

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

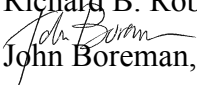
Richard B. Robins, Jr.
Chairman

Lee G. Anderson
Vice-Chairman

800 North State Street, Suite 201
Dover, Delaware 19901
Tel 302-674-2331
Toll Free 877-446-2362
Fax 302-674-5399
www.mafmc.org

Christopher M. Moore, Ph.D.
Executive Director

M E M O R A N D U M

DATE: May 27, 2011
TO: Richard B. Robins, Jr., Chairman, Mid-Atlantic Fishery Management Council
FROM:  John Boreman, Ph.D., Chairman, MAFMC Scientific and Statistical Committee
Subject: Report of May 2011 Meeting of the MAFMC Scientific and Statistical Committee

The Scientific and Statistical Committee (SSC) of the Mid-Atlantic Fishery Management Council (MAFMC) met on 25-26 May 2011 to review stock assessment information and develop acceptable biological catch (ABC) recommendations for four species under the management purview of the MAFMC: *Loligo* squid, *Illex* squid, butterfish, and Atlantic mackerel. A total of 12 SSC members were in attendance on May 25th and 11 on May 26th, which represented a quorum each day as defined by the SSC standard operating procedures. Also in attendance were representatives of the MAFMC, MAFMC staff, and the public. Stock assessment scientists from the Northeast Fisheries Science Center participated by phone during the ABC discussions (see attached attendance list).

For each species, MAFMC staff described the assessment history, the most recent survey and landings information, and comments from the Advisory Panel and Monitoring Committee. Scientists from the NEFSC were then asked to comment, followed by the SSC species lead on socioeconomics then the SSC species lead on biology. The public was then invited to comment. The SSC species lead for biology led the SSC discussion on selection of an ABC for the 2012 fishing year (and beyond in some cases). Once the discussion was completed, the SSC provided consensus statements in response to the terms of reference provided by the MAFMC. The terms of reference were the same for each of the six species. The SSC also developed research recommendations for investigations that would likely lead to reduction in scientific uncertainty associated with the ABC recommendation.

The following represents the consensus responses by the SSC to the ABC terms of reference and research recommendations for each of the four species covered in the 25-26 May 2011 meeting.

***Loligo* Squid**

1) The materials considered in reaching its recommendations:

- MAFMC Staff Memorandum from Jason Didden to Chris Moore: “2012 Atlantic Mackerel, *Illex*, *Loligo*, and Butterfish OFL/ABC Recommendations,” dated 3 May 2011

- Letter from Lars Axelson, Jeff Reichle, Dave Ellenton, Geir Monson, Peter Moore, Jeff Kaelin, and Hank Lackner to John Boreman, dated 13 May 2011.
- Letter from the National Coalition for Marine Conservation to Rick Robins, dated 6 April 2011
- MAFMC Staff Report: Loligo AP Informational Document, dated April 2011. 30pp.
- SARC 51 panelist reports
- SARC 51 panelist summary report. 51pp.
- *Loligo pealeii* Stock assessment for 2010. 51st SAW stock assessment report. 158pp.
- Squid-Mackerel-Butterfish (SMB) Advisory Panel (AP) Fishery Performance Report (FPR) – *Loligo* (undated). 1pp.

2) *The level (1-4) that the SSC deems most appropriate for the information content of the most recent stock assessment, based on criteria listed in the version of the proposed Omnibus Amendment submitted to the Secretary of Commerce:*

The SSC deemed the assessment to be Level 4 because of the lack of an OFL reference point.

3) *If possible, the level of catch (in weight) associated with the overfishing limit (OFL) based on the maximum fishing mortality rate threshold:*

Not possible as no OFL was provided.

4) *The level of catch (in weight) associated with the acceptable biological catch (ABC) for the stock. The ABC will be selected based on the overfishing definition contained in the FMP and to reflect the level of scientific uncertainty inherent in the stock assessment such that the recommended ABC is less than or equal to the overfishing limit in line with the Act and the National Standard 1 Guidelines to the Act:*

The SSC recommends an ABC of **23,400 mt**, based on the catch in the year with the highest observed exploitation fraction (catch divided by the estimated biomass) during a period of apparent light exploitation (1976-2009). Based on the results of the accepted SAW 51 assessment, the SSC interpreted this level of exploitation to be sustainable over the long term.

5) *If possible, the probability of overfishing associated with the OFL and ABC catch level recommendations (if not possible, provide a qualitative evaluation):*

Not possible, given available information.

6) *The most significant sources of scientific uncertainty associated with determination of OFL and ABC:*

- Surveys cover unknown portion of entire range (variable availability). Range may extend beyond survey coverage;
- Poor precision of U.S. discard estimates;
- Using a bottom trawl survey gear for a semi-pelagic species may induce variation in the indices of abundance and obscure the true signal;
- Highly variable survey trends;
- Highly variable natural mortality;
- Extremely short life-span (less than 1 year), and unknown, but likely high, impact of environmental factors on recruitment;
- Because of its short life span, its high rate of natural mortality and the delay in collating survey and catch information, there is an inherent lag in information pertaining to the current state of the

stock; and

- Inability to distinguish between inter-seasonal differences in productivity and inter-seasonal differences in catchability.

7) *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.

Research Recommendation

Explore alternative weightings of semi-annual surveys other than simple averaging.

Illex Squid

1) *The materials considered in reaching its recommendations:*

- MAFMC Staff Memorandum from Jason Didden to Chris Moore: “2012 Atlantic Mackerel, *Illex*, *Loligo*, and Butterfish OFL/ABC Recommendations,” dated 3 May 2011
- Letter from Lars Axelson, Jeff Reichle, Dave Ellenton, Geir Monson, Peter Moore, Jeff Kaelin, and Hank Lackner to John Boreman, dated 13 May 2011.
- Letter from the National Coalition for Marine Conservation to Rick Robins, dated 6 April 2011
- MAFMC Staff Report: Illex AP Informational Document, dated April 2011. 19pp.
- Squid-Mackerel-Butterfish (SMB) Advisory Panel (AP) Fishery Performance Report (FPR) – *Illex* (undated). 1pp.
- Northeast Fisheries Science Center. 1996. Report of the 21st Northeast Regional Stock Assessment Workshop (21st SAW): Stock assessment review committee consensus summary of assessments. Northeast Fisheries Science Center Reference Document 96-05d. 200pp.
- Northeast Fisheries Science Center. 1996. Report of the 21st Northeast Regional Stock Assessment Workshop (21st SAW): Public review workshop. Northeast Fisheries Science Center Reference Document 96-05h. 50pp.
- SARC 42 Assessment Working Group. 2006. C. Assessment of northern shortfin squid on the eastern USA shelf during 2003 and 2004. 83pp.
- 42nd Northeast Regional Stock Assessment Workshop (42nd SAW): 42nd SAW assessment summary report. Northeast Fisheries Science Center Reference Document 06-01. 61pp.
- SARC 42 review panelist reports

2) *The level (1-4) that the SSC deems most appropriate for the information content of the most recent stock assessment, based on criteria listed in the version of the proposed Omnibus Amendment submitted to the Secretary of Commerce:*

The SSC deemed the assessment to be Level 4 because of the lack of an OFL reference point.

3) *If possible, the level of catch (in weight) associated with the overfishing limit (OFL) based on the maximum fishing mortality rate threshold:*

The SSC determined it was not possible to provide an OFL given currently available scientific information.

4) *The level of catch (in weight) associated with the acceptable biological catch (ABC) for the stock. The ABC will be selected based on the overfishing definition contained in the FMP and to reflect the level of scientific uncertainty inherent in the stock assessment such that the recommended ABC is less than or equal to the overfishing limit in line with the Act and the National Standard 1 Guidelines to the Act:*

The SSC recommends an ABC of **24,000 mt**. The 24,000 mt for *Illex* is not an assessment-based ABC. Even though trawl survey CPUE and landings have varied, there do not appear to be any long-term trends; changes in landings could be the result of changes in abundance, availability, and/or market conditions. Additionally, there is no available evidence that landings of 24,000-26,000 MT have caused harm to the *Illex* stock. The SSC recommends this ABC for a three-year period (2012-2014), subject to SSC annual review.

5) *If possible, the probability of overfishing associated with the OFL and ABC catch level recommendations (if not possible, provide a qualitative evaluation):*

Not possible, given available information.

6) *The most significant sources of scientific uncertainty associated with determination of OFL and ABC:*

- Surveys cover an unknown portion of the entire range (leading to variable availability);
- Poor precision of U.S. discard estimates (but of low magnitude);
- Using a bottom trawl survey gear for a semi-pelagic species may induce variation in the indices of abundance and obscure the true signal;
- LPUE values are sensitive to availability;
- Highly variable natural mortality;
- Extremely short life-span (less than 1 year), and unknown, but likely high, impact of environmental factors on recruitment; and
- No available estimates of biological reference points (F & B), and no estimates of recent biomass and/or fishing mortality.

7) *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.

Research Recommendations

- Demographic information on growth, mortality, reproduction by sex, season, and cohort.
- Consider a length-based assessment with a sub-annual time step, undertaking cooperative research with the fishing industry.
- Expand investigations into oceanographic correlates with trends in recruitment and abundance.
- Investigate range and range dynamics at depths >185 m.
- Refine between-vessel survey calibration estimate for *Illex*, and consider a size-based calibration.
- Analyze the change in availability of *Illex* to the survey and fishery, resulting from long-term changes in climate or other oceanographic factors.
- Consider an *Illex* index standardization for the NEFSC trawl survey.

Butterfish

1) *The materials considered in reaching its recommendations:*

- Northeast Fisheries Science Center. 2010. 49th Northeast Regional Stock Assessment Workshop (49th SAW) Assessment Summary Report. NEFSC Ref. Doc. 10-01; 41 p.
- Northeast Fisheries Science Center. 2010. 49th Northeast Regional Stock Assessment Workshop (49th SAW) Assessment Report. NEFSC Ref. Doc. 10-03; 383 p.
- SARC 49 review panelist reports
- Open letter from Joel Sohn, dated 15 May 2011
- Squid-Mackerel-Butterfish (SMB) Advisory Panel (AP) Fishery Performance Report (FPR) - Butterfish (undated). 1p.
- MAFMC Staff Memorandum from Jason Didden to Chris Moore: “2012 Atlantic Mackerel, *Illex*, *Loligo*, and Butterfish OFL/ABC Recommendations,” dated 3 May 2011
- Letter from Lars Axelson, Jeff Reichle, Dave Ellenton, Geir Monson, Peter Moore, Jeff Kaelin, and Hank Lackner to John Boreman, dated 13 May 2011.
- Letter from the National Coalition for Marine Conservation to Rick Robins, dated 6 April 2011
- MAFMC Staff Report: Butterfish AP Informational Document, dated April 2011. 21pp.
- Berkson, J., L. Barbieri, S. Cadrin, S. L. Cass-Calay, P. Crone, M. Dorn, C. Friess, D. Kobayashi, T. J. Miller, W. S. Patrick, S. Pautzke, S. Ralston, M. Trianni. 2011. Calculating Acceptable Biological Catch for Stocks That Have Reliable Catch Data Only (Only Reliable Catch Stocks – ORCS). NOAA Technical Memorandum NMFS-SEFSC-616. 56pp.

2) *The level (1-4) that the SSC deems most appropriate for the information content of the most recent stock assessment, based on criteria listed in the version of the proposed Omnibus Amendment submitted to the Secretary of Commerce:*

The SSC deemed the assessment to be Level 4 because of the lack of an OFL reference point.

3) *If possible, the level of catch (in weight) associated with the overfishing limit (OFL) based on the maximum fishing mortality rate threshold:*

An estimate of OFL was not available from the most recent stock assessment (49th SAW).

4) *The level of catch (in weight) associated with the acceptable biological catch (ABC) for the stock. The ABC will be selected based on the overfishing definition contained in the FMP and to reflect the level of scientific uncertainty inherent in the stock assessment such that the recommended ABC is less than or equal to the overfishing limit in line with the Act and the National Standard 1 Guidelines to the Act:*

The SSC recommends an ABC of **3,622 mt**, which represents a doubling of the 2011 ABC.

- Survey indices appear to be stable or increasing.
- Anecdotal observations of increased butterfish abundance, as described in the AP Fishery Performance Report.
- Fishing mortality appears to be very low, particularly when compared to natural mortality.
- The above 3 bullets suggest an increase in ABC from the 2011 level is warranted.
- Analysis of the existing relationship among fishing mortality and yield for lightly exploited stocks contained in the OCRS report (Berkson, et al., cited above) suggests that OFLs could be

doubled (ORCS Report); the same rationale was applied to 2011 butterfish ABC.

5) *If possible, the probability of overfishing associated with the OFL and ABC catch level recommendations (if not possible, provide a qualitative evaluation):*

Not possible, given available information.

6) *The most significant sources of scientific uncertainty associated with determination of OFL and ABC:*

- Discards imprecisely estimated;
- Survey indices, except for the NEFSC fall survey;
- Model-based estimates of biomass and F are generally imprecise;
- Survey efficiency and stock area coverage;
- High natural mortality;
- Possible low survey catchability (pelagic fish);
- Conflicting trends among surveys;
- No accepted reference points; and
- Probable large role of environmental drivers (including predation).

7) *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.

Atlantic Mackerel

1) *The materials considered in reaching its recommendations:*

- Letter from Lars Axelson, Jeff Reichle, Dave Ellenton, Geir Monson, Peter Moore, Jeff Kaelin, and Hank Lackner to John Boreman, dated 13 May 2011.
- Letter from Cape Cod Commercial Hook Fishermen's Association to Rick Robins, dated 7 April 2011.
- Letter from the National Coalition for Marine Conservation to Rick Robins, dated 6 April 2011
- Letter from James Dow, Janet Messineo, Capt. Patrick Paquette, and Stephen Medeiros to Rick Robins, dated 8 April 2011
- MAFMC Staff Report: Mackerel AP Informational Document, dated April 2011
- MAFMC Staff Memorandum from Jason Didden to Chris Moore: "2012 Atlantic Mackerel, *Illex*, *Loligo*, and Butterfish OFL/ABC Recommendations," dated 3 May 2011
- Squid-Mackerel-Butterfish (SMB) Advisory Panel (AP) Fishery Performance Report (FPR) – Atlantic Mackerel (undated)
- Transboundary Resources Assessment Committee. 2010. Atlantic mackerel in the Northwest Atlantic - 2009 (NAFO Subareas 2 – 6). Summary of Status Report 2010/01. 12pp.
- Deroba, J. J., G. Shepherd, F. Gregoire, J. Nieland, and J. Link. 2010. Stock assessment of Atlantic mackerel in the Northwest Atlantic – 2009. Transboundary Resource Assessment Committee. Reference Document 2010/01. 64pp.

2) *The level (1-4) that the SSC deems most appropriate for the information content of the most recent stock assessment, based on criteria listed in the version of the proposed Omnibus Amendment submitted*

to the Secretary of Commerce:

Level 4: an OFL was not provided in the most recent stock assessment (2010 TRAC).

3) If possible, the level of catch (in weight) associated with the overfishing limit (OFL) based on the maximum fishing mortality rate threshold:

An estimate of OFL was not provided in the most recent stock assessment (2010 TRAC), and thus the SSC cannot provide a catch in weight associated with OFL.

4) The level of catch (in weight) associated with the acceptable biological catch (ABC) for the stock. The ABC will be selected based on the overfishing definition contained in the FMP and to reflect the level of scientific uncertainty inherent in the stock assessment such that the recommended ABC is less than or equal to the overfishing limit in line with the Act and the National Standard 1 Guidelines to the Act:

The SSC recommended an ABC of **80,000 mt**, based on the results of the most recent TRAC (2010). No information was presented to the SSC to cause the SSC to deviate from the TRAC recommendation.

Recent survey data are inconclusive because of:

- Potential changes in catchability in the change from RV Albatross to R/V Bigelow have yet to adequately specified. In particular, the SSC currently lacks estimates of length-specific catchability.
- Concerns remain over the extent to which the survey provides a reliable index of abundance given changes in availability.

Catch data may be inconclusive because:

- Catch may not be a reliable index of abundance owing to concerns related to availability and the short duration of the fishing season.
- Increases in fuel prices may have limited the flexibility of the fishery to search for mackerel.

5) If possible, the probability of overfishing associated with the OFL and ABC catch level recommendations (if not possible, provide a qualitative evaluation):

No OFL is available for this stock, and thus it is not possible to provide a quantitative estimate of the probability of overfishing. Also, the SSC is unable to specify in a qualitative sense of the level of risk assumed by the adoption of the recommended ABC.

6) The most significant sources of scientific uncertainty associated with determination of OFL and ABC:

- Disparate trend between NEFSC trawl survey and both the commercial CPUE trend and landings;
- Apparent, but not fully explainable changes in survey catchability, which may alias a number of unidentified factors;
- Lack of quantification of the linkage between US and Canadian catches;
- Surveys cover an unknown portion of entire range (variable availability);
- No Canadian discard information and poor precision of U.S. discard and recreational estimates (though likely low);
- Using a bottom trawl survey gear for a semi-pelagic species may induce variation in the indices of abundance and obscure the signal;

- Conflicting catch-at-age and survey information; and
- No satisfactory explanation of model retrospectives.

7) *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.

Research Recommendations

- Explore patterns in consumption as an additional index of abundance.
- Collaborate with industry to explore the spatial and temporal pattern and variability in catch to evaluate issues of abundance and availability.
- Re-evaluate existing data.

The SSC also endorse the following research recommendations developed during the 2010 TRAC:

- Explore opportunities for the development of alternative indices of abundance.
- Attempt to develop total stock abundance.
- Initiate broad scale international egg surveys covering potential spawning habitat that is consistently representative of the total stock area, including the shelf break. Investigate potential to conduct work in cooperation with commercial fishing industry (priority: high, long term).
- Explore spatial distribution of stock relative to the mixing of the northern and southern 'contingents' of mackerel i.e. tagging, genetics, chemical assay, microchemistry of otoliths (priority: high, medium-long term).
- Explore influence of environmental factors on spatial distribution of the stock e.g. rate of mixing and distribution of stock relative to the survey area (high priority, short term)
- Extend predation estimates to include DFO data and entire predator spectrum (marine mammals, highly migratory species).
- Examine methodology for incorporating consumptions estimates in the assessment.
- Quantify the magnitude of additional sources of mortality in Canada including the bait fishery, recreational catch and discards (high priority; short term)
- Exploration of bottom trawl characteristics for catchability of mackerel.
- Participate with industry in investigating the contemporary overlap of survey stock area, commercial fishery, and mackerel distribution and explore historical databases for the same purpose to better understand interpretation of abundance indices (survey, cpue) (medium term)
- Collaborate with industry to investigate alternative sampling gear (i.e. jigging) to survey adult abundance (long term)
- Explore MARMAP database relative to spatial distribution of survey indices.
- Investigate alternative assessment models that incorporate spatial structure (i.e. northern and southern contingents, different age groups).
- Explore alternative assessment models that incorporate covariates.
- Initiate a technical TRAC WG in order to advance and monitor progress of research recommendations.

Attachment

cc: Members, MAFMC SSC, R. Seagraves, L. Anderson, J. Didden, J. Saunders

MAFMC Scientific and Statistical Committee Meeting
Baltimore, MD

May 25, 2011

SSC Members in Attendance

<u>Name</u>	<u>Affiliation</u>
John Boreman (SSC Chairman)	North Carolina State University
Tom Miller (SSC Vice-Chair)	University of Maryland - CBL
Mike Wilberg	University of Maryland - CBL
Robert Latour	Virginia Institute of Marine Science
David Tomberlin	NMFS/S&T
Dave Secor	University of Maryland - CBL
Doug Lipton	University of Maryland - College Park
Cynthia Jones	Old Dominion University
Wendy Gabriel	NMFS/NEFSC
Yan Jiao	Virginia Tech
Bonnie McCay	Rutgers University
Mike Frisk	SUNY Stony Brook

Others in attendance

Rich Seagraves	MAFMC staff
Jason Didden	MAFMC staff
Rick Robins	MAFMC Chair
Lee Anderson	MAFMC Vice-Chair/University of Delaware
Fred Serchuk	NMFS/NEFSC
Pam Lyons Gromen	NCMC
Jud Crawford	Pew Environmental Group
Joel Sohn	Seafreeze/Harvard University
Jeff Kaelin	Lunds Fisheries
Greg DiDomenico	Garden State Seafood Association
Jeff Reichle	Lunds Fisheries
Josh Kohut	Rutgers University
Laura Palmara	Rutgers University

By phone

Lisa Hendrickson	NMFS/NEFSC
Kiersten Curti	NMFS/NEFSC
Tim Miller	NMFS/NEFSC
Jon Deroba	NMFS/NEFSC
Aja Peters-Mason	NMFS/NERO

May 26, 2011

SSC Members in Attendance

<u>Name</u>	<u>Affiliation</u>
John Boreman (SSC Chairman)	North Carolina State University
Tom Miller (SSC-Vice-Chair)	University of Maryland - CBL
Mike Wilberg	University of Maryland - CBL
Robert Latour	Virginia Institute of Marine Science
David Tomberlin	NMFS/S&T
Dave Secor	University of Maryland - CBL
Doug Lipton	University of Maryland - College Park
Wendy Gabriel	NMFS/NEFSC
Yan Jiao	Virginia Tech
Bonnie McCay	Rutgers University
Mike Frisk	SUNY Stony Brook

Others in attendance

Rich Seagraves	MAFMC staff
Jason Didden	MAFMC staff
Rick Robins	MAFMC Chair
Lee Anderson	MAFMC Vice-Chair/University of Delaware
Fred Serchuk	NMFS/NEFSC
Jud Crawford	Pew Environmental Group
Jeff Kaelin	Lunds Fisheries
Greg DiDomenico	Garden State Seafood Association
Jeff Reichle	Lunds Fisheries
Tom Alspach	Surf Clam/Ocean Quahog Industry Advisory Panel

By phone

Lisa Hendrickson	NMFS/NEFSC
Aja Peters-Mason	NMFS/NERO