Mid-Atlantic Fishery Management Council
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Michael Luisi, Chairman | G. Warren Elliott, Vice Chairman
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M E M O R A N D U M

DATE: 22 March 2017

TO: Michael Luisi, MAFMC Chairman

FROM: John Boreman, Ph.D., Chair, MAFMC Scientific and Statistical Committee

SUBJECT: Report of the March 2017 SSC Meeting (Webinar)

The SSC met via webinar on the 15th and 16th of March 2017; due to winter storm conditions, it was switched from an in-person meeting scheduled for the same dates. The main objectives of the meeting were to develop new ABC recommendations for Golden Tilefish and Blueline Tilefish. In addition, the meeting agenda (Attachment 1) also included: (1) review of a pending report to the MAFMC from the Northeast Fisheries Science Center (NEFSC) on the state of the ecosystem in the mid-Atlantic region; (2) a presentation on the National Academies of Science (NAS) review of the NMFS Marine Recreational Information Program (MRIP); (3) an update on progress being made by the SSC's OFL CV Working Group; and (4) a heads up on actions being taken by the MAFMC with regard to Atlantic Chub Mackerel.

A total of 14 SSC members were in attendance on March 15th and 15 members attended on March 16th, which constituted a quorum for both days (Attachment 2). Also in attendance, besides you, were MAFMC members, MAFMC staff, staff from NMFS GARFO, and representatives from the fishing industry and the Pew Charitable Trust. For both Golden Tilefish and Blueline Tilefish, public comments were received between the stock status presentations by NEFSC and MAFMC staff and the SSC's ABC deliberations.

Golden Tilefish

The SSC was requested by the MAFMC to develop ABC recommendations for fishing years 2018-2020. Paul Nitschke (NEFSC staff) reviewed the results of the updated assessment, followed by José Montañez (MAFMC staff) who updated the SSC on fishery regulations and fishery performance, and presented MAFMC staff's ABC recommendations. Based on the

results of the stock assessment update, the Golden Tilefish resource is not overfished and overfishing is not occurring in assessment terminal year (2016). In 2016, the stock was at 89% of the accepted reference point (SSB_{MSY} proxy = $SSB_{38\%}$) and the fishing mortality rate (F) in 2016 was 0.249, 20% below the fishing mortality threshold reference point F_{MSY} proxy = $F_{38\%}$ = 0.310.

Responses by the SSC to the Terms of Reference (in *italics*) provided by the MAFMC are as follows:

For Golden Tilefish, the SSC will provide a written report that identifies the following for fishing years 2018-2020:

1) The level of uncertainty that the SSC deems most appropriate for the information content of the most recent stock assessment, based on criteria listed in the Omnibus Amendment.

The SSC accepts the overfishing limit (OFL) estimate provided in the assessment, and determined the level of uncertainty of OFL in the assessment requires an SSC-specified coefficient of variation (CV). The SSC maintains its 2014 determination based on consistency between input data and model dynamics, the available model diagnostics, and the lack of a pathological retrospective pattern.

The SSC re-expresses its concerns that the assessment relies solely on fishery-dependent data. The SSC recommends efforts to thoroughly explore index standardization to account for factors known to affect catch-per-unit-effort (CPUE).

2) If possible, the level of catch (in weight) and the probability of overfishing associated with the overfishing limit (OFL) based on the maximum fishing mortality rate threshold or, if appropriate, an OFL proxy.

The SSC accepts the recommendation from the stock assessment update that the F_{MSY} proxy for 2018 is F_{MSY} =0.31. Specifying the OFL for subsequent years depends upon the ABC determination. The SSC notes that the MSY estimate relies on a dome-shaped selectivity curve, which suggests a large portion of the population is not vulnerable to harvest.

3) The level of catch (in weight) and the probability of overfishing associated with the acceptable biological catch (ABC) for the stock, the number of fishing years for which the ABC specification applies and, if possible, interim metrics that can be examined to determine if multi-year specifications need reconsideration prior to their expiration.

The SSC recommends a three-year ABC specification using the Council's revised approach to its risk policy, which seeks to maintain consistency in catch advice. The average ABC over the three-year period (**ABC = 742 mt**) was calculated based on the F_{MSY} proxy, an assumed lognormal coefficient of variability around OFL of 100%, the assumption that the ABC is taken each year, and applying the Council's risk policy for a typical life history. This ABC was then applied for each year of the three-year specification period to calculate the related OFLs and P*s. The resultant recommendations are:

Fishing year	F_{MSY}	OFL (mt)	P*	ABC (mt)
2018	0.31	1,058	0.34	742
2019		1,098	0.32	742
2020		1,039	0.34	742

The SSC accepts this approach for Golden Tilefish because there has been no strong trend in stock biomass in recent years. The SSC notes that this approach may not be applicable for all species. For example, in species in which there is a trend in biomass, or a history of substantial errors in projections, this approach may be inadvisable.

The SSC recommends that these ABCs be re-examined annually in light of substantial changes in the size distribution in the catch or in the spatial distribution of the fishery. This will be particularly important as the 2013 year class fully recruits to the fishery over the next two years.

The SSC notes that the poorly described level of recreational catch for Golden Tilefish is currently unaccounted for within the stock assessment. If the recreational harvest is substantially larger than currently believed, the SSC recommends that efforts should be made to directly account for this source of removals in the assessment.

4) The most significant sources of scientific uncertainty associated with determination of OFL and ABC.

- Reliance on fishery-dependent data in the assessment.
- Reliability of the F_{MSY} proxy and its relationship to potential SPR-based reference points.
- The dome-shape selectivity curve that makes a strong assumption about the presence of older fish in the population, for which strong empirical evidence is lacking.
- The extent of site fidelity of individuals, uncertainty in the stock range and distribution, and the consequences of the newly closed areas on stock dynamics that increase uncertainty and potential bias in assessment results.
- The lack of reliable recreational catch information.
- The use of a pooled age-length key that may lead to misspecification of age structure and reduced ability to both follow and estimate the size of year classes.
- The lack of a recruitment index that places a heavy burden on the estimation of past recruitments from size composition in the landings.

5) Ecosystem considerations accounted for in the stock assessment, and any additional ecosystem considerations that the SSC took into account in selecting the ABC, including the basis for those additional considerations.

No specific additional ecosystem considerations were taken into account by the SSC in reaching its ABC recommendation.

6) Prioritized research or monitoring recommendations that would reduce the scientific uncertainty in the ABC recommendation and/or improve the assessment level.

- Explore development of a fishery independent survey to estimate abundance and distribution*.
- Perform exploratory analyses of fish distributions to assess whether the dome-shaped selectivity curve used in the assessment reflects fishery selectivity or availability, or both*.
- Expand observer coverage to improve index standardization of fishery-dependent data.
- Leverage existing fishing activity to provide samples to improve life history and distribution information.
- Assess the accuracy and reliability of aging techniques.
- Evaluate the role of sanctuaries on the Golden Tilefish stock and its fisheries.

The SSC chose not to rank these recommendations.

*The SSC notes that an experimental fishing project, funded through the MAFMC Council, is currently underway that may address these research areas.

7) The materials considered in reaching its recommendations.

- 2017 Tilefish Fishery Performance Report (MAFMC staff)
- Golden Tilefish Stock Assessment Update Through 2016 (NEFSC staff)
- 2017 Golden Tilefish Advisory Panel Information Document (MAFMC staff)
- MAFMC Staff Memo on 2018-2020 Golden Tilefish Specifications
- Deroba, J.J., and T. J. Miller 2016. Correct in theory but wrong in practice: bias caused by using a lognormal distribution to penalize annual recruitments in fish stock assessment model. Fisheries Research 176 (2016): 86–93.
- Legault, C. 2015. Should I stay or should I go? The ASAP likelihood constants explained. Manuscript dated 27 August 2015. 2 pp.

These materials are accessible through the SSC's meeting website: (http://www.mafmc.org/ssc-meetings/2017/march-15-16).

8) A certification that the recommendations provided by the SSC represent the best scientific information available.

To the best of the SSC's knowledge, these recommendations are based on the best available scientific information.

Blueline Tilefish

Jason Didden (MAFMC staff) presented an updated of 2016 catch and landings information for Blueline Tilefish caught in the mid-Atlantic region. Lower commercial landings in 2015 and 2016 had been anticipated due to the emergency regulations put in place for part of 2015 and most of 2016.

The MAFMC requested the SSC to develop ABC recommendations for Blueline Tilefish for fishing years 2018 and 2019. However, a benchmark assessment for Blueline Tilefish is currently underway via the SEDAR process, with peer-reviewed results expected by the end of the 2017 calendar year. Because of the pending results of the benchmark assessment, which could change the biological reference points for Blueline Tilefish dramatically, the SSC decided it would only provide an ABC recommendation for the 2018 fishing year. The SSC will develop an ABC recommendation for the 2019 fishing year after reviewing the benchmark assessment results.

Responses by the SSC to the Terms of Reference (in *italics*) provided by the MAFMC are as follows:

For Blueline Tilefish, the SSC will provide a written report that identifies the following for fishing years 2018-2019:

1) The level of uncertainty that the SSC deems most appropriate for the information content of the most recent stock assessment, based on criteria listed in the Omnibus Amendment.

The SSC determined that the approach to estimating the ABC for Blueline Tilefish qualifies it as a stock for which there is **no accepted OFL**, and thus the SSC used methods that do not rely on biological reference points.

2) If possible, the level of catch (in weight) and the probability of overfishing associated with the overfishing limit (OFL) based on the maximum fishing mortality rate threshold or, if appropriate, an OFL proxy.

No OFL could be calculated for this stock.

3) The level of catch (in weight) and the probability of overfishing associated with the acceptable biological catch (ABC) for the stock, the number of fishing years for which the ABC specification applies and, if possible, interim metrics that can be examined to determine if multi-year specifications need reconsideration prior to their expiration.

The SSC recommends an ABC for fishing year 2018 of **39,477 kg (87,031 lbs)**, pending a new assessment that is anticipated for completion in 2017. The ABC was calculated using the DLMTool as described in the SSC Blueline Tilefish Working Group report (Miller 2016). The SSC expects to re-evaluate the ABC for fishing year 2019 when the new stock assessment is available.

4) The most significant sources of scientific uncertainty associated with determination of OFL and ABC.

- The model used by the SSC to set the ABC assumes that Blueline Tilefish in MAFMC waters represents a distinct sub-unit with limited exchange with a sub-unit to the south. However, the SSC notes that the SEDAR stock identification workshop for BLT has determined that there is a single, coastwide stock that includes the entire Atlantic seaboard and portions of the Gulf of Mexico.

- The catch time series was developed from a Delphi method and remains uncertain.

- The steepness of the stock recruitment relationship was based on estimates from the SEDAR 32 assessment and the Shertzer and Conn (2012) paper, but remains highly uncertain.

- The DLMTool assumes that the carrying capacity and productivity of Blueline Tilefish in MAFMC waters is constant. It is unclear whether the spatial expansion of the fishery since its inception represents increasing awareness of the fish as a target or increasing spatial range of its population as result of climate change (and hence increasing productivity).

- The SSC model used von Bertalanffy growth parameters specific to the northern sub-unit.

- The unknown extent of the depletion of the northern sub-unit, and assumptions regarding the influence of the level of depletion on the estimated ABC.

- The DLMTool cannot represent fisheries with substantially different selectivities, such as may be present in the recreational and commercial fisheries, which may affect the conversion of catch numbers to catch weight.

5) Ecosystem considerations accounted for in the stock assessment, and any additional ecosystem considerations that the SSC took into account in selecting the ABC, including the basis for those additional considerations.

No data were available to allow the SSC to include specific ecosystem considerations in determining ABC.

6) Prioritized research or monitoring recommendations that would reduce the scientific uncertainty in the ABC recommendation and/or improve the assessment level.

1. Improvements in the accuracy of the catch time series, in particular in the recreational sector, would be an important enhancement to estimating ABCs in the future.

2. Implementation of fishery-independent sampling will enhance understanding of the dynamics of the stock and the range of management procedures that can be applied in estimating ABC.

3. The most recent information on stock structure of Blueline Tilefish indicates a single population along the Atlantic seaboard. The level of genetic exchange estimated suggests a high degree of connectivity in the population, but it is uncertain whether this occurs through early life stage distribution or movement of adults within the population. Consequently, the potential for localized depletion of fish in specific areas is unknown and worthy of study. There is a potential to leverage work on this species with similar research on Golden Tilefish.

4. The selectivity of the commercial fishery in the northern part of the range needs to be determined.

5. No age data are used in the current assessment because of uncertainty in age determination. Research into the reliability of aging and determination of growth parameters would provide additional approaches to assessing the stock and should be a high research priority.

7) The materials considered in reaching its recommendations.

- Miller, T. J. 2016. Memo to John Boreman, Chair, Mid-Atlantic Fishery Management Council SSC, dated 22 March 2016, entitled: "Proposed BLT Subcommittee Report." 23pp.
- Shertzer, K. W., and P. B. Conn. 2012. Spawner-recruit relationships of demersal marine fishes: prior distribution of steepness. Bulletin of Marine Science, 88: 39-50.
- SEDAR 50 Stock ID Work Group. 2016. Recommendations from the SEDAR 50 (Blueline Tilefish) Stock ID Work Group Meeting. SEDAR50-DW12. SEDAR, North Charleston, SC. 40 pp.
- Blueline Tilefish Fishery Performance Report (MAFMC staff)
- Blueline Tilefish Fishery Information Document (MAFMC staff)
- Blueline Tilefish MAFMC Staff Memo

The last four documents listed are accessible through the SSC's meeting website (http://www.mafmc.org/ssc-meetings/2017/march-15-16).

8) A certification that the recommendations provided by the SSC represent the best scientific information available.

To the best of the SSC's knowledge, these recommendations are based on the best available scientific information.

State of the Ecosystem Report

Sarah Gaichas (SSC member) walked the SSC through the most recent draft of the State of the Ecosystem Report for the mid-Atlantic region, prepared by the Ecosystem Dynamics and Assessment Branch of the Northeast Fisheries Science Center. The objective of the report is to present ecosystem information relevant to fisheries management decisions in the region, but not be too exhaustive in doing so. Dr. Gaichas requested SSC feedback on the report's contents and graphics before presenting it to the MAFMC at its April meeting, and wanted to make sure the SSC's comments on an earlier draft of the report have been addressed satisfactorily. The SSC made some suggestions to improve the report's clarity and focus on the mid-Atlantic region, but overall was generally pleased with the draft.

NAS Review of MRIP

Cynthia Jones (SSC member) briefed the SSC on the recent review of the NOAA Fisheries Marine Recreational Information Program conducted by the National Academies of Science (NAS); her presentation is available on the SSC meeting website (http://www.mafmc.org/ssc-meetings/2017/march-15-16). Dr. Jones co-chaired the review panel, and SSC member Tom Miller was also a panel member. NOAA Fisheries requested the NAS to undertake the review to evaluate the agency's efforts to address the recommendations contained in the 2006 NAS review of the Marine Recreational Fisheries Statistics Survey (MRFSS). In its re-authorization of the Magnuson-Stevens Act in 2007, Congress specifically requested the agency to follow the recommendations of the 2006 NAS review to the extent possible.

The NAS review panel determined that the new fishing effort survey is a major improvement to the original Coastal Household Telephone Survey that employed random digit dialing. The panel encouraged the agency to continue investigating the cognitive properties of the two-month recall period that is contained in the survey; consider evaluating a prospective data collection method (advising people ahead of time that they will be surveyed); and further evaluate electronic data collection as an option for the fishing effort survey. The panel also found that the MRIP access point angler intercept survey, which measures catch per unit effort (CPUE), is a major improvement over the one employed under MRFSS. The panel recommended that the agency investigate estimation procedures for small areas, evaluate potential differences in CPUE between private and public access points, conduct a study comparing information from anglers

using electronic applications to information obtained from anglers via traditional methods, and develop a validation for estimation of discards at sea.

The NAS panel also noted that the agency has invested in a well-structured process for continued scientific evaluation, review, and certification, and MRIP has benefitted significantly from increasing staffing, using outside expert consultants, conducting workshops, conferences, and symposia, conducting pilot studies, and certifying new survey methodologies. The panel recommended expanding the pool of expert consultants, both in number and areas of expertise, and streamlining the certification process.

The NAS panel found that MRIP has made significant progress in its responsiveness to regional and state needs, while maintaining a national perspective for data collection through its process for certification. The panel asked the agency to evaluate whether the design of MRIP is compatible with in-season management of annual catch limits, to continue and expand investments in efforts to coordinate with and provide technical support for regional and state partners, and increase efforts to clearly articulate the significance and need to maintain a national perspective.

According to the NAS panel, MRIP has made significant progress in communications and outreach, but much still needs to be done. The panel suggested assembly and use of a group of communications experts to support outreach and education much in the same way the cadre of technical experts has been utilized. In addressing the problems associated with transitioning from MRFSS to MRIP, the NAS panel encouraged development of more detailed calibration methodology, and felt more attention to the implications for stock assessments and fisheries management was needed.

In conclusion, Dr. Jones said that the morphing of MRFSS into MRIP has yielded impressive progress in providing more reliable catch information to fishery managers; that major improvements to the statistical soundness of the survey designs were achieved by reducing sources of bias, increasing sampling efficiency, and increased coordination with partners and expert consultants; but some additional challenges remain, including those associated with non-response, electronic data collection, and communication and outreach to some audiences.

A number of questions raised by members of the SSC focused on discussions among the NAS panel members or recommendations regarding the appropriate use of MRIP data; specifically, appropriate resolution (region, state, mode, etc.) and level of precision that are suitable for use in management. It was noted that these are very valid questions and areas that need to be explored; however, they were outside the charge to the panel and therefore were not part of the review. Other questions by members of the SSC focused on the recent changes to the fishing effort sampling frame in moving to a mail survey instead of randomly phoning coastal county households. For example, what are the trade-offs in the estimates with a web-based mail survey vs the traditional phone survey, with different responses or potential biases depending upon the family member responding, and with other surveys that are being conducted to validate the increases in effort indicated by the preliminary mail surveys.

OFL CV Working Group

The SSC continued to work on refining its overfishing limit (OFL) coefficient of variation (CV) methods description. Paul Rago presented a discussion paper further extending work of the OFL CV Working Group from September 2016. The paper also included the input of several staff from the Population Dynamics Branch of the Northeast Fisheries Science Center. Overall, the objectives for the SSC are to use an OFL CV that provides prudent decisions for catch advice, is understandable, is supportable with evidence, and provides a basis and motivation for improving stock assessments. The paper outlines the SSC assessment categories and some theory that could be used to break down OFL CVs into their measureable component parts, and then focuses on developing estimators for prediction error to be incorporated in the overall OFL CV estimate. A worked example is provided in the paper, based on the projection performance of Summer Flounder assessments (including information shown by Dr. Mark Terceiro during the past two assessment reviews).

The paper was well received by the SSC and generated much discussion. Clarifying the components of OFL CV is similar to what the SSC has already described based on meta-analysis of simulation experiments, but also allows information from specific assessments, such as prediction error, to be included. While not all assessments can be treated in this way due to changes in methods over time or infrequent updates, the framework presented in the paper could incorporate a default prediction error, if necessary. Criteria can be used to evaluate considerations from both within and outside assessments to establish an OFL CV, such as the rigor of model identification during the assessment process. The OFL CV can further be informed by retrospective patterns in the model to assess the role of bias, by comparison with empirical measures of abundance, by ecosystem factors or comparisons with other species, by measures of trend in recruitment, as well as by prediction error. A formal scoring algorithm to address these criteria may not be feasible, but a narrative description would be helpful for justifying decisions

Suggestions from SSC members included examination of the magnitude of variance contributions associated with uncertainty in the F_{msy} estimate and more formal Bayesian approaches. SSCs in other regions use a variety of methods to address uncertainty in the OFL. Although some similarities exist, differences in species life histories, status of stocks, availability of assessment data, and modeling approaches have led to markedly different regional approaches. The Working Group expressed concern about including influence of other candidate models, but noted that simulations were the only feasible approach to address this topic.

Further work is in progress to provide example calculations to evaluate other components of OFL CVs based on data and assessment characteristics, as well as expanding to other species for discussion prior to the next SSC meeting. The goal is to have clear and repeatable criteria for selecting an OFL CV as soon as possible, but certainly prior to the January 2018 National SSC meeting where this topic will be discussed across regions. This work is also critical to the Council's five-year review of its risk policy.

Atlantic Chub Mackerel

Julia Beaty (MAFMC staff) briefly updated the SSC on the history and current status of the Atlantic Chub Mackerel fishery in the mid-Atlantic region, and management actions planned by the MAFMC. The MAFMC will be seeking SSC input as status determination criteria are being developed for the species, as well as an eventual ABC recommendation.

c: SSC Members, Warren Elliott, Chris Moore, Rich Seagraves, Jason Didden, José Montañez, Julia Beaty, Paul Nitschke, Jan Saunders

Attachment 1

Mid-Atlantic Fishery Management Council
Scientific and Statistical Committee Meeting
15-16 March 2017

Final Agenda

Wednesday, 15 March 2017

1:00 Golden Tilefish ABC Specification (Nitschke/Montañez)

5:15 Blueline Tilefish ABC Specification (Didden)

6:00 Adjourn

Thursday, 16 March 2017

8:30 Blueline Tilefish ABC Specification (continued)

9:00 NEFSC Ecosystem Status Report (Gaichas)

10:00 MRIP Program Review (Jones)

11:00 OFL CV Subgroup report (Rago/Gaichas)

12:00 Chub Mackerel Status Determination Criteria (Beaty)

12:30 Adjourn

Attachment 2

MAFMC Scientific and Statistical Committee
15-16 March 2017 Webinar

Name	Affiliation
SSC Members in Attendance:	
John Boreman (SSC Chairman)	NC State University
Tom Miller (SSC Vice-Chair)	University of Maryland - CBL
Mark Holliday	NMFS (Retired)
Doug Lipton (3/16 only)	NMFS Headquarters
Sarah Gaichas	NMFS Northeast Fisheries Science Center
Ed Houde	University of Maryland – CBL
Lee Anderson	University of Delaware (Retired)
Yan Jaio	VA Tech
Brian Rothschild	UMass Dartmouth (Retired)
Rob Latour	VIMS
Dave Secor	University of Maryland - CBL
Paul Rago	NMFS (retired)
Mike Frisk	Stony Brook University
Cynthia Jones	Old Dominion University
Michael Wilberg	University of Maryland - CBL
Others in attendance:	
Mike Luisi	MAFMC chair
Rich Seagraves	MAFMC staff
Brandon Muffley	MAFMC staff
Kiley Dancy	MAFMC staff
José Montañez	MAFMC staff
Julia Beaty	MAFMC staff
Jason Didden	MAFMC staff
Matthew Seeley	MAFMC staff
Paul Nitschke	NMFS Northeast Fisheries Science Center
Dewey Hemilright	MAFMC member
Mark Terceiro	NMFS Northeast Fisheries Science Center
Laurie Nolan (3/15 only)	MAFMC member
Doug Potts (3/15 only)	NMFS GARFO
Dan Farnham (3/15 only)	Fisherman
Frank Green (3/15 only)	Fisherman
Ron Callis (3/15 only)	Fisherman
Purcie Bennett-Nickerson (3/16 only)	Pew Charitable Trust
Sean Lucey (3/16 only)	NMFS Northeast Fisheries Science Center
Doug Christel (3/16 only)	NMFS GARFO