




Mid-Atlantic Fishery Management Council
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MEMORANDUM

Date: September 21, 2023
To: Wes Townsend , Chairman, MAFMC
From:  Paul J. Rago, Ph.D., Chair, MAFMC Scientific and Statistical Committee (SSC)
Subject: Report of the September 2023 SSC Meeting

Executive Summary

Background

The SSC met in person in Baltimore, MD, and via webinar from 12th - 13th of September 2023, to discuss: offshore wind topics, an update on development of recreational harvest measures setting framework/addenda, various SSC work group reports, an overview of the Commercial Port sampling program, an evaluation of scup discards in the Gear Restricted Areas, and proposed Atlantic Mackerel stock projections.

Offshore Wind

A session themed on fishery adaptation generated substantial interest in the development of telecommunications, simulation, and survey design approaches to address how fisheries will adapt to offshore wind development in the Mid-Atlantic Bight. New methods for evaluating recreational data, including analyses of geolocation of angler-at-sea cell phone lookups for regulation information, were presented. The approach holds promise in more generally informing the spatial distribution of recreational fishing effort. Results from a generalized commercial fishery simulator were presented for surf clams that included an agent-based modeling approach to capture possible commercial captain responses to offshore wind development. Finally, details of a long-term BACI monitoring program addressing how offshore wind development will impact Ocean City Maryland black sea bass fisheries was presented.

Recreational Measures Setting Process

Council timelines for updating the Harvest Control Rules Framework, which sunsets at the end of 2025, with a new framework/addenda were presented to the SSC. Early engagement of the SSC was appreciated.

Commercial Port Sampling Overview

The SSC reviewed recent trends in the Northeast port sampling program. Reductions in total budget, increasing costs, and the low overall number of samples were alarming. Recent improvements via technological advances were appreciated, but these will not be sufficient to offset losses in funding and costs. The SSC suggested that a more comprehensive review of sampling strategy would be useful. If the problems in the Northeast US are being experienced elsewhere in the US then a review by the National Academy of Sciences may be warranted.

Scup Discards and Gear Restricted Areas Analysis

The SSC favorably reviewed the evaluation prepared by Council staff. The closure areas appear to have kept the rate of discard mortality very low (about 2%) since their inception in 2000. It is not possible to establish these areas as THE causal factor for Scup recovery and currently high overall abundance. However, the low discard rates are thought to have contributed to the management success. The SSC did not endorse a special study to relate scup discards to predictive environmental drivers at this time, and identified alternatives analyses for consideration.

Atlantic Mackerel Stock Projection Alternatives

The SSC reviewed and approved a set of seven projection scenarios that will be used for setting ABCs following receipt of the results from the Management Track Assessment for Atlantic Mackerel.

Working Group Updates

The SSC received updates on several ongoing projects of the Ecosystem Work Group. Updates to the OFL-CV process for setting ABCs will be conducted between September 2023 and March 2024; a revised approach will be applied for the 2024 assessments.

Summary Report

Background

The SSC met in person in Baltimore, MD, and via webinar from 12th - 13th of September 2023. The agenda for the meeting and the participants are provided in Attachments 1 and 2, respectively. Topics discussed included: various offshore wind projects and analyses, an update on development of recreational harvest measures setting framework/addenda, an overview of the Commercial Port sampling program, an evaluation of Scup discards in the Gear Restricted Areas, and proposed Atlantic Mackerel stock projections. Reports from various SSC Work Groups were also received.

Meetings of the SSC reflect the combined planning efforts of management and scientific staff. Brandon Muffley, in particular, is thanked for his efforts to coordinate the many topics considered by the SSC. We also thank scientists from the Council, GARFO, and NEFSC for their presentations and working papers. As always, we benefited from timely and insightful comments by members of the public. Members of the SSC are thanked for their rigorous arguments and active participation at the meeting. Finally, we thank Sarah Gaichas for sharing her meeting notes and Tom Miller for leading the discussion to address Terms of Reference on the Council's GRA analyses.

All documents referenced in this report can be accessed via the SSC's meeting website <https://www.mafmc.org/ssc-meetings/2023/sept-12-13>. The OFL CV framework table that provides the general evaluation metrics associated with the nine decision criteria for each OFL CV bin can be found in Attachment 3. A comprehensive guide to the acronyms in this and earlier reports is found in Attachment 4.

Offshore Wind Topics

Recreational Data Sources

Geret DePiper, NEFSC, summarized recent analyses of fine-scale georeferenced data from recreational fishermen, obtained by cell-phone lookups of fishing regulations. Currently, MRIP data on spatial distribution of fishing effort is summarized coarsely by landing site within states and an inshore vs offshore designation for fishing activity. These designations are part of scientific survey design and can therefore be used to derive estimates for the entire population. In contrast, opportunistic samples at much finer spatial scales can be used to identify loci of fishing activities. This working paper provided a first glimpse of the potential to utilize such data. Data were obtained from a company whose cell phone app called FishRules allows users to obtain georeferenced recreational fishing regulations for individual species. This analysis investigated the hypothesis that such requests, when made at sea, could be used to identify fishing locations. The first step in the request is to look for clusters, then validate fishing activity, and then evaluate locations with respect to wind energy areas. Various likelihood methods, drawn from spatial epidemiology, were used to detect clusters of potential fishing areas

for 11 species. Data were binned into ten-minute squares and compared to VTR data from Charter/Party vessels. Initial comparisons are promising, but the relatively small size of the current dataset (~10,000 cases) makes fine-scale inferences difficult. With further development, a goal is to link fishing activity with presence of wind energy areas and identify potential impacts. Geret noted that the software companies FishRules and FishBrain are presently encouraging partnerships with science to improve information for management.

Discussions by the SSC noted the difficulties of dealing with multispecies fisheries, tracking clusters over time, detecting seasonal changes, and effects of regulations and weather. Larger databases in the future will allow finer spatial and temporal partitioning. The SSC inquired about the process of how locations are generated since inquiries can be made both on land and at sea. The SSC noted that regulatory complexity may induce more requests in some states than others. Concerns were also raised about the avidity of users relative to the overall population of anglers. With respect to angling opportunities in the vicinity of wind areas, it is not clear how accessible sites will be. Data currently available from wind farm areas are unlikely to be predictive of future activities.

Discussions expanded about the general nature of angling as a privilege to use a public resource. Under this principle, routine reporting of activity should be a responsibility. The SSC is well aware of the policy implications and noted that statutory authority exists for such a change. The SSC urged further consideration of this topic by the Council, particularly as usage patterns by commercial and recreation interests are expected to evolve with climate change, wind energy areas, and revisions to MRIP.

Climate Impacts and Wind Energy Areas on Mid-Atlantic Shellfish

Andrew Scheld, College of William and Mary, reported on progress associated with modeling of fleet behavior for commercial clam vessels and potential effects of wind energy areas on behavior, economics, and stock assessments. Displacement from traditional fishing areas, as well as ongoing increases in temperature, are expected to change distributions of Surfclam and Ocean Quahogs. The modeling, developed in collaboration with Rutgers, Old Dominion, and the University of Southern Mississippi includes a Spatially Explicit Fisheries Economic Simulator. SEFES currently operates at a resolution of ten-minute squares. A length-based population model, coupled with a complex agent-based model for choice of fishing areas, is used to simulate stock dynamics and fishing behaviors with and without consideration of wind energy areas. Port locations and availability of processing facilities are also included to evaluate economic impacts. Avoidance of mixed catches of Surfclams and Ocean Quahogs in transition areas is also a factor in guiding behavior and deriving economic costs. Further developments will include consideration of impacts of *de facto* closed areas on stock assessments. More detailed predictions of bottom temperatures are expected from linkages to other oceanographic models.

SSC members inquired about expected behavior of captains, especially with respect to weather conditions and searching behavior, which are currently incorporated into the modeling approach. The overall quota is not expected to have much influence on behavior because it is not limiting, though opportunity costs associated with quota use are considered. Criteria for validating the

model are under investigation for refinement and extrapolation to conditions outside the current conditions. The model may also be useful for interpretation of existing LPUE data in stock assessments, particularly for Surfclams where commercial spatial patterns reflect changes among areas as well as overall abundance. The economics of fishing operations suggest that some vessels operate at a loss. The vertical integration of companies allows these losses to be offset by shoreside mark-ups for finished products.

A member of the public appreciated the flexibility of the model to adapt to changing conditions and its utility for comparing a wide range of future scenarios.

Wind Impacts on Black Sea Bass Fisheries

David Secor, UMD Chesapeake Biological Lab, provided an overview of an industry-sponsored 9-year monitoring program, which has the acronym “TAILWINDS”. TAILWINDS is an integrated survey to evaluate how recreational and trap fisheries for black sea bass will be impacted as well as protected marine mammals, including the North Atlantic right whale and includes monthly fishery surveys, and continuous and real-time bioacoustics assets to evaluate the incidence and behaviors of whales, dolphins, porpoises and migratory fishes.

The study exemplifies other academic-industry partnerships now occurring throughout the Mid-Atlantic states designed to understand the impact of offshore wind development on living resources and fisheries. Secor walked through how TAILWINDS conformed with ROSA and BOEM guidance for such studies, emphasizing Before-After-Control-Impact and Before-After-Gradient design elements, hypotheses specific to effect sizes and power analysis, and curtailed cumulative impacts to living resources, particularly protected resources. The SSC noted the limited nature of the fishery surveys – targeting only black sea bass. Secor noted that the survey was indeed “surgical” with intent to follow BOEM guidelines for efficiently evaluating the effects on key fisheries impacted in the development region.

Members of the public inquired about interactions between attraction to sites and rates of removal, if fishing mortality is higher within wind areas. Comparisons with behavior of fish near oil rigs in the Gulf of Mexico may be useful.

Recreational Measures Setting Process

Julia Beaty, MAFMC staff, provided a detailed overview of the process that would be used for updating the Harvest Control Rule approved by the MAFMC in 2022, which implemented the Percent Change Approach. The HCR was used for development of 2023 measures for Black Sea Bass, Summer Flounder, and Scup. It was not applied to Bluefish because that species is currently in a rebuilding plan. The HCR included a sunset provision at the end of 2025 such that work on refining the HCR needs to begin relatively soon.

In response to SSC concerns about the definition of a control rule, the new approach under this Framework/Addenda will be called the Recreational Measures Setting Process. Julia provided an overview of the current methods within the HCR and additional background on advances in methodology, such as the Recreational Demand Model (RDM). The SSC appreciated the

advance notice of Framework development and the opportunity to participate in some future capacity beginning in 2024.

The presentation generated extensive discussion by the SSC, particularly with respect to impacts of recreational harvest measures on commercial fisheries. A key objective of the HCR is to achieve stability in regulations rather than have frequent updates that cause problems over time and among states. The typical suite of measures has many moving parts, so isolating individual factors can be difficult. The SSC noted that stability in regulations creates problems for control of populations and fishing mortality. Undetected overfishing can require substantial changes in regulations between assessment; such lags would offset the initial benefits of stability of regulations. The SSC reiterated earlier concerns about the nature of the “bins” that define the basis for making catch adjustments and the proposed magnitudes of percentage changes in quotas induced by transitions among “bins.” Many of the measures have a sound conceptual basis, but simulation analyses are needed to support the magnitudes of such changes, particularly with respect to species. Care needs to be taken to avoid introducing instability into populations through inappropriate discrete responses.

More frequent assessment updates should reduce some of the concerns related to discrete changes. Similarly, advances in modeling approaches might lead to use of control measures based on target F levels rather than predicted harvests. Finally, it was noted that there is often a disconnect between perception and the management process. There may be more benefit in trying to affect the perception rather than to change the management process.

Comments from the public dealt with clarification of the use of HCR in 2023 and 2024, and implementation of new harvest rules in 2026. It was also noted that there are continuing concerns about potential overestimation of fishing effort in the MRIP surveys.

Sarah Gaichas and Geret DePiper reported on the management strategy evaluation (MSE) framework used for Summer Flounder in 2022, which linked a Summer Flounder population model with the RDM in a closed loop framework. That MSE tested seven management procedures by using a variety of metrics developed through an extensive stakeholder process. The existing RDM, in conjunction with the MSE, has significant potential to address many of the topics to be developed for the Recreational Measures Setting Process Framework/Addenda. Examples include thresholds for policy decisions and the magnitude of associated management adjustments.

SSC discussions focused on strategies for implementation and efficacy of measures. Compliance may be an emergent property of the strategy if it could be built into the operating model. Implementation uncertainty and time lags could also be built in. Further advances are likely as part of an iterative process. The Committee noted that the recreational fishery is heterogeneous such that optimizing conditions for one group may not work for another. Pareto optimality analyses may be helpful for evaluating tradeoffs among groups. While long term performance is a basis for selection among policies, the effects of short-term uncertainty often create the stimuli that managers need to address. Hence, some consideration should be given to short-term metrics of catch performance.

Interactions with commercial fisheries also sparked discussion. Recent interactions for Black Sea Bass are likely to occur for other species. Some metric of borrowing among fishery types will need to be developed.

Commercial Port Sampling Overview

Victor Vecchio, GARFO, and Brian Linton, NEFSC, made complementary presentations on recent trends in commercial port sampling. The port sampling program is a complex enterprise requiring sampling over seven geographical regions, four annual quarters, multiple gears, multiple stock areas, and, for many species, market categories. Thirty species are routinely monitored. The SSC appreciated the update on this critical issue for stock assessments. The current sampling program has experienced severe cutbacks in the numbers of sampling events, and numbers of lengths and ages subsampled since 2017. Changes in contractors, increased costs, and reduced total budgets have acted in concert to cause significant declines in numbers of samples taken. For some species, very low landings have made it difficult to fully meet the target sampling goals (i.e., samples are hard to find). Improved technology, including the use of electronic measuring boards and reporting systems, are expected to offset some of these losses in primary sampling units. Electronic monitoring measures (specifically bar coding) also have improved chain of custody issues related to transmittal of samples from the contractors to the NEFSC. Such measures also allow for near real-time monitoring of sampling targets. At the stock level, the effects have not been equal across species. Shortfalls in sampling may be manifest in various and unpredictable ways depending on the manner in which samples must be weighted in response to under-sampling. A full review of the effects has not been conducted but will potentially rely on simulation studies. Brian Linton indicated that such studies cannot be done at present due to staffing concerns, but suggested collaborative projects as a way forward.

SSC comments began with questions about budget priorities and emphasizing the centrality of such sampling for characterizing stock status and informing management. The SSC acknowledged the support for supplemental samples in 2023 provided by the MAFMC, but noted that this was not a long-term fix. The SSC inquired about the definition of the primary sampling unit which is an individual trip. Catches from split trips (i.e., trips that occur in more than one stat area or stock areas) cannot be effectively sampled due to unknown patterns of mixing within the boxes. Subsamples within trips include species and market categories. Sampling agents visit ports, fish houses, and vessels where they are most likely to fill the sampling requests. The potential effects of this selection prioritization are unknown. GARFO staff meet regularly with the contractor to review progress within the year and to compensate for shortfalls when possible.

SSC members suggested several ways to revisit the efficacy of sampling programs, especially some measures instituted in Virginia. Close collaboration with various state-focused programs should yield benefits. An ongoing program with the Commonwealth of Massachusetts was noted.

The SSC emphasized that lack of funding and poor coordination undermines the entire stock assessment enterprise. The critical need should be raised to the highest levels within the Agency.

Less sampling means greater uncertainty and ultimately lower ABCs. Regardless of funding trends, the SSC noted that a more formal method of allocation of sampling effort may be necessary. Individual analysts need to be the fulcrum for this process. Comparisons of length frequency samples among randomly selected vessels would be a good starting point for a more formal examination of the sampling program.

As commercial port sampling is important for almost all Councils (North Pacific fisheries rely on at sea observers), a review by the National Academy of Sciences might be sufficient to elevate the importance of the program and improve sampling efficiency.

The alternative of using observers to obtain biological samples is infeasible in the Northeast for many species because the samples are not sorted by market category on the vessel at the time of the tow. This point begged the question of how the sampling designs might be improved through redesign of the entire program. Electronic systems can be programmed to coordinate cessation of sampling and identify shortfall across the entire sampling frame.

Scup Discards and Gear Restricted Areas Analysis

Jason Didden, MAFMC staff, provided an excellent overview of an analysis of the efficacy of the Gear Restricted Areas (GRA) in the Mid Atlantic. Hannah Hart led the review but was unable to be present. The GRAs were initiated in 2000 with the objective of reducing juvenile Scup discards in small mesh fisheries, especially those for squid. The closed areas boundaries and associated regulations were modified slightly in 2016, but can be viewed as a long-term management experiment. Estimation approaches changed slightly in 2020 with the shift to Catch Accounting and Monitoring System (CAMS), which uses two mesh categories rather than three used previously under the Area Allocation (AA) method. The SSC considered these changes to be relatively minor and do not detract from the overall evaluation. The SSC praises Council staff's review of these areas and their potential role in the rebuilding of scup populations.

Following this presentation and initial discussion, the SSC addressed the Terms of Reference (*italics*) for the GRA analysis. Responses by the SSC (standard font) to the Terms of Reference provided by the MAFMC are as follows:

Terms of Reference

For the Scup discards and Gear Restricted Areas (GRA) analysis, the SSC will provide a written report that identifies the following:

- 1. Comment on the 2023 discard report and GRA analysis and its potential application for science and management considerations. Were the data and methods applied appropriately and do the results and recommendations seem reasonable?;*

The SSC appreciated the extensive and appropriate analysis of catches and discards of scup during GRA implementation. The GRA appears to have shifted spatial distribution of discards,

but overall rates as a proportion of SSB have remained low since implementation. The SSC noted the lack of a performance metric to evaluate GRA effectiveness in meeting management objectives. This begs the question: “What level of discard is considered acceptable?”

The SSC noted that discard totals are expected to increase with population size so that the measure of efficacy of a particular management measure is the slope of the relationship between total discards and population size. Data provided in Figures 9 from the [2023 Draft Commercial Scup Discards Report and GRA Analysis](#) illustrates the correspondence of discards with recent recruitment estimates and also suggest discard rates since 2000 are about 2%, well below the prior 10%. Similarly, the discard rates expressed as a fraction of SSB are similarly high and low, before and after the GRA, respectively. The causality of the reduction in discard rate and rebuilding of the stock could not be established with these analyses. Moreover, the SSC noted that discard rates in 1999, a year before the GRA implementation, were already low. Causes for this low rate are not known but may be due to changes in harvester behavior in anticipation of the closures in 2000. The uncertainty in the discard rates is not presented so it is not possible to support this hypothesis without further analyses. An examination of the age-specific fishing mortality rates on younger age classes before and after the closures may provide additional evidence of efficacy.

Observer coverage increased sharply in 2004, so fine-scale differences in prior discard rates may be difficult to discern. The SSC expressed interest in testing for effects of reduction in the size of the southern GRA since 2017.

- 2. Provide any feedback and direction on potential future analysis or modeling approaches that could examine the predictability of scup bycatch, including methods that incorporate environmental data, or any other alternative approaches the Council could consider to continue to reduce commercial scup discards.*

In TOR 1 the SSC suggestions include options that can be accomplished by revisiting data sets used to prepare the Staff report. Under TOR 2 we consider options that would likely require more extensive analysis and evaluation of new data sets.

By imposing some assumptions on historical recruitment estimates and the underlying spatial distribution of Scup, it may be possible to conduct a counterfactual assessment to determine the effect of maintaining earlier discard rates.

If sufficient data are available, spatial modeling distribution of Scup over time relative to the GRAs is recommended. Have the centers of distribution for the population and bycatch changed? Data from the NRHA might be useful for these analyses. Survey, fishery, and experimental data suggest high spatial and temporal variability. More fine-scale data are needed to evaluate and improve seasonal and spatial bycatch management for Scup. Similarly, a requirement for development of a predictive model for discard rates would be an evaluation of changes in physical/habitat variables (SST, bottom temp) over time during the season of GRA closures.

The GRA restrictions have had apparent benefits for Scup, but may have imposed costs on other fisheries such as Longfin Squid and Atlantic Mackerel. An evaluation of the tradeoffs with these stocks would be helpful for evaluating total impacts. What are other drivers of Scup bycatch besides season and area?

The SSC questioned whether additional analyses were needed given that Fig 10 from the [draft report](#) (bycatch % of SSB) suggests the bycatch problem has been solved by GRAs. The expected benefits of fine-tuning a process in which discard rates are roughly 2% of SSB should be formally stated.

Research recommendations include:

- Future research would benefit from a clear statement of management objectives in terms of volume of Scup bycatch reduction relative to tradeoffs of other fishery objectives
- Assuming that future analyses or modeling approaches can be developed to predict Scup bycatch, the SSC recommended some thought about how the environmental data would be used and whether dynamic area management could be supported. On the other hand, use of environmental data for discard prediction is an important scientific issue; such implementation details might be ignored initially.
- Can raw discard data be used to evaluate whether there has been a regime shift between pre and post GRA frequency of 0s and address whether data change drives observed change in bycatch?
- Evaluate temporal and spatial changes in physical habitat variables (SST, bottom temp) in GRA closure areas before modeling their effects on bycatch rates.
- Consider previous work on thermal habitat by Manderson et al.
- Couple Roberts et al. (2023) approach with physical model (ROMS, other regional ocean model)
- Evaluate potential impacts of offshore wind areas on small mesh effort in those areas (perhaps minimal) and effects on Scup bycatch

Atlantic Mackerel Stock Projection Alternatives

Jason Didden, MAFMC staff, led a discussion of seven alternative projections that would be used to evaluate alternative OFLs for Atlantic Mackerel. These alternatives will be evaluated by the SSC at its October 30, 2023, meeting following the MTA for Atlantic Mackerel in September. The alternatives were prepared in collaboration with Kiersten Curti, NEFSC. They build upon earlier recommendations of the SSC made in July 2023 and concerns about the apparent overestimation of recruitment in recent assessments. These disparities have resulted in overly optimistic expectations of rebuilding. The proposed scenarios reflect progressively less optimistic expectations of contemporary abundance estimates.

After discussion, the SSC agreed that the scenarios were well designed for evaluating alternatives, and should cover the range of feasible options consistent with the Council's desire for a constant two-year harvest quota in 2024 and 2025.

Working Group Updates

Ecosystem Working Group Report

Sarah Gaichas, NEFSC, provided an overview of the objectives of the Ecosystem Working Group (WG) established in May 2021 to:

- Clarify the ecosystem criteria for the OFL CV process
- Develop prototype processes for multispecies and system level scientific advice
- Collaborate with assessment leads to incorporate Ecosystem Terms of Reference in Research Track Assessments.

Effects of environmentally driven recruitment on ABC decisions are being examined by Mike Wilberg (U Md) and John Wiedenmann (Rutgers) via simulation studies. The WG is also providing significant input to the Council's EAFM process through the refinement of ecosystem overfishing indicators. Analyses suggest that methods that incorporate regional productivity measures are more appropriate than methods based on global productivity. Simulations are planned for the NE US Atlantis ecosystem model. Single species considerations will be addressed within this framework. An Index Numbers approach (Walden and DePiper 2023) has demonstrated utility in characterizing ecosystem performance. Ecosystem and Socio-Economic Profiles (ESP) are currently in development but recent staffing changes are impeding full development.

The SSC raised questions about measures of diversity among recreational users and species.

OFL CV Working Group

The SSC's process for setting the Acceptable Biological Catch (ABC) relies on the Council's risk policy for overfishing and an evaluation by the SSC of appropriate level of uncertainty for the Overfishing Limit (OFL) obtained from the stock assessment. The level of uncertainty is defined as the coefficient of variation (CV) of the OFL (OFL CV). The difference between the OFL and ABC increases as the OFL CV increases. In a nutshell, increases in uncertainty result in lower catch limits. The process of defining the OFL CV involves an evaluation of nine factors based on attributes of the stock assessment (See Attachment 3). Simulation studies have suggested that three levels of OFL CV are sufficient to span the range of uncertainty. Each factor is evaluated against specific criteria and, after discussion, the SSC assigns each factor a CV level. Finally, an overall evaluation of the nine factors is used to define the appropriate overall CV for the OFL. The focus is to work through the process rather than to justify a specific decision.

One mark of a good procedure is that it provides a consistent response. While the procedure is complex, it is also designed to be transparent such that the basis for determination is a matter of record. To ensure that the process continues to evolve in response to new models, stock status, and fisheries, the SSC has initiated a review of the OFL CV process that will be completed by March 2024. To meet this goal, the SSC will meet regularly between now and then to address the decision matrix and review recent applications of the method.

The SSC reviewed results of an initial meeting held on August 24, 2023, that included a number of suggestions for improvement and review. The topics and SSC discussions are described below:

- Modify or Remove the criteria for MSE.
 - Rationale—Full scale MSE studies can be exceptionally costly to develop and implement. Such studies have not been conducted to date, but less intensive approaches have been used for model evaluation.
 - Discussion—Work towards refining the criteria to allow credit for less intensive MSE applications.
- Consider a streamlined process for setting ABCs when B/BMSY exceeds 1.5.
 - Rationale—Selection of OFL CV has little effect on the ABC when B/Bmsy exceeds 1.5 because the Council’s risk for overfishing is set to 0.49. A default level specification would be more efficient.
 - Discussion—The SSC clarified that while the OFL and ABC will increase with increasing stock size, the fishing mortality rate cannot exceed Fmsy proxy. “Fishing down” a stock by allowing $F > F_{msy}$ is not allowed under the MSA. One option would be to set a default OFL CV when $B > B_{msy}$ but consider the contingency that B/Bmsy could fall below the 1.5 threshold during the projection period.
- Consider dropping the requirement for an interim review of data for two-year projection period.
 - Rationale—For most MAFMC stocks, assessments will be updated every two years via Management Track Assessments. To date, the SSC has reviewed previous ABC recommendations during each year of the projection period, irrespective of its duration. In each instance, the SSC has concluded that data have been insufficient to justify modification of previous recommendations. Moreover, no specific criteria have been developed that would justify the magnitude of an adjustment. Another consideration is that it is unclear if management changes could be made in a timely fashion.
 - Discussion—The SSC noted that this provision should not apply to stocks under a rebuilding plan. Another alternative might be to update the projection for the interim year conditioned on the magnitude of removals that have actually taken place, rather than estimates of removals that were used to create the original projection. This would integrate new information in the context of original

assessment rather than introduce an *ad hoc post hoc* approach. The SSC also noted that the wide range of life histories for MAFMC stocks would require adjustments to account for the differences between short-lived squid and long-lived clams. Overall, the SSC expressed some reservations about streamlining the process too swiftly before the potential contingencies could be evaluated.

- Consider modification of the process when state-space models are used.
 - Rationale—State-space models are rapidly changing the assessment landscape by addressing stock uncertainty in a more comprehensive way than previous models. Consideration should be given to modifying the process.
 - Discussion—A Research Track Assessment is nearing completion and will be reviewed later this fall. The SSC recommends using the results of the RTA before making changes to the OFL CV decision matrix.
- Ensure that concerns of all SSC members are considered when scoring OFL CV factors
 - Rationale—Assessment leads on SSC are responsible for the initial draft of OFL CV decision matrix. Concerns were expressed that steps should be taken to ensure all members views are considered before rendering a final decision.
 - Discussion—The SSC noted that having a transparent process was essential for deriving the OFL CV. Transparency also requires that the decisions are NOT made in advance prior to open discussion in a public forum. Hence, the process explicitly avoids specification of levels prior to the meeting. Instead, the key lines of reasoning are summarized but no scores are set in advance. To ensure that all concerns are heard, the SSC recommended that all members prepare opinions on scoring prior to the plenary meetings. By precedent, the SSC seeks to achieve consensus on decisions rather than rely on voting. It is expected that this precedent will continue. The SSC noted that the Decision Matrix should be reviewed at each meeting before it is applied for the first time. The methodology is posted on the web and paper handouts are recommended for distribution to members of the public in attendance. Consultations with user groups are also recommended to determine if the process is transparent and understood.
- Revisit the summary narrative for determining the overall OFL CV
 - Rationale—The summary narrative integrates the collective judgment of SSC on the appropriate CV, but the implicit weightings of factors is not clear
 - Discussion—The SSC noted the perils of false quantification of the Decision Matrix. A particular concern was that some criteria, such as data quality, have a dominant overarching effect that cannot be offset by improvements in other factors. Future revisions to the Decision Matrix should make this distinction clear. This might be accomplished by including a preamble that specifies the process for synthesis more clearly. Another way of addressing this topic would be to estimate the implied weighting of criteria based on past performance.
 - The SSC also emphasized the need for realism in projections—adjustments should always be based on direct evidence of rebuilding rather than projections.

- Evaluate the process when ABC recommendations are not based on assessment update
 - Rationale—Delivery of assessment results can be delayed for many reasons. The SSC should plan for such contingencies by modifying this particular evaluation process.
 - Discussion—The SSC should anticipate delays in future assessments owing to unavoidable delays and unanticipated problems. Further work is needed on how to treat such instances systematically.

Additional material: Bi et al.- <https://onlinelibrary.wiley.com/doi/full/10.1111/faf.12714>

Alternative stock performance metrics

Paul Rago presented a report on a methodology that may be useful for characterizing changes in Biological Reference Points between assessments. The concept of dynamic biological reference points is often cited as a consequence of changes in ecological processes or responses to management measures. In collaboration with Brian Rothschild, a methodology was developed to partition the effects of growth, selectivity, maturity, natural mortality, and recruitment on the overall estimates of maximum sustainable yield and the proxy value for SSB at MSY. The methodology relies on approaches originally applied in human demography. The benefit of partitioning (or decomposing) the total change into its component factors is that effects of ecosystem changes and population density can be isolated from changes that are due to modeling decisions or responses to fishery regulations. The method was applied to recent stock assessments for Georges Bank Haddock, Bluefish, and Summer Flounder. Changes in BRPs for Haddock are primarily driven by reductions in average weights at age, although these effects are offset somewhat by an increase in the average age in the fishery. In contrast, changes in Bluefish are driven by the recent use of an alternative function of natural mortality at age.

SSC comments included questions about possible genetic selection for smaller size in Haddock. This method could not distinguish genetic selection from density dependence. Uncertainty in the estimates can be addressed in a variety of ways, possibly using the Sobol method described in the working paper. Further development of the method was encouraged.

Other Business

Upcoming events include:

- Joint MAFMC and NEFMC SSC subgroup to review information for updating EFH designations meeting in September. Ed Houde, John Boreman, and Yan Jiao will represent our MAFMC.
- October 30 full SSC webinar for Atlantic Mackerel MT assessment and specs for Spiny Dogfish.
- Subgroups will meet for OFL CV prior to March 2024

- Peer review needs in 2024 include a chair for the Golden Tilefish RTA in March 2024. An SSC member to chair and serve as a reviewer for the June 2024 MTA review for Black Sea Bass and Golden Tilefish.
- The Scientific Coordination Sub-Committee (SCS) will convene its Eighth national meeting on August 26-28, 2024 in Boston. NEFMC will be the host. The theme will be the application of ABC control rules in a changing environment. Possible sub-themes include:
 - how to integrate social science information,
 - data availability and modeling needs to support assessments including climate change and variations,
 - regime shifts and recruitment with projection implications.
 - case studies from each region are anticipated.

Attachment 1



Mid-Atlantic Fishery Management Council Scientific and Statistical Committee Meeting

September 12 – 13, 2023

Royal Sonesta Harbor Court Baltimore (550 Light Street, Baltimore, MD)
or via Webex webinar

This will be an in-person meeting with a virtual option. SSC members, other invited meeting participants, and members of the public will have the option to participate in person at the Royal Sonesta Harbor Court Baltimore or virtually via Webex webinar. Webinar connection instructions and briefing materials will be available at Council's website:

<https://www.mafmc.org/council-events/2023/september-2023-ssc-meeting>.

AGENDA

Tuesday, September 12, 2023

10:00 Welcome/Overview of meeting agenda (P. Rago)

10:05 Offshore Wind Session

- New tools for tracking recreational effort within wind projects (G. DePiper)
- Offshore wind development and climate impacts on mid-Atlantic commercial shellfish fisheries (A. Scheld)
- Team for Assessing Impacts to Living resources from offshore WIND turbines (TailWinds): study on the impact of the US Wind MarWin project on Black Sea Bass fisheries, migratory fishes, and marine mammals (D. Secor)

12:30 Lunch

1:30 Update on the Development of the Recreational Measures Setting Process Framework/Addenda

- Overview of framework/addenda development, timelines, and potential SSC engagement (J. Beaty)
- Overview of proposed Recreational Demand Model and Management Strategy Evaluation analysis to support action (G. DePiper, S. Gaichas)

3:00 Break

- 3:15 SSC Work Group Updates
- Ecosystem Work Group (S. Gaichas)
 - EAFM risk assessment review (B. Muffley)
 - Overfishing Limit (OFL) Coefficient of Variation (CV) Sub-Group (P. Rago)
 - Alternative Stock Performance Metrics Sub-Group (P. Rago, B. Rothschild)
- 5:15 Adjourn

Wednesday, September 13, 2023

- 8:30 Northeast Commercial Port Sampling Overview (V. Vecchio, B. Linton)
- Administration, sampling design and targets, recent/future status
- 9:45 Scup Discards and Gear Restricted Area (GRA) Review
- Overview of new commercial Scup discards and GRA analysis (J. Didden)
 - SSC discussion and address Terms of Reference
- 11:15 Break
- 11:30 Mackerel Stock Assessment and Projection Update
- Overview of recent and updated analysis for September Management Track peer review (K. Curti, J. Didden)
- 12:30 Other Business
- Remaining 2023 SSC schedule
 - Update on 2024 Scientific Coordination Subcommittee workshop
- 1:00 Adjourn

Note: agenda topic times are approximate and subject to change

Attachment 2

MAFMC Scientific and Statistical Committee

September 12-13, 2023

Meeting Attendance in Person and via Webinar

<u>Name</u>	<u>Affiliation</u>
Paul Rago (SSC Chairman)	NOAA Fisheries (retired)
Tom Miller	University of Maryland – CBL
Ed Houde	University of Maryland – CBL (emeritus)
Dave Secor	University of Maryland – CBL
John Boreman	NOAA Fisheries (retired)
Jorge Holzer	University of Maryland
Yan Jiao	Virginia Tech University
Sarah Gaichas	NOAA Fisheries NEFSC
Wendy Gabriel	NOAA Fisheries (retired)
Cynthia Jones	Old Dominion University
Geret DePiper	NOAA Fisheries NEFSC
Andrew Scheld	Virginia Institute of Marine Sciences
Mark Holliday	NOAA Fisheries (retired)
Olaf Jensen	U. of Wisconsin-Madison
Rob Latour	Virginia Institute of Marine Sciences

Others in attendance (only includes presenters and members of public who spoke):

Jason Didden	MAFMC staff
Brandon Muffley	MAFMC staff
Kiersten Curti	NEFSC
Brian Linton	NEFSC
Victor Vecchio	GARFO
Julia Beaty	MAFMC staff
James Fletcher	United National Fisherman's Assoc.
Greg DiDomenico	Lund's Fisheries
Jeff Kaelin	Lund's Fisheries
Mike Waine	American Sportfishing Assoc.
Des Kahn	DE DNREC (retired)
Renee Reilly	ROSA
Ron Larsen	Sea Risk Solutions

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	Recruitment pattern highly inconsistent and variable. Recruitment trend not considered or no recruitment estimate.

		appropriately accounted for recent trends in recruitment.	
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: Glossary (cumulative from previous SSC reports)

AA—Area Allocation Approach
ABC—Acceptable Biological Catch
ACCSP—Atlantic Coastal Cooperative Statistics Program
AGEPRO—Age Projection software
APAIS—Access Point Angler Intercept Survey
ASMFC—Atlantic States Marine Fisheries Commission
 B_{msy} —Biomass at Maximum Sustainable Yield
CAMS—Catch Accounting and Monitoring System
CCC—Council Coordination Committee
CIE—Center for Independent Experts
CPUE—Catch Per Unit Effort (Catch=Landings+ Discards)
CV—Coefficient of Variation
DFO—Department of Fisheries and Oceans, Canada
EAFM—Ecosystem Approaches to Fisheries Management
ESP—Ecosystem and Socio-economic Profiles
 F_{msy} —Fishing mortality at maximum sustainable yield
FSV—Fishery Survey Vessel
FMAT—Fishery Management Action Team
GARFO—Greater Atlantic Region Fisheries Office
HCR—Harvest Control Rule
GRA—Gear Restricted Area
LPUE—Landings per Unit Effort
M—Instantaneous Rate of Natural Mortality
MRIP—Marine Recreational Information Program
MTA—Management Track Assessment
MSE—Management Strategy Evaluation
NEFSC—Northeast Fisheries Science Center
NRHA—Northeast Regional Habitat Assessment
OFL—Overfishing Limit
P*—Probability of Overfishing
PSE—Proportional Standard Error
RDM—Recreational Demand Model
RHL—Recreational Harvest Limit
RMSP—Recreational Measures Setting Process
RTA—Research Track Assessment
R/V—Research Vessel
SCS—Scientific Coordination Subcommittee
SEDAR—Southeast Data, Assessment, and Review
 SSB_{msy} —Spawning stock biomass at maximum sustainable yield
SSC—Scientific and Statistical Committee
TAILWIND—Team for Assessing Impacts to Living resources from offshore
WIND turbines

UTID-- Universal Trip Identifier
VAST—Vector Autoregressive Spatio-Temporal
WHAM—Woods Hole Assessment Model