

# Summary of February Assessment Oversight Panel Meetings for June 2024 Management Track Stock Assessments

February 28, 2024 via Video Conference

April 4, 2024 via Video Conference

The NRCC Assessment Oversight Panel (AOP) met on February 28, 2024 to review the Management Track Assessment plans for Butterfish, Atlantic Herring, Atlantic Surfclam, Black Sea Bass, and the four newly designated stocks of Atlantic Cod: Eastern Gulf of Maine, Western Gulf of Maine, Georges Bank, and Southern New England. A second meeting followed on April 4, 2024 to review the Management Track Assessment Plans for Golden Tilefish following the review of the Research Track Assessment of the stock in March; the AOP also revisited discussions on assessment review level for Atlantic Surfclam and Georges Bank Cod at this time based on requests from the assessment leads, who had noted shifts in assessment plans potentially necessitating a shift in the plans presented during the earlier discussions. After convening the second meeting, the AOP was advised by the WGOM Atlantic Cod assessment lead that additional projection analyses for the stock (described below) would be included in the assessment and may necessitate additional review; the AOP discussed this issue asynchronously via email. One assessment was recommended for Level 1 Reviews (Direct Delivery); this assessment will undergo an internal review before being delivered to the appropriate management body. The assessments for stocks/species recommended for Level 2 and 3 peer reviews will be reviewed during meetings scheduled for June 18-21 and June 24-28, 2024.

## Assessment Oversight Panel Members

- Kristan Blackhart (Chair), Northeast Fisheries Science Center, Woods Hole, Massachusetts
- Mike Celestino, representing the Atlantic States Marine Fisheries Commission, New Jersey Department of Environmental Protection
- Lisa Kerr, Ph.D., Chair of the NEFMC Scientific and Statistical Committee, Gulf of Maine Research Institute
- Paul Rago, Ph.D., Chair of the MAFMC Scientific and Statistical Committee, NOAA Fisheries (retired)

## Meeting Details

This meeting was guided by the NRCC-approved stock assessment guidance documents. Standard background documents were provided to the Panel in advance of the meeting:

1. An updated prospectus for each stock
2. An overview summary of all the salient data and model information for each stock
3. The NRCC Guidance memo on Management Track Assessments

Additional documents submitted by stakeholders and partners were provided to the AOP where available. Prior to the meeting, each assessment lead prepared a proposal for their Management Track Assessment. The proposal reflected the Research Track or most recent assessment results, the peer 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.

#### 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. AOP guidelines can be found in the [stock assessment process document](#).

Stock	Assessment Lead	Review Level	Rationale and Comments
<b>Butterfish</b>	Charles Adams	Level 2	<b>Rationale:</b> No new sources of information; no anticipated changes to the assessment model; recruitment stanza used for projections will be updated to start in 2010 instead of 2011 (as in 2021 RT/2022 MT) due to updated condition analysis - change in recruitment stanza technically is a Level 3 review, but extra information was presented indicating this change propagated through with minor changes to assessment results.
<b>Atlantic Herring</b>	Jonathan Deroba	Level 1	<b>Rationale:</b> No new sources of information; no changes to model; no changes to projection methods; RT review scheduled for 2025. Concerns about overly optimistic projections and impacts on catch advice; also missing survey data, potential changes to change point analysis, retro adjustment - if the cumulative impacts of changes to projections on catch advice appear large as assessment develops, lead to flag this as requiring an elevated review.

Stock	Assessment Lead	Review Level	Rationale and Comments
<b>Atlantic Surfclam</b>	Daniel Hennen	<del>Level 1</del> Level 2	<b>Rationale:</b> Originally, based on no new sources of information, no changes to model, no changes to projection methodology, and backup approach previously vetted, led to Level 1 review. Subsequent identification of significant trends in VB K parameters that the lead wanted to include in the modeling framework resulted in Level 2 review.
<b>Black Sea Bass</b>	Emily Liljestrand	Level 2	<b>Rationale:</b> First MT following RT in 2023; uses RT accepted model; presented sensitivity analyses required by RT peer review focused on VAST index development for guidance on proceeding with VAST vs. individual indices. AOP agrees with the assessment plan for use of VAST index but feels that the additional sensitivity analyses requested by the RT review panel require additional peer review via the MT process.
<b>Eastern Gulf of Maine Cod</b>	Cameron Hodgdon	Level 3	<b>Rationale:</b> Newly defined stock, first MT following RT in 2023; MT plans to incorporate cod bycatch estimates (data not available yet, so magnitude still unknown) from EGOM lobster fishery into total catch; uses same projection methodology from RT; backup as recommended from RT (simplified WHAM w/ fewer RE). Lobster bycatch represents an unvetted, new data resource that deserves flexibility for the review panel to investigate.
<b>Western Gulf of Maine Cod</b>	Charles Perretti	<del>Level 2</del> Level 3	<b>Rationale:</b> Newly defined stock, first MT following RT in 2023; no new data; no changes to model; no changes to projection methodology; backup as recommended from RT (simplified WHAM w/ fewer RE). Suggests Level 2 because it is a new stock. Considering projections explorations if time permits; if any significant improvements are found, would request elevated review. Level 2 is appropriate because assessment will be supporting status determination for the first time. In April, assessment lead notified AOP of plans to explore stochastic projection approaches, which could result in changes to BRPs so review level elevated to Level 3.

Stock	Assessment Lead	Review Level	Rationale and Comments
<b>Georges Bank Cod</b>	Amanda Hart	<del>Level 2</del> Level 3	<b>Rationale:</b> Originally based on stock area redefined, first MT following RT in 2023; no new data; model changes include correcting calibration of NEFSC survey indices, adopt correction in equilibrium initiation numbers-at-age, and correct weight-at-age input; no changes to projection methodology; and backup as recommended from RT (simplified WHAM w/ only FE), this assessment was assigned a Level 2 review. An additional request for analysis on spatial allocation of biomass estimated for the U.S. Georges Bank stock area to the eastern Georges Bank transboundary area required elevation to Level 3.
<b>Southern New England Cod</b>	Alex Hansell	Level 3	<b>Rationale:</b> Stock area redefined, first MT following RT in 2023; no new data; model changes include new recreational CPUE index (previous LPUE index did not include zero observations) - will impact model fits, but unknown what overall impacts are until index is available and incorporated - addresses a major recommendation from RT review panel; projection methodology unchanged from RT; backup as recommended in RT.
<b>Golden Tilefish</b>	Paul Nitschke	Level 3	<b>Rationale:</b> RT review recommended additional model exploration (i.e. did not identify preferred configuration or agree with WG base model). Challenges remain on the sensitivity of adding random effects to the data poor WHAM model for tilefish, as well as balancing model diagnostics with biological realism. Disagreement between review panel and WG on plan B approaches. Panel suggested using a suite of models to indicate uncertainty around projections, but did not provide advice on how to accomplish this.

## Individual Stock Discussion Summaries

Butterfish (AOP Lead: Mike Celestino)

*Recommendation: Level 2 (Expedited Review)*

The current assessment model for Butterfish is the 2021 RT accepted WHAM model, as updated during the 2022 MT. The proposed work plan for the 2024 MT assessment is to update all data through 2023, using the current WHAM model configuration with no changes. Biological reference points will be updated using the 2021 RT-approved methodology, though the recruitment stanza for short term projections and reference points will be updated. The alternative backup assessment plan is a loess smooth of the spring and fall NEFSC (Bigelow) and NEAMAP fishery-independent surveys.

The AOP and analyst discussed at length the change point analysis that resulted in selection of a recruitment stanza that differed from that selected by the RT analysis. The RT analysis showed a significant change point between 2010 and 2011, while, after addition of two more years of condition data, the updated analysis showed a significant change point between 2009 and 2010 (and thus the start year for the recruitment stanza would now be 2010).

The analyst proposed a Level 2 review to accommodate the proposed changes. According to the [‘Description of New England and Mid-Atlantic Region Stock Assessment Process’](#) document, a change in recruitment stanza is associated with a Level 3 review. The AOP discussed this at length and supported the Level 2 recommendation for a number of reasons. The AOP was reassured by the fact that the analyst had done some additional work suggesting the impact of this stanza change was very small (e.g., 1% change in  $B_{msy}$  proxy). The AOP described the intent of Level 3 reviews associated with changes in recruitment stanzas likely being related to exploring and understanding impacts when an assessment moves from using a full recruitment time series to a reduced time series, and not the more modest update in the present situation. Additionally, the AOP thought the time allocated to a Level 2 review (1-2 hours) was sufficient for a panel to adequately review the proposed work.

The AOP did raise questions about how best, broadly, to update change point analyses. The AOP noted that in the present case, the change in recruitment stanza was modest and not impactful to reference points, but acknowledged that there could be scenarios where more meaningful changes are seen, and having a set of best practices would be advantageous in dealing with non-trivial cases. The AOP revisited this discussion at the end of the meeting on 26 February 2024. The AOP discussed that development of best practices for change point analyses as it relates to impacts on reference points could be considered in association with the future RT (2027) scheduled to address projection methodologies.

**For the reasons described above, the AOP recommended a Level 2 review for Butterfish.**

Atlantic Herring (AOP Lead: Lisa Kerr)  
*Recommendation: Level 1 (Direct Delivery)*

The 2022 management track assessment for Atlantic herring indicated that the stock is overfished (i.e., 2021 SSB was 21% of the SSBMSY proxy = 185,750 mt) and overfishing is not occurring (i.e., 2021 F was 31% of the FMSY proxy = 0.5). The stock assessment used the Age Structured Assessment Program (ASAP) which was used in previous assessments; however, the methods used to derive biological reference points (BRPs) and conduct short-term projections were changed as part of the management track assessment. Retrospective patterns remain an issue for this assessment and a retrospective adjustment was necessary. The continued poor recruitment of the stock also remains a concern and the SSC has expressed concern that the short-term projections have been consistently overly optimistic for this stock.

The analyst proposed a Level 1 review (direct delivery) for the 2024 management track assessment for Atlantic herring as there are no new sources of information being added to the assessment and no changes anticipated to the model. The management track assessment plan will focus on updating all survey and catch time series through 2023. The spring 2023 NEFSC bottom trawl survey will be missing for this stock but is not expected to be a problem in the context of this analytical model as there will be three surveys available for that year (fall NEFSC bottom trawl survey, acoustic survey, and the shrimp survey). There is also extensive work underway in the Atlantic herring Research Track Stock assessment which is scheduled to be completed in 2026 (catch advice for 2027). This management track assessment will inform catch advice setting for 2025-2027 (with the last year likely being replaced by next assessment).

**The AOP supported a Level 1 review for this stock conditional on no additional concerns being identified by the analyst during the update process with the intention being to flag issues early and to elevate to a higher level of review if necessary.**

Atlantic Surfclam (AOP Lead: Mike Celestino)  
*Recommendation: Level 1 (Direct Delivery)*

The current assessment model for Atlantic Surfclam is the 2016 SAW 61 accepted Stock Synthesis model (and a subsequent Level 3 MT reviewed in 2020). The original (February 28th) proposed work plan for the 2024 MT assessment was to update survey and commercial data through 2023 as well as upgrade to the latest version of Stock Synthesis. The alternative assessment plan, should one be necessary, is a swept area biomass estimate from the surfclam survey, adjusted with the median catchability coefficient from depletion studies. At that time, the analyst recommended a Level 1 review.

The AOP commented that B/Bmsy is well above the threshold and that F/Fmsy is well below the threshold, and this has simplified the Mid-Atlantic SSC's task of specifying catch advice. In terms of work for potential inclusion as part of subsequent management or research track

assessments, the analyst noted that he could revisit the methods used to derive the trend-based reference points once or if the fishery has a measurable effect on the stock, which at present, it does not. The analyst also did not anticipate any modeling challenges or changes as a function of upgrading the modeling software.

The analyst noted that harvest and discard estimates will come from CAMS and noted that the years that are available for comparison with the commercial fisheries dealer database (CFDERS) are similar.

Since the time of the February AOP meeting the analyst compiled data and completed some preliminary analyses and model runs. This work showed significant trends in Von Bertalanffy (VB) growth curve K parameters for both modeled surfclam regions. Significant trends in VB  $L_{inf}$  are already included and modeled in the base model. Additionally, sensitivity runs from the 2020 assessment indicated that inclusion of the additional growth parameter (K) had no notable impact from the final base model output, but did improve some diagnostics. The analyst and AOP agreed at the April 4th 2024 AOP meeting that this proposed change (modeling time varying K) met the criteria for level 2 review [i.e., “Adjustment of method for estimating biological information (growth, maturation, sex ration, changes to length-weight relationships, etc.) when based on methods developed with sufficient peer review or justification for its use”].

**In light of the new information, the AOP revised their original recommendation from a Level 1 review for this assessment at their February 28th meeting, to a Level 2 review at their April 4th meeting.**

Black Sea Bass (AOP Lead: Paul Rago)  
*Recommendation: Level 2 (Expedited Review)*

The MT assessment for Black Sea Bass will be the first assessment following the RT in December 2023. Major innovations introduced in the RT included:

- Transition from a statistical catch at age model (ASAP) to a stage-space model with random effects (WHAM). The new model has two spatial components (North and South) with movement between components.
- Use of an autoregressive spatial model (VAST) to synthesize age-specific indices from 10 separate surveys into a single set of indices at age.
- Introduction of an improved recreational catch-per-angler index.
- Incorporation of bottom temperature with random effects as a covariate for recruitment.
- Use of random effects for recruitment, numbers at age, and fisheries and index selectivities in the Northern component.

The RT review panel recommended three specific sensitivity analyses to be conducted prior to the MT. The most significant issue related to the use of the VAST model outputs as measures of

relative abundance. The stock assessment lead investigated the sensitivity of the model results to deletion of individual indices. These results were reviewed by the AOP to help guide staff work prior to the MT in June 2024. Analyses presented to the AOP suggested that the model was robust to deletion of single indices, except for the MADMF survey in the northern stock area. A potential cause of this effect is that the model was weighting the MA index, which covers a small fraction of the northern stock area, equally with the NEFSC survey that samples a much larger area. Residual patterns for other surveys had undesirable properties, suggesting that the synthesis afforded by the VAST model was more realistic.

Additional questions by the AOP clarified that VAST indices should be robust to missing observations (e.g., missing 2020 and 2023 NEFSC BTS) because it utilizes spatial and temporal patterns explicitly in a hierarchical model.

An important change from the previous assessment model results is the biomass trend in recent years. The ASAP model suggested that the declining abundance of the 2011 and 2015 year classes would lead to rapid stock decline through 2025. The new model, using data through 2021, suggests continued high abundance but no evidence of decline in recent years. Moreover, the population's center of gravity appears to be moving northward. Confirmation of these trends await the MT update that will include survey and catch data through 2023. The Black Sea Bass assessment will be the first assessment in the Northeast to update an assessment based on application of the VAST model. The behavior of the overall model with additional data is unknown, but major changes in perceptions of historical relative abundance are not expected.

The AOP expressed appreciation that a detailed supplemental report describing the responses to the RT peer review recommendations would be prepared as part of the MT. The AOP recommended continued use of VAST for the MT and did not recommend reversion to tuning WHAM with multiple independent indices.

The AOP approved the use of a simplified WHAM model as the backup assessment plan. This approach retains the information from multiple data sources and age data that would otherwise not be considered in an index approach.

Technically, the assessment model to be used in the MT corresponds to the peer-reviewed model in the RT and would qualify as a Level 1 review. After discussion, the consensus opinion of the AOP was that an additional level of review would reduce the uncertainty of the first-time implementation of an assessment that differs quantitatively and qualitatively from its predecessor. **In light of these considerations and the review of necessary follow-up tasks requested by the RT Peer Review Panel, the AOP recommended a Level 2 review.**



Eastern Gulf of Maine Cod (AOP Lead: Paul Rago)  
*Recommendation: Level 3 (Enhanced Review)*

The Eastern Gulf of Maine Cod (EGOM) stock is a newly defined stock that previously was part of the Gulf of Maine cod stock. Revised stock definitions were approved in August 2023 at the RT Peer Review. The stock was assessed with a state-space model (WHAM) using data from 1981 to 2021. Per the RT Terms of Reference, stock status was not determined. Estimated biological reference points were based on a MSY proxy based on F40% MSP; the resulting fishing mortality threshold ( $F_{40\%}$ ) estimate is 0.26 and spawning stock biomass target ( $SSB_{F40\%}$ ) is 2,274 mt.

The RT Peer Review recommended incorporation of cod bycatch into the estimate of total catch. This represents a major change in the model configuration evaluated by the Peer Review. Population size is expected to increase because the scale of a population in most assessments is largely determined by the magnitude of total catch. The magnitude of such changes for EGOM cod are unknown. Additional requests by the RT Peer Review to modify the stock assessment model, particularly those related to consideration of survey indices were considered a lower priority and cannot be addressed in this MT. These requests will be handled incrementally in future MT assessments.

The AOP appreciated the inclusion of lobster discard data, but noted the difficulties of hindcasting historical data based on only recent samples. About 20 years of observer and harvester reported data are available. Total discards will be assumed to be proportional to lobster landings. Details on the hindcasting method have not been developed to estimate discards prior to 2000. It was noted that substantial differences in the lobster fishery have occurred in the past decade. Such changes may require modification of the assumptions used to hindcast historical discard data. Ideally, the estimation will generate age-specific discard estimates in the lobster fishery. Assumptions about the discard survival rates will also be a concern.

The effects of introducing a revised catch time series on the behavior of the assessment model are unknown. Alternative decisions regarding weighting of model parameters and survey indices (generalized tweaking) may be required. This MT will be the first assessment to assign status determinations (i.e., overfishing/overfished) to this newly defined stock.

The AOP expressed concern about the number of biological samples collected by Port Agents, particularly at finer spatial scales. The partitioning of historical data from the former Gulf of Maine stock into the new Eastern and Western GOM stocks reduces the number of samples historically. These concerns have been addressed in the RT Peer Review. However, recent reductions in numbers of port samples in the Northeast could pose problems for support of many stock assessments, particularly those with smaller spatial domains.

As a backup assessment, the assessment lead proposed the use of a simplified WHAM model with few or no random effects. This approach was considered sound by the AOP because it

retained the information content from multiple surveys and the age composition of the indices and catch.

**In view of the significant changes proposed, the AOP recommended a Level 3 review.**

Western Gulf of Maine Cod (AOP Lead: Kristan Blackhart)

*Recommendation: Level 2 (Expedited Review)*

The Western Gulf of Maine (WGOM) Cod stock represents a new stock definition, although there is a good deal of overlap with the previously defined Gulf of Maine stock. This is the first MT assessment for this stock following the Atlantic Cod RT assessment in 2023. The assessment methods adopted for this stock in the RT used the WHAM configured with two fishery fleets (commercial landings/discards, recreational landings/discards), three fishery selectivity blocks, and a lifetime estimate of natural mortality ( $M=0.2$ ) based on a suite of life history based estimators developed during the RT. The proposed assessment approach for the June MT uses the current WHAM configuration with no changes and all fishery and survey data updated through 2023. Commercial data updates for 2022 and 2023 will be pulled from CAMS. As recommended by the RT review panel, the backup method uses a simplified WHAM model with fewer random effects. At the February AOP meeting, the assessment lead noted that if time permits, additional explorations into the projection methodologies may be explored for this assessment as suggested by the RT review recommendations. It was unknown at that time whether those explorations would be incorporated into the June MT or lead to any changes in the projection methods or biological reference points. Other explorations suggested by the RT review panel for this stock (i.e., decoupling process error across ages, examining selectivity configurations, modeling recruitment) will likely be deferred until later MTs due to time constraints.

After the April AOP meeting, the assessment lead submitted a request to the AOP to increase the review level based on his work on the assessment projection methodologies, as noted above. WGOM Cod uses the standard projection and reference point methodology found in WHAM. However, there are two issues associated with the standard method for the stock: 1) long-term projections at  $F_{MSY}$  do not result in SSB reaching  $SSB_{MSY}$ ; and 2) projections do not include the effect of new process errors in the projection period. Since the February AOP meeting, the assessment lead has spent time exploring a potential solution to both of these issues which is to include process error in the projections (i.e., perform stochastic projections), and use those long-term stochastic projections to estimate  $SSB_{MSY}$ . This work will be presented alongside the standard approach at the Management Track, and could lead to changes in biological reference points for the stock.

**At the time of initial discussion in February, no changes to the model or data inputs were planned and the lead analyst suggested a Level 2 review because this is a newly defined stock. The AOP agreed with that suggestion and noted this assessment will support a**

**first-time status determination, justifying a Level 2 review. After the April request from the assessment lead, the AOP agreed that elevating this to a Level 3 review is appropriate.**

Georges Bank Cod (AOP Lead: Lisa Kerr)

*Recommendation: Level 2 (Expedited Review)*

A research track stock assessment for Georges Bank cod was concluded in 2023. This assessment process resulted in a change in the spatial scale of management for cod and a shift from application from an empirical approach (i.e., Ismooth method) to an analytical model, the Woods Hole Assessment model, for the Georges Bank cod stock. This is the first management track assessment that will apply the approved methods coming out of the research track assessment process.

Between the conclusion of the research track and the management track errors were identified that will be addressed in the management track assessment. It was found that the survey data used in the research track assessments for GB Atlantic Cod did not incorporate the Bigelow:Albatross calibration. In addition, an issue with the specification of equilibrium initial numbers at age and the weight-at-age input were also identified as needing correction. These corrections were made and a rerun of the model conducted to evaluate the impact. The model return indicated that the corrections resulted in the anticipated adjustment of results and improved model diagnostics.

During the February 28, 2024 meeting of the AOP, the analyst proposed a Level 2 review (expedited review) for the 2024 management track assessment for Georges Bank Atlantic cod. There are multiple changes being made in this management track: 1) calibration NEFSC survey indices, 2) correction to equilibrium initial NAA, 3) correction weight-at-age input. However, work to date indicates that the cumulative impact of these changes improved diagnostics and resolved areas of concern from the Research Track. There are no new sources of information being added to the assessment and no additional changes anticipated to the model. The management track assessment plan will focus on updating all survey and catch time series through 2023. The NEFSC 2023 spring survey is missing due to sampling interruption (could result in only 1 spring survey in 2023) and the DFO spring survey is missing in 2022. The missing surveys will be treated as missing in the model and is not expected to be a significant problem in the context of this analytical model as there will be at least one spring survey available for each year.

The AOP reconvened on April 4, 2024 and discussed new information needs regarding the Georges Bank cod stock assessment. Due to recent changes in the TRAC process there is now a need for spatial allocation of the biomass estimated for the full Georges Bank stock area to the eastern Georges Bank transboundary area. The analyst plans to deliver this information and suggested elevation of the review from a Level 2 to a Level 3 due to the current uncertainty around the approach that will be taken.

**The AOP supports a Level 3 review for this stock due to the multiple changes being made to the stock assessment, as well as the request for analysis on spatial allocation of biomass estimated for the U.S. Georges Bank stock area to the eastern Georges Bank transboundary area.**

Southern New England Cod (AOP Lead: Kristan Blackhart)

*Recommendation: Level 3 (Enhanced Review)*

As with the other cod stocks, Southern New England Cod was redefined in the last RT and this represents the first MT for this stock using the new stock definition. The current model from the 2023 RT uses WHAM based on data inputs from 1981-2021. Natural mortality is age based and catch-at-age data is available for commercial and recreational landings/discards. The RT assessment utilized two abundance indices: NEFSC spring and a recreational LPUE index from 1996-2021. The planned MT assessment does not include any new data inputs beyond updating fishery and survey data through 2023, but does change the WHAM configuration by addressing a major RT review recommendation and developing a new recreational CPUE index that includes zero observations to replace the existing LPUE index. Development of this CPUE index is pending based on ongoing exploration of various methodologies, so the overall impact of the inclusion of this new index on the assessment is hard to predict. **The lead analyst suggested a Level 3 review, in line with the NRCC process document requirements for an Enhanced Review when assessments include a new or alternate interpretation of an index. The AOP concurs with a Level 3 review.**

Golden Tilefish (AOP Lead: Kristan Blackhart)

*Recommendation: Level 3 (Enhanced Review)*

The previous assessment model for Golden Tilefish used ASAP and was last updated in the 2021 MT. A RT for the stock was completed in March 2024 exploring the use of WHAM, using the same data as the 2021 MT assessment (terminal year 2020). The RT working group found that the WHAM model results for this data limited stock were sensitive to the inclusion of random effects. Models without random effects estimate large domes at the end of the time series, producing results similar to the 2021 MT ASAP assessment with reasonable diagnostics. Adding additional random effects to the model provides relative improvements to the diagnostics while also estimating a flattening of the selectivity curve, reducing the cryptic biomass in the 10+ age group through estimation of larger reductions in biomass since the development of the directed longline fishery in the 1970s and relatively lower rebuilding of the stock after management was implemented.

The RT also developed several new time series of data for Golden Tilefish that were not included in the RT WHAM model, but will be added for the MT in addition to updating all data series to 2023. Additionally, the RT review panel suggested additional exploration of WHAM model

configurations to optimize model performance, which will be done as necessary as new data is added to the base configuration. Because of the uncertainty present in this assessment, the AOP discussed the assessment lead providing information on the implications of alternative models to provide additional context for the SSC in producing cautionary management advice.

Because of the extensive review required for this assessment following the RT, the lead analyst suggested a Level 3 review. **The AOP concurs with a Level 3 review.**

### Meeting Conclusions

The AOP met on February 28 and April 4, 2024 to review the stock assessment plans for 9 stocks scheduled for the June 2024 Management Track cycle. Additional discussion occurred asynchronously following the April meeting. The panel concluded that a Level 1 review (Direct Delivery) was warranted for Atlantic Herring; Level 2 reviews (Expedited Review) for Atlantic Surfclam, Butterfish, and Black Sea Bass; and Level 3 review (Enhanced Review) for Eastern Gulf of Maine Cod, Georges Bank Cod, Golden Tilefish, Southern New England Cod, and Western Gulf of Maine Cod. The Level 2 and 3 reviews will occur during the June 2024 Management Track Peer Review scheduled for June 18-21 and June 24-28, 2024. Any additional 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. Assessment Oversight Panel Meeting participants (names only, no call-in numbers).

Kristan Blackhart, AOP Chair (NEFSC)

Paul Rago, AOP (MAFMC)

Mike Celestino, AOP (ASMFC)

Lisa Kerr, AOP (NEFMC)

Michele Traver - NEFSC

Alan Bianchi - North Carolina Division of Marine Fisheries

Alex Dunn - NEFSC

Alex Hansell - NEFSC

Amanda Hart - NEFSC

Andrew Jones - NEFSC

Angela Forristall - NEFMC staff

Anna Mercer - NEFSC

Anthony Wood - NEFSC

Ashley Asci - GARFO

Brad Schondelmeier - MADMF

Brandon Muffley - MAFMC staff

Brian Linton - NEFSC

Cameron Hodgdon - NEFSC

Carrie Nordeen - GARFO

Cate O'Keefe - NEFMC Executive Director

Charles Adams - NEFSC

Charles Perretti - NEFSC

Chengxue li - NEFSC

Chris Kellogg - NEFMC staff

Chris Legault - NEFSC

Conor Davis - New Jersey Department of Environmental Protection

Dan Hennen - NEFSC

Dave McElroy - NEFSC

Emilie Franke - ASMFC staff

Emily Bodell - NEFMC staff

Emily Keiley - GARFO

Emily Liljestrang - NEFSC

Gareth Lawson - Conservation Law Foundation

Jacqueline Odell - Northeast Fisheries Coalition

Jamie Cournane - NEFMC staff

Jason Boucher - NEFSC

Jeff Kaelin - Lund's Fisheries

Jessica Blaylock - NEFSC  
Jessica Coakley - MAFMC staff  
John Pappalardo - Cape Cod Commercial Fisherman's Alliance  
John Wiedenmann - Rutgers University  
Jon Deroba - NEFSC  
Joseph Meyers - ASMFC staff  
Julia Beaty - MAFMC staff  
Julie Nieland - NEFSC  
Kai Lorenzen - University of South Florida  
Kathy Sosebee - NEFSC  
Kiersten Curti - NEFSC  
Kiley Dancy - MAFMC staff  
Larry Alade - NEFSC  
Libby Etrie - Conservation Law Foundation  
Liz Sullivan - GARFO  
Mark Grant - GARFO  
Mary Sabo - MAFMC staff  
Melanie Griffin - MADMF  
Olaf Jensen - University of Wisconsin (Madison)  
Paul Nitschke - NEFSC  
Rebecca Peters - Maine Department of Marine Resources  
Rick Bellavance - NEFMC Council Member  
Robin Frede - NEFMC staff  
Sam Truesdell - NEFSC  
Samantha Tolken - GARFO  
Sefatia Romeo Theken - Deputy Commissioner for MA Fisheries and Game  
Spencer Talmage - GARFO  
Steve Cadrin - SMAST  
Susan Wigley - NEFSC  
Tara Dolan - MADMF  
Thomas Alspach - Sea Watch International  
Tracey Bauer - North Carolina Division of Marine Fisheries  
Will Poston - American Saltwater Guides Association

*Key:*

ASMFC - Atlantic States Marine Fisheries Council  
GARFO - Greater Atlantic Regional Fisheries Office  
MADMF - Massachusetts Division of Marine Fisheries  
MAFMC - Mid-Atlantic Fisheries Management Council  
NEFMC - New England Fisheries Management Council  
NEFSC - Northeast Fisheries Science Center

SMAST - University of Massachusetts School of Marine Science and Technology



## Appendix 2. Acronyms Used in This Report

AOP - Assessment Oversight Panel  
ASAP - Age Structured Assessment Program  
CAMS - Catch Accounting and Monitoring System  
CFDERS -  
CPUE - catch per unit of effort  
EGOM - Eastern Gulf of Maine  
FE - fixed effects  
LPUE - landings per unit of effort  
MAFMC - Mid-Atlantic Fishery Management Council  
MSP - maximum spawning potential  
MT - Management Track  
NEAMAP - NorthEast Area Monitoring and Assessment Program  
NEFMC - New England Fishery Management Council  
NEFSC - Northeast Fisheries Science Center  
NRCC - Northeast Region Coordinating Council  
RE - random effects  
RT - Research Track  
SAW - Stock Assessment Workshop  
SSC - Scientific and Statistical Committee  
VAST - Vector Autoregressive Spatio-Temporal model  
WHAM - Woods Hole Assessment Model