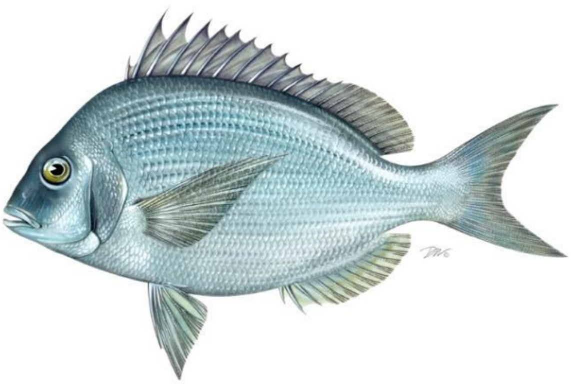
Draft Addendum for Public Comment

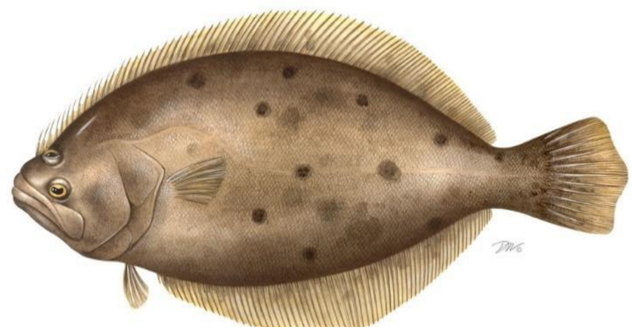
Atlantic States Marine Fisheries Commission

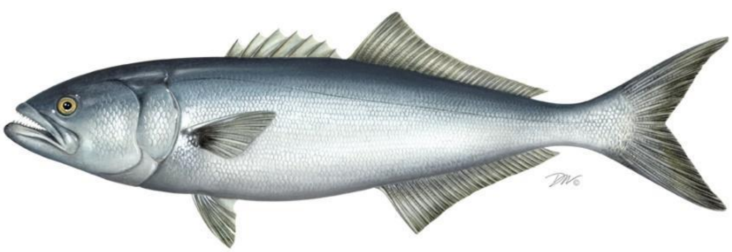
DRAFT OMNIBUS ADDENDUM TO THE FISHERY MANAGEMENT PLANS FOR SUMMER FLOUNDER, SCUP, AND BLACK SEA BASS, AND BLUEFISH FOR PUBLIC COMMENT

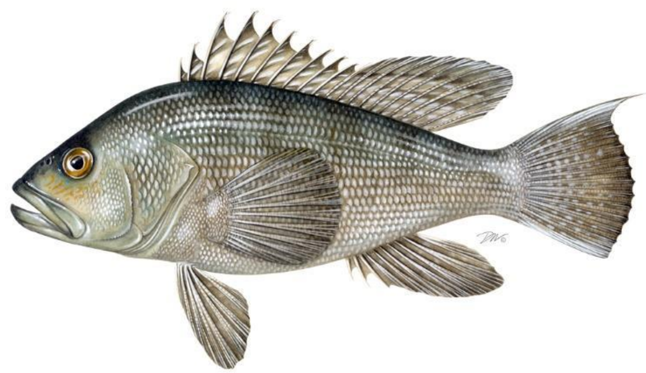
Harvest Control Rule for Recreational Management

This action is being developed with the Mid-Atlantic Fishery Management Council.









This draft document was developed for Policy Board review and discussion. This document is not intended to solicit public comments. Comments on this draft document may be given at the appropriate time on the agenda during the scheduled Policy Board and Council meeting. If approved, a public comment period will be established to solicit input on the issues contained in the document.

October 2021

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Public Comment Process and Proposed Timeline

In October 2020, the Atlantic States Marine Fisheries Commission's (Commission's) Summer Flounder, Scup, and Black Sea Bass Management Board (Board) and the Mid-Atlantic Fishery Management Council (Council) initiated a draft addendum (for the Commission) and framework action (for the Council) to address management of the recreational summer flounder, scup, black sea bass, and bluefish fisheries. This Draft Addendum and the Council's framework considers modifications to the process for setting recreational bag, size, and season limits (i.e., "recreational measures") for all four species. The Draft Addendum and the Council's framework action will consider an identical set of options. This document presents background on recreational management for these species and a range of options to set recreational measures for public consideration and comment. The addendum process and expected timeline are below.

Summer & Fall 2021	**Draft Addendum Developed for Board Review**	← Current step in the Addendum development process
Winter 2021/2022	Board Reviews Draft Addendum and Consider Approval for Public Comment	
TBD	Public Comment Period	
TBD	Board Reviews, Selects Management Options and Final Approval	

The public is encouraged to submit comments regarding this document at any time during the public comment period. The final date comments will be accepted is DATE TBD at 11:59 p.m. Comments may be submitted at state public hearings or by mail, email, or fax. If you have any questions or would like to submit a comment, please use the contact information below. **All comments will be made available to both the Commission and Council for consideration; duplicate comments do not need to be submitted to both bodies.**

Mail: Dustin Colson Leaning, FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland Street, Suite 200 A-N
Arlington, VA 22201

Email: comments@asmfc.org
(Subject: Draft Addendum XXXIV)
Phone: 703.842.0740
FAX: 703.842.0741

Tips for Providing Public Comment

We value your input, and to be most effective we request that your comment include specific details as to why you support or oppose a particular proposed management option. Specifically, address the following:

- Which proposed options/sub-options do you support, and which options/sub-options do you oppose?
- Why do you support or oppose the option(s)?
- Is there any additional information you think should be considered?

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1.0 Introduction

Summer flounder, scup, black sea bass, and bluefish fisheries are managed cooperatively by the Commission in state waters (0-3 miles), and by the Council and NOAA Fisheries in Federal waters (3-200 miles). The management unit for summer flounder in US waters is the western Atlantic Ocean from the southern border of North Carolina northward to the US-Canadian border. The management unit for scup and black sea bass in US waters is the western Atlantic Ocean from Cape Hatteras, North Carolina north to the Canadian border. Bluefish are managed in US waters along the entire eastern US coast, from Maine to Florida.

The Council and Commission jointly agree to recreational annual catch limits (ACLs) and recreational harvest limits (RHLs) for all four species. They also jointly agreed to the overall approach to setting recreational bag, size, and season limits (i.e., recreational measures). Recreational measures in state waters are determined through the Commission process. The current process for setting recreational measures in state waters for summer flounder and black sea bass was established in 2018 through Addendum XXXII to the Summer Flounder, Scup, and Black Sea Bass FMP. Amendment 1 to the Bluefish FMP established a process for setting recreational measures for bluefish.

In October 2020, the Commission's Policy Board and the Mid-Atlantic Fishery Management Council approved the following motion:

> *Move to initiate a joint framework/addendum to address the following topics for summer flounder, scup, black sea bass, and bluefish, as discussed today:*
>
> - *Better incorporate MRIP uncertainty into management*
> - *Develop guidelines for maintaining status quo measures*
> - *Develop a process for setting multi-year measures*
> - *Consider changes to the timing of federal waters measures recommendations*
> - *Harvest control rule*
>
> *and to also initiate an amendment to address recreational sector separation and recreational catch accounting such that scoping for the amendment would be conducted during the development of the framework/addendum.*

During their February 2021 meeting, the Council and Policy Board prioritized development of the harvest control Rule referenced in the motion above prior to further development of the other topics. This Draft Addendum and the Council's framework address only the harvest control Rule; however, as described in more detail in later sections of this document, considerations related to uncertainty in the MRIP data, guidelines for status quo measures, and multi-year measures are incorporated into many of the options.

The Draft Addendum and the Council's framework propose different options for setting recreational measures for summer flounder, scup, black sea bass, and bluefish.

> **The goal of this Draft Addendum and the Council's framework is to establish a process for setting recreational bag, size, and season limits for summer flounder, scup, black**

sea bass, and bluefish such that measures aim to prevent overfishing, are reflective of stock status, appropriately account for uncertainty in the recreational data, take into consideration angler preferences, and provide an appropriate level of stability and predictability in changes from year to year.

2.0 Overview

2.1 Statement of Problem

The Commission and Council face a number of challenges with regard to setting recreational management measures for summer flounder, scup, black sea bass, and bluefish. As described in more detail in section 2.2, recent challenges have included concerns related to uncertainty and variability in the recreational fishery data and the need to change measures, sometimes annually, based on those data, as well as the perception that measures are not reflective of current stock status. In addition, management measures have not always had their intended effect on overall harvest.

The purpose of this document is to consider a management approach called a harvest control rule to establish a process for setting recreational bag, size, and season limits for summer flounder, scup, black sea bass, and bluefish such that measures aim to prevent overfishing, are reflective of stock status, appropriately account for uncertainty in the recreational data, take into consideration angler preferences, and provide an appropriate level of stability and predictability in changes from year to year. A harvest control rule relies less on expected fishery performance and instead uses a more holistic approach with greater emphasis on traditional and non-traditional stock status indicators and trends.

Addendum XXXII established an interim management approach that addressed several key management objectives and served as a foundation for broad-based, long-term management reform. The Policy Board and Council are addressing ongoing management challenges and objectives via comprehensive, long-term management reforms over the next several years starting with this document. Those actions will draw upon improved recreational fishery data[1], new stock assessments, and innovative management tools.

2.2 Background

For all four species, recreational ACLs are set under the joint management program with the Council. The ACL accounts for landings and dead discards. An RHL for each species is set equal to the ACL minus expected dead discards. Recreational measures (i.e., bag, size, and season limits) are set with the goal of preventing RHL overages. In preventing RHL overages, these measures also aim to prevent ACL overages.

[1] MRIP is an evolving program with ongoing improvements to its methods. Several recent advancements including the transition from a telephone survey to a mail survey to estimate fishing effort have resulted in the need to calibrate estimates of recreational catch and effort for 1981–2017 for comparison to newer estimates. In addition, the MRIP harvest estimates for 2018 need to be “back-calibrated” for comparison to the 2018 and interim 2019 RHLs, because these RHLs were based on stock assessment using the pre-calibrated MRIP harvest estimates.

The ACLs and RHLs are revised each time new stock assessment information becomes available and are based on stock assessment projections, considerations related to scientific uncertainty, and commercial/recreational allocations. The RHLs also account for management uncertainty and assumptions about dead discards. Assumptions about discards also impact the ACLs for summer flounder and black sea bass due to the landings-based commercial/recreational allocations for those species, as opposed to the catch-based allocations for scup and bluefish.

The methods used to determine which measures will prevent RHL overages are not specified in the FMPs and can be modified based on annual recommendations from the Council's Monitoring Committees and the Commission's Technical Committees. Marine Recreational Information Program (MRIP) harvest data from one or more recent years are typically used to predict the impacts of changes in bag, size, or season limits on harvest. For summer flounder, scup, and black sea bass, this analysis has typically relied heavily on preliminary, incomplete current year data and assumptions based on trends in MRIP data from one or more previous years. For bluefish, this analysis typically considered multi-year averages of final, full-year MRIP data. The bluefish measures remained unchanged for many years and RHL overages through 2019 were rare. Measures for summer flounder, scup, and black sea bass changed much more frequently. In addition, summer flounder and black sea bass harvest approached or exceeded the RHL more frequently than for the other species. For these reasons, the Monitoring and Technical Committees felt it was appropriate to rely on the most recent MRIP data, including preliminary current-year data for summer flounder, scup, and black sea bass and to use a multi-year average of final, full-year data for bluefish.

The analysis for all four species typically relied on the assumption that if the recreational measures remained unchanged, then next year's harvest would be similar to harvest in the current year or a recent year average. If unchanged measures were expected to result in harvest notably above or below the RHL, then the measures were adjusted to achieve a desired percent liberalization or reduction in harvest based on an analysis of trends shown in previous years' MRIP data.

Because the bluefish specification process typically did not use preliminary current year data, and because measures remained unchanged for several years, decisions on bluefish recreational measures were typically made in August, when the Board and Council usually jointly approve the recreational ACL and RHL for the upcoming year. However, in recent years, the bluefish RHL has been more constraining and recreational measure setting has begun to follow the approach taken for summer flounder, scup, and black sea bass.

The summer flounder, scup, and black sea bass ACLs and RHLs for the upcoming year are also typically approved in August; however, the approach for setting recreational measures is usually not recommended until December to allow for consideration of preliminary current year data though August. In December, the Council and Board typically agree to the overall approach for recreational measures for summer flounder, scup, and black sea bass (e.g., status quo or an overall percentage liberalization or reduction), as well as the federal waters measures. State waters measures are typically approved by the Board in February of the following year.

This process has resulted in management challenges for several reasons. As previously stated, for all four species, the RHLs changed each time new stock assessment information became available. For recreational fisheries that tend to harvest close to, and sometimes more than, their RHL (primarily summer flounder and black sea bass), this resulted in a frequent need to change the recreational bag, size, and season limits to prevent future RHL overages. This was sometimes exacerbated by the reliance on a single year of MRIP data in the analysis of management measures as MRIP data can show variable harvest from one year to the next, even under the same management measures. The required changes in management measures sometimes felt more like a response to variability and uncertainty in the MRIP data than a clear conservation need. This challenge has been referred to as “chasing the RHL.” In addition, many recreational stakeholders expressed frustration that the black sea bass measures did not seem reflective of stock status as they have generally been more restrictive in recent years than when the stock was under a rebuilding plan, despite the stock currently being more than double the target level and highly available to anglers.

Although the scup and bluefish recreational measures were able to remain largely unchanged for many years (prior to 2020 for bluefish), the Policy Board and Council agreed that solutions to these challenges should be developed in such a way that they could apply to all four jointly managed species to allow for consistency in management approaches.

The bluefish stock was declared overfished in 2019, triggering the development of a rebuilding plan and a need for more restrictive management measures than had previously been in place. The options in this document include special considerations for stocks in a rebuilding plan. The options in this document are not meant to replace the bluefish rebuilding measures. Any measures implemented for bluefish must comply with the rebuilding plan.

2.3 Status of the Stocks

2.3.1 Summer Flounder

The most recent summer flounder management track stock assessment was completed in June 2021, using data through 2019 (NEFSC 2021a). The assessment approach is a complex statistical catch-at-age model incorporating a broad array of fishery and survey data. Results from the 2021 assessment indicate that the summer flounder stock was not overfished, but was 14% below the biomass target, and overfishing was not occurring, in 2019 (**Figure 1**). Fishing mortality was 20% below the threshold level defining overfishing. More detail on the assessment can be found in the draft report provided to the SSC.

The 2021 management track stock assessment provided the basis for setting fishery specifications for 2022–2023.

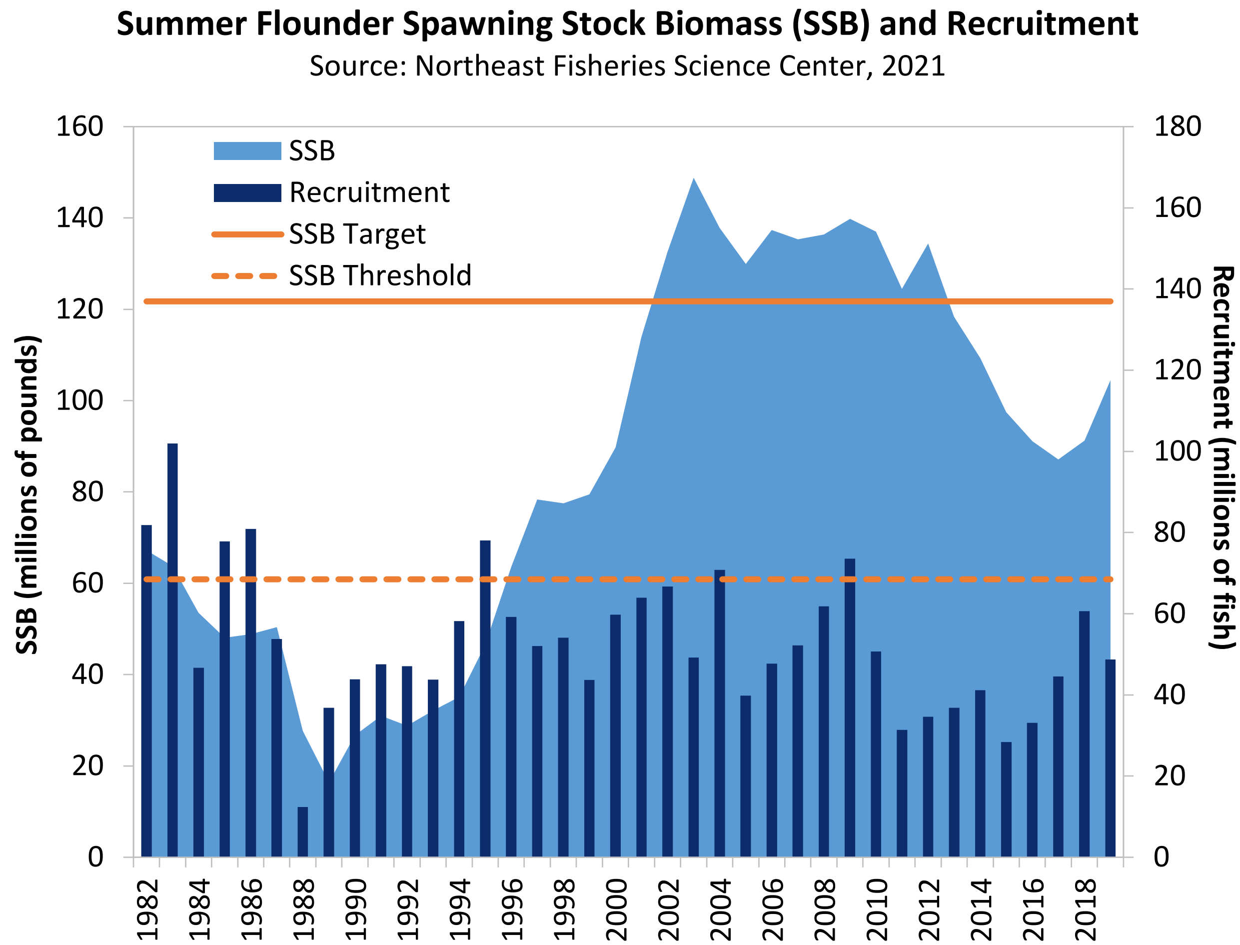

Figure 1. Summer flounder spawning stock biomass and recruitment. Source: 2021 Operational Assessment Prepublication Report, Northeast Fishery Science Center.

2.3.2 Scup

The most recent scup management track stock assessment was completed in June 2021, using data through 2019 (NEFSC 2021b). The assessment approach is a complex statistical catch-at-age model incorporating a broad array of fishery and survey data. Results from the 2021 assessment indicate that the scup stock was not overfished and was about two times the biomass target, and overfishing was not occurring, in 2019 (**Figure 2**). Fishing mortality was 32% below the threshold level defining overfishing. More detail on the assessment can be found in the draft report provided to the SCC.

The 2021 management track stock assessment provided the basis for setting fishery specifications for 2022–2023.

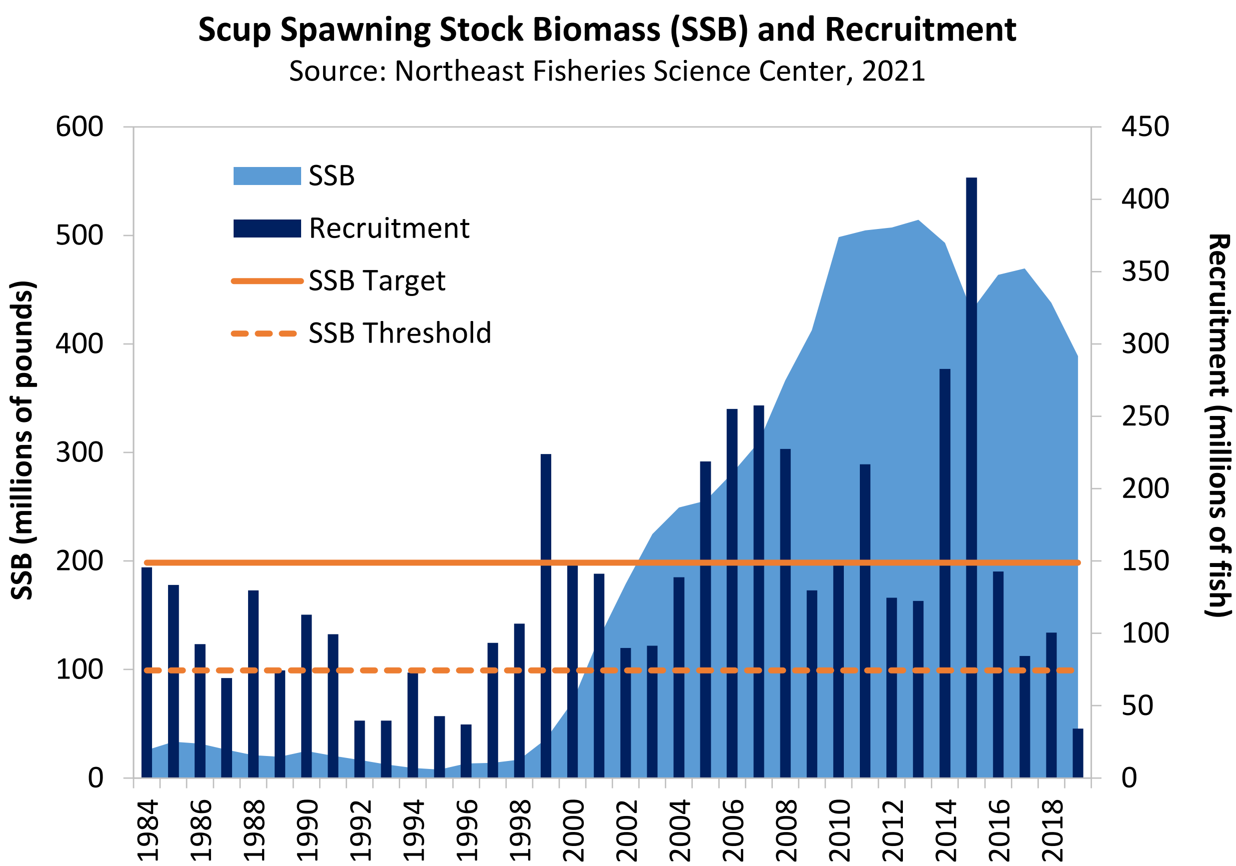

Figure 2. Scup spawning stock biomass and recruitment. Source: 2021 Operational Assessment Prepublication Report, Northeast Fishery Science Center.

2.3.3 Black Sea Bass

The most recent black sea bass stock assessment update was completed in July 2021, using data through 2019 (NEFSC 2021c). The assessment used a combined-sex, age-structured assessment model. The assessment modeled black sea bass as two separate sub-units (North and South) divided approximately at Hudson Canyon, from which results were combined for the coastwide stock status determination. Results from the 2021 assessment indicate that the black sea bass stock was not overfished and was about 2.2 times the target level, nor was overfishing occurring, in 2019 (**Figure 3**). Fishing mortality was 15% below the threshold level defining overfishing. The assessment required an adjustment to account for the significant retrospective pattern. This adjustment was only applied to the terminal year of the assessment and the adjusted values are used for management. Of the four species considered in this action, only black sea bass required a retrospective adjustment in the assessment. More detail can be found in the draft report provided to the SSC.

The 2021 management track stock assessment provided the basis for setting fishery specifications for 2022–2023.

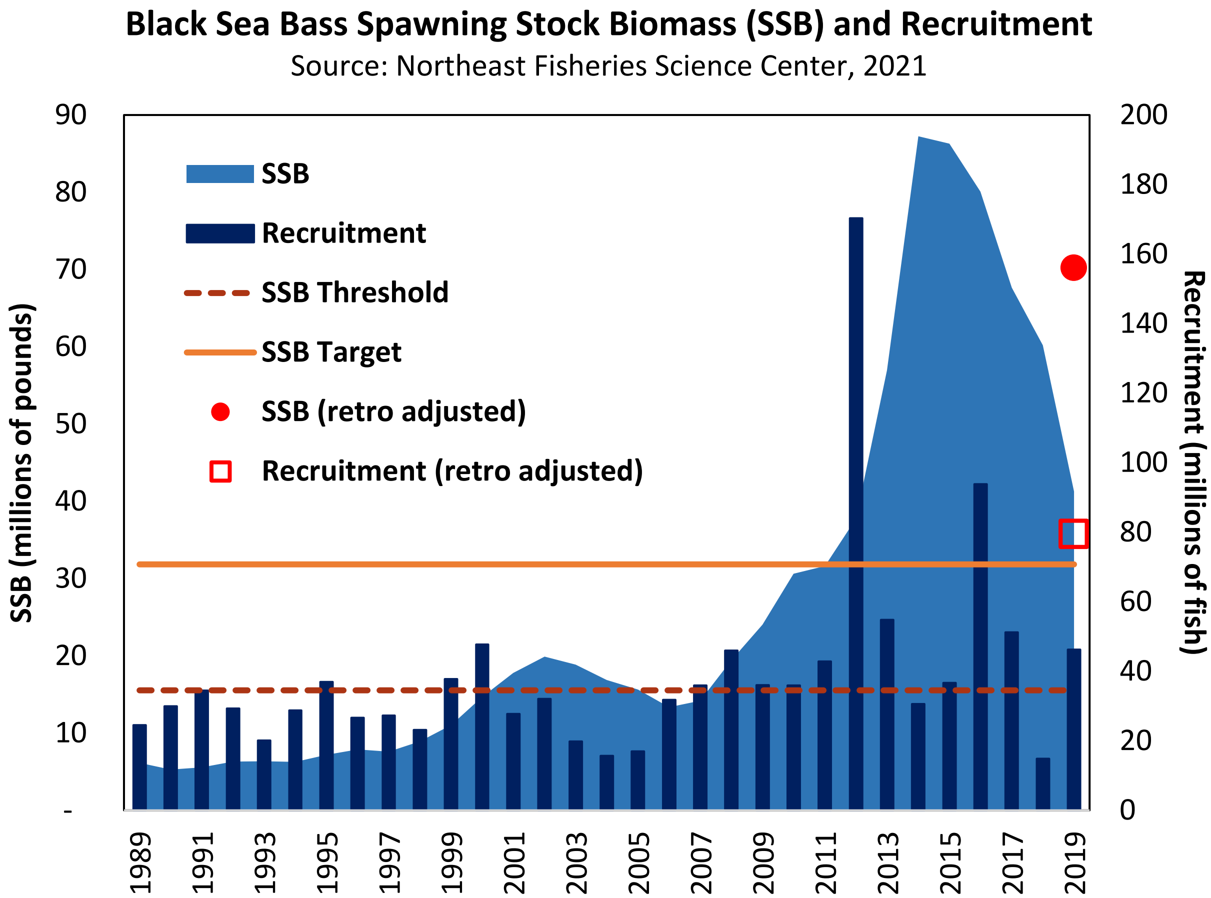

Figure 3. Black sea bass spawning stock biomass and recruitment with retrospective adjusted values to account for internal error. Source: 2021 Operational Assessment Prepublication Report, Northeast Fishery Science Center.

2.3.4 Bluefish

The most recent bluefish management track stock assessment was completed in June 2021, using data through 2019 (NEFSC 2021d). The assessment approach is a complex statistical catch-at-age model incorporating a broad array of fishery and survey data. Results from the 2021 assessment indicate that the bluefish stock was overfished and was 5% below the overfished threshold, but overfishing was not occurring in 2019 (**Figure 4**). Fishing mortality was 5% below the threshold level defining overfishing. More detail on the assessment can be found in the draft report provided to the SCC.

The 2021 management track stock assessment along with the preferred rebuilding plan selected jointly by the Board and Council at their June meeting in 2021 provided the basis for setting fishery specifications for 2022–2023.

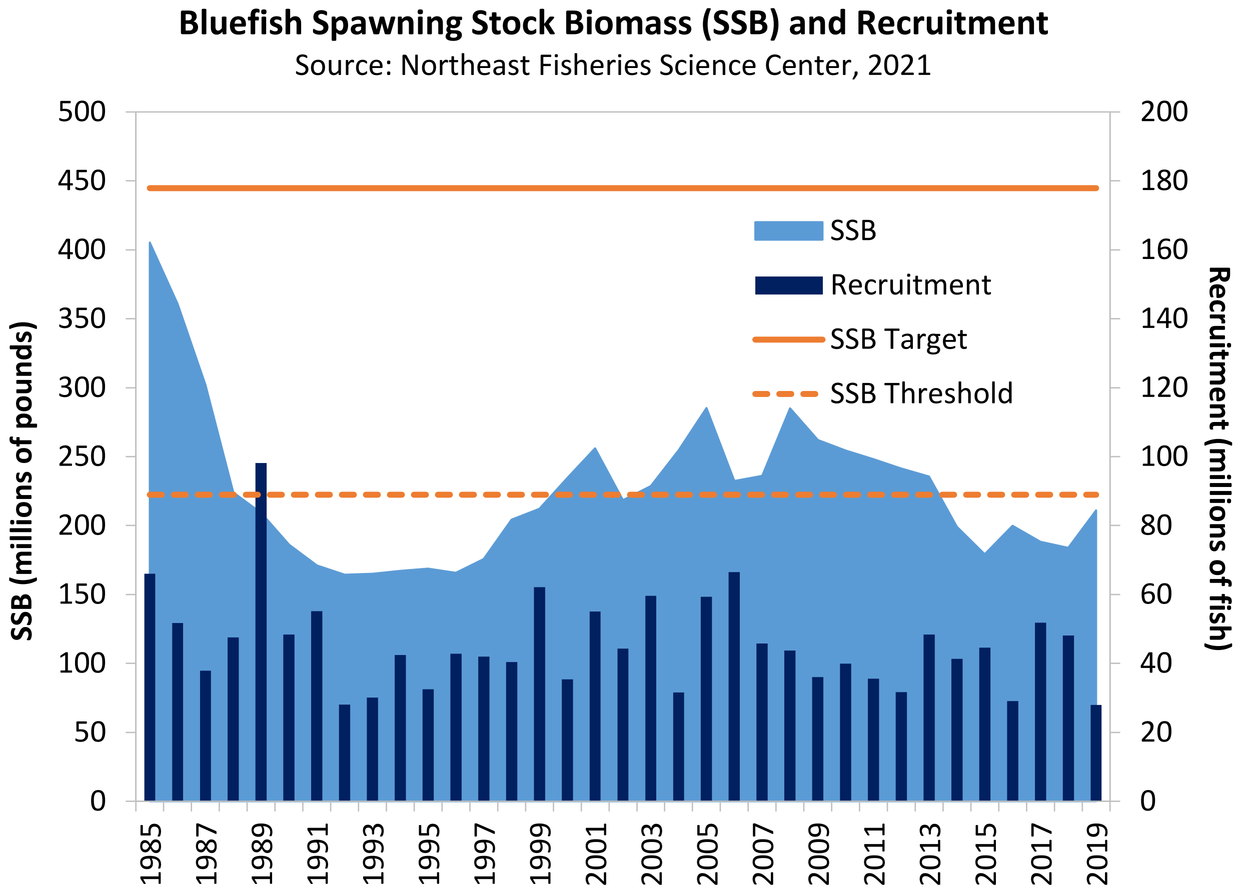

Figure 4. Bluefish spawning stock biomass and recruitment. Source: 2021 Operational Assessment Prepublication Report, Northeast Fishery Science Center.

2.4 Status of the Fishery

2.4.1 Summer Flounder

Recreational harvest peaked in 1983 at 36.74 million pounds, and declined to a time series low of 5.66 million pounds in 1989. A more recent review of recreational fishery performance from 2011 to present reveals an average of 12.59 million pounds with a high of 19.41 million pounds in 2013 and a low of 7.60 million pounds in 2018. Recreational harvest in 2020 was 10.06 million pounds, a 29% increase from the prior year's harvest of 7.80 million pounds. The total recreational catch (harvest plus live and dead releases) of summer flounder in 2020 was 33.32 million fish, slightly lower than the time series average of 34.46 million fish. The assumed discard mortality rate in the recreational fishery is 10%. In 2020, an estimated 80% of the harvest (in numbers of fish) originated from private/rental boats, while shore-based anglers and party/charter boats accounted for an average of 18% and 2% of the harvest, respectively. In addition, 61% of summer flounder harvested by recreational fishermen (in numbers of fish) were caught in state waters and about 39% in federal waters.

2.4.2 Scup

Most recreational scup catches are taken in states of Massachusetts through New York. From 2011 to 2020, recreational harvest has ranged from 8.27 million pounds in 2012 to 14.12 million pounds in 2019. In 2020, recreational harvest was 12.91 million pounds. The total catch (harvest plus releases) of scup in 2020 were 27.27 million fish, slightly higher than the ten year average of 27.07 million fish. The assumed discard mortality rate in the recreational fishery is 15%. In 2020, an estimated 62% of the harvest (in numbers of fish) originated from private/rental boats, while shore-based anglers and party/charter boats accounted for an average of 28% and 10% of the harvest, respectively. In addition, 90% of scup harvested by recreational fishermen (in numbers of fish) were caught in state waters and about 10% in federal waters.

2.4.3 Black Sea Bass

After a drastic peak in 1986 at 11.19 million pounds, recreational harvest averaged 5.02 million pounds annually from 1987 to 1997. Recreational harvest limits were put in place in 1998 and harvest generally increased from 1.92 million pounds in 1998 to 9.06 million pounds in 2015. In 2016 and 2017 harvest jumped up to 12.05 and 11.48 million pounds, respectively; however the 2016 and 2017 estimates are regarded as implausibly high outliers by the Technical Committee. In 2020, recreational harvest was estimated at 9.12 million pounds with recreational live discards from Maine to Virginia estimated to be 29.79 million fish. Assuming 15% hook and release mortality, estimated recreational dead discards are 4.47 million fish, equal to 51% of the total recreational removals (harvest plus dead discards).

2.4.4 Bluefish

From 2011-2020, recreational catch (harvest plus fish caught and released) of bluefish in U.S. waters of the Atlantic coast averaged 44.46 million fish annually. In 2020, recreational catch was estimated at 30.68 million fish. In 2020, recreational anglers harvested an estimated 9.34 million fish weighing 13.58 million pounds (6,160 metric tons). Harvest during 2018-2020 was exceptionally low compared to the ten year average of 25.69 million lbs. The 2020 average weight of landed fish is 1.45 pounds, which is also lower than the ten year average of 1.65 pounds. This lower average weight is due to the regional distribution of state landings in 2020. The majority of the recreational harvest (pounds) came from Florida (42%), North Carolina (16%), New Jersey (13%), and New York (11%). Fish from southern states (NC-FL) made up 59% of the landings and are typically smaller on average than fish caught in northern states (ME-VA). In 2020, recreational dead releases (15% of released alive fish) were estimated at 3.20 million fish.

3.0 Proposed Management Program

As a step towards broad-based management reform, the Board and Council are considering changing the process of how recreational management measures are set. The Board and Council are seeking public comment on each of the options included in this Draft Addendum. As previously stated, the Council is considering the same options through a framework action.

These management changes are considered through the management programs of the Commission and the Council. The Council is bound by the requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), including requirements for ACLs, accountability measures, and prevention of overfishing. NOAA Fisheries will not approve measures that are inconsistent with the MSA. NOAA Fisheries provides guidance throughout development of Council actions to ensure that the preferred options selected for implementation are consistent with the MSA and other applicable laws.

As proposed, a single option would be selected for all four species. It is not intended that one harvest control rule option would be used for some species and a different option for others. All harvest control rule approaches involve various combinations of input metrics, flexibilities, and accountability measures with the goal of standardizing management measure setting and providing stability to these recreational fisheries. A table for comparison across all options can be found in Appendix 1 ***[to be included with supplemental briefing materials for Oct 21 Policy Board and Council meeting]***.

Stocks under an approved rebuilding plan are subject to the measures of that rebuilding plan, which may differ from the measures under the options below. None of the options in this document are meant to replace rebuilding plan measures. In some instances, measures implemented through the options below may be used as temporary measures until a rebuilding plan is implemented, which can take up to two years after the stock is declared overfished. Once a stock is no longer in a rebuilding plan, measures may be set using the options below.

3.1 Management Options to Set Recreational Management Measures

A. Status Quo (Current Recreational Measures Setting Process)

Section 2.2 describes the process used in recent years to set recreational measures. The details of this process are not defined in the FMPs and can be modified without an addendum or other change to the FMPs. For example, it is not required that preliminary current year MRIP data be used for summer flounder, scup, and black sea bass and that a multi-year average of final full-year data be used for bluefish. The Monitoring and Technical Committees have considerable flexibility in how they use the data to recommend measures aimed at preventing RHL and ACL overages. The following sections summarize the language currently in the Commission's FMPs regarding recreational measures for each species. Under the no action option, these sections of the FMPs could remain unchanged[2].

[2] Under the no action option, predicted harvest under any combination of measures could continue to rely on the methods described above, or option methods could be used if deemed appropriate. For example the Council and Commission are supporting the development of statistical models for predicting harvest based on management measures and other factors. These models could be used under the no action option.

1. **Summer Flounder**

   As outlined in section 3.1 of Addendum XXXII, management measures are set annually through a specification process. The process involves the following steps:

   - At the joint meeting with the Council typically in December, the Board and Council will decide whether to specify coastwide measures to achieve the coastwide RHL or conservation equivalent management measures using guidelines agreed upon by both management authorities. If the latter, the Board will then be responsible for establishing recreational measures to constrain harvest to the RHL.
   - The Technical Committee (TC) will continue to evaluate harvest estimates as they are released, and project how suites of possession limits, size limits and seasons might impact recreational landings in each region. In recommending adjustments to measures (reductions, liberalizations or no change), the TC will examine several factors and suggest a set of regional regulations, which when combined, would not exceed the RHL. These factors could include but are not limited to stock status, resource availability (based on survey and assessment data), and fishery performance (harvest, discards, effort, estimate uncertainty, inter-annual variability), as well as the standards and guiding principles set forth below. The Board will use information provided by the TC to approve a methodology for the states to use in developing regional proposals, typically at the Commission's Winter Meeting.
   - The states will collaborate to develop regional proposals for the current year's recreational measures that include possession limits, size limits and season length pursuant to the Board-approved methodology. These proposals will be reviewed by the TC to ensure the data and analysis are technically sound.
   - **The Board will review proposals, TC recommendations, and establish final measures at the Commission's winter meeting.** Once the Board has approved the measures and the states have promulgated them, the Commission will send a letter to the Regional Administrator certifying the Board approved measures, in combination, will achieve but not exceed the RHL.

   The Board also uses a set of standards and guiding principles to structure the development of measures during specification setting (Addendum XXXII Section 3.1.1).

2. **Scup**

   Management measures are set annually through a specifications process. The process typically involves the following steps:

   - At the joint meeting with the Council typically in December, the Board and Council will determine whether to maintain status quo coastwide measures or a liberalization or reduction in measures are needed to achieve the coastwide RHL.

- States will then proceed to develop proposals, typically the states MA-NY, but other states could have adjustments, for the upcoming year's recreational measures that include possession limits, size limits and season length. These proposals will be reviewed by the TC to ensure the data and analysis are technically sound.
- The Board will review state proposals, TC recommendations, and establish final measures at the Commission's winter meeting.

3. Black Sea Bass

As outlined in section 3.2 of Addendum XXXII, management measures are set annually through a specification process. The process involves the following steps:

- At the joint meeting with the Council typically in December, the Board and Council will decide whether to adopt coastwide measures or if the states will implement measures to constrain harvest to the RHL. If the latter, the Board will then be responsible for establishing recreational measures to be implemented in state waters to constrain harvest to the RHL.
- The TC will continue to evaluate harvest estimates as they are released, and project how suites of possession limits, size limits and seasons might impact recreational landings in each region. In recommending adjustments to measures (reductions, liberalizations or no change), the TC will examine several factors and suggest a set of regulations for regions, which when combined, would not exceed the RHL. These factors can include but are not limited to stock status, resource availability (based on survey and assessment data), and fishery performance (harvest, discards, effort, estimate uncertainty, inter-annual variability), as well as the standards and guiding principles set forth below. The Board will use information provided by the TC to approve a methodology for the states to use in developing regional proposals, typically at the Commission's Winter Meeting.
- The states will collaborate to develop regional proposals for the current year's recreational measures that include possession limits, size limits and season length pursuant to the Board-approved methodology. These proposals will be reviewed by the TC to ensure the data and analysis are technically sound
- **The Board will review state proposals, TC recommendations, and establish final measures at the Commission's winter meeting.** Once the Board has approved the measures and the states have promulgated them, the Commission will send a letter to the Regional Administrator certifying the Board approved measures in combination will achieve but not exceed the RHL.

The Board also uses a set of standards and guiding principles to structure the development of measures during specification setting (Addendum XXXII Section 3.2.1).

4. Bluefish

As outlined in section 5.1.4.1.3 of Amendment 1, management measures are set annually through a specifications process. The process typically involves the following steps:

- At the joint meeting with the Council typically in December, the Board will determine whether to maintain status quo coastwide measures or a liberalization or reduction in measures are needed to achieve the coastwide RHL.
- In order to achieve the annual RHL, recreational fisheries will be constrained by a coastwide regime of coastwide size limits, bag limits, and seasons. Once a basic regime for these limits is established, typically at the joint meeting with the Council in December, states will be given the opportunity to vary these measures in accordance with the Commission's Conservation Equivalency process[3].
- A state may submit a proposal for a change to its regulatory program to the Commission. Such changes shall be submitted to the ASMFC staff, which will distribute the proposal to the Management Board, the Plan Review Team, the Technical Committee, the Stock Assessment Subcommittee, and the Advisory Panel.
- States must submit proposals at least two weeks prior to a planned meeting of the Technical Committee.
- The ASMFC staff is responsible for gathering the comments of the Technical Committee, the Stock Assessment Subcommittee, and the Advisory Panel and presenting these comments to the Management Board at the Commission's winter meeting.
- The Management Board will decide whether to approve the state proposal for an option management program if it determines that it is consistent with the harvest target and the goals and objectives of the FMP.

5. Current Accountability Measures for Summer Flounder, Scup, Black Sea Bass, and Bluefish

The Magnuson-Stevens Fishery Conservation and Management Act requires Council FMPs to contain provisions for ACLs and "measures to ensure accountability." The National Standards Guidelines state that accountability measures (AMs) "are management controls to prevent ACLs, including sector-ACLs, from being exceeded, and to correct or mitigate overages of the ACL if they occur. AMs should address and minimize both the frequency and magnitude of overages

[3] http://www.asmfc.org/files/pub/ConservationEquivalencyGuidance_2016.pdf

and correct the problems that caused the overage in as short a time as possible." (50 CFR 600.310 (g)).

The current recreational AMs were established through an omnibus amendment in 2013 (Amendment 19 to the Summer Flounder, Scup, and Black Sea Bass FMP and Amendment 4 to the Bluefish FMP). The AMs are included in the Council's FMP. They are not included in the Commission's FMP; however, any changes to the AMs considered through this action will be considered by both the Council and Commission.

Proactive AMs include adjustments to the management measures for the upcoming fishing year (as described in previous sections), if necessary, to prevent the RHL and ACL from being exceeded. Measures to prevent the RHL from being exceeded are ultimately intended to also prevent ACL overages, which in turn prevents overfishing.

Given the timing of MRIP data availability, the regulations do not allow for in-season closure of the recreational fishery if the RHL or ACL is expected to be exceeded. Therefore, measures must be set in a manner that is reasonably expected to constrain harvest to the RHL.

Reactive recreational AMs include a set of possible responses to exceeding the recreational ACL, depending on stock status and which limits are exceeded. Paybacks of ACL overages may be required in a subsequent fishing year, depending on stock status and the scale of the overage, as described below. ACL overages in the summer flounder, scup, and black sea bass recreational fisheries are evaluated by comparing the most recent 3-year average recreational ACL against the most recent 3-year average of recreational catch (i.e., landings and dead discards). If average catch exceeds the average ACL, then the appropriate AM is determined based on the following criteria:

1. If the stock is overfished ($B < ½ B_{MSY}$), under a rebuilding plan, or the stock status is unknown:

   The exact amount, in pounds, by which the most recent year's recreational ACL has been exceeded will be deducted in the following fishing year, or as soon as possible once catch data are available.

2. If biomass is above the threshold, but below the target ($½ B_{MSY} < B < B_{MSY}$), and the stock is not under a rebuilding plan:

   a. If only the recreational ACL has been exceeded, then adjustments to the recreational management measures (bag, size, and seasonal limits) would be made in the following year, or as soon as possible once catch data are available. These adjustments would take into account the performance of the measures and conditions that precipitated the overage.

b. If the ABC is exceeded in addition to the recreational ACL, then a single year deduction will be made as a payback, scaled based on stock biomass. The calculation for the payback amount is: *(overage amount) * (B_{MSY}-B)/½ B_{MSY}*.

3. If biomass is above the target (B > B_{MSY}):

Adjustments to the recreational management measures (bag, size, and seasonal limits) would be considered for the following year, or as soon as possible once catch data are available. These adjustments would take into account the performance of the measures and conditions that precipitated the overage.

Reactive recreational AMs for the bluefish recreational fishery are very similar to the process described above with a few key differences. First, ACL overages are evaluated on a 1-year basis as opposed to a 3-year average. Second, if a transfer between the commercial and recreational sectors caused the transferring sector to register an ACL overage, then instead of applying an overage payback to the transferring sector, a transfer in a subsequent year would be reduced by the amount of the ACL overage.

B. Percent Change Approach

This option proposes a mechanism for providing more stability and predictability of measures while better incorporating stock status into the measures setting process. Recreational measures would be considered every other year to align with the anticipated schedule of stock assessment updates.

This option differs from the no action option (status quo) in that it includes an explicit consideration of biomass compared to the target level (B/B_{MSY}) derived from the latest stock assessment when determining if the recreational management measures should be liberalized, reduced, or remain unchanged. The amount of change varies based on the magnitude of the difference between the average MRIP estimate from the two preceding years, including a confidence interval (CI) around that estimate, and the average RHL for the upcoming two years, as well as considerations related to B/B_{MSY}.

Table 1 displays the resulting pre-defined management responses associated with each outcome. Starting with the first column, the RHL for the upcoming two-year specifications period is compared to the CI[4] of the most recent two years of MRIP estimates, or an alternative predictor of harvest based on a statistical methodology, with an associated CI. The MRIP estimates are intended as a proxy for expected harvest in the upcoming years under status quo measures. Depending on whether the average RHL is above the upper bound of the CI, within the CI, or below the lower bound of the CI, the management responses are narrowed down to rows A, B, and C, respectively. The second column narrows down the suite of management responses further by taking into consideration the B/B_{MSY} ratio. The third column displays the resulting

[4] When developing a CI from two years of MRIP data, the PDT/FMAT recommends the use of a joint distribution 80% confidence interval that takes into consideration the PSE of each individual years' MRIP estimate and the variability of the estimates between years. This recommendation is based on an analysis of several years of MRIP data for each species.

percent change in measures required for the upcoming two years. The percent change in measures is mirrored up and down to provide similar consideration of the need for reductions and opportunities for liberalization.

As shown in Table 1, when the RHL is within the CI under status quo measures, this approach allows for an incremental liberalization when stock status is greater than 150% of the target or an incremental reduction for stocks below the target. When the RHL is above the CI, this approach allows for liberalizations that scale in proportion to stock health. Conversely, when the RHL is below the CI, this approach requires reductions that scale with the health of the stock.

This option considers changes from a starting point. The current management measures may not be the appropriate starting point for a variety of reasons (e.g., widespread angler dissatisfaction with some measures and the potential for continued significant overages under the current allocations for some species). The FMAT/PDT is considering ways to define the appropriate starting point for each species by using statistical models and other methods. Additional time is needed to further develop these ideas, and updates will be provided at a future Council and Policy Board meeting.

Table 1. Approach to enacting changes in measures under the percent change approach. [1][5]

<table>
<tr><th colspan="2">Future RHL vs MRIP Estimate</th><th>B/B_{MSY}</th><th colspan="2">Change in Measures</th></tr>
<tr><td rowspan="3">Row A</td><td rowspan="3">Future 2-YR avg. RHL greater than upper bound of 2-YR MRIP estimate CI</td><td>> 1.5</td><td colspan="2">40% Liberalization[3]</td></tr>
<tr><td>1 - 1.5</td><td colspan="2">20% Liberalization[3]</td></tr>
<tr><td>< 1</td><td colspan="2">0% (Status Quo)</td></tr>
<tr><td rowspan="3">Row B</td><td rowspan="3">Future 2-YR avg. RHL within CI of 2-YR MRIP estimate</td><td>> 1.5</td><td colspan="2">10% Liberalization</td></tr>
<tr><td>1-1.5</td><td colspan="2">0% (Status Quo)</td></tr>
<tr><td>< 1</td><td colspan="2">10% Reduction</td></tr>
<tr><td rowspan="3">Row C</td><td rowspan="3">Future 2-YR avg. RHL less than lower bound of 2-YR MRIP estimate CI</td><td>> 1.5</td><td>0% (Status Quo)[2]</td><td>10% Reduction[2]</td></tr>
<tr><td>1-1.5</td><td colspan="2">20% Reduction[3]</td></tr>
<tr><td>< 1</td><td colspan="2">40% Reduction[3]</td></tr>
</table>

[1] The proposed B/B_{MSY} inflection points are based on the Council's Risk Policy. Future changes to the Council risk policy may warrant reconsideration of this proposed process.
[2] The PDT/FMAT has not yet reached consensus on a recommendation for assigning the appropriate management response when the RHL is lower than the CI and biomass is higher than 150% of the target. Two options discussed by the FMAT/PDT are listed here.
[3] The PDT/FMAT is still in the process of determining whether the change in measures be capped such that the percentage change in measures does not exceed the percentage difference between the two-year average RHL and the two-year average MRIP point estimate.

[5] The two year average MRIP estimate with associated CI is intended as a predictor of future harvest under status quo measures. This may be replaced with statistical model based approaches for predicting harvest.

Accountability Measures under the Percent Change Approach

Under this option, measures will be more restrictive when stock status is poor and more liberal when stock status is good. This could be considered a proactive AM. In addition, when the upcoming RHL is below the lower bound of the CI of the expected harvest estimate (either a 2 year MRIP estimate or a model-based estimate), measures will be proactively reduced by a predetermined percent when the stock is less than 150% of the target level. Reductions will also be taken if the stock is below the target even when the RHL is within the CI, helping to rebuild the stock back to the target.

This option requires minimal changes from the current reactive AMs described in section 3.1-A-5. The current reactive AMs would be modified such that when paybacks are required, the payback could be spread evenly across two years to help facilitate the use of constant measures across two years. When a payback is applied, the percent change would be determined based on the reduced ACL.

Consideration could also be given to options 6 and 7 listed in section 3.2. These options consider modifications to the metrics considered when biomass is above the threshold but below the target and a scaled payback of a past overage may be needed.

C. Fishery Score Approach

The fishery score is a simple formulaic method that combines multiple metrics into one easy to interpret value. Based on the score, the stock would be placed into one of four bins with corresponding management measures. A new fishery score would be calculated every two years to align with the anticipated schedule of management track stock assessments for these species. The fishery score would be based on four metrics: Biomass (B) relative to the target (B_{MSY}), Recruitment (R), Fishing Mortality (F), and Fishery Performance, as described in more detail below. Each metric has a weight assigned to it, determined by the Monitoring Committee such that metrics with a stronger relationship to harvest would have more weight in the fishery score while still accounting for metrics that impact harvest but may not drive harvest. Additional metrics may be added and weighting schemes adjusted as more data become, based on the recommendations of the Monitoring/Technical Committees.

The fishery score is calculated using the following formula:

$$F/F_{MSY}(W_F) + B/B_{MSY}(W_B) + R\ Trend(W_R) + Fishery\ performance\ (W_{FP}) = Fishery\ Score$$

Where W refers to the weight of each factor. The fishery score value would correspond to a predetermined bin. For the purpose of explanation of the methodology, the fishery score will range from 1 to 5. The bins are defined as displayed in (**Error! Reference ource not found.**).

Bin	Fishery Score	Level of Concern	Stock Status and Fishery Performance Outlook	Measures
1	4-5	Low Risk	Good	Most Liberal
2	3-3.99	Medium Risk	Moderate	Liberal
3	2-2.99	High Risk	Poor	Restrictive
4	1-1.99	Highest Risk	Very Poor	Most Restrictive

Table 2. Fishery score bins and the associated level of concern, stock status, and measures that are associated with each bin.

Weights will have a minimum and maximum range (e.g., a minimum of 0.1 and a maximum of 0.5) to prevent any one metric from being weighed too heavily in relation to the others. The intent is to allow the Monitoring and Technical Committees to recommend changes to the weights through the specifications process based on their expert judgement and empirical methods when possible. Changes should be limited to provide stability in comparisons over time.

A declining fishery score over time could indicate negative trends in stock status. An examination of the individual fishery score metrics can provide insight into why the overall score is declining. This can also serve as an early warning of the need to use more restrictive measures in the future if the trend continues.

Measures associated with each of the four bins would aim to achieve a range of harvest that is appropriate for the stock conditions associated with each bin. The measures in each bin would be anticipated to produce a range of possible harvest values, given uncertainty and variability in the harvest data. Considerations related to confidence intervals and other statistical metrics and models could be used to define the appropriate range of expected harvest and the measures associated with each bin. Although the fishery score is calculated based on multiple factors, the measures associated with each bin could be defined based on four categories of biomass and the associated level of harvest deemed appropriate for that biomass level. The most liberal bin (bin 1, fishery score of 4-5 in the example above) could be associated with biomass greater than 150% of the target level. The next most liberal bin (bin 2, fishery score of 3-3.99) could be associated with biomass above the target, but less than 150% of the target. The next lowest bin (bin 3, fishery score of 2-2.99) could be associated with biomass below the target and above the threshold. The most restrictive bin (bin 4, fishery score less than 2) could be associated with biomass below the threshold (however; if the stock is under a rebuilding plan, the most restrictive fishery score measures may be temporary until replaced by rebuilding plan measures). Although the measures associated with each bin would be based on biomass compared to the target, placement of a year's measures within one of the four bins would be driven by multiple factors. For example, if the recruitment and fishery performance metrics have low scores, then the stock may be placed in a more restrictive bin with more restrictive measures than would occur based on biomass considerations alone. The opposite could occur if multiple metrics have high scores. In this way, the measures would be reflective of a combination of biomass relative to the target and assumed future conditions (e.g., high recruitment assumed to result in higher biomass in the future, allowing for more liberal measures).

<u>Determining Metric Values</u>

The following section provides an example of how the metrics listed above could be used to generate a fishery score value ranging from 1 to 5.

$B/B_{MSY}(W_B)$

Biomass from the most recent stock assessment would be given a value of 1-5 based on the following criteria, which are loosely based on other aspects of the management program (e.g., the Council's risk policy).

- 5: Biomass is equal to or greater than 150% of the target
- 4: Biomass is less than 150% of the target, and equal to or greater than the target
- 3: Biomass is below the target, and equal to or greater than 75% of the target
- 2: Biomass is below 75% of the target, and equal to or above the threshold (which is ½ the target and defines an overfished state)
- 1: Biomass is below the threshold

$F/F_{MSY}(W_F)$

The proposed categories for fishing mortality consider whether the most recent fishing mortality estimate is at, above, or below the threshold level. Only three increments were selected for fishing mortality as other aspects of the management program consider only whether F is at, above, or below the target.

- 5: F/F_{MSY} is at least 5% less than 1
- 3: F/F_{MSY} within 5% of 1
- 1: F/F_{MSY} is at least 5% greater than 1

Recruitment(W_R)

To determine the recruitment metric, the most recent estimate of recruitment will be compared to the 20th, 40th, 60th, 80th, and 100th percentiles of the distribution of the time series of recruitment used in stock projections. This percentile categorization of the relative strength of an incoming year class was deemed more informative than measuring trends in recruitment, especially given the highly variable nature of recruitment from year to year. Assessing where recruitment fell in the percentile distribution was determined a more appropriate measure of recruitment's impact on future levels of biomass.

- 5: terminal year R in the 81-100 percentile
- 4: terminal year R in the 61-80 percentile
- 3: terminal year R in the 41-60 percentile
- 2: terminal year R in the 21-40 percentile
- 1: terminal year R is in the 0-20 percentile

Fishery performance (W_{FP})

Fishery performance is evaluated by comparing the confidence interval derived from the most recent two-years of MRIP harvest estimates to the two-year average RHL. The score is determined by where the average RHL appears in relation to the 2 year MRIP CI.[6] The following three categories are used for this metric:

- 5: 2-yr avg. RHL above upper bound of CI
- 3: 2-yr avg. RHL within CI
- 1: 2-yr avg. RHL below lower bound of CI

<u>Accountability Measures under the Fishery Score Approach</u>

Under this option, measures are set based on a variety of factors such that they are more restrictive when stock status is poor and more liberal when stock status is healthy. This is considered a proactive AM. In addition, as described above, this method can also provide an early warning of deteriorating stock conditions which can inform the setting of measures.

As under the no action option, ACL overages would be evaluated by comparing the most recent 3-year average recreational ACL against the most recent 3-year average of recreational catch (i.e., landings and dead discards). If average catch exceeds the average ACL, then the appropriate AM is determined based on the following criteria:

1. If the stock is overfished ($B < ½ B_{MSY}$), under a rebuilding plan, or the stock status is unknown:

    a. The stock is placed in the most restrictive bin. These may be temporary measures until replaced by measures required by a rebuilding plan, which can take up to two years to implement.

    b. If the stock was already in the most restrictive bin or the measures in the most restrictive bin are otherwise expected to continue to result in overages,

[6] When developing a CI from two years of MRIP data, the PDT/FMAT recommends the use of a joint distribution 80% confidence interval that takes into consideration the PSE of each individual years' MRIP estimate and the variability of the estimates between years. This recommendation is based on an analysis of several years of MRIP data for each species. The use of MRIP data in this context is intended as a proxy for expected future harvest under status quo measures. This may be replaced with statistical modelling approaches for predicting harvest, with associated CIs, if such approaches are available in the future.

then those measures must be modified as soon as possible following the determination of the overage such that they are reasonably expected to prevent future overages.

2. If biomass is above the threshold, but below the target (½ B_{MSY} < B < B_{MSY}), and the stock is not under a rebuilding plan:

a. If only the recreational ACL has been exceeded, then the stock would remain in its current bin, but the measures associated with that bin and all other bins, will be re-evaluated with the goal of preventing future ACL overages.

b. If the ABC or F_{MSY} (as determined through section 3.2) is exceeded in addition to the recreational ACL, then the stock must drop down a bin and a re-evaluation of measures in all bins is triggered.

3. If biomass is above the target (B > B_{MSY}):

Consideration should be given to adjusting the management measures associated with each bin, taking into account the performance of the measures and the conditions that precipitated the overage.

D. Biological Reference Point Approach

Under this option, the primary metrics of terminal year B/B_{MSY} and F/F_{MSY} from the most recent stock assessment would be used to guide selection of management measures. Management measures would be grouped into seven bins, as illustrated in Table 3. Each bin would have a set of default measures which would be implemented the first time the stock is placed in that bin.

To define the bins under this option, fishing mortality (F) would be considered in two states (i.e., overfishing: above the threshold or not overfishing: equal to or below the threshold) while B/B_{MSY} would be further divided to provide managers and anglers with more responsive levels of access. The following categories of B/B_{MSY} are proposed.

- Biomass is greater than or equal to 150% of the target.
- Biomass is greater than or equal to the target but less than 150% of the target.
- Biomass is less than the target, but greater than or equal to the threshold (the threshold is ½ the target).
- Biomass is less than the threshold (the stock is overfished).

Recruitment and trends in biomass are secondary metrics under this option which are used to fine tune default measures <u>only</u> when stock conditions (F/F_{MSY} and B/B_{MSY}) relative to the categories above have not changed between the prior and most recent assessments. In this case, biomass and recruitment trends can be used to further relax, restrict, or re-evaluate measures. As such, trends in biomass and recruitment would impact the management measures, but to a lesser extent than F/F_{MSY} and B/B_{MSY}.

Changes to the measures would be considered based on the following process when updated stock assessment information is available (anticipated to be every other year). The first time a stock is in a new bin, the fishery would be subject to the default measures. If the bin remains unchanged after a subsequent stock assessment update, then trends in recruitment and biomass would be considered to determine if measures remain unchanged or if limited liberalizations or reductions can be permitted. As described below, liberalizations within a bin are only allowed in bins 1 and 2, which are associated with a healthy stock status. Restrictions and/or re-evaluation within a bin can be required based on secondary metrics for bin 3-6. This allows for relative stability if stock status is unchanged, but also room for tuning of measures if biomass and/or recruitment trends warrant it. It is intended that the changes within a bin would be based on predetermined guidelines.

Liberalizations within a bin are not permitted when biomass is below the target level or when F exceeds F_{MSY}. For example, if a stock in bin 2 (F below F_{MSY} and biomass above B_{MSY}, but below 150% of B_{MSY}) remains in bin 2 based on an updated stock assessment, then measures may be liberalized to preset measures if recruitment and/or biomass are trending upwards. If either of those trends are down, then measures would stay status quo. If the updated stock assessment information indicates biomass exceeds 150% of B_{MSY}, then the stock would move into bin 1, triggering a new set of default measures more relaxed than those from bin 2. Alternatively, if biomass is below the target, then the stock would move to a more restrictive bin (bins 3-6).

Stocks in bin 3 are not subject to overfishing and are not overfished, but are below their target biomass level. Stocks in bins 4-6 are experiencing overfishing. The goal of the management measures in bins 3-6 is to improve stock status by ending overfishing and/or increasing biomass. If the initial default measures do not accomplish this, but the primary metrics of F/F_{MSY} and B/B_{MSY} do not change, then secondary measures can inform how to better adjust regulations to reach the target through additional restrictions. This differs from stocks in bins 1-2, where measures would not be adjusted in this circumstance. Additionally, when a stock is in bins 4-6 (F exceeds F_{MSY}) and the current measures produce catch or harvest that exceed the ACL or RHL (e.g., based on a multi-year average), then the default measures should be re-evaluated.

Any overfished stock (biomass below ½ B/B_{MSY}) would automatically fall into bin 7 until an approved rebuilding plan is implemented. Stocks under a rebuilding plan must comply with the requirements of the rebuilding plan, and the rebuilding plan measures may differ from the pre-defined measures in this option.

Measures for bins 1-7 would aim to achieve a range of harvest that is appropriate for the stock conditions associated with each bin. The measures in each bin would be anticipated to produce a range of possible harvest values, given uncertainty and variability in the harvest data. Considerations related to confidence intervals and other statistical metrics and models could be used to define the appropriate range of expected harvest and the measures associated with each bin. Measures within each bin will take into consideration small changes to allow for liberalizations or reduction to allow for the flexibility to fine tune measures based on both recruitment and biomass trends in addition to the current biomass and fishing mortality levels[7].

	F ≤ Fmsy	F > Fmsy
150%Btarget ≤ B	R↑ / R↓ B↑: liberal | liberal B↓: default | default **1**	R↑ / R↓ MRIP ≤ RHL/ACL — B↑: default | restrictive MRIP ≤ RHL/ACL — B↓: restrictive | restrictive MRIP > RHL/ACL — B↑ B↓: restrictive; re-evaluate measures **4**
Btarget ≤ B < 150%Btarget	R↑ / R↓ B↑: liberal | liberal B↓: default | default **2**	R↑ / R↓ MRIP ≤ RHL/ACL — B↑: default | restrictive MRIP ≤ RHL/ACL — B↓: restrictive | restrictive MRIP > RHL/ACL — B↑ B↓: restrictive; re-evaluate measures **5**
Bthreshold ≤ B < Btarget	R↑ / R↓ B↑: default | restrictive B↓: restrictive | restrictive **3**	R↑ / R↓ MRIP ≤ RHL/ACL — B↑: default | restrictive MRIP ≤ RHL/ACL — B↓: restrictive | restrictive MRIP > RHL/ACL — B↑ B↓: restrictive; re-evaluate measures **6**
B < Bthreshold	**MOST RESTRICTIVE/REBUILDING PLAN**	**7**

Table 3. Biological Reference Point table showing bins as a result of different combinations of stock conditions. The < refers to 'greater than' and the > refers to 'less than'. A line present underneath the symbol means 'equal to'.

[7] The PDT/FMAT has not yet reached consensus on a recommendation for assigning the appropriate management measures for each bin. Proposed options will be related to biomass levels, but the exact methodology that is appropriate is still under development.

Accountability Measures under the Biological Reference Point Approach

Under this option, measures are set based on a variety of factors such that they are more restrictive when stock status is poor and more liberal when stock status is healthy. Each bin has two sets of measures associated with it: a default set and either a more liberal or more restrictive set of measures. This is considered a proactive AM due to the auto-regulatory movement of a stock among bins based on stock status.

As under the no action option, ACL overages would be evaluated by comparing the most recent 3-year average recreational ACL against the most recent 3-year average of recreational catch (i.e., landings and dead discards). When average catch exceeds the average ACL, then the appropriate AM is determined based on the following criteria:

1. If the stock is overfished ($B < ½ B_{MSY}$), under a rebuilding plan, or the stock status is unknown:

    a. The stock is placed in the most restrictive bin. These may be temporary measures until replaced by measures required by a rebuilding plan, which can take up to two years to implement. This is incorporated into the option as described above and will occur regardless of whether a reactive AM has been triggered.

    b. If the stock was already in the most restrictive bin or the measures in the most restrictive bin are otherwise expected to continue to result in overages, then those measures must be modified as soon as possible following the determination of the overage such that they are reasonably expected to prevent future overages.

2. If biomass is above the threshold, but below the target ($½ B_{MSY} < B < B_{MSY}$), and the stock is not under a rebuilding plan:

    a. If only the recreational ACL has been exceeded, then the stock would remain in its current bin, but the measures associated with that bin and all other bins, will be re-evaluated with the goal of preventing future ACL overages.

    b. If the ABC or F_{MSY} (as determined through section 3.2) is exceeded in addition to the recreational ACL, then the next most restrictive measures would be implemented (i.e., either the more restrictive measures in the current bin, or, if the stock is already at the most restrictive measures in a bin, then the more liberal measures in the next lower bin). A re-evaluation of measures in all bins is also triggered.

3. If biomass is above the target ($B > B_{MSY}$):

   Consideration should be given to adjusting the management measures associated with the current bin (either bin 1 or 2), taking into account the performance of the measures and the conditions that precipitated the overage.

E. Biomass Based Matrix

This option uses a matrix to set recreational measures based on two factors: B/B_{MSY} and the most recent trend in biomass (increasing, stable, or decreasing). Using these two factors and four parameters for each, as described below, provides a three-by-four matrix to determine the appropriate management measure bin. Bin A represents the optimal conditions, while Bin F represents the worst conditions. Certain pairs of conditions (e.g., a healthy stock that is increasing or an abundant stock with any biomass trend) are treated as equivalent to reduce the number of bins to six.

The specific combination of management measures that are appropriate for each bin will be species specific. However, the conditions that drive the bins can be the same across all species.

Definitions:

- Abundant = Stock is at least 150% of the target level (B_{MSY})
- Healthy = Stock is above the target, but less than 150% of the target
- Below Target = Stock is below the target, but above the threshold (the threshold is half of the target and defines an overfished condition)
- Overfished = The stock is below the threshold

When biomass exceeds 150% of the target level, regardless of the biomass trend, bin A measures are selected. This special condition is aimed at providing an opportunity to keep recreational management measures aligned with stock status, which in this case, is significantly above the target. When a stock is fished at F_{MSY} it is expected that stock size will decrease towards the biomass target unless above average recruitment events occur. Thus, it is not necessarily a negative sign if the stock at such high biomass levels experiences a declining trend.

Measures associated with each of the six bins (A-F) would aim to achieve a range of harvest that is appropriate for the stock conditions associated with each bin. Stock condition would be defined based on the biomass categories listed above and whether the biomass trend is stable, increasing, or decreasing. The measures in each bin would be anticipated to produce a range of possible harvest values, given uncertainty and variability in the harvest data. Considerations related to confidence intervals and other statistical metrics and models could be used to define the appropriate range of expected harvest and the measures associated with each bin.

Table 4. Recreational management measure matrix under the biomass based matrix approach.

		Biomass Trend		
		Increasing	**Stable**	**Decreasing**
Stock Status	**Abundant**	Bin A		
	Healthy	Bin A	Bin B	
	Below Target	Bin C	Bin D	
	Overfished	Bin E	Bin F	

<u>Accountability Measures Under the Biomass Based Matrix</u>

Under this option, measures are set based on a variety of factors such that they are more restrictive when stock status is poor and more liberal when stock status is healthy. This is considered a proactive AM.

As under the no action option, ACL overages would be evaluated by comparing the most recent 3-year average recreational ACL against the most recent 3-year average of recreational catch (i.e., landings and dead discards). If average catch exceeds the average ACL, then the appropriate AM is determined based on the following criteria:

1. If the stock is overfished ($B < ½ B_{MSY}$), under a rebuilding plan, or the stock status is unknown:

    a. The most restrictive measures would be implemented. These may be temporary measures until replaced by measures required by a rebuilding plan, which can take up to two years to implement.

    b. If the most restrictive measures were already in place, or are otherwise expected to continue to result in overages, then those measures must be modified for the upcoming fishing year such that they are reasonably expected to prevent future overages.

2. If biomass is above the threshold, but below the target ($½ B_{MSY} < B < B_{MSY}$), and the stock is not under a rebuilding plan:

    a. If only the recreational ACL has been exceeded, then the stock would remain in its current bin, but the measures associated with that bin and all other bins, will be re-evaluated with the goal of preventing future ACL overages.

    b. If the ABC or F_{MSY} (as determined through section 3.2) is exceeded in addition to the recreational ACL, then the measures associated with the next more restrictive bin would be implemented and a re-evaluation of measures in all bins would be triggered.

3. If biomass is above the target ($B > B_{MSY}$):

   Consideration should be given to adjusting the management measures associated with all bins, taking into account the performance of the measures and the conditions that precipitated the overage.

3.2 Accountability Measures Comparisons

The options in this section consider a change to one component of the reactive AMs. Specifically, they address situations when a reactive AM has been triggered and biomass is above the threshold but below the target level. All other components of the AMs are summarized along with options A-E above. The options described below could be used in combination with any of the other options listed above, including the no action option. These changes are only considered for the recreational AMs. No changes to the commercial AMs are considered through this action.

A. Catch compared to the ABC

Under this option, when a reactive AM has been triggered by a recreational ACL overage and the most recent biomass estimate is between the target and the threshold, catch relative to the ABC would also be considered. The response to the overage would be more restrictive if the ABC was also exceeded (e.g., a payback would be required or the stock would be placed in a more restrictive bin, depending on the option). If only the recreational ACL was exceeded, the response to the overage would be less strict (e.g., measures would be revised but a payback would not be required or the stock would remain in its current bin, depending on the option).

B. Fishing mortality compared to an F threshold

This option maintains ACL evaluations within the AMs, but rather than considering if the ABC was also exceeded, consideration would be given to if the fishing mortality threshold (F_{MSY}) was also exceeded. The intent behind this option is that it considers if total fishery removals negatively impacted the stock based on the most recent information. For example, catch in a past year may have exceeded the ACL, but a subsequent stock assessment update may indicate that the stock did not suffer notable negative impacts if the fishing mortality threshold was also not exceeded. The most recent fishing mortality estimate considers more recent information and relies on less assumptions than the information used to set a previous year's ACL. To set the ACL and ABC, projections must be made that make assumptions about how the fishery may perform. This approach using a fishing mortality comparison would look at data that represents what actually transpired in the fishery or stock during the time being evaluated, according to the most recent stock assessment. If regularly updated estimates of total fishing mortality compared to the threshold are not available, then this comparison would default to the ABC comparison described above.

The FMAT/PDT is still in the process of fully analyzing the potential benefits and challenges with this approach and can provide additional information to the Board and Council at a future meeting.

4.0 Compliance

TBD

5.0 Literature Cited

Northeast Fisheries Science Center (NEFSC). 2019. Operational Stock Assessment Report

NEFSC. 2021a. Summer Flounder Management Track Assessment Report.

NEFSC. 2021b. Scup Management Track Assessment Report.

NEFSC. 2021c. Black Sea Bass Management Track Assessment Report.

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MAFMC. 2003. Amendment 13 to the Fishery Management Plan for Black Sea Bass. Available at: http://www.mafmc.org/sf-s-bsb

Appendix 1. Comparison of Options

Will be included in supplemental materials.