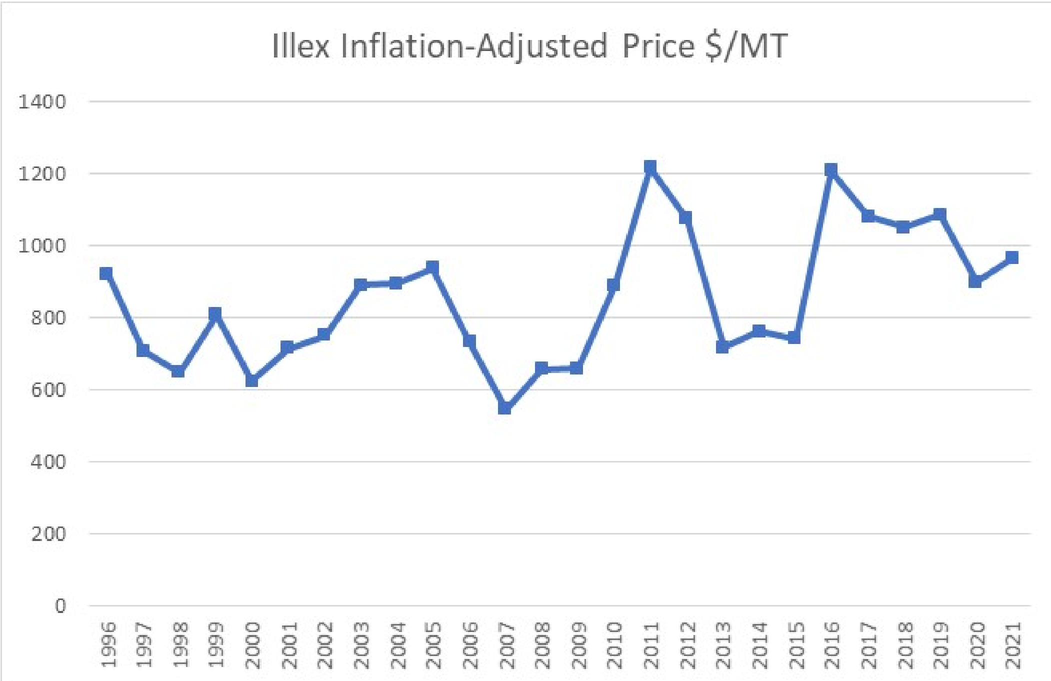


Figure 3. Ex-Vessel *Illex* Prices 1996-2021 Adjusted to 2021 Dollars Source: NMFS unpublished dealer data.

THIS SPACE INTENTIONALLY LEFT BLANK

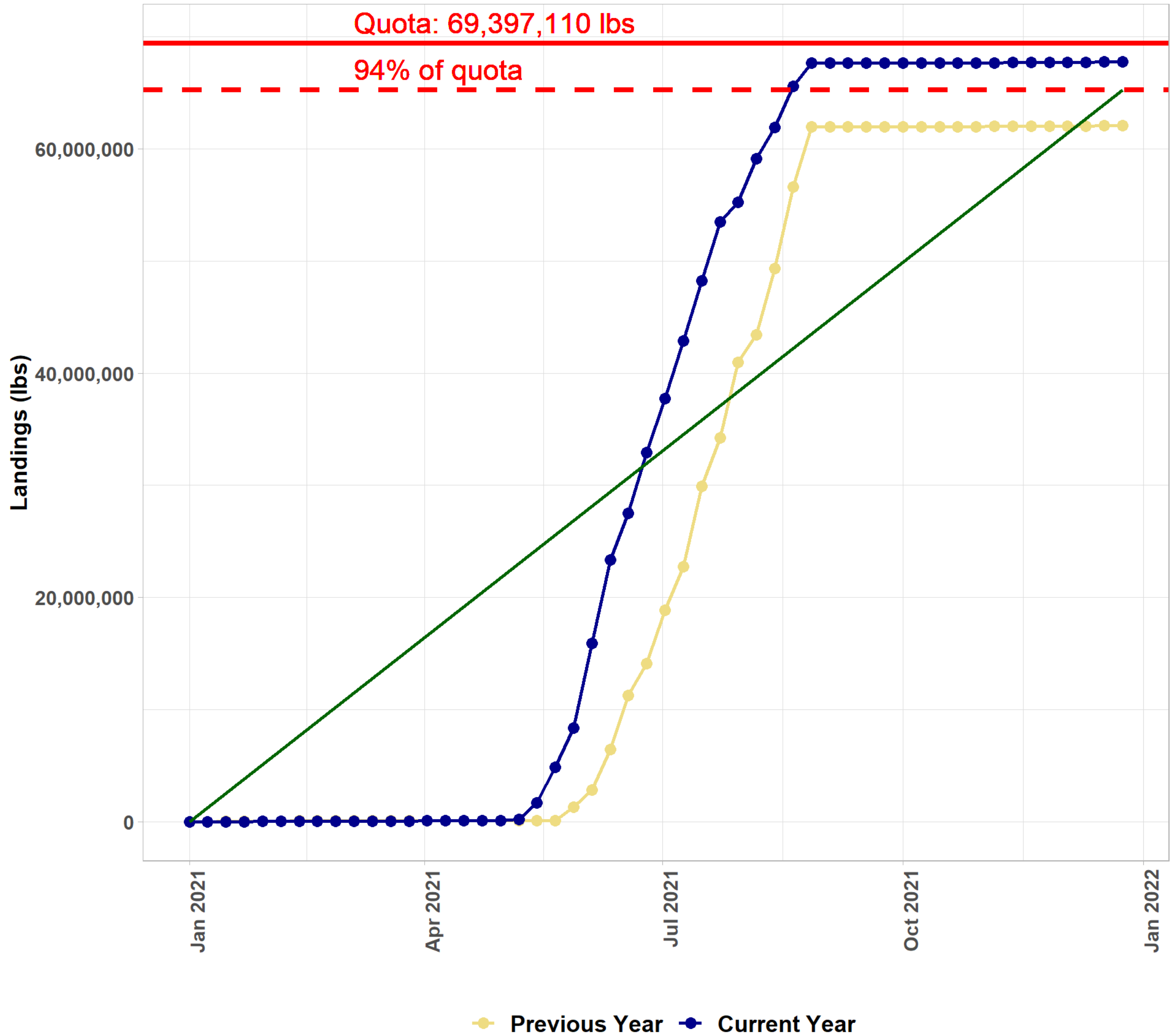


Figure 4. U.S. Preliminary *Illex* landings; 2021 in blue, 2020 in yellow-orange. Source: https://www.fisheries.noaa.gov/new-england-mid-atlantic/commercial-fishing/quota-monitoring-greater-atlantic-region

Table 1. Commercial *Illex* landings (live weight) by state in 2021. Source: NMFS unpublished dealer data.

Most 2021 *Illex* landings occurred in RI, NJ, and MA (in that order), but further breakdown may violate data confidentiality rules (in spirit if not to the letter).

Table 2. Commercial *Illex* landings (live weight) by gear in 2021. Source: NMFS unpublished dealer data.

GEAR	Metric_Tons
Otter Trawl	29,383
Midwater Trawl	1,063
UNKNOWN	266
Other	3
Total	30,714

Table 3. Commercial *Illex* landings by statistical area in 2021. Source: NMFS unpublished VTR data.

NEMAREA	MT
622	17,988
526	3,714
537	2,852
616	1,710
626	1,504
623	920
632	543
636	269
621	193
627	134
Other	265
Total	30,091

Table 4. Vessel participation over time in the *Illex* Fishery based on annual landings (pounds)

YEAR	Vessels 500,000+	Vessels 100,000 - 500,000	Vessels 50,000 - 100,000	Vessels 10,000 - 50,000	Total
1982	7	7	0	10	24
1983	1	8	7	11	27
1984	4	15	4	6	29
1985	2	6	4	3	15
1986	8	6	4	3	21
1987	7	10	2	1	20
1988	3	3	1	2	9
1989	8	5	1	3	17
1990	12	3	0	1	16
1991	12	1	1	0	14
1992	16	1	0	1	18
1993	19	3	1	3	26
1994	21	7	5	8	41
1995	24	5	2	7	38
1996	24	5	6	4	39
1997	13	9	2	0	24
1998	25	4	1	3	33
1999	6	9	2	10	27
2000	7	7	0	2	16
2001	3	4	1	2	10
2002	2	3	1	1	7
2003	5	6	1	2	14
2004	23	5	2	0	30
2005	10	10	2	2	24
2006	9	8	1	2	20
2007	8	2	1	0	11
2008	12	5	0	0	17
2009	10	3	1	1	15
2010	13	5	0	4	22
2011	17	4	2	0	23
2012	8	3	2	2	15
2013	5	4	3	5	17
2014	5	3	2	2	12
2015	3	0	1	1	5
2016	4	3	3	2	12
2017	14	6	0	0	20
2018	19	7	0	5	31
2019	26	6	0	3	35
2020	25	4	2	1	32
2021	23	8	0	2	33

THIS IS THE END OF THE DOCUMENT

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: July 29, 2022

To: Council

From: Jason Didden, Staff

Subject: *Illex* Permit Action Update

Per a June 7, 2022 notice of availability (NOA), NMFS will approve, disapprove, or partially approve the Council's Amendment regarding *Illex* permits in the coming months. Given the pending decision by NMFS, NMFS's previously communicated concerns about the action, and amount of time since Council approval (July 2020), this agenda item reviews the Council recommendations in the *Illex* Permit action. No action is needed at this time. Attached are several relevant documents:

- Council July 2022 Comments on the NOA for the *Illex* Permit Action (Comments due August 8, 2022)
- June 2022 NOA on the *Illex* Permit Action
- 2020 Council Press Release on the *Illex* Permit Action
- 2020 GARFO Letter Expressing Concerns about the *Illex* Permit Action

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

July 29, 2022

Mr. Michael Pentony
National Marine Fisheries Service (NMFS), GARFO
55 Great Republic Drive
Gloucester, MA 01930

Dear Mike:

Please accept this letter as a comment in response to the announcement of the availability of Amendment 22 to the Mackerel, Squid, and Butterfish Fishery Management Plan, also referred to as the *Illex* Permit Action.

The Council would like to reiterate its desire for full implementation of this action. The proposed action addresses concerns that excessive participation in the fishery by previously inactive permits will exacerbate the race to fish observed in the fishery since 2017 and the negative impacts to participants caused by early fishery closures. The Council's recommended measures were carefully considered to strike a balance of ensuring that sufficient capacity remains to harvest optimum yield while mitigating negative impacts. We look forward to continuing to work with NMFS to implement this Amendment.

Please call me or Jason Didden of my staff if you have any questions.

Sincerely,

Christopher M. Moore, Ph.D.
Executive Director

cc: M. Luisi, W. Townsend, J. Didden, C. Bari population will be treated as if it were listed as a threatened species for purposes of establishing protective regulations under section 4(d) of the Act with respect to such population. The species-specific rules (protective regulations) adopted for an experimental population under § 17.81 will contain applicable prohibitions, as appropriate, and exceptions for that population.

■ 5. Amend § 17.83 by revising paragraph (b) and adding paragraph (c) to read as follows:

§ 17.83 Interagency cooperation.

* * * * *

(b) For a listed species, any experimental population that, pursuant to § 17.81(c)(2), has been determined to be essential to the survival of the species or that occurs within the National Park System or the National Wildlife Refuge System, as now or hereafter constituted, will be treated for purposes of section 7 of the Act as a threatened species.

(c) For purposes of section 7 of the Act, any consultation or conference on a proposed Federal action will treat any experimental and nonexperimental populations as a single listed species for the purposes of conducting the analyses and making agency determinations pursuant to section 7(a) of the Act.

■ 6. Amend § 17.84 by:

■ a. Revising the section heading; and

■ b. Removing the word ''special'' where it appears in the heading and first sentence of paragraph (l)(1) and in the headings to paragraphs (l)(16) and (x)(8).

The revision reads as follows:

§ 17.84 Species-specific rules—vertebrates.

* * * * *

■ 7. Amend § 17.85 by revising the section heading and paragraph (a)(2)(i) to read as follows:

§ 17.85 Species-specific rules—invertebrates.

(a) * * *

(2) * * *

(i) Except as expressly allowed in the rule in this paragraph (a), all the prohibitions of § 17.31(a) and (b) apply to the mollusks identified in the rule in this paragraph (a).

* * * * *

§ 17.86 [Removed and Reserved]

■ 8. Remove and reserve § 17.86.

Shannon A. Estenoz,

Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 2022–12061 Filed 6–6–22; 8:45 am]

BILLING CODE 4333–15–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 648

RIN 0648–BK20

Magnuson-Stevens Fishery Conservation and Management Act Provisions; Fisheries of the Northeastern United States; Amendment 22 to the Mackerel, Squid, and Butterfish Fishery Management Plan

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Announcement of the availability of a proposed fishery management plan amendment; request for comments.

SUMMARY: NMFS announces that the Mid-Atlantic Fishery Management Council submitted Amendment 22 to the Mackerel, Squid, and Butterfish Fishery Management Plan to the Secretary of Commerce for review and approval. We are requesting comments from the public on this amendment in accordance with the Magnuson-Stevens Fishery Conservation and Management Act. This amendment would implement updated and reformatted goals and objectives for the fishery management plan, a tiered permit system for vessels currently issued an *Illex* squid moratorium permit, a fish hold volume baseline, a fish hold volume upgrade restriction for the highest tier *Illex* squid moratorium permits, and clarify that all *Illex* squid moratorium permits must submit daily catch reports via the vessel monitoring system. The purpose of this action is to align the fishery goals/objectives with current Council vision and priorities and to revise the number and types of *Illex* squid moratorium permits to reduce the negative effects from a race to fish in recent years.

DATES: Comments must be received on or before August 8, 2022.

ADDRESSES: You may submit comments on this document, identified by NOAA–NMFS–2022–0056, by the following method:

Electronic Submission: Submit all electronic public comments via the Federal e-Rulemaking Portal. Go to *www.regulations.gov/#!docketDetail;D=NOAA-NMFS-2022-0056*, click the ''Comment Now!'' icon, complete the required fields, and enter or attach your comments.

Instructions: Comments sent by any other method, to any other address or individual, or received after the end of the comment period, may not be considered by NMFS. All comments received are a part of the public record and will generally be posted for public viewing on *www.regulations.gov* without change. All personal identifying information (*e.g.,* name, address, etc.), confidential business information, or otherwise sensitive information submitted voluntarily by the sender will be publicly accessible. NMFS will accept anonymous comments (enter ''N/A'' in the required fields if you wish to remain anonymous).

The Mid-Atlantic Council prepared an environmental assessment (EA) for Amendment 22 that describes the proposed action and provides an analysis of the impacts of the proposed measures and other alternatives considered. Copies of Amendment 22, including the EA, the Regulatory Impact Review, and the Regulatory Flexibility Act analysis, are available from: Christopher Moore, Executive Director, Mid-Atlantic Fishery Management Council, Suite 201, 800 State Street, Dover, DE 19901. The EA and associated analysis is accessible via the internet *http://www.mafmc.org/supporting-documents.*

FOR FURTHER INFORMATION CONTACT: Carly Bari, Fishery Policy Analyst, 978–281–9150.

SUPPLEMENTARY INFORMATION:

Background

The original goals and objectives for the Mackerel, Squid, and Butterfish Fishery Management Plan (FMP) were developed in 1981 when the individual fisheries were merged into one FMP. Since that time, the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) has been amended several times and the Mid-Atlantic Fishery Management Council has developed several strategic plans to reflect updated priorities and strategic initiatives such as integrating an ecosystem approach to fisheries management into its FMPs. In September 2020, Atlantic chub mackerel was formally integrated into the FMP, along with updated goals and objectives for managing this species. The Council initiated Amendment 22 in January 2019 in part to update the FMP's goals and objectives to reflect current Council vision and priorities, make them consistent with the formats used in other FMPs managed by the Council, and to merge the original FMP goals and objectives with those developed for Atlantic chub mackerel.

Amendment 22 is also intended to reconsider the appropriate number of

Illex squid moratorium permits. Originally implemented in 1997 under Amendment 5 to the FMP (May 27, 1997; 62 FR 28638), there are currently about 75 *Illex* moratorium permits remaining in the fishery. Since 2017, we have closed the *Illex* squid fishery in August or September of each year because the fishery fully harvested the available quota, with more vessels actively participating in the fishery in recent years. Because not all vessels issued an *Illex* moratorium permit have actively participated in the fishery in recent years, the Council is concerned that these other permits may become active in the fishery, exacerbating the race to fish observed since 2017 and the negative impacts to participants caused by early fishery closures.

To address these issues, Amendment 22 proposes the following measures, which are outlined in further detail in the EA prepared for this action (see **ADDRESSES**):

- Updated FMP goals and objectives reformatted to reflect current Council vision and priorities and the integration of approved Atlantic chub mackerel goals and objectives;
- A Tier 1 *Illex* squid moratorium permit for any existing *Illex* moratorium permit that landed at least 500,000 lb (226.8 mt) of *Illex* squid in one year from 1997–2013 or purchased and installed a refrigerated seawater system, plate freezing system, or blast freezer between January 1 and August 2, 2013, that also landed at least 200,000 lb (90.7 mt) of *Illex* squid before December 31, 2013;
- A Tier 2 *Illex* squid moratorium permit for any existing *Illex* moratorium permit that landed at least 100,000 lb (45.4 mt) of *Illex* squid in one year from 1997–2018;
- A Tier 3 *Illex* squid moratorium permit for any existing *Illex* moratorium permit that landed at least 50,000 lb (22.7 mt) of *Illex* squid in one year from 1997–2018;
- *Illex* squid possession limits for new *Illex* squid moratorium permits proposed in this action, including an unlimited initial possession limit for Tier 1 permits, a 62,000-lb (28,123-kg) possession limit for Tier 2 permits, and a 20,000-lb (9,072-kg) possession limit for Tier 3 permits;
- A fish hold volume baseline measurement and 10-percent upgrade restriction for proposed Tier 1 *Illex* squid moratorium permits; and
- Clarification that *Illex* squid moratorium permits must report daily catch via the vessel monitoring system on declared *Illex* squid trips.

In accordance with section 304(a)(1) of the Magnuson-Stevens Act, we are soliciting public comments on Amendment 22 to the Mackerel, Squid, and Butterfish FMP and its incorporated documents through the end of the comment period specified in the **DATES** section of this notice of availability (NOA). Under this provision of the Magnuson-Stevens Act (section 304(a)(3)), the Secretary may approve, partially approve, or disapprove the amendment as submitted by the Council. All comments received by the end of the comment period of the NOA will be considered in the approval/disapproval decision on the amendment. Comments received after the end of the comment period for the NOA will not be considered in the approval/disapproval decision.

In a letter dated April 22, 2020, and available on the Council's website (see the July 16, 2020, meeting at *www.mafmc.org/meetings*), we expressed concerns with the requalification and tiered permitting measures considered by the Council in the development of this action. These concerns remain, and we invite public input on whether this action satisfies the requirements of the Magnuson-Stevens Act's National Standards, is consistent with the Mackerel, Squid, and Butterfish FMP's goals and objectives, and accomplishes the Amendment's statements of need, purpose, and objectives. If, after reviewing public comments received in response to this NOA, we approve this action, we will publish a proposed rule in the **Federal Register** that would implement the amendment's management measures and solicit additional public comment at that time on the proposed regulations.

Authority: 16 U.S.C. 1801 *et seq.*

Dated: June 2, 2022.

Jennifer M. Wallace,

Acting Director, Office of Sustainable Fisheries, National Marine Fisheries Service.

[FR Doc. 2022–12226 Filed 6–6–22; 8:45 am]

BILLING CODE 3510–22–P

PRESS RELEASE

FOR IMMEDIATE RELEASE
July 20, 2020

PRESS CONTACT: Mary Sabo
(302) 518-1143

Council Approves Changes to Management of *Illex* Fishery

Last week the Mid-Atlantic Fishery Management Council approved an amendment that proposes modifications to the permitting and management of the *Illex* squid fishery. These changes are intended to both reduce excess capacity in the fishery and mitigate the rapid use of the quota seen in recent years. The amendment also revises the goals and objectives of the Mackerel, Squid, Butterfish (MSB) Fishery Management Plan (FMP). After considerable discussion and consideration of public comments, the Council selected preferred alternatives and adopted the amendment for Secretarial review and implementation. Below are summaries of the issues and the Council's preferred alternatives.

Illex Permitting

In June 2017, the Council considered, but did not adopt, revisions to *Illex* squid permits as part of Amendment 20 to the MSB FMP. Since then, effort and landings have substantially increased, and the fishery closed early in 2017-2019 after harvesting the *Illex* squid quota. Given recent fishery performance, the Council initiated this amendment to evaluate whether permitted access to the *Illex* fishery should be modified based on present and historical participation, and/or other considerations. The amendment considered a range of permitting alternatives, including various time periods and thresholds for permit re-qualification and options for a tiered permitting system.

During last week's meeting, the Council reviewed analyses and public comments and heard additional public testimony from fishery participants both in favor of, and opposed to, potential changes to *Illex* permitting. The Council ultimately voted to implement a tiered permitting system. The proposed tiers, qualification criteria, and trip limits are described in the table below.

	Qualification Criteria	**Trip Limit**
Tier 1	*Either:* • Landed at least 500,000 pounds in one year between 1997 and 2013 OR • Purchased and installed a refrigerated seawater system, plate freezing system, or blast freezer between January 1, 2012 and August 2, 2013 and landed a minimum of 200,000 pounds of Illex in the 2013 fishing year	None
Tier 2	• Landed at least 100,000 pounds in one year between 1997 and 2018	62,000 pounds
Tier 3	• Landed at least 50,000 pounds in one year between 1997 and 2018	20,000 pounds

Under this tiered permitting system, of the 75 current limited access moratorium permits, it is estimated that 35 would qualify for Tier 1, 13 would qualify for Tier 2, 2 would qualify for Tier 3, and 25 would not qualify for any Tier. The Council acknowledged that this action would have positive and negative

800 N State St., Suite 201, Dover, DE 19901
Phone (302) 674-2331 * FAX (302) 674-5399
www.mafmc.org

economic consequences for some fishery participants but ultimately concluded that the selected alternative best balanced the needs of historic participants, present participants, and dependent fishing communities.

Other Illex Management Measures

The Council also voted to require that Tier 1 permit holders obtain a baseline measurement of their vessel fish hold volume. These permit holders would then be subject to a 10% upgrade restriction. This measure is intended to help freeze the footprint of the fishery and avoid additional over-capitalization. The amendment would also clarify that daily catch reporting of *Illex* is required via Vessel Monitoring Systems (VMS) for vessels with limited access *Illex* permits.

Next Steps and Additional Information

The Council will submit this amendment to the Secretary of Commerce for approval and implementation. Updates will be posted on the Council's website at http://www.mafmc.org/actions/illex-permitting-msb-goals-amendment. For additional information about this action, contact Jason Didden at jdidden@mafmc.org or (302) 526-5254.

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 22, 2020

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

Dear Chris:

I offer the following comments for consideration by the Mid-Atlantic Fishery Management Council on the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan (FMP) Goals/Objectives and *Illex* Permit Amendment. Before taking final action on this amendment, I encourage the Council to clearly define the problem this action would address, consider all available information regarding the status of the fishery, and fully justify measures it adopts relative to applicable law and the FMP objectives.

The Council should clearly identify and understand what problems it is trying to address through this action. During recent meetings and public hearings, both Council members and industry participants expressed different opinions about the health of the stock, the state of the fishery, and the implications of recent high fishery landings and seasonal closures. The public hearing document lays out a number of possible reasons for taking action, most notably to reduce the implications of a race to fish. A clear and accepted problem statement will help the Council identify and justify appropriate measures focused on the most important issues raised during the scoping process for this action and discussed during recent public hearings.

The Council should consider the current state of the fishery to provide context for this action and assess what this action may accomplish in addressing the articulated problem statement. Based on available information, both the stock and the fishery are healthy and robust at this time. The Council's Scientific and Statistical Committee (SSC) continues to maintain that the stock is lightly exploited and not subject to overfishing. Although still under development and subject to future peer review, preliminary analysis by the SSC's *Illex* Working Group may offer further evidence to support previous SSC conclusions, which could be used to support higher *Illex* quotas in future years. Since 2017, the fishery has fully harvested available quotas and achieved optimum yield (OY). Market prices are high, participants are profiting from the fishery, and there are few bycatch concerns. Given the current condition and future outlook for the fishery, I would encourage the Council to consider compromise measures that would help mitigate the race to fish, minimize impacts to active permits, and preserve the ability of the fishery to achieve OY during years in which *Illex* is less available.

As you know, measures adopted under this action must be consistent with applicable law and the objectives of the FMP. The public hearing document notes that section 303(b)(6) and National Standards 4, 5, and 8 of the Magnuson-Stevens Fishery Conservation and Management Act are central to this action.[1] Analysis supporting this action should relate to the Council's rationale, take into account present participation in the fishery, and demonstrate how permit measures help achieve OY, minimize economic impacts, and maximize overall benefits to the fishery, including how total benefits outweigh hardships for affected fishery participants. Updated FMP objectives proposed for this action emphasize minimizing additional restrictions and providing the greatest degree of freedom and flexibility (Objective 2.1), and allowing operational flexibility (Objective 2.2). In adopting final measures, the Council should clearly describe how revisions to *Illex* permits would achieve these objectives and balance the social and economic needs of various sectors of the fishery (Objective 2.3). I am concerned that it may be difficult to demonstrate compliance with applicable law and FMP objectives without sufficient justification, and recommend that the Fishery Management Action Team prepare comprehensive analysis before the Council takes final action in June.

I recognize this will not be an easy decision for the Council. Both proponents and opponents have presented valid arguments for and against various alternatives. In balancing these perspectives, the Council must consider the tradeoffs and potential costs/benefits to the fishery. For example, if the Council wants to rely solely upon the 2013 control date to re-qualify existing moratorium permits and determine eligibility for the highest tier of fishery access, it must demonstrate that doing so is consistent with the goals and objectives of the action and the FMP and that the associated benefits to the Illex fishery at large outweigh potential costs to recent participants whose fishing opportunities would be constrained.

I encourage the Council to fully consider all relevant information regarding past and present performance of the fishery and ongoing efforts to improve the science supporting the status determination and future catch limits. Clearly articulating its rationale and developing sufficient supporting analysis will help the Council ensure this action is consistent with FMP objectives and applicable law.

Thank you for considering these comments. Doug Christel is available to discuss these comments with your staff, if you have questions regarding this letter.

Sincerely,

Michael Pentony
Regional Administrator

cc: Michael Luisi, Council Chairman

---

[1] National Standard 4 Guidelines at 50 CFR 600.325 indicate that any allocation of fishing privileges must be reasonably calculated to promote conservation, and should help achieve OY and be justified in terms of the FMP objectives. National Standard 5 Guidelines at § 600.330 indicate that measures cannot have economic allocation as their sole purpose and should not redistribute gains without also increasing efficiency. The National Standard 8 Guidelines (§ 600.345) suggest the Council should select a permit alternative that minimizes adverse economic impacts and provides the greatest potential for sustained participation by fishing communities.

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: August 4, 2022

To: Michael P. Luisi, Chairman, MAFMC

From: Paul J. Rago, Ph.D., Chair, MAFMC Scientific and Statistical Committee (SSC)

Subject: Report of the July 2022 SSC Meeting

Executive Summary

Surfclam Genetics

Recently completed genetic studies of Surfclams suggest two significantly different haplotypes for *Spisula solidissima solidissima* and a difference between *S.s. solidissima* and *S.similis*. Gene flows among populations support high levels of genetic diversity. Report authors recommended management as separate species. The implications of these differences for management are unknown because differences in life-history traits are unknown. The ability to assess and manage these units as separate stocks will require major changes in monitoring procedures, as well as possible spatial management regulations.

Interim *Illex* Squid Specifications for 2023

The SSC received an update on the key findings of the Research Track Assessment (RTA) review panel. Attempts to develop a new stock assessment model were not successful and no biological reference points could be specified. Research conducted, particularly on aging and maturation, could lead to better models in the future, but in the meantime the SSC will continue to base its ABC recommendations on a risk analysis of escapement estimates based on the Councils Risk Policy and candidate reference points used in other squid fisheries. **The SSC recommended continuation of the 2022 ABC of 40,000 mt (approved in March 2022) for 2023. In March 2023 the SSC will receive an update of this analysis using data through 2022 and potentially revise this recommendation.**

Butterfish ABC Specifications for 2023-2024

The SSC reviewed the results of the RTA and received a Level 1 MTA (direct delivery) of the updated assessment through 2021. Despite considerable efforts to include new ecological information in the assessment, estimates of consumption of Butterfish by a wide range of fish, avian, and mammalian predators, data were insufficient to revise natural mortality rates. The stock was assessed with the recently developed state space model known as the Woods Hole Assessment Model (WHAM). **The SSC recommended the use of a F=2/3M biological reference point and catch limits of 17,267 mt for 2023 and 15,764 mt for 2024.**

Update on Recreational Reform Initiative and Harvest Control Rule

The SSC received an update on the decisions of the Council on the Harvest Control Rule and noted its sunset provision in 2025. The SSC expressed interest in continued involvement with the HCR process when a new FMAT is convened in 2023 to update the HCR.

Summer Flounder Catch Recommendation

Recreational catches declined in 2021. Catches continued to be below existing quotas. **The SSC recommended continuation of previously approved quota of 15,021 mt for 2023.**

Scup Catch Recommendation

Catches of Scup for 2021 were updated. The 2021 MTA concluded that the stock was not overfished and overfishing is not occurring. SSB remains above target values, but recruitment has been below average with 2019 being the lowest in the time series. **The SSC recommended continuation of previously approved quota of 13,460 mt for 2023.**

Black Sea Bass Catch Recommendation

Commercial catches of Black Sea Bass were under the quota in 2020 and 2021; recreational landings exceeded the RHL by 56% and 89% in 2020 and 2021, respectively. Black Sea Bass will be reviewed in a RTA in February 2023. **The SSC recommended continuation of previously approved quota of 7,557 mt for 2023.**

Bluefish Catch Recommendation

Bluefish are currently in a rebuilding plan and a RTA will be reviewed in December 2022. The state-space model known as the Woods Hole Assessment Model (WHAM) will be used. No new information was provided to suggest that a change from the current ABC is warranted**. The SSC recommended continuation of the current ABC of 13,890 mt for 2023.**

Northeast Regional Climate Action Plan

The SSC received an overview of the draft Northeast Regional Climate Action Plan. The presentation sparked much praise and debate within the Committee. Suggestions by the SSC included improving linkages with existing monitoring stations, considering improved survey sampling designs, developing a basis for support of spatial models, improving near-term forecasts of environmental drivers to reduce uncertainty in population forecasts, and examining a broader range of species life histories when developing environmental forecast models (i.e., contrast *Illex* squid with Ocean Quahog).

Background

The SSC met in person and via webinar from 25th -26th of July 2022, addressing the following topics:

- Surfclam genetics
- Interim *Illex* squid specifications for 2023 fishing year
- Butterfish ABC specifications for 2023-2024
- Receive update on Recreational Reform Initiative and HCR decision from Council
- Summer Flounder catch recommendations for 2023
- Scup catch recommendations for 2023
- Black Sea Bass catch recommendations for 2023
- Bluefish catch recommendations for 2023
- Draft Northeast Regional Climate Strategy Action Plan

See Attachment 1 for the meeting's agenda. An Executive Summary provides a quick summary of the primary conclusions of the SSC.

Most SSC members were able to participate for all or part of the meeting (Attachment 2), but only five SSC members attended in person in Baltimore. Other participants included Council members, Council staff, NEFSC and GARFO staff, and representatives of industry, stakeholder groups, and the general public. Most participants were online rather than onsite. Council staff provided outstanding technical support to implement the hybrid meeting. The hard work of Brandon Muffley to plan the meeting and run the hybrid meeting is especially appreciated.

Within the SSC, Thomas Miller's leadership on the *Illex* squid TOR and Rob Latour's leadership on Butterfish TORs were exceptionally noteworthy. I thank Sarah Gaichas and Geret DePiper for contributing their meeting notes – they were a major help for crafting this report.

I also 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/july 25-26. A comprehensive guide to the acronyms in this report may be found in Attachment 5.

Atlantic Surfclam Genetics

In 2019 the Council supported a study to investigate potential genetic differences between *Spisula solidissima solidissima* and *Spisula solidissima similis* in the management area that extends from the Mid-Atlantic region to Georges Bank. Matt Hare, Cornell University, provided a detailed overview of recently completed genetic analyses of Surfclam samples. The purpose of his presentation was to begin discussions on the implications of these findings for assessments, surveys, and management, and identify further research.

Compared to earlier approaches, advances in genetic methods now allow for much higher capabilities to distinguish genetic differences among areas and potential gene flows. Differences in phenotypes are less well described, but the results may have important implications for future management of the mixture of haplotypes and subspecies that comprise the Surfclam resource.

Following these presentations and general discussion, the SSC addressed the Terms of Reference (italics) for the Surfclam genetics research. Responses by the SSC (standard font) to the Terms of Reference provided by the MAFMC are as follows:

Terms of Reference

For the Surfclam genetics research, the SSC will provide a written report that identifies the following:

1) *Evaluate and consider the results of the final report on Surfclam population structure and population connectivity (genetics) and the additional aging work completed;*

   The presentation stimulated considerable discussion within the SSC. The SSC appreciated the comprehensive and thorough summary of a complex topic. It also noted that the genetic methods and analyses reflected state-of-the-art approaches. The report was lucid and detailed. The SSC questions included the presence of hybrids, the ability to identify underlying ecological or climatic factors, and technical questions on the statistical analyses. The additional work on ageing is intriguing but, as noted below, further work will be necessary to determine the phenotypic importance of the genotypic differences detected.

   Modern genetic methods now allow for greater resolution of differences among sample sites. Latitudinal differences among samples from Georgia to Massachusetts were initially posited as important for distinguishing between *S.s.solidissima* and *S.s.similis*. However, the current study suggests important differences between inshore and offshore populations. In the parlance of modern genetics these are known as Operational Taxonomic Units (OTU).

   Metrics of genetic diversity appear to be similar for all OTUs, but clear distinctions among sample sites were detected. Two OTUs for *S.s.solidissima* were identified and their proportions varied by sample site. Investigators used Principal Components Analyses (PCA) and two measures of gene flow to describe spatial patterns. Initial ageing analyses of samples suggest differences in growth rates, but further studies are required to distinguish between genetic and environmental influences.

2) *Identify potential implications to our understanding of Surfclam life history (i.e., recruitment, distribution, growth, maturity, etc.), to the stock assessment, NEFSC clam survey, and fisheries management;*

   Current sampling is insufficient to determine the influence of genetic differences on recruitment, growth, maturity, or other life history traits. For example, initial investigations into differences in growth rates among haplotypes or subspecies need to include consideration of possible environmental differences, such as depth or productivity. It is currently unknown how the sample information scales to the total population. Many of the samples were taken inshore such that the inshore strata may be oversampled relative to the population as a whole. Simply put, the samples may need to be properly weighted before estimating the total population fractions.

3) Identify new research needs to address data and science gaps with respect to the new information identified with the existing research.

Most of the recommendations for new research follow from the premise that genetic differences alone are not sufficient to change harvest levels or management.

The SSC noted that additional biological analyses are needed to determine whether different life history characteristics, including age and growth, can be associated with genetic differences. Further work is needed to evaluate how oceanographic processes (especially advective transport) affect patterns of gene flow and differences in OTUs. The implications of the genetic studies for management are indeterminate at this time. In particular, it is not clear how such differences will affect sampling regimes for the surveys, how biomass and F for spatial sub stocks will be estimated in the model, and how spatial management might be implemented. Alternative survey sampling allocations may be required, as well as increased spatial resolution of harvesting, particularly in state waters. As with other recent genetic analyses in the Northeast Region (e.g., cod), the questions of stock structure will ultimately be resolved by considering what differences are important and whether existing or future sampling programs can provide an adequate basis for more refined management. Continued monitoring of the distribution of the different species and haplotypes is essential, particularly if climatic changes are responsible. If spatially distinct exploitation patterns are evident then patterns of genetic diversity may change. It is not clear if historical exploitation would be sufficient to reduce genetic variation; available data do not suggest any significant differences in genetic diversity among species.

Hybrids were detected between the A and B OTUs but only two to three individuals were identified. No work on the role of ecological factors or climatic factors have been attempted (yet). While the PCAs generally explain a small fraction of the total variance, it was noted that such values are common when the number of potential genetic types are very high. In this study there were nearly 12,700 possible SNPs. The spatial and temporal patterns for genetic sampling were affected by Covid, and samples from smaller vessels operating in state waters may be overrepresented in the sampling relative to the total harvest patterns. Future sampling by the Joint Industry-NEFSC survey will be helpful for acquiring samples. Archiving of samples is considered valuable, particularly since samples may be analyzed several years after collection.

Illex Squid

This session opened with a formal recusal by Paul Rago on *Illex* decisions owing to his support from the Council for analyses. Michael Wilberg kindly served as chair of the SSC during these discussions.

Lisa Hendrickson, NEFSC, provided an overview of the updated catch data for 2021 and the 2022 NEEFC bottom trawl survey indices. Multiple state and regional surveys, along with various DFO Canada surveys, were presented. The NEFSC spring survey has a much lower frequency (14%) of positive tows vs the fall survey, which averages about 57% positive tows. Surveys that cover only a small fraction of the stock area, particularly when inshore only, are difficult to interpret since abundance cannot be readily distinguished from availability. Landings in Canada increased significantly in 2022 with a sharp increase in the Newfoundland jig fishery. Total catches in 2021 for NAFO areas 3-6 were the highest since 1981. Discards constitute a small fraction (6.4%) of US catch. Various GLM model approaches have been used to summarize commercial vessel catch rates. Key predictors include vessel type, days absent, and port landed. These analyses may be useful for future stock assessments.

Key results from the March 2022 Research Track Assessment include:

- Estimates of stock biomass and fishing mortality rates could not be provided because none of the proposed approaches were considered sufficient.
- A generalized depletion model (GDM) was attempted, but its reliance on strong assumptions and weekly data led to its rejection for assessment advice. Increased frequency of data (daily rather than weekly), and alternative model parameterizations may be helpful in future applications. Importantly, simulation testing using realistic assumptions about migration of *Illex* into and out of the survey area should be investigated. The CIE reviewers, however, were not unanimous in their recommendations for future work on the GDM.
- The Plan B smooth approach was not recommended given the limited support for autocorrelation in indices and the multiple generations of *Illex* that occur between annual survey estimates.
- No revised biological reference points were developed and a previously used method could not be applied due to lack of contemporary data.
- Valuable information on *Illex* ageing was obtained via seasonal biological sampling supported by industry and the Council. These and other scientific advances, notably in understanding of oceanographic influences, were summarized in the SSC report from its May 9-19, 2022 meeting,
- An ensemble approach of multiple models, which examine the range of abundance estimates over likely ranges of catchability, availability, and natural mortality, was recommended as an interim approach for providing catch advice. These methods have been considered by the SSC in its derivation of ABCs for 2020 to 2022.
- Reviewers recommended a Management Strategy Evaluation (MSE) approach for future assessments.
- Difficulties with the timing of the RTA and subsequent MTA were noted. In particular, the 2022 ABCs were set in March only a few days after the RTA was completed. The joint comments of the reviewers were not received until May and the CIE reviews were not available until just before this SSC meeting.

I (Paul Rago) summarized the methodology used by the SSC in March 2022 for its determination of ABC for the 2022 fishery. The methodology used by the SSC is largely based on the approaches presented to the RTA but differs in several important ways:

- Numerical methods are improved and the joint effects of the range of model parameters are considered. These changes allow for estimation of the distribution of possible outcomes for key decision variables, such as escapement.
- Alternative quotas are examined with respect to their consequences for risk of exceeding biological reference points (BRP). There are no accepted BRPs for *Illex* squid, but the escapement targets ranging from 40 to 50% have been used for other squid fisheries. In addition, harvest rates where F=2/3 M have been used for forage species in various assessments around the world. The methodology allowed the SSC to examine the probability of violating the reference point for various levels of catch limits ranging from 24,000 to 60,000 mt.
- The Council's Risk Policy was recognized by considering the current stock status ranging from 0.5 to 1.5 B_{msy}. Earlier assessments and previous SSC deliberations have concluded that *Illex* appears to be lightly exploited.
- Further work could include consideration of uncertainty in the survey indices. This would be expected to increase the range of likely outcomes for key decision variables, such as escapement.

Jason Didden, MAFMC, provided a summary of input from the Advisory Panel, comparisons of current landing with last year's catch rates, and initial recommendation for catches in 2023. Catch rates in 2022 have only recently begun to increase. High catch rates and prices for longfin squid and high fuel costs may be delaying the shift towards *Illex* fishing. Various oceanographic drivers of *Illex* availability in the fishing areas are continuing to be monitored. Council staff recommend a continuation of the 40,000 mt ABC as a provisional quota for 2023 in lieu of additional analyses. The analyses considered by the SSC in March 2022 will be updated in March 2023 to include new survey data and potential enhancements described above.

SSC discussions noted the divergence of opinions by the CIE reviewers, particularly with respect to the future utility of the GDM approach. However, there was general agreement by the CIE and SSC that an MSE-like approach would be valuable. The SSC noted that Rago's work partially addressed these issues and might serve as a basis for future work.

A closed loop simulation framework with alternative Harvest Control Rules (HCR) was suggested. Fishery dependent CPUE indices should be considered more extensively.

It was noted that the TOR for the RTA did not include a specific recommendation to examine alternative catch limits. This omission explains some of the differences for methods considered in the RTA with respect to methods used by the SSC. The SSC noted that the distinction between what NOAA Fisheries uses for determination of stock status and what the SSC needs for decision making should be highlighted. The Council needs to manage the fishery based on the scientific advice from the SSC, irrespective of the validity of the formal status determination. The SSC noted that TOR in RTA should be updated to reflect the dilemma when assessments fail. The RTA and MTA process should revisit this aspect of the assessment planning and review process. With respect to *Illex*, the catch advice is being crafted apart from the formal review process. Efforts should be placed on how to manage without an assessment. Continuation of work begun by the RTA for Index Methods could be useful.

Following these presentations and general discussion, the SSC addressed the Terms of Reference (italics) for *Illex* Squid. Responses by the SSC (standard font) to the Terms of Reference provided by the MAFMC are as follows:

Terms of Reference

For *Illex* squid, the SSC will provide a written report that identifies the following for the 2023 fishing year:

1. *Utilizing the 2022 research track stock assessment and peer review results and the most recent fishery and NEFSC trawl survey information, specify a preliminary 2023 acceptable biological catch (ABC), in weight, and provide any rationale and justification for the recommended ABC (note: the SSC will review an updated "Indirect Method" analysis in March 2023 with 2022 catch and the fall 2022 NEFSC trawl survey information, which could be used to modify/finalize the 2023 ABC);*

   The Research Track Assessment (RTA) did not provide any acceptable reference points on which the SSC could base any revision of our previous March 2022 specification.

   In March 2022, the SSC established an ABC of 40,000 MT. This ABC emerged from the Council-supported escapement analysis and was associated with an approximately 5% chance of exceeding the ⅔ F:M generic guidance for data poor species. Model results suggest this provides greater than 50% escapement for *Illex* squid.

   The SSC expects to revisit this ABC in March 2023.

2. *Provide any recommendations or areas of consideration to update the "Indirect Method" analysis (see [Rago 2022]) for 2023;*

   The SSC recommends the following analyses be considered to improve the "indirect method analysis":

   - Consider effects of point estimates of uncertainty in estimates of abundance on overall risk profiles.
   - Undertake a "first principles" consideration of the sign and potential magnitude of covariation among q, v, and M.
   - Conduct exploratory analyses over whether the model effort results are sensitive to levels of covariation among q, v, and M. If these exploratory analyses indicate that covariation is important, additional analyses should be conducted to inform the scale of the anticipated covariation.
   - Consider development of an "indirect method" analysis package that facilitates the transfer of the approach to the Center.

   The SSC notes that the recommendations provided above are offered as short-term improvements in the indirect method. The SSC joins the external peer reviewers of the RTA in recognizing the need for a longer-term plan for improvements to the scientific advice to managers for this species. The SSC notes also a desire for improvements in the systems and procedures used to deliver that scientific advice, given the short life span of this species and the highly variable nature of its biology and ecology.

3. The most significant sources of scientific uncertainty associated with determination of the ABC;

The SSC concluded the following sources of uncertainty were important:

- The lack of a peer-reviewed OFL introduces substantial uncertainty for the foundation of ABC determination. As an alternative, the SSC is relying on data-poor approaches and reference points used to manage other squid fisheries and used to promote sustainability of exploited forage species.
- Continued uncertainty over the fraction, and the interannual variability, of the squid population that is subject to exploitation. This likely leads to estimates that are likely lower bound estimates of the impact of the fishery on the squid population.
- The lack of understanding of stock-recruitment processes in squid complicates development of biological reference points.
- The lack of understanding of the coherence of squid availability on the shelf with environmental drivers of distribution complicates understanding of whether sequences of good or bad years are likely to occur, which would bias understanding of stock status when using data poor approaches.
- Levels of escapement or other biological reference points that afford protection against overfishing are poorly understood analytically and empirically.
- Estimates of q, v, and M are uncertain and estimates are assumed to be uncorrelated, whereas there are easily conceived processes that could introduce correlations among these key parameters.

4. 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 certifies this advice meets the National Standard guidelines for best scientific information available.

Butterfish

Charles Adams, NEFSC, provided an updated MTA using data through 2021. The methodology was based on the recently-completed RTA that included a new state-space modeling approach known as the Woods Hole Assessment Model (WHAM). A key difference between this model and earlier ASAP models is that the numbers at age are modeled as an autoregressive process. Many of the technical innovations and ancillary research efforts were presented to the SSC at its May 2022 meeting.

Estimated natural mortality rates are about M = 1.3/yr, which suggest a short life span. However, examination of estimated consumption of Butterfish by a broad range of piscine, avian, and mammalian predators was insufficient to explain the high natural mortality rates. Predation from other predators, perhaps squid, or another source of mortality may be important. The high rates of natural mortality, rapid growth, and early maturation lead to very high rates of fishing mortality at 50% MSP and higher still at 40% MSP (i.e., F>5.6/yr). The implied stock biomass at $F_{40\%MSP}$ was lower than any point estimate of biomass in the 40+ year time series. This may be true if the resource has been lightly fished, but the CIE Peer Review Panel and RTA chair expressed concerns about the validity of such high rates. Underlying this concern was the consequence of being wrong for future fisheries. Much hinges on the reliability of the catchability estimate of the NEFSC bottom trawl survey, and the associated fixed estimate of availability over all years. Setting this parameter at a fixed value is the primary control on stock size estimates, which in turn allows for estimation of M. If the catchability estimate has changed in recent years, the high population biomass would be an artifact. To counteract this possibility, the Review Panel recommended consideration of a reference point for F = 2/3M, based on an approach of Patterson (1992). Using this alternative reference point basis, the stock is not overfished and overfishing is not occurring. Using a lower F for reference point implies that the %MSP is higher than 50%, but the exact value was not available for review by the SSC.

A review of assessments since 2009 provides additional context for the F = 2/3M reference point. A delay-difference model failed to determine scale. A later assessment, using ASAP4 allowed for incorporation of thermal habitat as a primary determinant of Butterfish availability. The product of availability and gear efficiency led to a time invariant catchability because interannual variations in thermal habitat were small. A $F_{50\%MSP}$ reference point was rejected in that assessment as well, so the choice of an F = 2/3M reference point in this assessment is consistent with previous assessment reviews. The current assessment suggests that maturation is occurring at an earlier age which also leads to a higher $F_{50\%}$ value. Given the "fast" dynamics of this species , the SSC commented on the potential value of using a subannual time-step in the model. However, no specific proposals were tabled.

Jason Didden, MAFMC, reviewed the current fishery, noting that effort is low in view of much better prices for Longfin squid.

Following these presentations and general discussion, the SSC addressed the Terms of Reference (italics) for Butterfish. Responses by the SSC (standard font) to the Terms of Reference provided by the MAFMC are as follows:

Terms of Reference

For Butterfish, the SSC will provide a written report that identifies the following for the 2023-2024 fishing years:

1. *Based on the criteria identified in the acceptable biological catch (ABC) control rule, assign the stock to one of four types of control rules (analytically derived, modified by the assessment team, modified by the SSC, or OFL cannot be specified) the SSC deems most appropriate for the information content of the most recent stock assessment;*

   Type 3 (Modified by the SSC): the SSC recommends the use of F = ⅔ M as a reference point because the F50% reference point was not accepted by the peer review panel. This reference point has been used in past Butterfish assessments.

2. *If possible, determine the level of catch (in weight) associated with the overfishing limit (OFL) for each requested fishing year based on the maximum fishing mortality rate threshold*

or, if appropriate, an OFL proxy, and the associated coefficient of variation recommended by the SSC and its basis. If necessary, please provide any rationale and justification for the maximum fishing mortality rate threshold (or proxy) used to determine the OFL;

The SSC applied a 100% OFL CV based on the table in Attachment 4. See criteria in Attachment 3.

OFL for 2023 based on F = ⅔ M = 0.85 is 17,631 mt.
OFL for 2024 based on the same F is 16,096 mt.

3. *The level of catch (in weight) and the probability of overfishing (P*) associated with the ABC for each requested fishing year, based on the traditional approach of varying ABCs in each year. If appropriate, specify interim metrics that can be examined to determine if multi-year specifications need reconsideration prior to their expiration;*

ABC for 2023 is 17,267 mt with a P* of 0.49
ABC for 2024 is 15,764 mt with a P* of 0.49

Interim metrics:
CPUE from the surveys and indices of recruitment

4. *The most significant sources of scientific uncertainty associated with determination of OFL and ABC;*

- Choice of reference points, especially $F_{50\%}$, since the value was estimated to be > 6.0 in the research track assessment, and 5.6 in the management track assessment.
- Scale of the population. A q of 0.2 for the Fall Albatross survey was needed to reasonably scale the population. However, a q of 0.2 implies that up to 80% of the stock is not within the survey area, which is potentially problematic given that Butterfish are frequently captured throughout the survey.
- Uncertainty in discard estimates, particularly early in the time-series.
- Gap-filling procedures potentially blending cohorts and potentially leading to bias in the age composition data.
- Estimated consumption removals account for only a small fraction of estimated M. Results seem inconsistent with Butterfish being considered a forage species.

5. *Ecosystem considerations accounted for in the stock assessment, as appropriate, and any additional ecosystem considerations that the SSC considered in selecting the ABC, including the basis for those additional considerations;*

Changes in Butterfish condition were related to ecosystem indices and used to determine the appropriate stanza for recruitment projection starting in 2011.

Considerable work estimating consumption of Butterfish by fishes, marine mammals, and seabird predators was completed. Unfortunately, this did not further resolve the Butterfish natural mortality estimate.

6. *Research or monitoring recommendations that would reduce the scientific uncertainty in the ABC recommendation and/or improve the assessment level;*

In addition to the research recommendations identified by the peer review panel (see page 6 of the Summary Report of the 2022 Butterfish and Shortfin Squid Research Track Stock Assessment Peer Review), the SSC recommends the following:

- Research into survey catchability is a high priority.
- Examine shorter (sub-annual) model time steps.
- Evaluate maturity methods, impact on maturity ogive, and estimated reference points.
- Consider alternative ways to calculate discards.
- Evaluate adequacy of port sampling to support continued assessments (is full age structure sampled?).
- What is eating butterfish? Consider additional methods to estimate predation mortality.
- Evaluate methods for developing age length keys to avoid pooling.

7. *The materials considered by the SSC in reaching its recommendations;*

- SSC Terms of Reference for Butterfish
- Staff Memo: 2023-2024 Butterfish ABC Recommendations
- 2022 Butterfish Management Track Assessment Report
    - Management Track Report Figures
    - Management Track Report Tables
- 2023-2024 Butterfish OFL/ABC Stock Projections
- Draft Butterfish OFL CV Decision Criteria Summary
- Summary Report of the 2022 Butterfish and Shortfin Squid Research Track Stock Assessment Peer Review (same report as provided under Illex above)
- Center for Independent Experts (CIE) Reports for the 2022 Butterfish and Shortfin Squid Research Track Stock Assessment Peer Review (same reports as provided under Illex above):
    - Report #1 - Thomson
    - Report #2 - Cook
    - Report #3 - Chen
- 2022 Butterfish Research Track Assessment Working Group Report
    - See the Stock Assessment Support Information (SASINF) Search Tool for additional information including tables, figures, and additional analyses
- April 11, 2022 Assessment Oversight Panel (AOP) Report (same report as provided under Illex above)
- 2022 Butterfish Advisory Panel Fishery Performance Report
    - Supplemental: Consumption of important pelagic fish and squid by predatory fish in the northeastern USA shelf ecosystem with some fishery comparisons (Overholtz 2000)
- 2022 Research Track Industry Perspectives Working Paper
- 2022 Butterfish Fishery Information Document

- Hare, J. A., Morrison, W. E., Nelson, M. W., Stachura, M. M., Teeters, E. J., Griffis, R. B., Alexander, M. A., et al. 2016. A Vulnerability Assessment of Fish and Invertebrates to Climate Change on the Northeast U.S. Continental Shelf. PLOS ONE, 11: e0146756. Supplemental information at https://www.st.nmfs.noaa.gov/data-and-tools/NE-CVA/pdf/Tilefish.pdf

8. 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 agrees that this recommendation is based on the best available scientific information.

Update on Recreational Reform Initiative and Harvest Control Rule

Julia Beaty, MAFMC staff, provided a review of the Council decision on the Harvest Control Rule made at its June 2022 Meeting. The Council selected the option known as the Percent Change Approach. This approach relies on a comparison of the joint distribution of recent average catches from the last two years with the projected RHL based on the assessment. When the projected RHL lies outside of the prescribed confidence interval, one or more management actions may be imposed to adjust the expected catch. The magnitude of these changes (liberalization or restriction of regulations) depends on the current biomass status of the resource. The Council-approved method will first be implemented in 2023 for Summer Flounder, Scup, and Black Sea Bass. Bluefish regulations will not be affected because it is currently in a rebuilding plan. To allow for continued improvement of the methodology, the amendment will sunset in 2025 and be followed by an anticipated revised methodology informed by new information and experience.

SSC members inquired about who will be leading the development of new methods. Julia responded that a new FMAT will be formed, possibly including an SSC member. Additional concerns were raised about the possible interactions between quota limits imposed on commercial fisheries and effort regulations applied to the recreational harvests. There are no interactions specifically considered in the approved HCR amendment, but it was noted that current MSE approaches used for Summer Flounder do include consideration of some aspects of interactions. Members inquired about the short anticipated life span of this amendment and ways in which the success or failure would be judged. No specific or incremental monitoring plans have been proposed, but the addition of two additional years of data, along with estimates of the realized F given the recreational harvests, would be useful as a means of evaluating the efficacy of the measures. SSC members encouraged more detailed consideration of differences between the for-hire vessels and the private boat and shore-based anglers. As noted in its previous review of the HCR, the SSC reiterated that management uncertainty may increase as a result of HCR interventions, which, in turn, could lead to changes in data quality and possibly changes in the OFL CV.

Members of the public inquired about the level of stock status necessary to require accountability measures, especially in the case of recreational overages. Accountability measures are grouped into three different biomass categories. Pound-for-pound paybacks are required when the stock is below the threshold. Above the threshold, the payback is variable and recommendations on the magnitude of payback are based on analyses of the Monitoring Committee.

Summer Flounder

Kiley Dancy, MAFMC, led the initial discussion by reviewing the results of the 2021 MTA, noting that the stock was not overfished and no overfishing was occurring in 2019. The estimated recruitment in 2018 was above average and is showing up in updated size frequency distributions from the fishery. Discard estimates for 2020-2021 are not yet available, but recreational harvests in 2021 were low. Commercial harvests have typically been below the quota. Improved methods for estimation of dead discards are desired and further work by the monitoring committee is needed. Prices for summer flounder have been low in 2022 so far and fuel prices have been very high. The potential profit squeeze may lead to catches lower than quotas in some states.

Questions were raised about the precision of recreational harvest limits and their potential utility for evaluating the interim information on stock condition by the SSC. Mark Terceiro, NEFSC, reported that typical CVs for Summer Flounder were about 10% for the stock as a whole over the entire year. Other SSC members suggested some consideration of overall recreational effort and measures of CPUE as potential signals for consideration. Recreational CPUE is not used in model development. Terceiro noted that Covid led to reductions in angler sampling efforts in 2020 and 2021; this could compromise interpretation of trends in recent years.

Members of the public inquired about the availability of commercial and recreational discards. Commercial discard estimation for 2020 and later relies on an updated CAMS data. To date, the Center and Regional Office have focused on providing timely estimates for species undergoing RTA. As a result, information for other species has lagged.

SSC found no reasons to change the ABC and recommends continuation of the previously approved ABC=15,021 mt for the 2023 fishing year.

Scup

Hannah Hart, MAFMC, provided an overview of stock status and the recent fishery information for Scup. The 2021 MTA concluded that the stock was not overfished and overfishing is not occurring. While SSB remains above target values, recruitment has been below average with 2019 being the lowest in the time series. Recreational catches were close to or exceeded RHL in the past two years (98% and 171%, respectively) and are greater than commercial catches. Because the stock size remains high, there are no provisions for payback of recreational catch overages. Scup commercial landings in 2022 are tracking patterns observed in 2021 fairly closely. The commercial fishery has been below quota levels in all years.

Model projections suggest the population will continue to decline as the strong year classes die out. However, despite the RHL overages, no evidence suggests the need to change the previously specific catch levels.

The SSC recommended continuation of previously approved quota of 13,460 mt for 2023.

Black Sea Bass

Julia Beaty, MAFMC, opened the discussion by reviewing current stock status and recent harvests of Black Sea Bass. The stock is not overfished and overfishing is not occurring. An RTA is currently underway with an expected review in February 2023. In the most recent MTA the retrospective pattern suggests significant underestimation of biomass and overestimation of F. This pattern is uncommon in Mid-Atlantic assessments. Year classes in 2011, 2015, 2016, and 2019 were above average. Recreational landings have exceeded RHLs in 2021 by 89%, while commercial landings continue to be below ACLs. Discard estimates have lagged due to impacts of Covid on sampling schedules and the ongoing efforts to reconcile catch estimation methods in the CAMS project.

Historic overages in the recreational fishery and imposition of accountability measures led to a low RHL in 2022. High fuel prices and other costs are expected to further reduce fishing effort.

The SSC questioned the basis for projections, noting that the retrospective adjustment biomass was positive. NEFSC staff advised that the forecasts were based on properly adjusted terminal year abundance estimates.

The SSC recommended continuation of previously approved quota of 7,557 mt for 2023.

Bluefish

Karson Cisneros, MAFMC, began the discussion with an overview of the current status of Bluefish and a summary of recent fisheries. The 2021 Management Track revealed that the stock remains overfished, but overfishing is not occurring. A Research Track Assessment will be reviewed in December 2022 followed by an MTA in 2023 to inform catch advice for 2024-2025. The SSC expressed interest in learning about scientific advances from the RTA at its March 2023 meeting.

Recreational CPUE declined in 2020, but increased slightly in 2021. The NEFSC and GARFO are working on improved estimation of recreational discards, particularly differences in practices between northern and southern states. The SSC highlighted the importance of compliance in the recreational fishery and implications for assessments and rebuilding plans.

The commercial fishery has been under the annual quotas, but catches above the RHL will trigger accountability measures with pound-per-pound payback of overages in 2023. An estimated 97% of Bluefish recreational landings occur in state waters. Total catch has declined. Spatial and temporal patterns of Bluefish availability vary by state, but no major anomalies were observed in 2021 and thus far in 2022. Inshore presence of tuna, noted in several states, may be affecting Bluefish catches.

In the absence of any major signals and in consideration of the potential revisions to the stock estimates in the RTA, the **SSC recommends no change to the previously adopted 2023 ABC of 13,890 mt.**

Northeast Regional Action Plan for Climate Science

Vince Saba, NEFSC, presented an overview of the draft Northeast Regional Action Plan (NERAP) accomplishments to date and new initiatives for 2022 and beyond. The Northwest Atlantic Region is warming faster than elsewhere around the globe as the behavior of the Gulfstream continues to change and marine heat waves become more common. Surface pH has also declined with the increased uptake of atmospheric CO_2. As waters warm, many fish species have responded by moving north and into deeper waters. In response to these changes NERAP 2.0 has identified ten priority research actions for public review and comment. The initial version of NERAP 1.0 achieved a number of goals, including progress on species, habitat, and social vulnerability analyses. Formal approaches to scenario planning are underway, and laboratory studies have been used to inform process-oriented models. Some progress has also been made in the inclusion of environmental factors in stock assessment models. Physical oceanography models have improved significantly, thereby affording higher resolution temporal and spatial models that can improve linkages with resource utilization (e.g., fishing practices). However, near-term prediction skill for physical and chemical processes remains poor.

NERAP Priority Action research goals (abbreviated) include:

1: Maintain ecosystem survey and data collection efforts in the Northeast U.S. Continental Shelf ecosystem.
2: Coordinate with other partners to link living marine resource data, science, and management to climate science and research.
3: Continue to build industry-based fisheries and ocean observing capabilities.
4: Continue production of the NEFSC State of the Ecosystem reports.
5: Conduct laboratory and field research on the mechanistic effects of multiple climate factors on living marine resources to inform process-based models.
6: Work with partners to develop and improve regional hindcasts, forecasts, and projections of ocean and estuarine/river physics and biogeochemistry to develop and improve climate-ready management of living marine resources.
7: Improve spatial management of living marine resources.
8: Develop and use Vulnerability Analyses, Scenario Planning, and Management Strategy Evaluations to examine the effects of different management strategies under various climate change scenarios
9: Increase social, economic, and ecosystem scientist involvement in climate change research through multidisciplinary work.
10: Develop stock assessment models (e.g., WHAM) that include environmental terms with a priority for stocks in Research Track Assessments.

The SSC applauded the considerable progress achieved under NERAP 1.0 and looks forward to future accomplishments under NERAP 2.0. SSC discussions included concerns about the diminished role of historical observations as more recent trends dominate discussions and research focus. The SSC emphasized a need for high resolution temporal data (e.g., for phenology comparisons across years), especially from fixed buoys and possible collaborations with wind energy installations. It was noted that high resolution models such as those developed under Action Item 6 can help fill in data gaps. Cooperative research with fishery dependent platforms is central to this effort.

SSC members also acknowledged the importance of spatial modeling (#7). New assessment models that incorporate high resolution environmental data, as well as spatial and temporal harvesting patterns, will be essential in a changing environment. The VAST model framework provides a consistent approach to estimation at different temporal and spatial scales. Combining VAST with WHAM to take advantage of state-space methodology could be a productive endeavor. One of the key modeling limitations is poorly resolved harvest data. Several approaches are underway (e.g., study fleets) to acquire such information. Vessel Monitoring System data were suggested as an alternative approach to examining the totality of fishing behavior. In turn, such data could unlock the potential of Study Fleet data by allowing proper weighting of the subsample data to the whole fleet.

The SSC expressed some concerns about future funding of these projects. Internal reallocation of resources to address these needs is underway and collaborative studies with Canada have improved the comprehensiveness of some surveys. Attention should be given toward improving the precision of existing surveys via improved sampling strategies.

The nexus between science and management needs improvement. Inclusion of environmental data in stock assessment is valuable but the necessary next step is to generate near term forecasts of ecosystem conditions. Such forecasts, as noted above, often have low prediction capability, but recent physical modeling improvements may prove useful. Recent work on the dynamics of the Cold Pool have been illustrative.

SSC inquired about the current status of ecosystem models such as ATLANTIS. Substantial progress has been made, especially through the inclusion of higher resolution physical forcing for both historical evaluations and future projections.

Members of the public inquired about the linearity of environmental drivers (e.g., temperature) and the likelihood of interactions with other factors. Not all drivers will change at the same rate, so comprehensive approaches to modeling effects of environmental processes on biological responses are a high priority. Simulation studies are helpful in this regard. SSC further noted that effects vary across species, such that techniques applicable to, say, Summer Flounder may be less useful for *Illex* squid.

The SSC did not develop a formal list of recommendations, but discussions suggested an emphasis on the following concerns:

- Improve linkages with existing monitoring stations.

- Improve design efficiency for existing sampling programs.
- Increase temporal resolution of sampling to examine finer scale seasonal and phenological changes.
- Increase focus on spatial modeling of populations and increase spatial and temporal resolution of harvest estimates.
- Improve short-term forecasts of environmental data to avoid increases in uncertainty when incorporating environmental data in assessments.
- Consider a broader range of species when developing environmental forecast models to address the span of life histories ranging in scope from *Illex* squid to Ocean Quahogs.

The SSC looks forward to regularly receiving updates on implementation progress for the Action Plans identified under NERAP 2.0.

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 SSC initiated discussions of potential topics for consideration at the October joint meeting of the Council and the SSC. An expected topic will be review of progress of the Ecosystem Working Group.

Brandon Muffley updated the SSC about the effects of recent delays in Research Track Assessments for SSC deliberations. None of the recent changes are expected to affect the ability of the SSC to derive ABCs, but it was noted that the interval between completion of the RTA and initiation of the MTA will be undesirably short. John Boreman will be chairing the RTA for Spiny Dogfish and Bluefish in December 2022. The Council is seeking an SSC member to chair the Black Sea Bass RTA in February 2023. The July 2023 meeting of the SSC will require derivation of ABCs for at least six species, including Atlantic Mackerel, Spiny Dogfish, Summer Flounder, Scup, Black Sea Bass, and Bluefish.

Attachment 1

Mid-Atlantic Fishery Management Council

Scientific and Statistical Committee Meeting

July 25 – 26, 2022

Hybrid Meeting:

Baltimore Marriott Waterfront (700 Aliceanna 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 Baltimore Marriott Waterfront 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/july-2022-ssc-meeting

AGENDA

Monday, July 25, 2022

10:00 Welcome/Overview of meeting agenda (P. Rago)

10:05 Surfclam species diagnostics and population connectivity estimates to inform management

- Presentation on research project final results (M. Hare, Cornell University)
- SSC feedback and input on document for consideration by Council

12:00 Lunch

1:00 Interim *Illex* squid specifications for 2023 fishing year

- Overview of research track assessment results, peer review findings and most recent fishery and survey information
- Review of staff memo and 2023 ABC recommendation (J. Didden)
- Interim 2023 SSC ABC recommendation (T. Miller)

3:00 Break

3:15 Butterfish ABC specifications for 2023-2024 fishing years

- Overview of 2022 management track assessment (C. Adams)
- Review staff memo and 2023-2024 ABC recommendations (J. Didden)
- 2023-2024 SSC ABC recommendations (R. Latour)

5:45 Adjourn

<u>Tuesday, July 26, 2022</u>

8:30 Update on Recreational Reform Initiative and Harvest Control Rule

- Outcomes from June 2022 Council meeting

9:00 Summer Flounder data and fishery update: review of previously recommended 2023 ABC (K. Dancy)

9:30 Scup data and fishery update: review of previously recommended 2023 ABC (H. Hart)

10:00 Black Sea Bass data and fishery update: review of previously recommended 2023 ABC (J. Beaty)

10:30 Break

10:45 Bluefish data and fishery update: review of previously recommended 2023 ABC (K. Coutre)

11:15 Draft Northeast Regional Climate Strategy Action Plan

- Overview of draft 2022—2024 plan (V. Saba, NEFSC)
- SSC input and feedback for Council consideration in comment letter

12:30 Other Business

- Joint Council/SSC meeting – initial discussion on potential topics

1:00 Adjourn

Note: agenda topic times are approximate and subject to change

Attachment 2

MAFMC Scientific and Statistical Committee

July 25 - 26, 2022

Meeting Attendance via Webinar

Name	Affiliation
SSC Members in Attendance:	
Paul Rago (SSC Chairman)	NOAA Fisheries (retired)
Tom Miller (July 25th only)	University of Maryland – CBL
Ed Houde	University of Maryland – CBL (emeritus)
Dave Secor	University of Maryland – CBL
John Boreman	NOAA Fisheries (retired)
Lee Anderson (July 25th only)	University of Delaware (emeritus)
Jorge Holzer	University of Maryland
Yan Jiao	Virginia Tech University
Rob Latour	Virginia Institute of Marine Science
Brian Rothschild	Univ. of Massachusetts-Dartmouth (emeritus)
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
Mark Holliday	NOAA Fisheries (retired)
Others in attendance (only includes presenters, staff, and members of public who spoke):	
Jason Didden	MAFMC staff
Brandon Muffley	MAFMC staff
Julia Beaty	MAFMC staff
Jeff Kaelin	Lund’s Fisheries
José Montañez	MAFMC staff
Charles Adams (July 25th only)	NEFSC
Lisa Hendrickson (July 25th only)	NEFSC
Greg DiDomenico	Lund’s Fisheries
Meghan Lapp	Seafreeze Ltd.
Michelle Duval	MAFMC
Vince Saba (July 26th only)	NEFSC
Mark Terceiro (July 26th only)	NEFSC
Tony Wood (July 26th only)	NEFSC
Matt Hare (July 25th only)	Cornell University
Hannah Hartung (July 25th only)	Cornell University
James Fletcher	United National Fisherman’s Assoc.
Jessica Coakley	MAFMC
Hannah Hart	MAFMC

Karson Cisneros	MAFMC
Kiley Dancy	MAFMC
Tracy Bauer	ASMFC

Attachment 3

OFL CV Decision Table Criteria (updated June 2020)

Decision Criteria	Default OFL CV=60%	Default OFL CV=100%	Default OFL CV=150%
Data quality	One or more synoptic surveys over stock area for multiple years. High quality monitoring of landings size and age composition. Long term, precise monitoring of discards. Landings estimates highly accurate.	Low precision synoptic surveys or one or more regional surveys which lack coherency in trend. Age and/or length data available with uncertain quality. Lacking or imprecise discard estimates. Moderate accuracy of landings estimates.	No reliable abundance indices. Catch estimates are unreliable. No age and/or length data available or highly uncertain. Natural mortality rates are unknown or suspected to be highly variable. Incomplete or highly uncertain landings estimates.
Model appropriateness and identification process	Multiple differently structured models agree on outputs; many sensitivities explored. Model appropriately captures/considers species life history and spatial/stock structure.	Single model structure with many parameter sensitivities explored. Moderate agreement among different model runs indicating low sensitivities of model results to specific parameterization.	Highly divergent outputs from multiple models or no exploration of alternative model structures or sensitivities.
Retrospective analysis	Minor retrospective patterns.	Moderate retrospective patterns.	No retrospective analysis or severe retrospective patterns.
Comparison with empirical measures or simpler analyses	Assessment biomass and/or fishing mortality estimates compare favorably with empirical estimates.	Moderate agreement between assessment estimates and empirical estimates or simpler analyses.	Estimates of scale are difficult to reconcile and/or no empirical estimates.
Ecosystem factors accounted	Assessment considered habitat and ecosystem effects on stock productivity, distribution, mortality and quantitatively included appropriate factors reducing uncertainty in short term predictions. Evidence outside the assessment suggests that ecosystem productivity and habitat quality are stable. Comparable species in the region have synchronous production characteristics and stable short-term predictions. Climate vulnerability analysis suggests low risk of change in productivity due to changing climate.	Assessment considered habitat/ecosystem factors but did not demonstrate either reduced or inflated short-term prediction uncertainty based on these factors. Evidence outside the assessment suggests that ecosystem productivity and habitat quality are variable, with mixed productivity and uncertainty signals among comparable species in the region. Climate vulnerability analysis suggests moderate risk of change in productivity from changing climate.	Assessment either demonstrated that including appropriate ecosystem/habitat factors increases short-term prediction uncertainty, or did not consider habitat and ecosystem factors. Evidence outside the assessment suggests that ecosystem productivity and habitat quality are variable and degrading. Comparable species in the region have high uncertainty in short term predictions. Climate vulnerability analysis suggests high risk of changing productivity from changing climate.
Trend in recruitment	Consistent recruitment pattern with no trend.	Moderate levels of recruitment variability or modest consistency in pattern or trends. OFL estimates adjusted for recent trends in recruitment. OFL estimate appropriately accounted for recent trends in recruitment.	Recruitment pattern highly inconsistent and variable. Recruitment trend not considered or no recruitment estimate.
Prediction error	Low estimate of recent prediction error.	Moderate estimate of recent prediction error.	High or no estimate of recent prediction error.

Assessment accuracy under different fishing pressures	High degree of contrast in landings and surveys with apparent response in indices to changes in removals. Fishing mortality at levels expected to influence population dynamics in recent years.	Moderate agreement in the surveys to changes in catches. Observed moderate fishing mortality in fishery (i.e., lack of high fishing mortality in recent years).	Relatively little change in surveys or catches over time. Low precision of estimates. Low fishing mortality in recent years. "One-way" trips for production models.
Simulation analysis/MSE	Can be used to evaluate different combinations of uncertainties and indicate the most appropriate OFL CV for a particular stock assessment.		

Attachment 4

SSC-Approved OFL CV Decision Table for Butterfish

Decision Criteria	Summary Points and Considerations	OFL CV bin (60/100/150)
Data quality	• Landings from 1989-2021 spanned three phases of commercial fishing activity: the historic directed fishery (1989-2001), the bycatch fishery (2002-2011), and the recent directed fishery (2013-2021). Landings during the recent directed fishery showed a variable but increasing trend through time, with magnitudes in several years comparable to those during the historic directed fishery (~3500-4000 mt). • Discard estimation was based on the standardized bycatch reporting methodology (SBRM, Wigley et al. 2007). During the historic directed and bycatch phases, the magnitude of discards often exceeded landings, however, during the recent directed fishery, discards have generally remained lower than landings (~1300-1600 mt). In the early part of the time-series, estimated precision of discards was generally poor, but since 2010, estimated precision has been good. • Landings-at-age have been stable within each of the three phases, with most harvested fish being ages 1-3 (majority age 2). Very few age 4+ fish appear in the landings. Most discards are age 0-2 with some age 3 fish and very few age 4+ fish. • The research track Peer Review Panel (herein, the Panel) concluded that the gap filling procedure applied by the WG to develop the age-length key and landings length composition likely leads to blending of cohorts which could introduce bias into the age composition data. Data gaps could be treated as missing years in the assessment model. • Indices of relative abundance recommended by the WG were based on the NEFSC Albatross Fall survey, NEFSC Spring and Fall Bigelow surveys, NEAMAP Spring and Fall surveys, and a coastal YOY composite time series based on six state surveys. The NEFSC Albatross and Bigelow surveys were treated separately in the assessment model. Uncertainties associated with the survey indices were well quantified. • The Panel suggested that the NEFSC Spring Albatross survey be included only as a sensitivity since butterfish availability during spring seems to have changed over	100

	time. The Panel also recommended that the life history data derived from different survey programs be compared to identify possible spatial variability. • Data used to characterize maturity ogive...samples at sea.	

Model appropriateness and identification process	• Initial model development done with ASAP3. The final ASAP3 model was brought into the Woods Hole Assessment Model (WHAM) for further development.
	• WHAM model preferred, years 1989-2019, ages 0-4+.
	• WHAM can implement random effects on interannual transitions in numbers-at-age, M, and selectivity.
	• The Panel made several comments/recommendations to the assessment modeling approach:
	  o Develop a model with a shorter time step than one year to more accurately reflect the biology of butterfish (relatively short-lived species).
	  o Separate catch into retained and discarded components as opposed to estimating the weight of discards and adding those quantities to landings. Age-structure of discards shows a skew toward smaller/younger fish when compared to that of the landings.
	  o Presentation of a broader set of sensitivity model runs.
	  o Free selectivity estimation (as opposed to estimation of a functional form) could hide or compensate for an incorrect value of M.
	  o Butterfish scale cannot be reliably estimated because there is little indication that fishing has affected abundance. Therefore, choosing a value for one of the catchabilities (q's) essentially defines scale/abundance.
	• WHAM model diagnostics showed generally good model fit and performance.
	• The WG considered several potential candidate reference points and recommended $F_{50\%}$ and $B_{50\%}$. However, the Panel had significant concerns about the very high estimated value for $F_{50\%}$ (> 6.0 yr^{-1}, ~ 99.9% mortality for fully selected ages). The recent range of years for estimation of $B_{50\%}$ was viewed as appropriate. Fishing appears to have little impact on the butterfish stock.
	• The Panel noted that the previously used reference point of F = 2/3M may be more appropriate than $F_{50\%}$.
		150

Retrospective analysis	• A retrospective analysis was performed and no retrospective adjustments were made to assessment model results.	60
Comparison with empirical measures or simpler analyses	• Presumably because of the sizable workload associated with first developing an ASAP3 model (reverting back from the ASAP4 model in recent assessments), migrating the final ASAP3 model to WHAM, and then further developing the WHAM model, no simpler analyses were presented. • q fixed in the model is a swept area estimate.	100
Ecosystem factors accounted	• Butterfish condition was related to copepod abundance and temperature, found breakpoints in time series, which justified the recruitment stanza starting in 2011 • The assessment included consideration of stomach contents data from NEFSC trawl surveys and studies on marine mammals and birds. The estimated consumption amounted to a small fraction of the estimated losses due to natural mortality. This result is odd given that butterfish is considered a forage species. • The Panel recommended that the WG consider alternative approaches for estimating consumptive removals of butterfish, and noted that results of the consumption study could be an indication that the estimated scale of the butterfish stock is too high. • Climate vulnerability analysis (Hare et al 2016) ranked butterfish low vulnerability to productivity impacts	100
Trend in recruitment	• Short-term projections of catch and SSB were computed by sampling from the cumulative distribution function of WHAM recruitment estimates, 2011-2021. The stanza beginning with 2011 was derived from an ecosystem analysis of butterfish condition. The most recent 5-year averages were used for the annual fishery selectivity, maturity ogive, and mean weights-at-age. The WHAM model assumes an AR(1) process for recruitment. • The recruitment pattern differs from the previous models that indicated declining recruitments in recent years. There was no substantial trend in recruitment detected in the most recent assessment. • WHAM incorporates AR(1) recruitment process into projections	100 or 60
Prediction error	• Predictive skill of the WHAM model was evaluated. Aggregate and age composition data for one index at a time were removed, the model was fitted to the reduced data, and the model was used to predict the removed data. Mean absolute scaled error (MASE) of	60

	the predictions over time horizons (1-3 years) was computed and appeared to be relatively low.	
Assessment accuracy under different fishing pressures	• Accuracy of assessment results were not characterized in relation to different fishing pressures. • F likely to be low relative to M	150
Simulation analysis/MSE	• The assessment results and subsequent management advice were not informed by simulation analysis or MSE.	NA

Attachment 5

Glossary

ABC—Acceptable Biological Catch
AIC—Akaike's Information Criterion
Bmsy—Biomass at maximum sustainable yield
CPUE–Catch per unit effort
CV—Coefficient of Variation
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
NERAP—Northeast Regional Action Plan
OFL—Overfishing Limit
P*—Probability of overfishing
q–Catchability parameter
RHL—Recreational Harvest Limit
RSA—Research Set Aside
RSC—Research Steering Committee
RTA—Research Track Assessment
R/V—Research Vessel
SNP—Single Nucleotide Polymorphisms
SSBmsy—Spawning stock biomass at maximum sustainable yield
SSC—Scientific and Statistical Committee
v—Availability Parameter
VAST—Vector Autoregressive Spatio-Temporal package
WHAM—Woods Hole Assessment Model

Northeast Trawl Advisory Panel Meeting

~ Meeting notes/summary ~

Wednesday, July 13th, 2022

1:00 a.m. - 4:30 p.m.

I. Participants

A. NTAP Members:

Name	Affiliation
Dan Salerno	NEFMC Member
Dustin Gregg	MAFMC Scientist
David Goethel	NEFMC Stakeholder
Jim Gartland	MAFMC Scientist
Kathryn Ford	NEFSC Lead
Frank Mirarchi	NEFMC Stakeholder
Michael Sissenwine	NEFMC Co-Chair
Philip Politis	NEFSC
Pingguo He	NEFMC Scientist
Tim Miller	NEFSC
Wes Townsend	MAFMC Co-Chair
Mike Pol	NEFMC Scientist
Emerson Hasbrouck	MAFMC Stakeholder
Robert Ruhle	ASMFC Representative
Dan Farnham	ASMFC Representative

B. Other Participants:

Name	Affiliation
Katie Burchard	NEFSC
Hannah Hart	MAFMC
Kelly Whitmore	Mass DMF
Alex Dunn	NEFSC
Jason Didden	MAFMC
Gareth Lawson	CLF

II. Summary Discussion Points by Agenda Topic:

(Action items identified in red)

Welcome, Introductions, Logistics (W. Townsend)

- **Introductions**
    - Wes introduces Hannah as the new staffer for the MAFMC that will assist NTAP
    - Went through Attendees introductions
- **Meeting summary from last meeting accepted**
    - Pending fix of Jon Grabowski affiliation

<u>Center Updates</u> (K. Ford)

- **Survey Updates (Phil Politis)**
    - Spring survey 364 of 377 planned stations complete including fixed gear closure area- less fixed gear than typically.
- **Update on recent studies (Tim Miller)**
    - The catch efficiency study paper is out for review with a scientific journal
        - Continues to be used in index-based assessments
    - Wingspread study discussed at Assessment Oversight Panel
    - Letter was drafted to send to Council describing how the research is being used in stock assessments
- **Wind**
    - SSEEP workshop – two reports posted on the SSEEP website
    - Gulf of Maine Planning Area, Survey Mitigation Implementation Strategy
    - Have a couple of state of the science publications that will be published in the next couple months
- **Data Management**
    - FRIMS update – improving fishery-independent data model so it's more efficient. Ongoing with a couple more years of work.
    - Log archiving project – Paper Survey Logs from trawl survey being brought to National Archive.
- **Comms with assessment scientists (Alex Dunn)**
    - Alex Dunn new NEFSC NTAP participant **–** his primary function is working with the stock assessments and communication with the councils and Commission. He shared the stock assessment calendar tool

Questions/Comments:

- **Are survey stations on rough bottom representative because of presence of fixed gear?** Not easy to answer. In small strata sampling frequency is quite high so yes, but Downeast Maine difficult place to survey due to fixed gear inshore. Once we get offshore, we don't have the same challenges with fixed gear. Fishing in Canadian waters has become more challenging in the fall where we need to stay half a mile away from fixed gear.
- **Albatross could sample in shallower water; we have calibration factors between Bigelow and Albatross. Any consideration to do analysis to formally describe the depth the ship sampled to get a rough gauge what the magnitude of the problem might be.** For the assessments where there was a shift in strata covered by Bigelow, the Albatross data was restricted to the strata covered by both surveys so there is consistency across those years.
- **Are there other sources of data used for waters too shallow for the Bigelow, like the Maine and New Hampshire trawl survey?** Stock assessment scientists using best data for a given assessment.
- **Have you thought of using Bottom Long Line to get more into that strata?** BLL covers same depth strata as Bigelow survey and is also stratified by bottom type.

Follow up: send map with strata for ME/NH and for BLLS; add depth of strata to orientation document FAQ section; provide information about what assessments use what datasets

<u>NTAP Orientation Document</u> (D. Gregg)

- The objective of the document is to serve as a reference that compiles everything NTAP but be interactive with clickable hyperlinks to help navigate to additional information, reports, publications.
- Ownership of the document will be NTAP admin support of MAFMC and NEFSC.
- Audience is future NTAP membership.
- Dustin stepped through the outline of the document.
- Plan to get a final draft to full panel in September for discussion at Winter NTAP Meeting with finalizing in March of 2023.

<u>Working Group Report</u> (D.Gregg, R. Ruhle)

- **Update on June 2022 survey work (**Restrictor Rope Research)
    - sampled full suite of data elements intended as laid out in the project planning- adding turbidity as suggested by the panel at the last meeting.
    - Modified site selection based on survey catches
        - High catch variability regardless of spatial distribution
    - Lengthened from trial tows (~29m doorspread, <12.99 wingspread)
    - Warp +5fm on restricted tows Warp
    - Tow tracks set off by ¼ mile
    - Additional 30 seconds to get restrictor on board to typical operations
    - Discussed and shared gear trawl metrics collected, wingspread, door spread, bridal angle
        - Bridle angle is an important metric to monitor due to its herding effect.
        - Bridle angle consistent
    - Restrictor rope shows little to no chafe
    - Respectable sample size of pairs of most target species
    - Exceeded spring target pair count
    - Go Pro footage attempted- not useful, no visibility/too dark
- **Survey September 2022**
    - Timing was planned for prior to fall NEAMAP- would be about September 10, 2022

Questions/Comments:

- **Did you avoid the South Shore of Long Island?** We didn't have what we needed to field overnight staffing for those stations further from shore.
- **How many tows 25 meters or deeper?** Majority of tows 120-145 feet, shallower than 25 fathoms
- **The NTAP survey was conducted daytime only? Y**es, mindful of comparing one tow with its matched tow, we were cautious about not fishing too close to sun-up or sun-down.
- **Very impressive operations both vessel and scientific crews. All the i's were dotted and t's crossed. The panel can be confident in the data that was collected.**
- **Is this study going to go into the NTAP orientation document to reference down the road?** Yes.
- **Interested in panels thoughts on instead of using ABBA change the approach.** Use Lewy method instead? This led to long discussion, concerns about changing design mid-stream. Decision was to hold a working group call to discuss in more detail. Meeting needs to be held before the next survey

- **We did collect acoustic data so in the future can look at what the abundance levels were for each tow.**
- **Door spread much lower with restrictor rope. So doors are not spreading. Be more interested in how much we can vary that warp so that the restrictor rope is restricting. Curious how we can tighten up that variation.** By lengthening it we tried to account for what you would normally account for as a catenary which doesn't allow it to spread to its fullest potential. The length of the restrictor is not what you would expect for the spread of your doors. Tried to look for a snatching effect on GoPro. Not sure how we can stretch that restrictor cable completely each tow. Discussion about tautness of the restrictor rope, impact of door size, changes in spreading force due to many factors.
- **Will there be any analysis done on first leg of data before fall leg?** Depends on how soon the working group meeting is.

Follow up: Add restrictor rope research to orientation document; plan working group conversation before fall restrictor rope field work to decide on ABBA vs Lewy designs

<u>Future priorities for NTAP</u> (Kathryn Ford)

- **Survey results**
    - Brief review of how we got to the survey
    - Survey more focused on needs of NTAP than on specific studies
        - 37% response rate
        - Top 3 priorities indicated for each question
    - Dr. Ford stepped through the results of the survey

Questions/Comments:

- **Seeing some common themes.**
- **Need to consider what is the study or action to accomplish? Is it doable and what is the impact of doing? Have sub-teams work on this.** Agreement to this point, not a lot of interest in revisiting priorities, focus on how to accomplish them.
- **Bring it to both the councils to see if they have anything to add.** Agreement to having a product for the Councils.
- **Are we going to change strata due to wind? Is that an NTAP responsibility?** How we will survey the areas impacted by wind farms is yet to be determined; several projects underway looking at this, including Scallop Survey looking at different ways of stratification. Decision making process needs to be outlined. Get feedback from the panel on survey changes expected. NTAP can help define these questions that need to be asked. Years where we don't hit deep pockets of strata, combination of allocation and stratification. NTAP can be working to define these out. ROSA meeting with BOEM-BOEM very receptive to using NTAP as an overarching mechanism for surveys.
- **Next steps for ranking priorities discussed.** Bring to Councils, discuss more definite/specific ideas in the winter. If goal is to find resources, bring to Councils. Put a stake in the ground and build momentum. But more detail needed to actually get resources – so far too vague.

- **How did restrictor cable research rise to the top?** Based on vote, influenced by amount of money available. Ranking projects and having price tags is our best way of going forward. Nice to have a shelf of projects we can run with if funds become available.
- **Next steps:** NEFSC Lead and co-chairs will meet and discuss moving from more general priorities to something more specific.

Follow up: make decision making process for survey changes available to NTAP (note: this is something NEFSC is working on, hasn't been finalized)

<u>Other Business</u> (W. Townsend)

- **Next Meeting**
    - Working group?
        - Discuss Tow Approach
        - Send out a doodle poll to the working group. Very latest would have to be the first week of September to change anything for next leg.
- **Timing for next full panel meeting**
    - There is funding for an in-person meeting
    - Hybrid meeting suggested
    - Virtual meeting in November to discuss orientation doc
    - Hybrid research priorities meeting in January
    - MAFMC will follow-up on working group scheduling and new members
- **Membership discussion**
    - Mike Sissenwine's last meeting is today
    - Check with executive directors and ask New England to confirm and modify membership

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: July 29, 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 August 2022 Council Meeting:

1. 2022 Planned Meeting Topics
2. Status of Council Actions Under Development
3. Status of Completed Council Actions and Specifications
4. Staff Memo: Protected Resources Update
5. Email from Kelly Denit: Climate Governance Follow-up
6. Conceptual Outline: Fisheries Governance Policy/Guidance pursuant to MSA 304(f)

2022 Planned Council Meeting Topics

Updated:7/26/22

August 8-11, 2022 Council Meeting - Philadelphia, PA

- 2023 Summer Flounder, Scup, and Black Sea Bass Specifications~~-~~: 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)
- 2023 Illex Specifications: Approve
- *Illex* Research Track Assessment Process Report
- *Illex* Permit Amendment: Update
- 2023-2024 Butterfish Specifications: Approve
- Climate Change Scenario Planning: Update
- BOEM Guidance for Mitigating Impacts of Offshore Wind Energy Projects on Commercial and Recreational Fisheries
- Presentation: Community Offshore Wind Project
- New England Council Updates

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~~
- Robert's Rules of Order Training
- NEFSC Fishery Monitoring and Research Division Update
- 2023 Spiny Dogfish Specifications: Approve

December 12-15, 2022 Council Meeting - Annapolis, MD

- 2023 Implementation Plan: Approve
- ~~2023 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: Discuss Next Steps
- Recreational Sector Separation and Catch Accounting Amendment: Discuss Next Steps

- Atlantic Surfclam and Ocean Quahog Species Separation Requirements Amendment: Final Action
- Climate Change Scenario Planning: Review Final Scenarios and Discuss Applications
- EAFM Risk Assessment Comprehensive Review: Update
- Habitat Activities Update (Including Aquaculture)
- Offshore Wind Updates
- Ocean City Video Project: Review Results
- 2023-2025 Monkfish Specifications and Management Measures FW: Approve

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

2022 Council Meeting Topics At-a-Glance

	August	October	December
Mackerel, Squid, Butterfish *and* **River Herring and Shad (RH/S)**	• 2023 *Illex* Specs • 2023-2024 Butterfish Specs • *Illex* Permits Amendment Update • *Illex* Assessment Process Report		
Recreational Reform			• Rec Reform Technical Guidance Doc: Discuss Next Steps • Rec Sector Separation and Catch Accounting Amd: Discuss Next Steps
Summer Flounder, Scup, Black Sea Bass (SF/S/BSB)	• SF/S/BSB 2023 Specs Review		• SF/S/BSB 2023 Rec Mgmt Measures
Bluefish	• Bluefish 2023 Specs and Mgmt Measures Review		
Tilefish		• Private Tilefish Permitting/ Reporting Update	
Atlantic Surfclam and Ocean Quahog (SC/OQ)		• SC/OQ Species Separation Amd: Approve Public Hearing Doc	• SC/OQ Species Separation Amd: Final Action
Spiny Dogfish		• 2023 Dogfish Specs	
Science Issues		• Joint Council-SSC Meeting •	Ocean City Video Project: Review Results
EAFM	• EAFM Summer Flounder MSE: Review Final Results		• EAFM Risk Assessment Comprehensive Review: Update
Habitat, Aquaculture, Wind	• BOEM Guidance for Mitigating Impacts of Offshore Wind • Presentation: Community Offshore Wind	• EFH Redo Amd: Initiate	• Habitat Update • Offshore Wind Update
Protected Resources			
Other	• Climate Change Scenario Planning: Update • New England Council Updates	• 2023 Implementation Plan: Draft Deliverables • NEFSC Fishery Monitoring and Research Division Update	• 2023-2025 Monkfish Specs and Mgmt Measures • 2023 Implementation Plan: Approve • Climate Change Scenario Planning: Final Scenarios and Discuss Applications

Acronyms/Abbreviations

Amd	Amendment
EAFM	Ecosystem Approach to Fisheries Management
FW	Framework
GRAs	Gear Restricted Areas
HCR	Harvest Control Rule
Mgmt	Management
MSB	Mackerel, Squid, Butterfish
MSE	Management Strategy Evaluation
Rec	Recreational
RH/S	River Herring and Shad
SC/OQ	Atlantic Surfclam and Ocean Quahog
SF/S/BSB	Summer Flounder, Scup, Black Sea Bass
Specs	Specifications
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

MID-ATLANTIC
FISHERY MANAGEMENT COUNCIL

Status of Council Actions Under Development

AS OF 7/26/22

FMP	**Action**	**Description**	**Status**	**Staff Lead**
Summer Flounder, Scup, Black Sea Bass *and* Bluefish	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 Commission will discuss next steps for this document in 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 Commission will discuss next steps for this amendment in December 2022.	Dancy
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 development; the Council is scheduled to review the public hearing document in October.	Coakley/ Montañez

FMP	Action	Description	Status	Staff Lead
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
Monkfish	Framework for 2023-2025 Specifications and other Management Measures	Includes potential changes to mesh size, days at sea usage, and trip limits. Joint FMP with New England.	NE Council Lead, Development ongoing, anticipated final action in December.	Feeney (NE), and Didden

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

As of 7/26/2022

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	4/12/22	6/7/22					Deeming regs approved May 19, 2022
Black Sea Bass Commercial State Allocation Amendment	SFSBSB Amd 23	8/4/21	11/19/21							Waiting on edits from GARFO/NEFSC review.
Tilefish Multi-Year Specifications Framework	Tilefish FW 7	8/11/21	7/10/21	4/22/22						
Summer Flounder, Scup, Black Sea Bass Commercial/ Recreational Allocation Amendment	SFSBSB Amd 22	12/14/21	5/1/22	6/24/22						Deeming regs approved 7/19/2022.
MSB Rebuilding 2.0 Amendment	TBD	6/8/22								Needs to be in place January 2023
Recreational Harvest Control Rule Framework	TBD	6/7/22								

Timeline and Status of Current and Upcoming Specifications for MAFMC Fisheries

As of 7/26/22

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	2022	4/6/22	5/18/22	6/30/22	na			SIR for 2022 ABC Increase to 40,000 MT, rule expected soon
Atlantic Mackerel (including RH/S cap)	2022	8/11/21	N/A	N/A	N/A	1/12/22	1/7/22	Emergency actions locked 2022 catch to near 2021 catch.
Chub mackerel	2023-2025	6/8/22						
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	Revisions expected for 2023
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	6/9/22	6/9/22	
Black sea bass rec measures	2022	12/14/21	2/11/22	2/24/22	4/18/22	6/9/22	6/9/22	
Scup rec measures	2022	12/14/21	2/11/22	2/24/22	4/18/22	6/9/22	6/9/22	
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: July 28, 2022

To: Chris Moore, Executive Director

From: Karson Cisneros, Staff

Subject: Update on Protected Resources Issues

Right Whales

The Atlantic Large Whale Take Reduction Team (TRT) is currently working 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 TRT 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. At their May meeting the TRT identified several potential collections of measures to be further analyzed to develop team recommendations. The results of these analyses are tentatively scheduled to be presented to the TRT on September 8th as a briefing webinar and phase 2 final recommendations are scheduled to be developed at a September 19th and 22nd two-day meeting.

The Council will plan to hold a Protected Resources (PR) Committee meeting the week before the September 19th and 22nd TRT meeting in order to inform the Council representation on the TRT before final recommendations are made. The PR Committee meeting date will be finalized when the TRT meeting date is confirmed.

Atlantic Sturgeon

In 2021, NOAA Fisheries released a "batched" Biological Opinion which considered the effects of several fishery management plans on ESA-listed species. The Biological Opinion specifies several requirements necessary to minimize the impacts of any incidental take. These include a requirement that NOAA Fisheries convene a working group to address Atlantic sturgeon bycatch in the Federal large mesh gillnet fisheries.

At their June Meeting, the Council received an overview of the Draft Atlantic Sturgeon Bycatch Action Plan released in May 2022. The draft action plan outlines that some reduction in sturgeon catch will be necessary however it is not currently clear how much reduction will be required, and the Final Action Plan (expected September 2022) may or may not specify an exact reduction amount. The plan outlines that the NEFMC and MAFMC can either initiate an action for 2023 to address sturgeon catch reduction, or NMFS will, and the implementation deadline is May 2024.

The PR Committee will plan to meet as needed prior to either the October or December Council meeting to review the finalized sturgeon Action Plan once released and discuss potential initiation of an action at the Council level. This PR Committee conversation can inform the Council's discussions related to the 2023 implementation plan.

Sea Turtles

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. 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.

NOAA Fisheries staff indicated that there is more research to be done and they are approximately a year away from the proposed rule stage.

July 2022 Court Ruling: 2021 NMFS Biological Opinion

A recent Court ruling linked here has found that NMFS violated the ESA by failing to satisfy the MMPA's "negligible impact" requirement before setting the authorized level of lethal take in its incidental take statement (ITS). NMFS also breached the time requirements mandated by the MMPA in the 2021 Final Rule related to right whale take reduction measures. The Court will thus hold the 2021 Biological Opinion and the 2021 Final Rule to be invalid. This document goes on to say that the Court will offer the parties the opportunity for further briefing to articulate alternatives that the Court may select.

At this time, it is unclear how this ruling will impact the ongoing sturgeon and whale actions and timelines given that they are both linked to the 2021 Biological Opinion that has been declared invalid.

From: Kelly Denit - NOAA Federal <kelly.denit@noaa.gov>
Sent: Wednesday, June 1, 2022 4:09 PM
To: _NMFS FMC Exec Directors <nmfs.rfmc@noaa.gov>
Cc: Pentony, Mike <Michael.Pentony@noaa.gov>; Strelcheck, Andy <andy.strelcheck@noaa.gov>; Scott Rumsey - NOAA Federal <scott.rumsey@noaa.gov>; Jon Kurland - NOAA Federal <jon.kurland@noaa.gov>; Tosatto, Michael <michael.tosatto@noaa.gov>; Jenni Wallace - NOAA Federal <Jenni.Wallace@noaa.gov>; Ruccio, Michael <michael.ruccio@noaa.gov>; Karen Abrams - NOAA Federal <karen.abrams@noaa.gov>; Marian Macpherson - NOAA Federal <Marian.Macpherson@noaa.gov>; Wendy Morrison - NOAA Federal <wendy.morrison@noaa.gov>; Samuel Rauch - NOAA Federal <samuel.rauch@noaa.gov>; _NMFS SF ARA <nmfs.sf.ara@noaa.gov>
Subject: Climate Governance Follow-up

Council EDs,

I wanted to follow up with you all regarding our project to develop guidance on NMFS's use of MSA section 304(f) (Governance). Recall the focus of this project is to develop clear and transparent guidance on how NMFS, acting on behalf of the Secretary of Commerce, will apply its existing authority under 304(f) in the face of shifting stocks and emerging fisheries.

We believe it is important to continue our work on this project and are mindful of the concerns you raised regarding the ongoing east coast scenario planning project. While NMFS's Governance project will be focused on agency decision-making, we intend to coordinate with the east coast scenario planning project and to inform the guidance we develop as much as possible by the important work being done there.

We have adjusted our proposed timeline so Councils can provide comments after July 30. We have also expanded our timeline to highlight that our monitoring of, and coordination with, the east coast scenario planning project will be as open and ongoing as possible within the constraints of meeting our target for completion. Attached is a conceptual outline to clarify the scope of the project.

If you have thoughts on what could be included in the process and criteria for determining when and how to review and/or adjust management authority, we would welcome your input. Please submit comments to marian.macpherson@noaa.gov.

Cheers,
Kelly

--
Kelly Denit (she/her)
Director, Office of Sustainable Fisheries
NOAA Fisheries | U.S. Department of Commerce
Office: (301) 427-8517
www.fisheries.noaa.gov

Conceptual Outline: Fisheries Governance Policy/Guidance pursuant to MSA 304(f)
6/1/2022

I. Overview and Objective

In anticipation of an increasing number of fish stocks shifting in geographic distribution, new fisheries emerging, and other demographic shifts in fisheries, NOAA Fisheries has identified as a top priority a need to develop national policy on assigning, reviewing, and/or revising management authority for newly emerging or unmanaged stocks and currently managed stocks that move across Fishery Management Council (Council) boundaries or occur under the authority of more than one Council. This conceptual outline provides an initial framework for developing a policy for applying Magnuson Stevens Fishery Conservation and Management Act (MSA) § 304(f) in these circumstances.

II. Issue to be addressed

Scientific studies and stock assessments have identified cases of some species distributions shifting within and across Council jurisdictions, driven by climate change and other causes. Many important commercial and recreational fish stocks have already shifted their distributions in response to environmental conditions, biological conditions, and condition of the stock, and more are predicted to follow.

The MSA assigns geographic areas of authority for each of the eight Regional Fishery Management Councils. (§302(a)(1)).[1] In situations where a fishery extends beyond the geographic area of any one Council, the MSA authorizes the Secretary of Commerce to either designate a Council to prepare the FMP, or require the relevant Councils to prepare the FMP jointly. (§304(f)(1)). To date, NOAA Fisheries and the Councils have addressed management of fisheries that span multiple Council jurisdictions on a case by case basis.[2] However, given that the distributions of species are expected to continue to shift across council jurisdictions in the future, preparing in advance for these situations, and having established processes and criteria in place for addressing them, will give NOAA Fisheries and the Councils a more transparent, orderly, and responsive approach for addressing these changes.

Establishing clear a policy that (1) sets forth criteria for determining when there is a need for a change in governance for a stock/species (i.e., move to a different Council or be jointly managed), and (2) establishes a process for assigning or re-assigning management authority to one or more Councils and for transitioning management to the new governance structure would further this objective.[3]

---

[1] Pursuant to MSA §304(f)(2), NMFS has specified these exact geographic boundaries in terms of latitude and longitude at 50 CFR 600.105.

[2] For a review of NMFS's management of fisheries that span multiple Councils' jurisdictions, see NOAA Technical Memorandum NMFS-OSF-10 September 2021 (Morrison). Link: https://repository.library.noaa.gov/view/noaa/32347

[3] We note that NMFS has existing guidance pertaining to whether a fishery is in need of conservation and management at 50 CFR 600.305.

III. Proposed Approach and Request for Feedback

A. Framework for Policy Development

Potential sections of the policy are listed below. The outputs of the west coast scenario planning effort and ongoing East Coast scenario planning process[4] will inform development of the following proposed components:

1. Overview of the 304(f)(1) Secretarial authority.
2. Identification of criteria that NOAA Fisheries would use to trigger a process for assigning shared or revised governance.
3. A process and criteria that NOAA Fisheries will use for recommending Secretarial determination of Council authority (outcome could include no change, shift authority to different Council, or joint management).
4. Issues pertaining to transitioning to a revised governance (e.g., options for adjusting existing regulations and management measures under development such as phase-ins and grandfather periods).

B. Issues to be considered

1. What criteria should trigger a need to revise governance? (e.g., biological, socio-economic, including community access to underdeveloped fisheries off their coasts).
2. What criteria should be used to decide appropriate governance?
    - Possibilities could include stock distribution, level of catch in relevant management areas (e.g., state vs Fed, Council area), level of catch relevant to representation in management bodies (e.g., a substantial portion of the catch is now coming from a state(s) that is not on the current Council), location of processors, community dependence, equity and fairness.
    - What elements (e.g., "Principles of Governance") would be necessary for Secretarial action to change governance? (e.g., should there be required elements of equity, biology).
3. What process and timelines should be established for NMFS action on revising governance?

C. Timeline and engagement plan for policy development

- May 2022: Presentation to CCC.
- July 30, 2022: Soft deadline for CCC comments – NMFS will initiate drafting, but will continue to accept comments if Councils provide them after this date (comments can be sent to marian.macpherson@noaa.gov)
- Oct 2022: Provide update at CCC meeting
- Winter/Spring 22/23: Ongoing monitoring of Scenario Planning Project with target of reviewing completion of "Application Phase"; incorporate outcomes into draft policy, as appropriate
- Spring 2023: Provide draft policy to CCC
- Fall 2023: Deadline for CCC and Council comments
- Summer 2024: Finalize and rollout Policy to CCC

[4] For more information – please see https://www.mafmc.org/climate-change-scenario-planning

New England Fishery Management Council Meeting Agenda
Tuesday - Thursday, June 28-30, 2022
Holiday Inn By the Bay, 88 Spring Street, Portland, ME 04101
tel: (207) 775-2311 | Holiday Inn By the Bay
Webinar Registration Option

Sending comments? Written comments must be received at the New England Fishery Management Council (NEFMC) office no later than 8:00 a.m., Thursday, June 23, 2022 to be considered at this meeting. Please address comments to Council Chair Eric Reid or Executive Director Tom Nies at: NEFMC, 50 Water Street, Mill 2, Newburyport, MA 01950. Email submissions should be sent to comments@nefmc.org. ** Written comments must address items listed on the agenda for this meeting or issues that will be brought up under the open period for public comment.

IMPORTANT: *The Council will hold its June 2022 meeting at the Holiday Inn by the Bay in Portland, ME. This will be a hybrid meeting with in-person participation, coupled with a webinar option for individuals who cannot or prefer not to attend in person. The Council continues to follow all public safety measures related to* ***COVID-19*** *and intends to do so for this meeting. The Council is encouraging all in-person participants to wear masks in the meeting room except when seated. Additional spacing between seats will be provided to allow for social distancing. Please participate remotely if you are experiencing COVID symptoms or do not feel well. Updates will be posted on the* ***Council's June 2022 meeting webpage****.*

PUBLIC COMMENTS: *The Council's "Guidelines for Providing Public Comments" can be found* ***here****. Anyone interested in speaking during the open period for public comment on Thursday, June 30, 2022 at 2:45 p.m. should fill out the sign-up sheet on the table at the entrance to the Council meeting room. To speak remotely, email Janice Plante at jplante@nefmc.org to get on the list.*

Tuesday, June 28, 2022

9:00 a.m. **Reports on Recent Activities**
Council Chair, Council Executive Director, Greater Atlantic Regional Fisheries Office (GARFO) Regional Administrator, National Oceanic and Atmospheric Administration (NOAA) General Counsel, Northeast Fisheries Science Center (NEFSC), Mid-Atlantic Fishery Management Council (MAFMC), Atlantic States Marine Fisheries Commission (ASMFC), U.S. Coast Guard, NOAA Enforcement, ICCAT Advisory Committee, Highly Migratory Species Advisory Panel, Northeast Trawl Advisory Panel (NTAP)

11:00 **CCC Subcommittee on Area-Based Management** (Council Chair Eric Reid)
Progress report on work by the Council Coordination Committee (CCC) Subcommittee on Area-Based Management to assist the CCC in responding to the 30x30 initiative in the draft White House report titled "Conserving and Restoring America the Beautiful"

11:30 **Northeast Climate Regional Action Plan** (Dr. Vince Saba, NEFSC; Dr. Lisa Kerr, SSC Chair; Tom Nies, Council Executive Director)
Overview of Draft Northeast Climate Regional Action Plan to Implement the NOAA Fisheries Climate Science Strategy in 2022-2024; Scientific and Statistical Committee (SSC) feedback; approve Council comment letter

12:15 p.m. **East Coast Climate Change Scenario Planning** (Staff)
Overview of the June 21-23, 2022 Scenario Creation Workshop and next steps under the East Coast Climate Change Scenario Planning initiative; CCC response to NOAA Fisheries work on Council Governance Guidance

12:45 **Lunch Break**

2:00 **Atlantic Herring Committee Report** (Cheri Patterson)
Framework 7: update on action to protect adult spawning herring on Georges Bank; 2023-2025 Specifications: initial update; Industry-Funded Monitoring (IFM): potentially approve a change in herring priorities and initiate an action to address IFM in the Atlantic herring fishery

3:30 **Ecosystem-Based Fishery Management (EBFM) Committee** (John Pappalardo; Tom Balf, Oceanvest)

EBFM Public Information Workshops: (1) preliminary summary of initial outreach to stakeholders; and (2) update on workshop planning; Prototype Management Strategy Evaluation (MSE): update on contractor solicitation to develop and conduct a Prototype MSE for EBFM and the Georges Bank example Fishery Ecosystem Plan (eFEP)

4:15 **2022-2026 Council Research Priorities** (Staff; SSC Chair Dr. Lisa Kerr)
Approve updates to 2022-2026 Council Research Priorities; receive SSC feedback on research priorities

Wednesday, June 29, 2022

9:00 a.m. **National Equity and Environmental Justice Strategy** (Dr. Matt Cutler, NEFSC)
Presentation on NOAA Fisheries' Draft Equity and Environmental Justice (EEJ) Strategy to reduce barriers to underserved communities and incorporate EEJ into daily activities; Council comments

9:30 **2023 State-Space Modeling Research Track Assessment** (Dr. Tim Miller, NEFSC)
Educational overview and opportunity for Council questions on the 2023 research track assessment to explore the application and use of state-space models across many stocks in the Greater Atlantic Region

10:15 **Monkfish Committee Report** (Libby Etrie)
Framework 13: progress report on 2023-2025 fishery specifications and other measures; Monkfish Research Set-Aside (RSA) Program: approve 2023-2024 RSA priorities

11:45 **Eastern Georges Bank and Georges Bank Haddock Research Track Assessment** (Dr. Russ Brown, NEFSC)
Presentation on peer review results for Eastern Georges Bank and Georges Bank Haddock Research Track Assessment

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

1:45 **Groundfish Committee Report** (Rick Bellavance; Dr. Lisa Kerr, SSC Chair, GMRI)
Framework 65: progress report on action to include (1) 2023-2024 total allowable catches (TACs) for U.S./Canada shared resources on Georges Bank, (2) 2023-2024 specifications for Georges Bank cod and Georges Bank yellowtail flounder, (3) 2023-2025 specifications for 14 additional groundfish stocks, (4) revised rebuilding plans for Gulf of Maine cod and Southern New England/Mid-Atlantic winter flounder, (5) additional measures to promote stock rebuilding, and (6) acceptable biological catch (ABC) control rule revisions; Metrics for Amendment 23 Monitoring System Review: progress report; Atlantic Cod Research Track Assessment: update

3:45 **Groundfish Sectors** (Jackie Odell, Northeast Seafood Coalition; Hank Soule and David Leveille, Sector Managers)
Presentation on sector operations, including overview of core responsibilities, functions, goals, challenges, benefits to groundfish management, and opportunities to enhance interactions with the Council

Thursday, June 30, 2022

9:00 a.m. **Atlantic Sturgeon Bycatch Working Group** (Spencer Talmage, GARFO)
Presentation on draft action plan to reduce Atlantic sturgeon bycatch in federal large-mesh gillnet fisheries by 2024; Council comments

9:30 **Habitat Committee Report** (Council Chair Eric Reid)
(1) Habitat Area of Particular Concern (HAPC): final action on framework to designate a new HAPC in Southern New England; (2) Northeast Regional Habitat Assessment: products, outreach, and next steps, plus SSC feedback; (3) Aquaculture, Offshore Energy, and Cables: update on regional issues, including an overview of the May 19, 2022 Gulf of Maine Intergovernmental Renewable Energy Task Force Meeting and wind energy leasing issues in the federal waters of the Gulf of Maine, as well as information from BOEM about the upcoming Programmatic Environmental Impact Statement for the New York Bight lease areas

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

1:30 **Atlantic Large Whale Take Reduction Plan** (Marisa Trego, GARFO)

Presentation on the May 2022 Atlantic Large Whale Take Reduction Team (TRT) meeting and update on Phase 2 amendments to the Atlantic Large Whale Take Reduction Plan for U.S. East Coast gillnet fisheries, as well as Atlantic mixed species trap/pot and Mid-Atlantic lobster and Jonah crab trap/pot fisheries

2:15 **Ropeless Fishing** (Henry Milliken, NEFSC)
Progress report on the Northeast Fisheries Science Center's collaborative research on ropeless fishing to help reduce the risk of right whale entanglements with fishing gear

2:45 **Open Period for Public Comment**
Opportunity for the public to provide brief comments on issues relevant to Council business but not listed on this agenda (please limit remarks to 3-5 minutes)

3:00 **Scallop Committee Report** (Melanie Griffin)
Scallop Research Set-Aside (RSA) Program: approve 2023-2024 RSA priorities; Specifications: initiate action for 2023 fishery specifications, 2024 default specifications, and other measures; Scallop Survey Working Group: update; Limited Access Leasing: update on scoping process; Nantucket Lightship scallop issues: update

4:30 **Other Business**
Discuss NOAA scoping process to consider designating a national marine sanctuary in the Hudson Canyon area, as well as factors that will contribute to the determination; approve Council comments; address other business as needed

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

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

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

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

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

Agenda

Key West Marriott Beachside
3841 N. Roosevelt Boulevard
Key West, FL 33040

June 13-17, 2022

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

Hybrid Public Comment Session:
The public comment session for the meeting (June 15, 2022, at 4 PM), will allow for both in-person and remote (via webinar) verbal public comment. Individuals intending to provide verbal public comment remotely are asked to sign-up at the following link: https://safmc.wufoo.com/forms/q1wp9e9j13t3u64/. Members of the public intending to provide verbal public comment in-person will be asked to sign-in at the meeting.

Written Comments:
To submit written comment on items on this agenda, visit the online public comment form:
https://safmc.wufoo.com/forms/q1gabmj1vfime3/
Written comments will be accepted from May 27 to June 17, 2022. These comments are accessible to the public, part of the Administrative Record of the meeting, and immediately available for Council consideration.
View submitted written comments at: https://safmc.wufoo.com/reports/2022-june-meeting-comment-report-/
Written comments submitted by mail/fax received by close of business the Monday before the meeting (June 6, 2022) will be compiled, posted to the website as part of the meeting materials, and included in the administrative record.
From June 7 to 5 PM on June 17, written comments must be submitted electronically through the online public comment form at the link above.

Monday, June 13, 2022 — COUNCIL SESSION

COUNCIL SESSION I /Mel Bell 8:30 am – 10:30 am (CLOSED)

Adopt agenda
Approve minutes
1. Advisory Panel (AP), Scientific and Statistical Committee (SSC), and Socio-Economic Panel (SEP) Appointments
2. Selection of 2021 Law Enforcement Officer of the Year

Monday, June 13, 2022 — COUNCIL SESSION

COUNCIL SESSION I /Bell 10:30 am – 12:00 noon

Call to order and introductions
Adopt agenda
Approve minutes

1. Reports (NOAA Office of Law Enforcement, US Coast Guard, Council liaisons, state agencies)
2. SEP report
    a. SEP report summary and input – Scott Crosson, SEP Chair
    b. Review of data-gathering tool to inform sector allocations
3. Commercial Electronic Logbook Amendment
    a. Review options paper

12:00 noon to 1:30 pm Lunch

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

4. Acceptable Biological Catch Control Rule Amendment
5. Progress Towards Meeting SAFMC Research Recommendations – Clay Porch, SEFSC

Tuesday, June 14, 2022 COMMITTEE MEETINGS

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

1. Regulatory Amendment 35 (Release Mortality Reduction and Red Snapper Catch Levels)
    a. AP input – Bob Lorenz, AP Chair
    b. SSC input – Jeff Buckel, SSC Chair
    c. Overview of options and analyses to date

12:00 noon to 1:30 pm Lunch

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

2. Gag (Amendment 53)
    a. AP input – Bob Lorenz
    b. Overview and analyses to date
3. Golden Tilefish and Blueline Tilefish (Amendment 52)
    a. AP input – Bob Lorenz
    b. Overview and analyses to date
    c. Consider approval for public hearings

5:00 to 6:00 pm Question and Answer Session

Wednesday, June 15, 2022 COMMITTEE MEETINGS

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

4. Snowy Grouper (Amendment 51)
    a. AP input – Bob Lorenz
    b. Overview and analyses to date

c. Consider approval for public hearings

12:00 noon to 1:30 pm Lunch

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

5. Greater Amberjack (Amendment 49)
    a. AP input – Bob Lorenz
    b. Overview and analyses to date
6. AP input on items not on agenda – Bob Lorenz
7. South Atlantic Reef Observer Coverage Expansion – Scott Leach, OP Branch Chief
8. Exempted Fishing Permit Brief – NMFS SERO

<u>Wednesday, June 15, 2022 PUBLIC COMMENTS</u>

4:00 pm

Public comment will be accepted from individuals attending the meeting (in-person and remotely) regarding any of the items on the Council agenda. The Council Chair, based on the number of individuals wishing to comment, will determine the amount of time provided to each commenter. Those intending to provide verbal public comment via webinar can sign-up here: https://safmc.wufoo.com/forms/q1wp9e9j13t3u64/

Public Hearing:

(1) Greater Amberjack (SG Amendment 49)

Approval for public hearings:

(1) Acceptable Biological Catch Control Rule Amendment
(2) Snowy Grouper (SG Amendment 51)
(3) Golden Tilefish and Blueline Tilefish (SG Amendment 52)

<u>Thursday, June 16, 2022 COMMITTEE MEETINGS</u>

<u>Dolphin Wahoo Committee/Marhefka 8:30 am – 12:00 noon</u>

1. AP Report – Chris Burrows, AP Chair
2. Regulatory Amendment 3
    a. Overview of options
2. Development of empirical Management Procedures (MPs) for Dolphin – TBD, SEFSC

12:00 noon to 1:30 pm Lunch

Citizen Science Committee/Marhefka 1:30 pm – 3:30 pm COMMITTEE MEETINGS

1. Program evaluation interview findings & next steps – Rick Bonney
2. FISHstory highlights
3. Snowy grouper project update
4. General Program update

Thursday, June 16, 2022 COUNCIL SESSION

COUNCIL SESSION II/Bell 3:30 pm – 5:00 pm

1. Legal brief (if needed)
2. Council Coordination Committee Report
3. Council staff report
4. Large Whale Take Reduction Team Report – Charlie Phillips
5. SSC input on items not on agenda – Jeff Buckel
6. NMFS Southeast Regional Office Report – Rick DeVictor
7. NMFS Southeast Fisheries Science Center Report – Clay Porch

Friday, June 17, 2022 COUNCIL SESSION

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

8. Committee & Full Council Session Reports
9. FMP Workplan Review and Upcoming Meetings
10. Other business

Adjourn