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

Date: 7 December 2018

To: Michael P. Luisi, Chairman, MAFMC

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

Subject: Report of the December 2018 SSC Webinar

The SSC met via webinar on the 6th of December 2018 specifically to address the report of the joint SSC/NEFSC Working Group assigned to develop an estimate of OFL for Atlantic Surfclam (Attachment 1). A total of 12 SSC members participated in the webinar (Attachment 2), which constituted a quorum. Also attending, in addition to yourself, were MAFMC staff and Council members, NEFSC staff (via webinar), GARFO staff, and representatives from academia and the fishing industry. Documents referenced in the report can be accessed via the SSC's meeting website (http://www.mafmc.org/council-events/2018/december-ssc-webinar).

At its May 2017 meeting, the SSC agreed with the findings of the Demersal Working Group and the SARC Review Panel that the estimate of OFL in the Atlantic Surfclam assessment was unreliable and should not be used as a basis for management advice. Instead, the SSC used catch records to support its ABC recommendations for 2018, 2019, and 2020. At the May 2018 SSC meeting Council staff proposed an alternative method for estimating OFL that the SSC determined warranted further investigation. Subsequently, the Council directed the SSC to work with NEFSC staff to determine if an OFL could be estimated given the most recent scientific information available: "*Move to have members of the SSC work with NEFSC to refine the OFL method provided so it can be considered for use with a P* approach to estimating an ABC. A joint SSC/NEFSC working group will be established for this project with delivery of the results at a future SSC meeting, no later than February 2019.*"

The joint SSC/NEFSC Working Group members are Dan Hennen (NEFSC staff and NEFSC lead assessment scientist for Atlantic Surfclam) and Mike Wilberg, Brian Rothschild, Paul Rago, and Tom Miller (SSC members). The report of the Working Group was presented to the SSC during the webinar in two parts. Dan Hennen presented the results of the analyses performed under the direction of the Working Group, and Mike Wilberg presented the Working Group's conclusions and recommendations. The Working Group concluded that enough information was available to determine an OFL and the best approach is to use the outputs from the benchmark assessment to establish an Atlantic Surfclam OFL in 2019 and 2020. However, the Working Group noted the high level of uncertainty associated with knowledge of the stock and

recommended using the point estimate of the OFL from the benchmark assessment and a coefficient of variation (OFL CV) of 150%.

The SSC agreed to support the findings and recommendations of the Working Group and used information provided in the Working Group report to recommend new ABCs for 2019 and 2020. Responses by the SSC to the terms of reference provided by the MAFMC (noted in italics) are as follows.

For Atlantic Surfclam, the SSC will provide a written report that identifies the following for the 2019-2020 fishing years:

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 deemed that Atlantic Surfclam should be considered a stock with an SSC-modified OFL probability distribution.

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

   The estimated OFLs are **74,281 mt** for 2019 and **74,110 mt** for 2020. The OFLs are based on the 2016 benchmark assessment.

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 assumed a lognormal OFL distribution with a CV of 150%. The SSC's choice of 150% CV for the OFL is for several reasons:

   - The uncertainty in biomass estimates derived from the assessment is several-fold higher than seen in assessments for other species;
   - The Georges Bank component of the survey declined unexpectedly with use of a higher efficiency gear in the new survey series;
   - Fishing mortality is low;
   - The Georges Bank component of the survey is highly uncertain due to small sample sizes;
   - There are few years in the new survey time series; and
   - Recruitment is difficult to estimate.

   The ABCs recommended by the SSC based on this CV are **56,419 mt** for 2019 and **56,289 mt** for 2020.

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

- Absolute estimates of spawning stock biomass (SSB), recruitment (R), and fishing mortality (F) are scale uncertain.
- Uncertainty from combining absolute SSB, F, and R estimates, and projected trends for the northern and southern areas into a "whole stock."
- Ecosystem analyses suggest surfclam habitat is changing – decreasing in Delmarva and increasing in NJ and Long Island. The net effects on total habitat area and carrying capacity are unknown.
- Model assumption of a 12% incidental mortality, which also may have changed.
- Dredge efficiency is a major factor for setting the scale of the model.
- Catchability was estimated differently for the old and new surveys.
- The assumed dome-shaped selectivity patterns for the survey were based on gear selectivity experiments and are not identical to the way selectivity is defined in the model.
- The distribution of size-at-age in the assessment has largest individuals at intermediate ages (probably because the CVs on size at age for the older ages are too small). This may cause a bias in estimates of F.
- There were conflicts between prior distributions of parameters and some other data sets for both models, but especially for the Southern Area. This is a common problem in integrated stock assessments, but may be indicative of structural problems that could be explored (e.g., heterogeneity in growth, recruitment, or mortality, which are not modeled in the assessment).
- The recent survey indices based on the new survey on Georges Bank are lower, which is inconsistent with use of a higher efficiency gear.

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

No additional ecosystem considerations were taken into account in selecting the ABC.

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

- Need for increased understanding in the link/relationship between the OFL and reproductive potential of the Atlantic surfclam stock.
- Reproductive consequences of fishery operations and relationship of clam density (i.e., high concentration areas versus low density patches); clam density differences in Georges Bank and Southern Region.
- Recovery potential of heavily fished areas.
- Increased understanding of stock dynamics at smaller spatial scales – scale needed is likely finer than current survey gear and survey design. Evidence suggests that patch

density in bivalves at small spatial scales can have a substantial impact on reproductive success.

- Dredge efficiency is a major factor for setting the scale of the model – more work may be needed.
- Re-examine whether the structural decisions in the assessment model are leading to conflicts in the data.
- Consider methods to estimate natural mortality (M) from the assessments by using data from shells and recently dead individuals.
- Continue to develop the institutional capacity and support for age-length integrated models.
- Examine spatial scales of variability in survey and commercial catch data, as they may be useful in improving the design of the survey or in developing regions for assessment or management.
- Model-based estimators should be used to "fill gaps" in survey strata.
- Consider the new observer discard data.
- Include Nantucket Shoals in the surveyed area for Atlantic Surfclam.
- Use "gap filling" (using data from adjacent years or areas) to calculate survey indices.

7) *The materials considered in reaching its recommendations.*

- Surfclam OFL Working Group Report and Meeting Summary
- Updated NEFSC Surfclam Analyses Report
- Atlantic Surfclam Background Document
- SAW 61: Summary Report, Assessment Report, and Panelist Reports
- Biological reference points for Atlantic surfclam (*Spisula solidissima*) in warming seas (Hennen *et al.*)

These documents can be accessed via the SSC meeting website (http://www.mafmc.org/ssc-meetings/2018/december-6).

8) *A conclusion that the recommendations provided by the SSC are based on scientific information the SSC believes meets the applicable National Standard guidelines for best scientific information available.*

The SSC believes that the recommendations provided are based on scientific information that meets the applicable National Standard guidelines for best scientific information available.

c: SSC Members, Warren Elliott, Chris Moore, Brandon Muffley, Jessica Coakley, Dan Hennen, Jan Saunders

Attachment 1

Mid-Atlantic Fishery Management Council

Scientific and Statistical Committee Meeting

December 6, 2018 Webinar (9:00 A.M. – 12:00 P.M.)

AGENDA

Thursday, December 6, 2018

9:00 Welcome/Overview of meeting agenda (J. Boreman)

9:10 Overview of SSC/NEFSC Surfclam OFL Working Group analyses and recommendations (D. Hennen/M. Wilberg)

10:00 SSC review and possible revisions of previously recommended 2019 – 2020 Surfclam ABCs (W. Gabriel)

11:30 Other business, if needed

12:00 Adjourn

Attachment 2

MAFMC Scientific and Statistical Committee
6 December 2018
Webinar

Meeting Attendance

Name	Affiliation
SSC Members in Attendance:	
John Boreman (SSC Chairman)	NC State University
Tom Miller (SSC Vice-Chairman)	University of Maryland – CBL
Ed Houde	University of Maryland – CBL (retired)
Mike Wilberg	University of Maryland - CBL
Paul Rago	NMFS Fisheries (retired)
Doug Lipton	NMFS
Wendy Gabriel	NMFS Northeast Fisheries Science Center
Lee Anderson	University of Delaware (emeritus)
Mark Holliday	NMFS (retired)
Brian Rothschild	UMass Dartmouth (emeritus)
Olaf Jensen	Rutgers University
Cynthia Jones	Old Dominion University
Others in attendance:	
Jessica Coakley	MAFMC staff
Brandon Muffley	MAFMC staff
Jose Montañez	MAFMC staff
Mike Luisi	MAFMC Chair
Peter DeFur	MAFMC member
Dan Hennen	NMFS Northeast Fisheries Science Center
Doug Potts	NMFS GARFO
Daphne Munroe	Rutgers University
Guy Simmons	Sea Watch international
Peter Himchak	LaMonica Fine Foods
Eric Powell	University of Southern Mississippi
Tom Hoff	Wallace and Associates