Summary of Assessment Oversight Panel Meetings for Spring 2022 Management Track Stock Assessments

February 24th and April 11th, 2022
Via Video Conference

The NRCC Assessment Oversight Panel (AOP) met to review the operational stock assessment plans for the Atlantic Herring and Southern New England Winter Flounder assessment on February 26, 2022 and the Illex and Butterfish assessments on April 11, 2022. The assessments for stocks/species recommended for Level 2 and 3 peer reviews will be reviewed during a meeting the week of June 27, 2022.

The AOP consisted of:

Russell W. Brown, Ph.D. (AOP Chair), Northeast Fisheries Science Center, Woods Hole, Massachusetts. (Both meetings)

Michael Celestino, representing the Atlantic States Marine Fisheries Commission, New Jersey Fish and Wildlife (Both meetings)

Olaf Jensen, Ph.D., member of the MAMFC Scientific and Statistical Committee, University of Wisconsin, Madison. (February 24, 2022 meeting only)

Lisa Kerr, Ph.D., Chair of the NEFMC Scientific and Statistical Committee, Gulf of Maine Research Institute (April 11, 2022 meeting only)

Cate O'Keefe, Ph.D., vice-chair of the NEFMC Scientific and Statistical Committee, Fishery Applications Consulting Team, LLC (February 24, 2022 meeting only)

Michael Wilberg, Ph.D., vice-chair of the MAMFC Scientific and Statistical Committee, University of Maryland. (April 11, 2022 meeting only)

Meeting Details:
These meetings were guided by the NRCC-approved stock assessment guidance documents. Three background documents were provided to the Panel: (1) an updated prospectus for each stock; (2) an overview summary of all the salient data and model information for each stock; and (3) the NRCC Guidance memo on the Operational Assessments. Prior to the meeting, each assessment lead prepared a proposal for their Management Track Assessment. The proposal reflected the Research Track or recent Assessment results, the review panel Summary Report results and any initial investigations conducted for the Management Track Assessment.

At the meeting, each assessment lead gave a presentation on the data to be used, model specifications (if applicable), evaluation of model performance, the process for updating the Biological Reference Points, the basis for catch projections, and an alternate assessment approach if their analytical assessment was rejected by the peer review panel. In the case of Illex, the stock was already being assessed annually by the SSC using an "index-based" or "empirical" approach.

Major Recommendations for Review of Individual Stocks:
In general, the AOP approved the plans presented, but recommended several points of emphasis to the recommended review levels as summarized below:

Stock	Lead	Review Level	Rationale and Comments
Atlantic Herring	Jonathan Deroba	Level 3 – Enhanced Review	**Rationale:** Justification from the AOP included concerns related to the recent pattern of poor recruitment used in the time series for projections and biological reference points, as well as allowance for exploration of methods to determine appropriate recruitment stanzas and/or modifications to projection methods (e.g., environmental covariates, autocorrelation processes, time series analyses). Missing 2020 survey and sampling information due to Covid.
Southern New England Winter Flounder	Tony Wood	Level 3 – Enhanced Review	**Rationale:** Concerns about the recent pattern of poor recruitment and the time series used for projections and biological reference points. Unknown effect of splitting the Albatross - Bigelow time series. NEFSC fall survey index is currently input as bumped Ages 2-7+, this is a carryover from when the model was a VPA. This survey will be input as un-bumped Ages 1-7+ for this assessment. Uncertainty in the CAMS landings allocation to stock area. Missing 2020 survey and sampling information due to Covid.

Illex Squid	Lisa Hendrickson	Data Update – Direct Delivery	**Rationale:** Research Track peer review was completed in March 2022. The AOP saw little value in providing an alternate assessment approach (Plan B Smooth) and concluded that the management track report will consist of a data update with 2020-2021 catch and 2020-2021 survey information. Once the 2022 catch and 2022 Autumn NEFSC survey data are available in 2023, the Rago "Indirect Method" (which relies on an assumed BRP to annually estimate an ABC), should be updated by the assessment lead and provided to the SSC.
Butterfish	Charles Adams	Level 1 - Direct Delivery	**Rationale:** Research Track peer review in March 2022, the management track report will consist of a model update that will include the 2020-2021 catch and 2020-2022 survey information. The AOP has some concerns given that the individual CIE reports were not available at the time of the meeting. The AOP recommended reaching out to NEAMAP staff to understand the source of changes in the index time series.

<u>Individual Stock Discussion Summaries</u>:

Atlantic Herring (AOP Lead: Michael Celestino)
Recommendation: Level 3 (Enhanced Review)

Atlantic herring was last assessed using the 35th SAW accepted ASAP model updated in 2020 using data through 2019. The stock is currently overfished, while overfishing is not occurring. For the current management track assessment, no new sources of information are anticipated, save NEFSC swept area adjusted survey indices. The assessment scientist did not anticipate this transition to create any problems given the variation already observed in the survey. Regarding the use of commercial landings, the assessment lead did not anticipate using the newly available CAMS, as the state of Maine handles QA/QC data and is considered the official catch record for herring. There were no objections from the AOP on this proposal.

No changes to the assessment model are proposed. Following a recommendation from the 2020 management track review, biological reference point calculations will account for fixed fleet fishing mortality (which are almost entirely Canadian catches). One notable proposed change is to the recruitment stanza and/or projection methods used in short term projections and projections to define the BRPs in light of approximately 10 years of unprecedented low recruitment; the past approach drew from the full time series of recruitments, which the assessment scientist viewed as increasingly inappropriate. Proposed examples included autocorrelated models [for example, AR(1), empirical dynamic modelling], or the use of environmental covariates (such as bird diet data as an early indicator of recruitment strength). The latter was viewed as unlikely, but included in the event this effort progressed rapidly. Discussion ensued regarding the types of covariates that would be of most use and the interest in ensuring that they too could be projected. The AOP suggested consideration of alternative time series methods as well, such as regime shift models, for example.

In terms of a plan B assessment, the assessment scientist proposed a LOESS smooth of all indices used in the assessment since 2009. The assessment scientist indicated that to operationalize this approach, all indices would be rescaled to their respective means, then averaged; the LOESS would be applied to the mean index. In response to a question about the influence of missing 2020 data (due to covid), the assessment scientist envisioned an in-depth, thorough treatment of interpolation methods and implications, similar to what has been done for groundfish stocks. There were no objections from the AOP on the plan B approach.

The AOP concurred with the lead analysist's proposed level 3 review. Justification from the AOP included concerns related to the recent pattern of poor recruitment used in the time series for projections and biological reference points, as well as allowance for exploration of methods to determine appropriate recruitment stanzas and/or modifications to projection methods (e.g., environmental covariates, autocorrelation processes, time series analyses).

Southern New England Mid-Atlantic (SNEMA) Winter Flounder (AOP Lead: Cate O'Keefe)
Recommendation: Level 3 (Enhanced Review)

Dr. Tony Wood provided an overview of the current stock assessment for SNEMA winter flounder and his recommendations to the Assessment Oversight Panel for the 2022 management track assessment. The stock is currently overfished, and overfishing is not occurring. The current assessment method for SNEMA winter flounder is a statistical catch-at-age (ASAP) model that includes age-specific commercial and recreational landings and discards, and 12 age-specific trawl indices from the NEFSC, four state fisheries agencies, and URI/GSO.

The SNEMA winter flounder model will be updated with information through 2021, including all fishery and survey data, and no new information sources will be introduced. The assessment will apply the ASAP model configuration as updated during

the 2020 management track assessment with a proposed change to use ages 1-7+ for the NEFSC fall survey index. Currently, the NEFSC fall survey index has been input as bumped ages 2-7+, as a carryover from the previous VPA model. The assessment will explore splitting the NEFSC bottom trawl survey time series to separate the R/V Albatross and Bigelow indices. Additionally, an environmental assessment model (Bell et al., 2018) will be updated and the results will be used to inform a stanza of recruitment more representative of the current stock regime. Current projections draw from the empirical cumulative distribution function (CDF) of recruitment using estimates from the full time-series, 1981-2019. It is expected that results from the environmental assessment model will suggest a truncation of the recruitment time series. Since estimates of recruitment in the early time-series are higher in magnitude, removing these estimates from the recruitment stanza is expected to lower median recruitment estimates in the projections, leading to a reduction in the projected estimate of $SSB_{MSY40\%}$.

The AOP discussed the application of results from the environmental assessment model to inform the SNEMA winter flounder recruitment stanza and approved the recommendation to use this external model to inform biological reference points and projections. SNEMA winter flounder is not scheduled for a research track assessment until 2026 and using the environmental model to inform a more representative recruitment stanza was considered appropriate for the management track assessment.

The AOP expressed concerns about potential uncertainties associated with the use of CAMS data for the SNEMA winter flounder assessment. Landings data for 2020 and 2021 will be generated differently from previous assessments, and the AOP discussed the potential need for additional comparisons of landings data from different sources (e.g., DMIS and CAMS). The AOP also discussed the missing 2020 survey and sampling information for several of the indices included in the SNEMA winter flounder assessment and supported the proposed sensitivity analyses to address missing data points.

The AOP agreed that a Level 3 assessment was appropriate based on changes to the recruitment time series used to estimate biological reference points and projections, uncertainties in CAMS data, missing survey data for 2020, splitting the Albatross and Bigelow survey time series, and changing the fall survey ages to 1-7+.

Illex Squid (AOP Lead: Russell Brown)
Recommendation: Level 1 (Direct Delivery)

Stock assessment approaches developed through the Research Track process were peer reviewed in March 2022. The panel did not support the Depletion model tabled for the peer review and had concerns about several other approaches that were explored by the working group. Efforts to develop biological reference points were unsuccessful and the status of the stock is currently unknown. However, the panel did conclude that there was evidence to suggest that the stock was "lightly fished".

Lisa Hendrickson presented information concluding application of the alternate stock assessment approach (in this case, Plan B Smooth), given that the Research Track peer review panel did not support the Depletion Model tabled by the Illex Research Track working group. The panel discussed the utility of applying the Plan B smooth approach to inform 2023 specification setting and concluded that this would not be a valuable exercise.

The MAFMC Scientific and Statistical Committee (SSC) has been utilizing an approach developed by Dr. Paul Rago to set quotas for the past two years. Management specifications including a quota of 40,000 mt has already been set for the 2022 fishing season, so results of the Management Track process would be used to inform 2023 specifications. Given that the Rago method requires the 2022 catch and the 2022 Autumn NEFSC survey index information, this approach cannot be updated for the June 2022 Management Track peer review.

After discussing the utility of the alternate assessment approach and the inability to update the Rago approach for the June 2022 Management Track meeting, the AOP concluded that a data update should be completed in this management track cycle and be provided to the MAFMC SSC for review at their July 2022 meeting. **This data update would review a Level 1 Data Update (Direct Delivery) review.** Once the 2022 catch and 2022 Autumn NEFSC survey indices are available, the Rago method would be updated and presented at the March 2023 meeting of the MAFMC SSC.

Butterfish (AOP Lead: Michael Celestino)
Recommendation: Level 1 (Direct Delivery)

Butterfish was last assessed in March 2022 through a Research Track assessment and was peer reviewed resulting in a new accepted model, the Woods Hole Assessment Model (WHAM) with included data through 2019. The stock is currently not overfished, and overfishing is not occurring. For the present management track assessment, all fishery and survey data will be updated through 2021. Several new/revised sources of data are available, including revised spring and fall NEFSC Bigelow survey indices of abundance, and revised NEAMAP survey indices of abundance. The revisions to the Bigelow index resulted from a change to station-specific swept area based calculations. It was unclear what led to revisions in the NEAMAP survey index and NEFSC staff are going to follow up with NEAMAP survey staff and will include a description of this change in the June management track assessment report. The revisions to the survey indices resulted in minor changes.

Another source of new data will be commercial landings from CAMS. The AOP concurred with the assessment scientist's conclusion that there were no notable differences between the AA tables and CAMS; the AOP recommended documenting this comparison in the management track assessment document. The research track assessment included data through 2019; commercial data from CAMS will be included in this management track assessment for 2020 and 2021.

No changes to the assessment model or the projection methods are planned. Biological reference points (BRPs) will be updated using the 2022 research track approved methodology. Discussion ensued between the AOP and assessment scientist regarding consideration of revising reference points based on discussion during the 2022 research track assessment. The assessment scientist indicated that changes were not likely due to data availability timing, though he was likely to use an alternative reference point (e.g., 2/3 of the natural mortality estimate) as a sensitivity run. Additionally, should information come to light in the research track peer review report, the AOP was comfortable relying on the assessment scientist's judgment to determine if any changes to reference points (or other assessment aspects) are appropriate for the June management track.

In terms of a plan B assessment, the assessment scientist proposed a LOESS smooth of NEFSC and NEMAP spring and fall indices (i.e., PlanBsmooth approach). The AOP was supportive of this approach. While it did not seem likely a plan B would be needed, discussion ensued as to how or if to treat missing survey values in the timeseries (e.g., 2020). The assessment scientist was reluctant to interpolate missing values due to the volatility of the indices. This point led to AOP discussion as to whether the index volatility calls into question the performance of the PlanB smooth, and an examination of the PlanB smooth performance for butterfish and butterfish-like species could be appropriate at some point.

The AOP concurred with the assessment scientist's proposed level 1 review.
Justification from the AOP included that no changes to the assessment model are planned, only minor changes to the input data are planned (i.e., prescribed adjustments to NEFSC and NEAMAP trawl survey indices), and the BRPs will be updated (no change in methodology; inputs updated to reflect updated average weight at age, average selectivity, etc). Should the assessment scientist determine that the peer review panel report (when it becomes available) requires substantive changes to the current proposal, the assessment level assignment may need to be revisited.

AOP Meeting Conclusions:
The AOP met on February 24th and April 11th, 2022 to review the stock assessment plans for four species scheduled for the Spring 2022 Management Track cycle. The panel concluded that Level 1 reviews (Direct Delivery) were warranted for Illex Squid and Butterfish and that Level 3 reviews (Enhanced Review) were warranted for Atlantic Herring and Southern New England Winter Flounder. The Level 3 reviews will occur during the Spring 2002 Management Track Peer Review scheduled for the week of June 27, 2022. Changes in the required review level would be triggered by a Northeast Fisheries Science Center request to increase the review level for a given stock. The AOP could concur to increase the review level via email or request to reconvene the AOP panel to have further discussions with the stock assessment lead. Any need to reconvene the panel would be a publicly announced meeting and any subsequent changes to the review level would be publicized to assessment partners and stakeholders.

Appendix 1. Meeting Participants (names, not call in numbers)

February 24, 2022 Meeting Participation:

Russ Brown, AOP Chair (NEFSC)
Olaf Jensen, AOP (MAFMC)
Mike Celestino, AOP (ASMFC)
Cate O'Keefe, AOP (NEFMC)
Michele Traver - NEFSC

Alex Hansell - NEFSC
Andrew Applegate - NEFMC Staff
Andrew Jones - NEFSC
Angela Forristall - NEFMC Staff
Anthony Wood - NEFSC
Ashley Asci - GARFO
Carrie Nordeen - GARFO
Charles Adams - NEFSC
Chris Kellogg - NEFMC Staff
Chris Legault - NEFSC
Chris Tholke - NEFSC
Deirdre Bohelke - NEFMC Staff
Dustin Colson Leaning - ASMFC Staff
Elizabeth Siddon - NEFSC (on detail)
Jamie Cournane - NEFMC Staff
Janice Plante - NEFMC Staff
Jon Deroba - NEFSC
Jonathan Peros - NEFMC Staff
Kiersten Curti - NEFSC
Larry Alade - NEFSC
Mark Terceiro - NEFSC
Mary Beth Tooley - O'Hara Corporation (Maine)
Matt Cieri - Maine Department of Marine Resources
Melissa Smith - Maine Department of Marine Resources
Paul Nitschke - NEFSC
Phil Politis - NEFSC
Raymond Kane - Cape Cod Commercial Fishermen's Alliance
Richard Klyver - stakeholder (he is an artist from Eastport, ME)
Rick Bellavance - NEFMC Council Member
Samuel Asci – NEFSC
Sean Hardison – University of Virginia
Steve Cadrin - SMAST, University of Massachusetts
Susan Wigley - NEFSC
Tom Miller - Chair for June 2022 Management Track Peer Review
Tom Nies - NEFMC Executive Director
Toni Chute - NEFSC, Rapporteur

Tracey Bower - ASMFC Staff
Zack Klyver – Blue Planet Strategies

April 11, 2022 Meeting Participation:

Russ Brown, AOP Chair (NEFSC)
Mike Wilberg, AOP (MAFMC)
Mike Celestino, AOP (ASMFC)
Lisa Kerr, AOP (NEFMC)
Michele Traver - NEFSC

Alex Dunn - NEFSC
Alex Hansell - NEFSC
Andrew Jones - NEFSC
Anna Mercer - NEFSC
Anthony Wood - NEFSC
Brandon Muffley - MAFMC Staff
Brian Linton - NEFSC
Carly Bari - GARFO
Cate O'Keefe - Fisheries Applications Consulting Team
Charles Adams - NEFSC
Chris Legault - NEFSC
Eric Reid - Fisheries Consultant
Gregory DiDomenico - Lunds Fisheries
Jeff Kaelin - Lunds Fisheries
Jon Deroba - NEFSC
Katie Almeida - Town Dock
Kim Hyde - NEFSC
Larry Alade - NEFSC
Lisa Hendrickson - NEFSC
Mark Terceiro - NEFSC
Meghan Lapp - Sea Freeze Ltd.
Paul Nitschke - NEFSC
Sarah Salois - NEFSC
Tim Miller - NEFSC
Tom Miller - Chair for 2022 June Management Track Peer Review

Appendix 2: Assessment Oversight Panel related guidelines.

Overarching statement from the Guidance Document. "If a change proposed by an analyst is not detailed below, the AOP will determine whether the modification is permissible and which level of peer review would be required."

Table elements in the columns 3 to 5 would be factors considered by the Panel. The Panel would put its comments in the most appropriate box irrespective of the Guidance Level (column 2). The final recommendation would be based on the preponderance of the evidence of comments in each column. A summary of the cumulative effects of within each Guidance Level is a row following each level. This would be an opportunity for synthesis of the evidence regarding the above factors.

Guidance Template for Deriving Recommended Level of Assessment Review

Task	***Guidance Level***	***Direct Delivery (1)***	***Expedited Review (2)***	***Enhanced Review (3)***
Model has been updated with revised data, with minor changes (such as small adjustments to data weights, fixing parameters estimated at bounds, correcting minor errors in previous model)	1			
Incorporation of updated data from recent years in the estimation of biological information (growth, maturity, length-weight relationship)	1			
Effects of delayed seasonal surveys or missing strata on fishery-independent measures of abundance	1			
Identification by lead analyst on potential problems of adding or revising data on model performance	1			
Cumulative Impact of Level 1 changes				
Updated discard mortality estimates, when based on peer-reviewed experimental evidence	2			
Evaluating effects of delayed seasonal surveys or missing strata on fishery independent measures of abundance if significant analysis is required to characterize the effects	2			
Recalibrated catch estimates (e.g., transition to Marine Recreational Information Program, area	2			

allocation tables, conversion factors (whole to gutted weight))				
Simple changes, corrections, or updates to selectivity, including but not limited to: --Changes to most recent selectivity stanza. --Changes to historical selectivity stanza if they are corrections or reinterpretations of previously used block timeframes	2			
Retrospective adjustment to management metrics following established retrospective adjustment protocols	2			
Adjustment of method for estimating biological information (growth, maturation, sex ratio, changes to length-weight relationships, etc.), when based on methods developed with sufficient peer review or justification for its use.	2			
Calculate new values for the existing BRPs	2			
Cumulative Impact of Level 2 changes	2			
Inclusion of new or alternate interpretations of existing indices	3			
Changes to estimation method of catchability, including but not limited to: ○ Empirical estimations ○ Changes in habitat/availability /distribution on catchability ○ Use of informed priors on catchability in a model	3			
Updating of priors on parameter estimates based on new research AND if done on a previously approved model	3			
Recommend significant changes to biological reference points, including but not limited to: --Change in the recruitment stanza --Number of years to include for recent means in biological parameters --Suggestions of alternate reference points if based off a similar modeling approach (e.g. age-based, length-based, etc.)	3			
Updating of historical selectivity stanzas	3			

Changing recruitment option used, meaning using a stock-recruitment relationship, or cumulative distribution function, etc.	3			
Changes to selectivity functional form (i.e. such as a new selectivity model) if supported by substantial empirical evidence.	3			
Changes to fleet configuration	3			
Changes to natural mortality (M)	3			
New modeling framework, if the new framework was evaluated during a previous research track topic investigation, and the species in question was one of the examples evaluated.	3			
Cumulative Impact of Level 3 changes. Determine if Research Track is warranted.				