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M E M O R A N D U M

Date: May 25, 2023

To: Michael P. Luisi, Chairman, MAFMC

From: Paul J. Rago, Ph.D., Chair, MAFMC Scientific and Statistical Committee (SSC)

Subject: Report of the May 9-10, 2023 SSC Meeting

Executive Summary

CAMS Project Summary

> The SSC received a summary of the most recent developments in the Mid-Atlantic/New England Catch Accounting and Monitoring System (CAMS), including results of a review by the Center for Independent Experts (CIE).   Progress towards a common database for catch accounting is occurring, but the SSC expressed several concerns regarding comparisons with previous methods and requested additional information on the algorithms used to estimate landings and discards in real time. Estimates based on the new CAMS data will be used in 2023 Management Track Assessments in July and September.

Spiny Dogfish

> Results of the recently completed Research Track Assessment (RTA) were reviewed. A size and sex-based model was developed, natural mortality and maturation rates were revised, and fishery selectivity was estimated. Results suggest lower productivity than previously estimated.   Reliable estimation of current age and growth rates remains a concern. A Management Track Assessment incorporating these changes will be reviewed in September and considered by the SSC at a to-be-determined meeting later this fall.

Bluefish

> As part of the recent RTA, a new state-space model was developed that allowed for incorporation of ecosystem information in model formulation. Major changes include use of age-specific natural mortality rates, improved estimation of discard weights in recreational fisheries, and new biological reference points. Recreational CPUE was

improved significantly by including consideration of trips that included closely related species. A Management Track Assessment incorporating these changes will be reviewed in June and considered by the SSC in July.

Surfclam and Ocean Quahog

Surfclam biomass remains above target levels and fishing mortality remains well below target values. Despite some warning signs in stock trends, the SSC concluded **that no changes were necessary for the previously approved ABC of 40,946 mt for Surfclam in 2024**.

In view of the high stock biomass, low fishing mortality, and absence of any trends in indicators**, the SSC concluded that no changes were necessary for the previously approved ABC of 44,065 mt for Ocean Quahog in 2024.**

Butterfish

Review of the recent data did not suggest that modification of the projected quotas was warranted. **The SSC recommended continuation of the previously recommended ABC of 15,764 mt in 2024 for Butterfish.**

Chub Mackerel

In view of the low commercial catches, scanty discard information, low and likely imprecise recreational catches, and absence of any reliable indicators of relative abundance, **the SSC recommended continuation of the current ABC of 2,300 mt in 2024.**

Golden and Blueline Tilefish

The Golden Tilefish population generally appears to be at equilibrium. Two fishery independent longline surveys will be conducted in 2023, and an RTA in 2024 will likely provide a comprehensive summary of current stock conditions and an improved basis for future catch limits. **The SSC affirmed its previously recommended ABC of 891 mt for 2024.**

Blueline tilefish will be assessed in a SEDAR benchmark assessment in 2024/5 and an expansion of a South Atlantic fishery independent deepwater longline survey will be conducted in 2023. In view of the low catches and the absence of any measures of relative abundance, **the SSC recommended continuation of the previously approved ABC of 45.6 mt (100,520 lb) for 2024.**

Guidance for Constant Average ABC

The SSC recommended continuation of current computational methods and collaboration with the Center to ensure that projections from WHAM satisfy the SSC's methodology for computing time-varying risks of overfishing. Consultation with other Councils' SSCs on this topic is recommended.

Updates to OFL CV

The SSC recommended review of the OFL CV process after the July SSC meeting. OFL CVs will be determined for a number of the species reviewed at that meeting. The review will consider the complexity of the process and the consistency of application, and transparency and communication of results.

Background

The SSC met in person in Baltimore and via webinar from 9th – 10th May 2023, addressing the following topics:

- Receive updates on recently completed peer reviews of
  - CAMS
  - Spiny Dogfish Research Track Assessment
  - Bluefish Research Track Assessment
- Receive reports of SSC Subcommittees on
  - Constant Average ABC calculations
  - Updates to OFL CV guidance document
- Review previously recommended ABCs for 2024 for the following species
  - Atlantic Surfclam and Ocean Quahog
  - Butterfish
  - Chub Mackerel
  - Golden and Blueline Tilefish
- Conduct other business

See Attachment 1 for the meeting's agenda. An Executive Summary provides a quick summary of the primary conclusions of the SSC.

About half of the SSC members were able to participate in person for both days of the meeting (Attachment 2). Other participants included Council members, Council staff, NEFSC and GARFO staff, and representatives of industry, stakeholder groups, and the general public. Council staff provided outstanding technical support throughout the process. The SSC benefited from preparations prior to the meeting; presentations and supporting documents were relevant and high quality. A special thanks to Brandon Muffley who guided the SSC's work before, during, and after the meeting. I thank Sarah Gaichas and Brandon Muffley for their excellent meeting notes, and members of the SSC and Council staff for their comments on an earlier draft of this report.

All documents referenced in this report can be accessed via the SSC's meeting website https://www.mafmc.org/ssc-meetings/2023/may9-10. This report uses many acronyms: a comprehensive list is in Attachment 3.

CAMS Review

The Greater Atlantic Region Fisheries Office (GARFO) and the Northeast Science Center (NEFSC) have been working jointly on the Mid-Atlantic/New England Catch Accounting and Monitoring System (CAMS) since 2019. The objective of CAMS is to develop a common approach to estimate landings and discards for both real-time monitoring and stock assessments. Owing to the difficulties of obtaining landings data from varying sources and deriving discard estimates, a comprehensive summary of total removals by stock has generally occurred after the end of the fishing year. Such estimates historically have been derived at NEFSC by the "Area Allocation" (AA) method, which uses the full year's data to link databases. The objective of CAMS is to improve data quality during the fishing year and accelerate the acquisition of landings and observer data to estimate landings and discards in real time. CAMS is designed to be the single source of landings and discard data for quota monitoring, stock assessments, protected species, ecosystem modeling, and so forth.

In January 2023, CAMS was reviewed by participants from the CIE and chaired by Cate O'Keefe, New England SSC vice-chair. Michael Lanning (GARFO) presented an overview of the CAMS to the SSC and recommendations of the CIE reviewers. Much, if not most, of the work thus far has focused on the development of support tables for database management. Discard estimation methodology is continuing and expected to be completed by September. The review panel did not examine the underlying source code or the methodologies for imputation. As one of the reviewers noted, the compressed time frame and sheer volume of material required the reviewers to "focus on systems and procedures more than technical details." Instead, it focused on broader considerations of system performance and potential improvements. One such measure endorsed strongly by the CIE reviewers was a "Change Control Board" to oversee, review, and document proposed methodological changes in the coming years.

CAMS estimates are updated weekly and contain data from 1996 onward. Side-by-side estimates from AA and CAMS will continue through September 2023. After that, all estimates will be based on CAMS. Comparisons of AA and CAMS estimates for 2019 only were considered by the reviewers. Comparisons with other years are now underway. Dr. Lanning reported that a comprehensive internal review of the methodology for CAMS is scheduled for later this year. CAMS landings estimates will be used in the June and September Management Track Assessments (MTA), but CAMS discard estimates are less likely to be used until the side-by-side comparisons are complete.

A major concern is the absence of unique trip identifiers to link data streams from Vessel Trip Reports (VTR), Dealer, Observer, and sampling. As a result, a time-consuming process of linking records based on date, vessel number, location, and other factors is required. Improvements in quality assurance methods have reduced, but not eliminated the need for various imputation methods. A primary goal of CAMS is to implement a Universal Trip Identifier (UTID) that can be used across all databases. CAMS, *per se,* is not responsible for design of the UTID, but will be one of the primary beneficiaries of this link. It is estimated that this work is 80-90% complete. The SSC strongly encouraged the implementation of a UTID and echoed the recommendations of the CIE review panel.

The concerns and recommendations of the SSC include:

- Overlap with the ACCSP activities should be clarified. State data obtained by dealer records are included in CAMS, but other state landings would need to be specifically requested to ensure that all removals were included in the stock assessments.
- It is not clear how Study Fleet data have or will be used in CAMS.
- CAMS does not include standardized methods for estimation of age-specific landings or discards. An overview of current methods from NEFSC scientists would be desirable.
- Archiving of component data bases, as well as historical estimates, is essential. Current concerns about limitations of data storage should be addressed immediately.
- Changes in estimation methodology over time must also be documented.
- Use of data from electronic discard monitoring programs (i.e., camera systems for discard estimation and compliance) needs to be clarified.
- After CAMS is implemented, it will be important to characterize the uncertainty of the estimates.
- While the primary focus of CAMS is catch accounting for quota monitoring and stock assessments, additional efforts to summarize total landings and estimate total discards by geographic regions are important for ecosystem considerations.
- Additional clarification on details may be necessary at the July meeting of the SSC. Demonstration of side-by-side differences for a representative species would be useful. Several members requested additional details on the matching algorithms and other implementation details.

Spiny Dogfish Research Track Assessment Update

Deborah Hart (NEFSC) provided a detailed overview of the results of the Research Track Assessment (RTA) recently completed in December 2022. The purpose of the presentation was to inform the SSC of new scientific advances prior to the MTA, which will occur later in 2023. The most significant accomplishment was the implementation of a sex-specific length-based model in Stock Synthesis 3 (SS3). A similar model is used for Pacific spiny dogfish. Previously, stock status was evaluated by using a stochastic estimator based on between and within year uncertainty in the survey indices, gear efficiency, and discard estimates. Projections were based on expected growth rates from a study conducted in 1985. The new model allows for more generality of growth, addition of additional fleets, and explicit fitting of model parameters to length frequency distributions. Additionally, the new model allows for within model testing of alternative stock recruitment hypotheses. Attempts to update the growth model were informative but insufficient to change the earlier basis because of the paucity of the very large female fish in recent decades. Recent analyses suggest a maximum average size of 91 cm vs earlier estimates of 105 cm.

Model-based inferences are generally consistent with earlier interpretations regarding the sharp decline in large female fish during the peak of the fishery, the resulting reduction in pup abundance, and the recovery following the period of severe quota restrictions. Abundance of the lightly-fished male spiny dogfish stock remains high. Changes in size at maturity have been documented with reproduction occurring at smaller sizes. It is not known if potential reductions in size at age are related to earlier maturation. The joint effects of decreased abundance of larger

fish, reduced size at maturation, decreased size at entry into the fishery, and increased natural mortality rate have reduced the productivity of the resource. An SPR of 60% is now recommended as a biological reference point; the resulting F on fully recruited sizes is now 0.03 vs 0.11 in the earlier assessment when size at entry to the fishery was larger. The stock has been declining since about 2012.

Questions from the SSC focused on the potential interrelations among growth, fishery selectivity, and maturation. Selectivity is modeled as two blocks breaking in 2010 with a highest mortality on the largest females. SSC members noted the shifting spatial distribution of the population. With a sizable fraction of the population in Canadian waters during the summer and fall, the NEFSC fall bottom trawl survey is not a useful indicator of relative abundance. Attempts to apply an alternative estimator of relative abundance (VAST) using environmental drivers was unsuccessful.

Several members of the SSC noted the importance of archival samples and recommended exploring aging techniques used for spiny dogfish in the Northeast Atlantic. Dave Secor offered to facilitate exchange of samples and methods with European scientists. Other SSC members noted the importance of contemporary growth data and the modelling challenges of simultaneous changes in growth, maturation, pups per female spawner, natural mortality, and selectivity.

The SSC will likely require a separate meeting later in the fall to address the results of the MTA.

Bluefish RTA Update

NEFSC and ASMFC staff gave four presentations on the scientific advances from the December 2022 RTA and peer review. Tony Wood (NEFSC) highlighted major changes in the assessment model, which included the transition from ASAP to the state space model WHAM. A notable feature of WHAM is its ability to incorporate environmental data. Many technical innovations were incorporated into the assessment and numerous (>40) alternative model formulations were evaluated. Key changes included:

- Revised estimators of recreational discards by geographic region. New approach will be used by both the NEFSC and GARFO, eliminating an earlier difference in estimation methods.
- New discard mortality rate.
- Additional state survey indices included in model formulation.
- Much higher age-based natural mortality rates with an average of 0.32 vs a previously used value of 0.2.
- Revised measures of recreational CPUE based on effort metrics from similar species (guild based).
- Updated parameters for length-weight relationship.
- Reduced retrospective patterns.
- Use of WHAM for catch projections vs previous AGEPRO model.

- The biological reference points for biomass declined from 201,729 mt to 91,849 mt and the F_{msy} proxy increased from 0.181 to 0.248. Both yield per recruit and spawning biomass per recruit declined substantially from previous estimates.

The WHAM model had a negligible retrospective pattern. The state space model's flexibility is desirable, particularly with respect to inclusion of ancillary data.

Sarah Gaichas reported on efforts to estimate forage fish trends in space and time as a potential mechanism explaining bluefish availability to survey and recreational fishery indices used in the assessment. The forage index was included in a companion model to the research track final model Abby Tyrell (NEFSC) summarized results of an Ecosystem and Socio-Economic Profile (ESP) for Bluefish. The ESP is a comprehensive synthesis of information coupled with a conceptual model of the major drivers of stock dynamics and harvesting patterns.

Research Track Assessments also review historical data, incorporate results of field studies, and recent advances reported in the literature. These in-depth reviews often lead to important advances. For example, discovery of regional differences in discarding patterns led to a reconciliation of recreational discard estimation approaches between managers and scientists. Katie Drew (ASMSC) reported on major changes in the computation of recreational catch per unit effort indices wherein "effort" was redefined as the number of trips for related species caught with similar gear. Previously, "Bluefish trips" were defined as those in which Bluefish were caught; this clearly underestimates the measurement of fishing effort. Current analyses include trips that caught Black Sea Bass, Striped Bass, Spanish Mackerel, Summer Flounder, and Weakfish. Estimates of total fishing effort for bluefish have increased by about 200% in recent years.

The RTA model will be updated at the upcoming Management Track Assessment (MTA) later this summer. Based on the RTA model, the stock is considered not overfished and overfishing is not occurring. Recruitment appears to have been below average in the last 12 years.

The SSC appreciated the thoroughness of the presentations and documentation, and congratulated all Working Group members for their significant advances. Questions (and answers) included:

- Q. Can the multiple models evaluated by the WG be used to inform the range of likely candidate models to inform application of the OFL CV? *A. Not yet. Multi-model inference is not yet sufficiently developed.*
- Q. Is there any evidence to support prior hypotheses of reciprocal changes in Bluefish due to Striped Bass abundance? *A. No, and a paper by Anne Richards had previously found little evidence to support this hypothesis in recent years.*
- Q. Fishermen report seeing larger fish offshore than in prior years. Does the model support these observations? *A. Yes, some evidence of declining availability and/or catchability for older fish. Forage index changes support reduction in nearshore abundance of prey species.*
- Q. Is there any evidence of nutritional deficiency in Bluefish owing to differences in availability of forage? *A. No. Condition factor for large Bluefish is improving.*

- Q. Will the projections based on WHAM be able to mimic the complexity of scenarios incorporated into AGEPRO? *A. Yes. Full compatibility is expected.*
- Q. What was the basis for major changes in age-specific natural mortality? *A. Documentation provided in a working paper based on empirical relationship between M and weight at age (Lorenzen method). Model fit is much better with this change and results are more consistent with recent observations.*
- Q. Bluefish occur worldwide except in the Eastern Pacific. Were these studies, particularly in the Gulf of Mexico, incorporated into the ESP? *A. Focus of ESP was on research in Northwestern Atlantic. Nearly 400 papers were examined. Relatively little data from the Gulf of Mexico was included, but may be considered in a future update. Such data may be important with respect to interpreting distributional responses to increased temperatures in the Mid Atlantic.*

SSC members cautioned that post stratification of MRIP data implies changes in measures of uncertainty that should be carried forward to the guild-based estimators of CPUE. Correlation patterns across years are likely to yield spurious correlations; multivariate methods may be helpful in this regard. Similarly, differences of guild associations among states and changes over time should be investigated further. The SSC concluded by noting that ESP and MRIP information will be helpful for characterizing the appropriate measures of uncertainty for calculation of ABCs.

Update on Surfclam and Ocean Quahog

Jessica Coakley (MAFMC) provided a comprehensive overview of current stock status, recent trends in the fishery, and a comparison of differences between historical and CAMS-based estimates for Surfclams and Ocean Quahogs. Surfclams were most recently assessed via a Level 3 MTA in 2020; Ocean Quahogs were last assessed in the same year as a Level 1 assessment. ABCs were set for both species for the 2021-2026 period.

Measures of Surfclam abundance continue to show long-term declines, including commercial LPUE. In part, these changes reflect ongoing shifts in spatial patterns of the fleet. The fraction of undersized clams in landings has been increasing recently with current estimates between 25.4% and 29.8%, just below the 30% trigger limit in the Management Plan. Mixed catches with Ocean Quahog remain a concern for both fisheries. A pilot study will be conducted this summer to investigate potential methods for separating species at sea. Biotoxin levels from algal blooms are preventing access to some areas on Georges Bank and industry has expressed a need for clarification of policy and funding of monitoring efforts. Industry has also requested access to the Great South Channel Habitat Management Area.

The SSC expressed concern about the differences between CAMS estimates of total catch historically and previous methods. Dan Hennen noted that such differences were unexpected and not currently understood, but that differences in recent years were much smaller. Moreover, CAMS data would be used moving forward from 2019 and not retroactively applied in the assessments.

SSC members discussed trends in markets and prices and suggested getting more information on trades of permits and quota. Following a gap in 2021 due to Covid, a phase of the cooperative survey with industry was conducted in 2022 and the next phase is expected later this year. Because of costs and limited resources, the survey is conducted in phases over multiple years. Survey-based biomass and size estimates are derived as the sum of observations of multiple years.

The presence of commercially viable areas of small Surfclams in southern areas was attributed to strong recruitment but slow growth due to temperatures. Bioenergetic data suggest the asymptotic sizes are smaller at higher temperatures.

Despite some warning signs in stock trends, the SSC concluded that no changes were necessary for the previously-approved ABC of 40,946 mt for Surfclam in 2024.

Genetics research on both species will continue in 2023 with the collection of additional samples that could not be obtained during the Covid pandemic.

Jessica Coakley also summarized the recent information on Ocean Quahogs. No new fishery independent information was available for review, but a summary of previous information on stock status did not raise any concerns by the SSC. Model-based estimates of abundance do not reveal any significant trends. Year-to-date catches are approximately equal to patterns observed in 2022. As with Surfclams, the total catches of Ocean Quahogs are expected to be well below the ABCs.

In view of the high stock biomass, low fishing mortality and absence of any trends in indicators, SSC concluded that no changes were necessary for the previously-approved ABC of 44,065 mt or Ocean Quahog in 2024.

Update on Butterfish

Jason Didden summarized the recent fishery information on Butterfish. The stock was last assessed in 2022 via a Level 1 MTA in 2022; a RTA was completed early in 2022. The stock was well above the biomass target and fishing mortality was low. The SSC set ABCs for 2023-24 at its July 2022 meeting. Landings and revenue were down slightly in 2022. ABCs are projected to decrease in 2024. Relative biomass estimates in 2022 were the highest in the Bigelow time series for both the spring and fall bottom trawl surveys.

Review of the recent data did not suggest that modification of the projected quotas was warranted. **The SSC recommended continuation of the previously-recommended ABC of 15,764 mt in 2024 for Butterfish.**

Update on Chub Mackerel

Julia Beaty (MAFMC) provided an overview of the Chub Mackerel fishery in 2022. Catches of 36 mt remain well below the ABC of 2,300 mt. It was noted that Chub Mackerel is an alternative species in the *Illex* fishery and is not pursued unless *Illex* catches are poor. Economic conditions in recent years that may have reduced landings include high success rates for both *Illex* and Longfin Squid, high fuel prices, and low market prices for Chub Mackerel. Discard estimates are not available since only eight observer trips have occurred on vessels landing 40,000 lbs or more of Chub Mackerel since 1999. Recreational catches have trended upwards, but part of this trend may be increased awareness of Chub Mackerel within the APAIS. PSEs were not reported but are expected to be very high.

An industry advisor noted that most of the Chub Mackerel are sold for bait. Individual states have offered licenses for bait dealers. While over 2400 licenses have been sold in Massachusetts, there has been virtually no reporting.

SSC members commented on the different spatial patterns of recreational and commercial catches in recent years. Occasional presence of Chub Mackerel very close to shore is thought to be responsible for this pattern. Recreational vessels have the advantage under these conditions.

In view of the low commercial catches, scanty discard information, low and likely imprecise recreational catches, and absence of any reliable indicators of relative abundance, the SSC recommended continuation of the current ABC of 2,300 mt in 2024.

Update on Golden and Blueline Tilefish

Golden Tilefish

Jose Montañez (MAFMC) summarized recent information on Golden Tilefish. The stock is not overfished and overfishing is not occurring. Size frequency data and fishermen reports suggest a better than average 2017 year class. Landings have been stable for the past five years. Both commercial and recreational harvesters reported reduced fishing opportunities because of greater frequency of high wind days. An incidental quota of 75K lbs is applied to non-IFQ fisheries. Reported incidental harvests were less than 36% of this quota in 2022. Golden Tilefish recreational catches for party/charter and private mode trips are intermittent, low, and imprecisely measured.

SSC discussions and concerns included:

- Changes in wind patterns are reported to have reduced fishery LPUE. Such changes are consistent with predictions related to reduced size of the Mid Atlantic Cold Pool.
- Requests for changes in recreational fisheries for larger bag limits on longer trips (especially overnight). Increased catch rates provide some evidence of a strong 2017 year class. On a cautionary note, the SSC highlighted that, although over 1500 incidental permits have been issued, there have been very few reports submitted. The SSC recommended consideration of these observations at the RTA.

- The overall low levels of port monitoring were noted and measures to improve coverage rates were recommended. Options to potentially include observations from biological observers and party charter fishers should be considered.
- The SSC noted that the reductions for management uncertainty for specification of commercial quotas seem small. The basis for the small magnitude of such changes should be reviewed. Staff noted that discards by Golden Tilefish permit holders only occur when caught fish are damaged. Golden Tilefish are rarely encountered in mobile gear.

While the stock has shown periodic changes in age composition over the past 20 years, the population generally appears to be at equilibrium. The fishery independent golden tilefish longline survey will be conducted in 2023, and an RTA in 2024 will likely provide a comprehensive summary of current stock conditions and an improved basis for future catch limits. After discussion, **the SSC affirmed its previously recommended ABC for 2024 of 891 mt.**

Blueline Tilefish

Hannah Hart (MAFMC) provided a summary of the most recent information on Blueline Tilefish. The stock is primarily found in the South Atlantic and assessed under the SEDAR process. The status of the stock north of Cape Hatteras is currently unknown. The next operational assessment of Blueline Tilefish, scheduled for 2024, will be available for management in 2025. Total catches peaked in 2014 at 215,928 lb (98 mt). Catches have been below 31,000 lb and well below the ABC of 100,520 lb since 2016

Although reporting by recreational permit holders is required, compliance has been low with MRIP estimates exceeding reported catches by two orders of magnitude. Underlying causes of the low reporting rates are unknown. A member of the public strongly urged government agencies to enforce the current mandatory requirements. It is not known if any citations for nonreporting have been issued. Intercepts of Blueline Tilefish are rare and PSEs generally exceed 70% under MRIP. Catches in the commercial fishery are primarily incidental takes in trawl and longline fisheries.

Concerns expressed by the SSC included:

- Average weight (3.65 lb) is low relative to sampling conducted in other projects where fish ranged from 3 to 8 lb.
- Different catch patterns for Blueline vs Golden Tilefish. Blueline Tilefish are more frequently caught in trawl fisheries; this pattern has been observed since the start of the fishery in the Mid Atlantic. A directed longline fishery began off the NJ coast in 2013-15. Restrictions in the South Atlantic led to a northward shift of the longline fishery.
- Private angler mode catches are imputed as 105% of the Charter VTR catches based on a Delphi Process. An update or review of this methodology is warranted.
- Lack of reporting under the recreational permit system. Since 2020, 1994 permits have been issued, but only 75 trips have been reported with total landings of 799 fish.
- Involvement of NOAA Fisheries Leadership and MRIP regarding reporting issues and potential for incorporating such data into the overall MRIP program.

- Public commenters noted that commercial harvesters are required to report; the apparent lack of reporting by recreational harvesters is irresponsible. The disparity between the number of permits issued and reports received is striking.

The South Atlantic Deepwater Longline survey will be extended to Wilmington Canyon in 2023 and is likely to provide additional information on Blueline Tilefish distribution. In addition, a benchmark assessment under SEDAR will be conducted in 2024. **In view of the low catches, and the absence of any measures of relative abundance, the SSC recommended continuation of the previously-approved ABC of 46 mt (100,520 lb) for 2024.**

Progress of SSC Working Groups

Constant/Average ABC Working Group

For purposes of economic stability and regulatory stability, the Council often prefers multi-year specification of constant ABCs. These approaches can be problematic with respect to the Council's risk policy, especially if the population is trending downward from a high level. A simple average of the realized sequence of ABC estimates may not satisfy risk policy constraints in all projection years. Michael Wilberg reported on the progress of the Working Group which proposed three options:

1. Continue with *status quo* procedures of iterative solutions to find the maximum average. This process is time consuming, complex, and approximate, depending upon the desired resolution of the ABC.
2. Implement optimization software that would operate in conjunction with the existing AGEPRO projection software
3. Use only the first-year projection as the basis for multi-year average ABCs.

The SSC discussed these options extensively. Option 1 puts the burden of estimation and reporting on the stock assessment lead at NEFSC, the Council staff liaison, and monitoring/FMAT/technical committees. Council and SSC demands on these groups can be problematic when multiple catch options are requested.   Option 2 is desirable from a quality assurance perspective because it builds upon well tested projection software. However, it also requires investment of programmer staff time by NEFSC, which is currently unavailable. Moreover, NEFSC is transitioning many assessments to the state-space model WHAM, which will have different algorithms for population projection and catch forecasts. Investment in ensuring such projections satisfy the risk policy of the Council may be a better use of programming resources.

Option 3 is enticing in its simplicity, and simulation work to date suggests it performs as well as or better than more refined methods. One argument for using such an approach is that three-year and longer projections for many Mid-Atlantic stocks are less necessary than in the past because many stocks are now updated every other year. SSC supported further work on this approach, but noted that additional justification would be required to offset perceptions that information on

future status was not being fully considered. It was noted that deviations about the projected ABCs is often less than 10%, a value much lower than the uncertainty of the projections themselves. A comprehensive review of past projection performance might also be helpful to support this approach.

After considerable debate, the SSC recommended continuation of Option 1 and recommended further collaboration with the Center to ensure that projections from WHAM would satisfy the SSC's methodology for computing time-varying risks of overfishing. Consultation with other Councils' SSCs would also be useful. Socio-economic consequences of fixed vs time-varying quotas should be considered.

OFL CV Working Group

One of the primary functions of the SSC is to identify an appropriate level of uncertainty associated with setting ABCs. The translation of Overfishing Limits derived from stock assessments to Acceptable Biological Catches (ABC) is done by considering multiple factors as described in the OFL CV guidance document.   The process has evolved over the past few years and become more complex as more factors have been included. Every attempt has been made to ensure that all SSC members have the opportunity to provide input and participate in an open, deliberative process. Following plenary discussions and public input, a summary narrative is prepared to capture the conclusions of the SSC. Following my presentation of the process and a list of key questions, the SSC made the following points:

- The process is becoming very complex and may be reaching the point of diminishing returns as further refinements are contemplated.
- Improved documentation and review of past decisions would be valuable.   Does the current process ensure that all concerns are raised and considered?
- The OFL CV subgroup will develop a plan for evaluating the efficacy of current procedures and suggest appropriate reviews of historical applications.
    - Unlike approaches that attempt to quantify uncertainty in physical events (e.g., hurricane paths), the true state of the population is never known.
- Are we capturing the uncertainty induced by multiple candidate models when only one model is used? The magnitude of the CV accommodates this concern to some extent as does the comprehensive model-building process used in RTAs.
- Given the complexity of the OFL CV matrix, it is important to ensure that factors that increase uncertainty are not double counted. For example, changes in recent average recruitment or decreased average size at age may be used in the specification of short-term forecasts and as evidence of ecosystem changes or changes in early life history mortality.
- Comparisons with approaches used by other Councils' SSC would be helpful. A recent comparative report prepared by the NEFMC (found here) is informative.

Following these discussions, the SSC recommended a more thorough review of the OFL CV process after the July SSC meeting. OFL CVs will be determined for a number of the species reviewed at that meeting. The review would not only consider the complexity of the process, but also the consistency of application, and transparency and communication of results.

Other Business

- The New England Fishery Management Council will host the 2024 meeting of the Scientific Coordination Subcommittee. An initial meeting of the SCS steering committee indicated broad support for the theme of applying ABC control rules in a changing environment. Challenges include characterization of uncertainty, balancing long vs short-term objectives in rebuilding programs, and how reference points can be responsive to climate change. Subtheme considerations include the social and economic effects on communities and how to incorporate such concerns into ABC recommendations. The CCC will make final recommendations, but the broad theme seems likely to accommodate many concerns (including wind energy development).
- A recurring theme of previous SCS meetings included the need for increased interactions among SSCs to ensure awareness of common themes and potential solutions to common problems. A simple proposed solution would be virtual participation by SSC members at other council's SSC meetings. The CCC maintains a calendar of SSC meetings for all Councils (https://www.fisherycouncils.org) which could be used as a starting point. It was noted that several MAFMC SSC members had attended or made presentations to other SSCs. Council-level support for "prisoner exchanges" might facilitate this process. One example might be intersessional meetings on specific topics with the broader scientific community. A discussion with the PFMC SSC on spiny dogfish was suggested as a possible example.
- The SSC's OFL CV working group will convene before the next SSC meeting to review current status of the OFL CV guidelines and check for consistency of applications.
- A public commenter inquired whether industry should be concerned about the transition of all catch monitoring to CAMS. It was noted that current comparisons between CAMS and the AA method generally suggest single digit percentage differences between the two methods. Changes comparable to those experienced in recreational catches when MRIP estimates were recalibrated are not expected. There is currently no evidence of increased retrospective patterns due to CAMS-based estimates. Comparisons between estimates are continuing as part of the CAMS implementation and will be reported in subsequent reports from GARFO and NEFSC.
- Other public comments provided in the "chat" comments included several concerns about spiny dogfish including: consideration of a male only dogfish fishery, the potential for increased consumption of dogfish by revising the market name, concern that observed size composition changes may be a function of catchability differences by the FSV Bigelow.
- SSC volunteers are needed for several upcoming assessments, as well as participation in a review of recent NRHA advances for an Essential Fish Habitat (EFH) Amendment.

- The July 24-26, 2023 meeting of the SSC will be an in-person meeting, with a remote option, in Philadelphia, PA. The agenda will include assessment updates and specification of 2024 ABCs for Longfin Squid, Atlantic Mackerel, Summer Flounder, Scup, Black Sea Bass, and Bluefish. An update on CAMS progress and overall implications for these stocks may be warranted.

Attachment 1

Mid-Atlantic Fishery Management Council

Scientific and Statistical Committee Meeting

May 9 - 10, 2023

Canopy by Hilton Baltimore Harbor Point (1215 Wills Street, Baltimore, MD)
<u>or</u> 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 Hilton Baltimore Harbor Point 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/may-2023-ssc-meeting.

AGENDA

Tuesday, May 9, 2023

9:30   Welcome/Overview of meeting agenda (P. Rago)

9:35   Overview of the Mid-Atlantic/New England Catch Accounting and Monitoring System (CAMS) (M. Lanning, GARFO)
   - Overview of CAMS landings and discards estimation procedure; differences between CAMS and previous catch estimates; peer review findings

11:00 Break

11:15   Introductory overview of the Spiny Dogfish Research Track stock assessment information (C. McManus, RI DEM)
   - Overview of Stock Synthesis 3 and comparison to previous assessment method
   - Finding of new spiny dogfish ageing information

12:30 Lunch

1:30   Introductory overview of the Bluefish Research Track stock assessment
   - Overview and development of Woods Hole Assessment Model for Bluefish; new dead discard estimation method (T. Wood, NEFSC)

- MRIP evaluation and updates to the MRIP index (K. Drew, ASMFC)
- Bluefish forage index (S. Gaichas, NEFSC)
- Bluefish Ecosystem and Socio-Economic Profile (A. Tyrell, NEFSC)

3:30   Break

3:45   Guidance for constant/average ABC calculations
- Review of approach(es) developed by SSC sub-group
- Provide recommendations for Council consideration

4:30   Potential updates to the OFL CV guidance document
- Review suggested changes and modifications by SSC sub-group
- Provide recommendations for Council consideration

5:30   Adjourn

Wednesday, May 10, 2023

8:30   Atlantic Surfclam and Ocean Quahog data and fishery update: review of previously recommended 2024 ABCs (J. Coakley)

9:30   Butterfish data and fishery update: review of previously recommended 2024 ABC (J. Didden)

10:15   Break

10:30   Chub Mackerel data and fishery update: review of previously recommended 2024 ABC (J. Beaty)

11:15   Golden and Blueline Tilefish data and fishery update: review previously recommended 2024 ABCs (J. Montañez and H. Hart)
- Update on 2023 fishery-independent tilefish surveys

12:45   Other Business
- Scientific Coordination Sub-Committee update

1:15   Adjourn

Note: agenda topic times are approximate and subject to change

Attachment 2

MAFMC Scientific and Statistical Committee
May 9-10, 2023
Meeting Attendance in Person and via Webinar

<u>Name</u>   <u>Affiliation</u>

SSC Members in Attendance:

Paul Rago (SSC Chairman)	NOAA Fisheries (retired)
Tom Miller	University of Maryland – CBL
Ed Houde	University of Maryland – CBL (emeritus)
Dave Secor	University of Maryland – CBL
John Boreman	NOAA Fisheries (retired)
Jorge Holzer	University of Maryland
Yan Jiao	Virginia Tech University
Sarah Gaichas	NOAA Fisheries NEFSC
Wendy Gabriel	NOAA Fisheries (retired)
Mike Wilberg (Vice-Chairman)	University of Maryland – CBL
Cynthia Jones	Old Dominion University
Gavin Fay	U. Massachusetts-Dartmouth
Alexei Sharov	Maryland Dept. of Natural Resources
Geret DePiper	NOAA Fisheries NEFSC
Andrew Scheld	Viginia Institute of Marine Sciences
Mark Holliday	NOAA Fisheries (retired)
Mike Frisk	Stony Brook University

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

Michael Lanning (May 9th only)	GARFO
Jason Didden	MAFMC staff
Brandon Muffley	MAFMC staff
Tony Wood (May 9th only)	NEFSC
Abby Tyrell	NEFSC
Dvora Hart (May 9th only)	NEFSC
Katie Drew (May 9th only)	ASMFC
Samantha Werner (May 9th only)	NEFSC
Michelle Passerotti (May 9th only)	NEFSC
Lee Anderson	Former SSC and Council member
Rich Wong	DE DFW
James Fletcher	United National Fisherman's Assoc.
Conor McManus (May 9th only)	RI DEM
Julia Beaty	MAFMC staff
Jessica Coakley	MAFMC staff
Hannah Hart	MAFMC staff
Jose Montañez	MAFMC staff
Dan Hennen	NEFSC
Greg DiDomenico	Lund's Fisheries

Attachment 3. Glossary

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
ESP—Ecosystem and Socio-economic Profiles
FSV—Fishery Survey Vessel
FMAT—Fishery Management Action Team
GARFO—Greater Atlantic Region Fisheries Office
HCR—Harvest Control Rule
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
RHL—Recreational Harvest Limit
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
UTID-- Universal Trip Identifier
VAST—Vector Autoregressive Spatio-Temporal
WHAM—Woods Hole Assessment Model