

2023 June Management Track Peer Review Panel Report

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Executive Summary

Five fish stock assessments were reviewed by the June 2023 Management Track peer review panel. One of these was Level 1 Expedited Review: deep sea red crab (*Chaceon quinque-dens*), and 4 of these were Level 2 Expedited Reviews: scup (*Stenotomus chrysops*), longfin inshore squid (*Doryteuthis (Amerigo) pealeii*), summer flounder (*Paralichthys dentatus*), and bluefish (*Pomatomus saltatrix*). Levels of review were as recommended by the Assessment Oversight Panel (Appendix A).

The Peer Review Panel (Panel) for the June 2023 Management Track Assessments met via webinar on June 26-28, 2023. The Panel was to determine whether the completed management track assessment was technically sufficient to (a) evaluate stock status, (b) provide scientific advice and (c) successfully address the assessment Terms of Reference (Appendix B). Table 1 presents a list of the stocks, name of the lead analyst/presenters, and conclusions about stock status.

Attendance at the meeting is provided in Appendix C with the Agenda shown in Appendix D.

We thank Russ Brown (Population Dynamics Branch Chief) and Michele Traver (Assessment Process Lead) for their support during the meeting and to the staff of the Population Dynamics Branch at NEFSC for the open and collaborative spirit with which they engaged the Panel.

Our thanks also extend to the rapporteurs for taking extensive notes during the meeting and to staff of the Mid-Atlantic Fishery Management Council.

The Panel has suggestions for improvements that could be made for review of Management Track assessments:

1. The Panel suggests that review materials be posted a week prior to the meeting and include, in addition to the NMFS analyst report, supporting materials and model diagnostics such as the standard R plots from ASAP, WHAM, and SS3, where such information is available.

The Panel also has several crosscutting recommendations with respect to the individual stock assessments:

1. For both summer flounder and bluefish, estimates of unusually high recruitment near the end of the time-series are propagated through the OFL projections, as these fish enter the fishery at relatively young ages (summer flounder are fully recruited to the directed fisheries at age-4 and bluefish at age-2). If these recruitment events are overestimated (as the summer flounder event in 2018 turned out to be), the resulting OFLs will be too high and may increase the risk of overfishing. The SSC may want to consider retrospectively adjusting anomalously high recruitment events near the terminal year of the assessment when doing OFL projections to mitigate this risk.
2. The 2023 peer review of the Catch Accounting and Monitoring System (CAMS; O’Keefe et al. 2023) concluded, with some caveats, that CAMS can be implemented to provide a single source of commercial fishery data for the primary purposes of quota monitoring and stock assessment. Where presented during the review, the differences between the commercial landings from CAMS and from the previously used databases were minimal; differences in the estimates of commercial discards were somewhat greater, although the CAMS estimates were generally within the confidence intervals of the previous estimates. The differences could not be explained. The Panel recommends that future stock assessment updates continue to check CAMS estimates against current or historical estimates of discards and harvest, where available to ensure that the differences remain negligible.
3. Reduction in Port sampling for individual lengths and age structures represents a significant threat to the stock assessment enterprise. NOAA should decide whether it can return Port sampling to levels comparable with those achieved prior to 2019. If they cannot, they should increase catch sampling by observers (either ASM or NEFOP) to balance the loss of these data.
4. NOAA should continue to evaluate the use of dynamic reference points with analytic assessments.

Table 1. Stocks reviewed at June 2023 Management Track Assessment Peer Review meeting

Stock	Lead Analyst/Presenter	Peer Review Panel conclusion on Stock Status
Expedited Review		
Deep Sea Red Crab	Toni Chute	Stock's overfished status and overfishing status are both unknown
Scup	Mark Terceiro	Stock is not overfished and overfishing is not occurring
Longfin Inshore Squid	Lisa Hendrickson	Stock is not overfished, the overfishing status is unknown
Summer Flounder	Mark Terceiro	Stock is not overfished and overfishing is occurring
Bluefish	Tony Wood	Stock is not overfished and overfishing is not occurring

Expedited Reviews

Deep sea red crab

Deep-sea red crab (*Chaceon quinque-dens*) is a data poor species with little known of its growth or longevity. They are found in areas outside the NEFSC surveys and so there is no fishery-independent estimate of abundance. A tagging study was attempted in 2010 but tag returns were very low and insufficient to derive any information about the species. The fishery is small with only 5 license holders and by regulation is a male only fishery. Data input included the calculation of LPUE based on 3 methods: 1) per trap, 2) per day, and 3) per day with constant steam time.

Management advice for deep-sea red crab is based on DCAC, the depletion corrected average catch model used for data poor stocks, and historical landings. The best estimate of MSY was based on 2 surveys conducted in 1974 and 2003-2005. The second survey showed a depletion of large males, potentially impacting mating success. The 2023 Management Tract Assessment (MTA) updates the last 2019 data update. This 2023 data update includes all information through 2022 including: landings, LPUE, carapace length of landed males, and observer data of length of kept and discard crabs and egg status of females.

MSY estimated from the DCAC ranged from 1785-1862 MT and the 2-point boundary model estimated 1987-2044 MT. The range of 1700 -1900 is now being used as the best estimate of MSY. Natural mortality used for MSY estimates are between 0.05 - 0.15.

The Peer Review Panel (Panel) discussed the importance of evaluating the time series of size-frequencies quantitatively to see patterns for landed males but also to evaluate discard lengths of smaller males and females for any patterns. We are aware that high grading may add some bias to results. They also discussed the availability of other modeling approaches to improve data input, such as the use of GLMs. The Panel also felt that the observer data was a valuable source of information for estimating female reproductive productivity.

Research suggestion – The assessment report included a number of research recommendations, all of which the Panel agreed would be useful information to obtain. However, the Panel prioritized the collection of growth and natural mortality information, the refinement of the LPUE index, and simulation modeling to develop reference points appropriate for this species's life history as the most important areas of research to move the assessment to a more analytical approach. The Panel emphasized the importance of obtaining basic information of growth and, if possible, age. The Panel suggests that use of a GLM might be a better way to develop the LPUE indices that improve information on stock status. The Panel suggests that one way to improve the consistency of VTR reporting going forward would be to contact the license holders to address how they fill out these reports because there are only 5 of them. This would also help improve the LPUE calculations. Additionally, the Panel suggested the potential value of a boundary model simulation, a quasi-Bayes approach, and the fisheries behavior of similar species. Finally, the Panel emphasizes the importance of undertaking recommendations made since 2008 because deep-sea red crab is a valuable food resource.

The Panel concluded that the 2023 assessment update for Deep-sea red crab fulfilled the recommendations of the AOP, is the Best Scientific Information Available evaluate stock status and meets the Terms of Reference for the stock's assessment (TORs 3-5 were not evaluated because this is a data poor stock).

Scup

The 2023 assessment for scup (*Stenotomus chrysops*) updates the 2021 management track ASAP assessment (NEFSC 2022). This assessment updates recreational and commercial fishery catch (landings and discards), survey indices of abundance, the analytical ASAP model, and reference points through 2022. Additionally, stock projections have been updated through 2025.

There was a retrospective pattern in both SSB and F (SSB rho = -21%; F rho = +43%) that required adjustments to the terminal estimates in the model, as the adjusted values fell outside the 90% confidence interval estimates from the model. The adjusted spawning biomass in 2022 of 193,097 mt is 246% of the biomass target (SSB_{MSY} proxy = 78,593 mt), and the adjusted fully-selected F of 0.098 was 52% of the overfishing threshold (F_{MSY} = 0.19). Based on these estimates from the updated model, scup is not overfished, and overfishing is not occurring.

Short-term projections of biomass were done, starting with the retrospectively-adjusted terminal abundance. Future recruitments were sampled from a cumulative distribution function of updated model estimates (1984-2022 year class), and future selectivity, maturity, and weight-at-age were based on the most recent five year averages (2018 - 2022). Projections were run with $F = F_{MSY}$ to determine the OFL in 2024 and 2025 for use in the Mid-Atlantic control rule. The estimated OFL from the projection was 20,295 mt in 2024, and 18,363 mt in 2025.

The Panel concluded that the 2023 assessment update for scup fulfilled the recommendations of the AOP, is technically sufficient to evaluate stock status and provide scientific advice and meets the Terms of Reference for the stock's assessment. The assessment represents Best Scientific Information Available (BSIA) for this stock for management purposes.

The Panel noted that the retrospective pattern has increased from previous assessments, and there was some discussion about the possible causes. The analyst noted that possible mechanisms include decreasing M , overestimated catches, and changes in catchability. The panel feels that exploration into these mechanisms is warranted if the retrospective pattern continues, but acknowledges that it is very challenging to quantify changes in M and bias in catch estimates. The model currently uses a combined index of abundance of the NEFSC survey (Albatross and Bigelow), and splitting the survey time series into two may help address the retrospective pattern.

Port sampling of commercial landings has declined for scup in recent years, with the lowest number of samples in 2022. This reduced port sampling is affecting all commercially-exploited stocks, but the Panel is concerned that it may be particularly problematic for a stock like scup where older ages are primarily collected in the commercial fishery.

The Panel noted that all four fleets in the model (recreational and commercial landings and discards) had dome-shaped selectivity. The Panel recommends continued exploration of the functional form of the selectivity across fleets, and whether there could be a mechanistic explanation for the dome across fleets.

Scup has exhibited declines in mean weights-at-age over time, and these declines contributed to the large change in SSB_{MSY} from the previous assessment. The analyst noted that the declines in weight-at-age were coincident with increases in scup biomass, and the Panel agrees that exploration of the potential for density-dependent growth is worthwhile, as it might allow for more accurate forecasts of weight in the projections.

Longfin inshore squid

This Level 2 Management Track Assessment of longfin inshore squid (*Doryteuthis(Amerigo)pealeii*) is an update of the 2020 Level 3 peer-reviewed Management Track Assessment. The assessment methodology has been consistent since the 2010 benchmark assessment SAW/SARC 51 (NEFSC, 2011a; NEFSC, 2011b), followed by the 2017, 2020 and this management track update.

The assessment uses catchability corrected swept area biomass to estimate stock size. A threshold equal to half of the B_{MSY} proxy estimate ($B_{MSY} = 42,405$ mt) is used to define the overfished status of the stock. A measure of relative stock exploitation rate is calculated as a ratio of total removals to biomass, but no reference point for fishing mortality or exploitation rate is currently employed and the overfishing status is not determined.

This assessment satisfactorily updated commercial fishery harvest and discards, catchability adjusted, swept-area biomass estimates, and exploitation indices (catch/biomass) through 2022. Catches and discards for 2020 -2022 were derived using the CAMS database. The indices for both surveys were corrected for the actual tow distances for each trawl tow rather than using nominal value. These corrections did not result in any significant changes.

Annualized biomass estimates as annually averaged spring and fall survey biomass estimates and annualized exploitation indices (annual catch/ annually averaged spring and fall survey biomass), were also updated. Cohort-specific biomass was estimated separately for the NEFSC spring surveys versus NEFSC fall + NEAMAP fall surveys. Cohort-specific exploitation indices (Jan-June catch/spring survey biomass versus July-December catch/fall survey biomass) were updated as well. The 2022 annualized exploitation index was estimated to be 0.155 (Figure 2), which was 20.1% less than the 1987-2021 median of 0.195.

The current assessment approach does not allow the estimation of recruitment, complete retrospective analysis or do bridge runs. A Plan B assessment was not possible for this stock. Short-term projections were not conducted because there is no accepted assessment model for longfin squid.

There are currently no accepted fishing mortality reference points available for this stock. The biomass reference point B_{MSY} proxy was defined in the past based on the historic data set when

the population was lightly exploited and therefore cannot be redefined within the management track assessment. The B_{MSY} proxy remained the same as the 2010, 2017 and 2020 assessments. Although cohort specific estimates are not currently used for the definition of the status of the stock, results suggested that neither of two cohorts were overfished.

The Review Panel supports an alternative to the annualized stock size approach for using cohort-specific reference points to provide annual stock status.

The Panel concludes that the 2023 management track assessment fulfilled the recommendations of the AOP and is technically sufficient to evaluate stock status for biomass. The assessment represents the BSIA for this stock for management purposes and meets the Terms of Reference applicable for the stock's assessment. The Panel agrees with the assessment report that longfin squid is not overfished. The panel further notes that while the overfishing status is unknown, due to the lack of an F_{msy} or proxy reference point, exploitation rates generated by the historic removals resulted in both cohort and annualized estimates of biomass near or above the B_{MSY} target values in recent years. The Panel concurs with the previous peer review recommendation to consider cohort-specific reference points based on the understanding of two dominant and largely non-overlapping intra-year cohorts of longfin squid, at the next research track assessment.

Recommendations

- 1. The Review Panel recommends considering further an option of cohort-specific reference points for determining stock status in addition to the annualized single stock BRPs.*
- 2. The Review Panel recommends continuing development of a stock assessment approach that is specifically tailored to the squid life cycle and data availability to develop biologically-based estimates of B_{MSY} and F_{MSY} instead of the historical proxy used currently.*
- 3. It is important to understand the growth and mortality of each of the two major cohorts to determine their contribution to the total stock biomass within the season, on a monthly, or other appropriate timestep. This will also help to address the question at what stage of biomass development each cohort is intercepted by the spring and the fall survey and how changes in survey timing may affect the biomass estimates.*
- 4. The Panel noted that in some years the exploitation rate was above 1 when the biomass estimates from the spring survey were used. This raises an issue of the appropriateness of current gear efficiency coefficient, since we can not be removing the entire cohort in the spring. Population biomass from the spring survey is likely to be underestimated. Survey catchability and stock distribution needs to be explored in further detail to evaluate true contribution of spring cohort to stock biomass.*

Summer flounder

The 2023 assessment of the summer flounder (*Paralichthys dentatus*) stock is the Management Track update of the 2021 management track assessment (NEFSC 2022). The last benchmark assessment for this stock was in 2018 (NEFSC 2018). This assessment uses the NOAA ToolBox

Age-Structured Assessment Program (ASAP) and updates commercial and recreational fishery catch data, research survey indices of abundance, weights and maturity at age, and reference points through 2022. Stock projections have been updated through 2025. Splitting the final selectivity block for all fleets was also explored, but it resulted in marginally worse diagnostics and was not included in the final model.

Retrospective adjustments of the model results were not necessary. Spawning stock biomass (SSB) in 2022 was estimated to be 40,994 mt which is 83% of the biomass target for this stock (SSB_{MSY} proxy = 49,561 mt). The 2022 fully selected fishing mortality was estimated to be 0.464 which is 103% of the overfishing threshold proxy (F_{MSY} proxy = $F_{35\%SPR}$ = 0.451). Based on this updated assessment, the summer flounder stock is not overfished but overfishing is occurring.

Short term projections were conducted in AgePro. For projection specifications, 2023 removals were assumed equal to the 2023 ABC of 15,023 mt, as approximately 96% of the ABC has been caught in recent years, and then fishing mortality was set equal to $F_{35\%SPR}$ for 2024-2025. The projections used the most recent 5-year averages for the annual fishery selectivity, maturity ogive, and mean weights at age; no retrospective adjustments were applied in the projections. The estimated OFLs from the short term projections were 10,422 mt for 2024 and 10,839 mt for 2025.

The Panel concluded that the 2023 assessment update for Summer flounder fulfilled the recommendations of the AOP, is technically sufficient to evaluate stock status and provide scientific advice and meets the Terms of Reference for the stock's assessment. The assessment represents Best Scientific Information Available for this stock for management purposes.

The Panel discussed the change in the estimated size of the 2018 year-class from the 2021 Management Track Assessment to this assessment, the potential decline in productivity in recent years due to decreasing weight-at-age and proportion female-at-age, and the resulting impact on stock status and catch advice. The 2021 assessment estimated the 2018 year-class at 61 million fish, well above the time-series average, while the 2023 assessment estimated it at 43 million fish, more in line with recent estimates of recruitment and below the time-series average. The estimates of SSB in recent years were also revised downwards, a function of the minor retrospective pattern that this model exhibits. Lower estimates of abundance in recent years, the lower estimate of the 2018 year-class, and the lower mean weight-at-age in recent years combined to produce OFL estimates that were lower than the 2021-2023 OFLs from the 2021 assessment. The increasing trend in biomass from 2017 onwards was somewhat arrested from 2020-2022 by the higher F and lower weights-at-age, but the stock remains above the biomass threshold, consistent with the increasing trends in survey indices and the expanded age-structure of the catch, especially for males. The Panel discussed concerns raised by previous panels about the impact of increasing size limits on a species where females grow faster and reach larger sizes than males do. The proportion of females in the survey data has declined since the start of the time series, but has stabilized at about 50% for all ages in recent years; more older males have been observed in the survey and catch data as well, indicating that the lower overall F rate on the population has allowed the males to survive to older ages and may balance out the potential negative effects of the higher size limit on females.

The Panel agreed with the analyst's conclusion not to split the final selectivity blocks, as it did not improve model performance and there was no evidence presented for changes in the fisheries to justify the split.

*The Panel **recommended** reevaluating the suite of indices used to fit the model in the next research track assessment, as the model currently includes 14+ indices, some of which provide conflicting information and end up being down-weighted to get a RMSE near one.*

Bluefish

A Research Track Assessment (RTA) was recently completed for Atlantic bluefish (*Pomatomus saltatrix*) in 2022. Bluefish had previously been assessed using NOAA ToolBox Age-Structured Assessment Program (ASAP). The RTA accepted the WHAM model, a state-space model, for use in bluefish assessments. The 2023 update used WHAM and included one year of data (2022). Commercial and recreational landings have declined through the time series Recreational landings of 5,002 MT are below the series average of 19,625 MT and are a series low. Total catch in 2022 was 7,436 MT, a series low. Eighty-six percent of the catch are from the recreational fishery.

The model also included new indices: an MRIP CPUE index based on a guild approach which considered a bluefish trip either when bluefish or a species associated with bluefish was caught, SEAMAP Age 1, and the calibrated ChesMMA Trawl Survey. Other new input data include recreational discards by season and region, the use of multinomial age-length keys to fill in missing values and 2 selectivity blocks for Commercial landings and 3 for Recreational. An improvement to the analysis is the use of lengths and weights of southern bluefish to estimate discard weights. There was concern that using lengths and weights from only northern fish would overestimate discards but also because the model fits both landings and discards. These modifications resulted in significant changes in natural mortality (M is now age-specific) and reduced the target SSB by 50%. The model retrospective SSB and F fell within the 95% confidence bands and were not adjusted.

The Management Track Assessment (MTA) in 2021 which used the ASAP model and determined that bluefish was overfished and overfishing was not occurring. The 2023 data update estimated a total bluefish population of 217 Million, a moderate increase. Recruitment is estimated at 137 Million, above the average and highest since 2005. The 2022 SSB is estimated to be 52,747 MT, above the $SSB_{\text{threshold}}$ of 44,066 MT and below the 2022 SSB_{target} of 88,131 MT. The $F_{35\%}$ reference point was 0.239. In the 2021 ASAP assessment the SSB_{target} was greater than twice the SSB_{target} in the RT 2022 WHAM model with the resulting $SSB_{\text{threshold}}$ in 2022 half that from the previous assessment. Those results in 2021 were twice the values from the previous assessment (SAW60) (NEFSC 2021) and believed to be the result of the MRIP calibration that scaled up recreational catch. The change in reference points presented in the MTA 2023 are believed to be the result of the use of WHAM that has less reliance on MRIP, uses a guild CPUE and inclusion of different indices used. The modeling also used a decreased discard mortality rate (15%-9.4%), discard lengths by season and region, and Lorenzen WAA to produce age-specific natural mortality. The MTA 2023 update resulted in evaluation that Atlantic bluefish

was not overfished and overfishing was not occurring. The recent fishing mortalities were among the lowest in the series, as was the catch in both the commercial and recreational fisheries.

Short-term projections were done in WHAM using Removals were assumed to be 13,890 MT, the 2023 ABC and were projected with the Frebuild (0.183) under the MAFMC 100% risk policy. The projected SSB increased from 59,135 MT in 2023 to 75,757 MT in 2025.

The Panel concluded that the TORs had been met. The Panel discussed the value of the WHAM model to further explore environmental variables that might be driving availability of bluefish. Of particular interest is the episodic spatial distribution of large bluefish. Their presence inshore and availability to the fishery is inconsistent with attributed numbers and the drivers of this availability uncertain. Another concern of the Panel was the estimate of higher recruitment given that it is among the highest in recent years. It falls within the confidence intervals but the model evidenced a tendency to overestimate R.

*The Panel had some research **recommendations**: Obtaining better data on recreational discard lengths would be valuable. This endeavor relies on volunteer angler reporting such as was done previously in South Carolina. NMFS should consider developing an app that can be used by anglers to report discard lengths. Because self-reporting can introduce bias, the statistical issues should also be explored. The Panel also commented that the M was high on young fish and evaluating the underlying causes might be a valuable project for funding.*

The Panel concluded that the 2022 assessment update for Atlantic bluefish fulfilled the recommendations of the AOP, is technically sufficient to provide scientific advice and meets the Terms of Reference for the stock's assessment.

Appendix A. Summary of Assessment Oversight Panel Meetings for June 2023 Management Track Stock Assessments

The NRCC Assessment Oversight Panel (AOP) met to review the operational stock assessment plans for Atlantic mackerel, bluefish, deep sea red crab, longfin inshore squid, spiny dogfish, scup and summer flounder stocks on February 23, 2023. One assessment was recommended for Level 1 Review (Direct Delivery) and 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 the peer review meeting scheduled for June 26-30, 2023.

The AOP consisted of:

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

Michael Celestino, representing the Atlantic States Marine Fisheries Commission, New Jersey Fish and Wildlife.

Cate O’Keefe, Ph.D., vice-chair of the NEFMC Scientific and Statistical Committee, Fishery Applications Consulting Team, LLC.

Paul Rago, Ph.D., Chair of the MAFMC Scientific and Statistical Committee, NOAA Fisheries (retired).

Meeting Details:

These meetings were guided by the NRCC-approved stock assessment guidance documents. Background documents were provided to the Panel: (1) an updated prospectus for each stock; and (2) an overview summary of all the salient data and model information for each stock. 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 is 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
Atlantic mackerel	Kiersten Curti	Level 1 - Direct Delivery (Provisional)	Rationale: The assessment will be updated with three years of data (2020-2022). There are questions about the availability of the 2022 egg/biomass index. If the 2022 egg/biomass index is not available, the review level should be elevated to Level 2. Ecosystem and Socioeconomic Profile will be provided as supplementary information. I-Smooth approach will be used as an alternate assessment approach.
Bluefish	Tony Wood	Level 2 - Expedited Review	Rationale: A Research Track assessment was completed in December 2022, which updated the previous ASAP model to a state space WHAM model. The Management Track assessment will add one additional year of data. Guild approach used to modify the CPUE index and represents a novel approach. Significant change in constant natural mortality to age based natural mortality. SSB target has been reduced by 50%. Regional estimation of discard weights, which accounts for regional differences.

Stock	Assessment Lead	Review Level	Rationale and Comments
Deep sea red crab	Toni Chute	Level 2 - Expedited Review	<p>Rationale: Data poor species with no assessment model. This assessment will add 4 years of data (2019-2022). No issue with missing 2020 data since there were reported catches and some observed trips. The sexes segregate by depth and the fishery targets areas with higher densities of males. During the CAMS review, there were issues with the discards for some gear types. CAMS data are not used in the data update. A tagging project had low return rates indicating the potential for high mortality of tagged individuals, or a super abundant population. A level 2 review of the available data and to highlight the limitations of analyses that have been attempted for this species is recommended to suggest potential approaches and generate useful research recommendations.</p>
Longfin inshore squid	Lisa Hendrickson	Level 2 - Expedited Review	<p>Rationale: This assessment will use the same methods as 2020 Management Track assessment including updating annualized B_{MSY} proxy and $B_{threshold}$ with data, but will explore changing the baseline time period from 1976-2022 to 1997-2022. This change in the time period is a primary reason for recommending a Level 2 review. The AOP would like to see results for both time periods presented to the peer review panel. The AOP panel would like to see consideration of any changes caused by the CAMS transition. Research recommendations from the peer reviewers will be important to contributing to the work of the planned 2026 Research Track assessment.</p>

Stock	Assessment Lead	Review Level	Rationale and Comments
Spiny dogfish	Dvora Hart	Level 3 - Enhanced Review	<p>Rationale: A Research Track assessment was completed in December 2022, which updated the previous stochastic estimator (swept area calculations) to a length based Stock Synthesis 3 model. The Management Track assessment will add three years of data (2020-2022). There was a significant change in natural mortality (Lorenzen M), which resulted in a reduction in the females reaching maturity. There is a significant change in the length at maturity. There is a chance that there could be a status change to overfished. The AOP encourages a careful look at the impacts of transitioning to the use of CAMS catch (landings and discards). The AOP recommends reporting the fishing mortality rate and biomass estimates for the male component of the population.</p>
Scup	Mark Terceiro	Level 2 - Expedited Review	<p>Rationale: The management track will add three years of updated catch for 2020-2022 (CAMS landings and discards; MRIP recreational). CAMS discards have a lot of uncertainty and it is unclear what the format of that data will look like and when they'll be available. Revision to NEFSC Bigelow indices ('by-tow' swept area). Minor changes in model input settings (CVs, ESSs). Near threshold for retro adjustments. Projections carrying forward using previously reviewed methods.</p>

Stock	Assessment Lead	Review Level	Rationale and Comments
Summer flounder	Mark Terceiro	Level 2 - Expedited Review	Rationale: The assessment will update the fishery and survey catches for 2020-2022 using CAMS estimates of landings and discards. It will revise the NEFSC survey indices for 2009-2022 to include area swept adjustments by tow. In terms of model adjustments, plan to inflate input CVs of a few survey indices (CT spring, NM fall, Bigelow fall) and recenter input catch ESS's to improve model diagnostics. Also plan to test split of terminal fishery selectivity blocks from 2008-2022 to 2008-2015 and 2016-2022.

Individual Stock Discussion Summaries:

Atlantic mackerel (AOP Lead: Cate O'Keefe)

Recommendation: Level 1 (Direct Delivery, Provisional)

Atlantic mackerel were last assessed in 2021 via a Management Track assessment; the most recent benchmark was in 2017 at SAW 64. 2021 results indicated the stock was overfished based on SSB_{2019} (42,862mt) being 24% of the SSB_{MSY} proxy ($SSB_{40\%} = 181,090\text{mt}$), and overfishing was occurring based on F_{2019} (0.46) being 208% of the F_{MSY} proxy ($F_{40\%} = 0.22$). The assessment included three indices: the NMFS Spring bottom trawl survey Albatross years from 1968-2008; the NMFS Spring bottom trawl survey Bigelow years from 2009-2019; and a range wide SSB index for 1977-2019 developed from the Canada DFO dedicated egg survey and the NEFSC MARMAP and ECOMON surveys. The assessment assumed constant natural mortality ($M = 0.2$) and included one fishery fleet with time-invariant, flat-topped selectivity.

Kiersten Curti presented the proposed assessment plan for Atlantic mackerel in 2023, which will use the current ASAP model configuration with no changes and updated fishery and survey data through 2022. CAMS estimates of commercial landings and discards will be used for 2020-2022. Survey updates will include the 2021 and 2022 NMFS Spring bottom trawl survey (2020 survey was not conducted) and the SSB index for 2021 and 2022, if available. Reference points will be updated using the SAW 64 projection approach with MSY level proxies of $F_{40\%}$ and $SSB_{40\%}$. Rebuilding projections for 2023-2024 will be based on an assumed bridge year catch in 2023, two-stanza recruitment, and $F_{rebuild} = 0.12$ as defined in the Atlantic Mackerel Rebuilding Amendment 2.0. The proposed backup assessment approach is the I-Smooth method using the SSB index developed from egg surveys.

The AOP raised questions about DFO data to support the SSB index and availability of data to support the assessment. Dr. Curti explained that the 2020 SSB index will be treated as missing, the 2021 SSB index is available, and the 2022 samples to support the SSB index are currently in transit. She expects that the 2022 SSB index will be available to support the assessment but noted that delays are possible. The AOP asked about model sensitivity to terminal year estimates and suggested that sensitivity analysis to examine the impacts of missing the terminal year SSB index may be warranted if the index is not available. The AOP also noted that this is the first iteration of the Atlantic mackerel assessment using CAMS data and recommended comparisons of CAMS landings and discards to outputs from previous methods to assess any substantial differences.

The AOP raised questions about application of the two-stanza recruitment assumptions for reference points and projections. Dr. Curti highlighted previous deliberations by the 2021 Management Track assessment process and the SSC. She noted that there is no clear evidence of environmental conditions impacting recruitment. Despite high adult condition since the mid-2010s, recruitment has been low, but Dr. Curti indicated there is little evidence of a shift in environmental conditions. Research in Canada has indicated that SSB and temporal/spatial overlap of larvae with preferred prey are significant drivers of strong year classes. Without clear evidence that recruitment is environmentally driven, the 2021 Management Track assessment did not change the SAW 64 assumptions for reference points and there are no proposed changes for the 2023 Management Track assessment.

The AOP supported continued development of the Ecosystem and Socioeconomic Profile (ESP) for Atlantic mackerel, which describes ongoing examinations of natural mortality and stock productivity. The ESP will be provided as supporting information in 2023 and results to date do not indicate that changes to the assessment model are warranted.

The AOP recommended a provisional Level 1 review for Atlantic mackerel. The AOP supported a direct delivery of the assessment to the SSC based on the proposal to maintain the model configuration and update three years of fishery and survey data. The SSC recommended that a Level 2 review may be warranted if the 2022 SSB index is not available for the assessment update or if large differences in CAMS data are detected. The NEFSC will consider all available data in the coming months and determine if the review needs to be elevated to a Level 2.

Bluefish (AOP Lead: Russ Brown)

Recommendation: Level 2 (Expedited Review)

Bluefish was last assessed in the Management Track in 2021 with data updated through 2019. That assessment utilized an ASAP statistical catch at age model to conclude that the stock was overfished, but overfishing was not occurring. Bluefish completed a Research Track assessment that was peer reviewed in December 2022. The newly accepted assessment developed a WHAM state space statistical catch at age model with deviations on the numbers at age estimates. Natural mortality, which was previously assumed constant at age 2, is now assumed to vary by age. The model employs two fishery fleets (recreational landings & discards and commercial landings), and 5 fleet selectivity blocks (2 commercial and 3 recreational). Three new indices were added to the model: MRIP CPUE Guild Approach index (1985-2021), SEAMAP Age 1 (1989-2021) and ChesMMAP Trawl survey (1985-2018). The 2022 Research Track assessment

(data through 2021) concluded that the stock was not overfished and overfishing was not occurring.

The 2023 Management Track assessment will update the current Research Track assessment with one year of additional data (2022). To address concerns of Research Track peer reviewers, the assessment will shift from full multinomial age length keys to only using multinomial approaches to fill in holes in age length keys (consistent with the approach used by StockEff). This may allow for exploration of alternate likelihoods for age compositions.

The assessment update will conduct short term projections in WHAM, which allows for incorporation of model uncertainty, auto-regressive processes and uncertainty in recruitment and numbers-at-age. Removals in 2023 will be assumed to be equal to the 2023 ABC (13,890 mt) and projections will be carried forward for years 2024-2026.

The AOP was concerned that the spawning biomass target has declined by 50% and is likely caused by changes in M using the Lorezen curve resulting in a reduction in the recruits to fishable sizes. However, the previous target had never been achieved in the fishery and was likely overinflated. This approach may represent a more reasonable level of reference points. It was noted that the SSC was concerned that the average weight of discards has disparities between the MRIP and angler surveys, likely due to higher average weights of large discarded fish. It was noted that the NEFSC and GARFO have agreed to use the same values in setting specifications. Previously, the approach was overestimating discards, particularly in the south (southern fish are generally smaller). The use of regionally stratified estimates is considered to be a more realistic and appropriate approach. The AOP recommended a Level 2 review for bluefish due to the significant reduction in the biomass target and proposed changes to the age length key approach.

Deep sea red crab (AOP Lead: Russ Brown)
Recommendation: Level 2 (Expedited Review)

Deep sea red crab is a data poor species that has not been considered in previous Management Tracks. A specifications update was completed in 2019 to set specifications for fishing years 2020-2023. This update included a time series from 2002-2019 including landings data from the limited access fleet, incidental landings, LPUE estimates for the limited access fleet and biological information from port samplers and observed trips. There is no assessment model, no biological reference points for this stock and none will be developed during this Management Track cycle.

This data update will add 4 years of data (2019-2022) including landings; LPUE estimates; port sampled carapace lengths for landed males; observer sampled carapace lengths for males; females and discarded males; and observer data on egg-bearing females and discards. There are no issues with missing 2020 survey data since the update relies on reported catches and some observed trips. The sexes segregate by depth and the fishery targets areas with higher densities of males. During the CAMS review, there were issues with the discards for some gear types. However, CAMS data are not used in the data update. A tagging project had low return rates indicating the potential for high mortality of tagged individuals, or a super abundant population. A level 2 review of the available data and to highlight the limitations of analyses that have been

attempted for this species is recommended to suggest potential approaches and generate useful research recommendations.

Longfin inshore squid (AOP Lead: Paul Rago)
Recommendation: Level 2 (Expedited Review)

Longfin squid was last assessed in 2020 at a Management Track assessment. The overfishing status was unknown, but the stock was not overfished. The “not overfished” status was based on a comparison of the average of the 2018 and 2019 annualized, q-adjusted swept area biomass estimates (i.e. averages of the NEFSC spring and fall survey biomass for each year), 63,349 mt, to the threshold B_{MSY} proxy ($B_{threshold}$) based on a long-term average (1976-2019). The threshold B_{MSY} proxy is 50% of the B_{MSY} target (i.e. $0.5 * 42,405 \text{ mt} = 21,203 \text{ mt}$). It was also noted that the NEAMAP fall survey biomass estimates are added to those from the NEFSC fall survey.

Lisa Hendrickson’s presentation highlighted the complexity of longfin squid life history and the seasonal nature of the fishery which has both inshore and offshore components. Unlike *Illex* squid, longfin squid are neritic (i.e. residents of shelf waters). Hence, both the spring and fall NEFSC bottom trawl surveys likely sample most of the stock inhabiting U.S. waters. The SARC 51 (2010) assessment approach considered the seasonal dynamics of the fisheries by calculating exploitation rates (catch/survey biomass) between the seasonal surveys. SARC 51 concluded that annualized survey biomass estimates were more appropriate. Dr. Hendrickson noted cohort-based estimates of biomass and exploitation rates have always been computed for squid caught in the spring versus fall surveys because the two cohorts have different growth rates and productivity levels. Although an approach based on analyzing each intra-annual cohort independently would be more realistic since it would capture the reliance of summer and fall fisheries on the recruits produced from the spring stock estimates, this approach has been deemed not permissible under the Management Track and will be suggested for exploration under the next Research Track. Similarly, the winter and spring fisheries depend on recruits produced from the fall survey stock estimates. Such a model would also allow inclusion of seasonal differences in growth rates.

Dr. Hendrickson recommended a change in the time series used to compute the B_{MSY} average from 1976-2008 to 1997-2022. The rationale was based on consideration of rapid warming and other changes in environmental conditions, and possibly productivity in recent years. Changes in fleet characteristics, data quality (i.e. mandatory fishery data reporting as of 1997), and in-season management as of 2000 were also considered relevant by the assessment lead to this proposed change.

Questions from the AOP addressed the basis for the proposed change in years to compute the B_{MSY} average and whether there was any evidence of trends in the surveys. No trends have been observed but further analyses are needed. The selection of appropriate stanzas of years for projections or measures of productivity are always controversial, so justifying any changes should be data driven and well supported.

Additional questions from the AOP and other meeting attendees included the methods used to estimate catchability in the trawl surveys, comparisons with assessments of species similarly impacted by environmental changes (e.g. Atlantic mackerel), and whether any preliminary

changes had been detected. To account for diel vertical migrations, abundance and biomass estimates are based on daytime tows where “daytime” is defined by solar zenith angle because the species is most available to bottom trawls during the daytime. These values vary with location and date. The exclusion of tows outside the solar zenith angle ranges for the NEFSC spring and fall surveys reduces the frequency of low and zero tows, and generally improves precision but also reduces sample sizes within strata. The NEAMAP fall trawl survey swept area estimates will be updated because they are added to those of the NEFSC fall surveys. The NEAMAP spring survey’s intermittent encounters of longfin squid are attributed to varying availability of squid to the survey area; the stock is generally farther offshore in the spring.

Collectively, these considerations led the AOP to recommend a Level 2 review and a continuation of the current assessment methodology. The selection of an alternative basis for the B_{MSY} average should be fully explored and compared to the existing span of years. Results of both approaches should be presented to the MTA reviewers. The inclusion of newly developed CAMS estimates of landings and particularly discards, should be fully explored. Finally, MTA review can lay the groundwork for the Research Track assessment now scheduled for 2026. The groundwork could include any pending or required research on basic biology, alternative modeling approaches, and required data streams from the commercial fleets. The Terms of Reference for the assessment have not been set; the newly chartered Research Track Steering Committee of the NRCC will likely be involved in this process.

Spiny dogfish (AOP Lead: Cate O’Keefe)

Recommendation: Level 3 (Enhanced Review)

A Research Track assessment for spiny dogfish was peer reviewed in December 2022. The Stock Synthesis 3 (SS3) model was used with a time series of 1989-2019. The stock was not overfished based on Reproductive Output₂₀₁₉ (239.9 million pups) being 65% of the SSB_{MSY} proxy (Reproductive Output Target = 370.8 million pups), and overfishing was occurring based on F_{2019} (0.032) being 128% of the F_{MSY} proxy ($F_{SPR60\%} = 0.025$). The assessment included the NMFS Spring and Fall bottom trawl survey indices and lengths, two landings fleets and three discard fleets, Lorenzen natural mortality estimates, and two maturity-growth relationship blocks.

Dvora Hart presented the proposed assessment plan for spiny dogfish in 2023, which will use the current SS3 model configuration with explorations and potential modification to the influence of the stock-recruit relationship and updated fishery and survey data through 2022. CAMS and SBRM-derived estimates of commercial landings and discards and MRIP estimates of recreational landings will be used for 2020-2022. Landed and discarded length and sex data by gear type will be updated based on available information. Survey updates include the 2021 and 2022 (2020 survey was not conducted) NMFS Spring and Fall bottom trawl survey indices and lengths. Reference points will be updated using the Research Track approach with MSY level proxies based on SPR60%. The projection method will be investigated to consider disproportional landings and discards. The proposed backup assessment approach is the previously used Stochastic Estimator model, which estimates F and SSB using swept area from the NMFS Spring survey with propagation of uncertainties.

The AOP raised questions about the backup assessment plan and potential challenges with applying reference points from the SS3 model to the outputs from the Stochastic Estimator model. The AOP noted that it is unlikely that the SS3 model would be rejected during the Management Track Peer Review as it was recently approved during the Research Track assessment. Dr. Hart noted that the new BRPs were approved through the Research Track assessment and would remain in place.

The AOP asked about the influences of changes in natural mortality assumptions and age information included in the SS3 assessment. Dr. Hart commented that the use of the Lorenzen M provides better results from the model and is more biologically realistic. Estimates of M range from 0.3 for newborn pups to 0.08 for large adult females, which influence the per recruit calculations and result in less females reaching the reproductive age. She noted that the only ageing study with a large scope was conducted ~40 years ago and there is evidence that growth rates have changed. Length at maturity has decreased suggesting that either growth has slowed, or females are maturing at earlier ages. Smaller, slower growing females indicate reduced reproductive output. The 2022 Research Track assessment suggested that reproductive output has rapidly declined in recent years, and the stock may be approaching an overfished status.

The AOP and other meeting attendees inquired about providing estimates of F and biomass for males. Dr. Hart commented that this question has been raised in the past and she could provide these estimates but does not propose deriving reference points for males.

The AOP recommended a Level 3 review for spiny dogfish. The AOP supported the proposed explorations and potential changes to the assessment and recommended that ample time be allotted for presentation and review during the Management Track Peer Review. The AOP noted the need for review of CAMS data and the potential for a change in stock status. They also highlighted that the 2023 Management Track is the first iteration of the SS3 assessment since the Research Track in 2022 and highlighted major changes in estimates of natural mortality and length at maturity.

Scup (AOP Lead: Paul Rago)

Recommendation: Level 2 (Expedited Review)

Scup were most recently assessed in 2021 via a Management Track assessment; the most recent benchmark assessment was in 2015 at SAW 60. Mark Terceiro presented the proposed assessment plan for scup in 2023 that will rely on the model structure (ASAP) but include updated fishery and survey data through 2022. CAMS estimates of commercial landings and discards will be used for 2020-2022, but questions remain about the commercial discard estimates. NEFSC trawl survey indices will include “by tow” area swept estimates but the effect of such changes on general trends are negligible. Some minor changes in tuning parameters will be used to improve model diagnostics. These parameters include the Coefficients of Variation (CV) for some state abundance indices. Population projections will assume a catch in 2023 equal to the approved ABC of 13,458 mt.

The AOP inquired about the potential effects of missing NEFSC survey data in 2020 and the effects of large year classes now moving into the plus group of the population. Such factors can increase the likelihood of retrospective patterns. Dr. Terceiro acknowledged these concerns and

noted that noisy indices might cause problems in future years. The model also includes a dome shaped selectivity pattern for the fishery. This creates a large “cryptic” biomass. Consideration of age-based natural mortality rates might be necessary in future benchmarks for this species.

Additional questions from the AOP inquired about the potential utility of methods to aggregate several indices to detect relative abundance and trend. Dr. Terceiro noted that various GLM approaches had been explored but previous reviewers expressed concerns about over-smoothing of abundance estimates outside of the assessment model. In theory, modern models are designed to address competing signals in the composite likelihood function, but they do not address the spatial arrangement of the indices or their covariance. Recent recruitment indices have been low, but attempts to estimate a parametric stock recruitment relationship have not been successful. The low values in recent years do not seem sufficient to support a change in the stanza of years used for stock and catch projections. Moreover, in view of Dr. Terceiro’s responsibilities for summer flounder at the June MTA, the analyses to justify such a change are unlikely to be completed.

No RTAs are currently planned for scup but likely topics for consideration include the aforementioned topics of age-specific M and aggregation of young of the year indices as well as concerns about discard estimates in the earlier decades of the assessment. The model currently starts in 1963, but estimates of age structure only began in 1984. There appears to be sufficient contrast in recent survey indices such that the earlier years of the time series could be dropped. The tradeoff between contrast in the surveys and uncertainty in the discards and age composition of earlier years may justify truncation at an RTA. The AOP unanimously endorsed a Level 2 review for Scup.

Summer flounder (AOP Lead: Mike Celestino)
Recommendation: Level 2 (Expedited Review)

The currently approved stock assessment model for summer flounder is a 2021 Management Track assessment (MTA) with data through 2019, that builds on the 2018 SAW 66 benchmark assessment. This is an ASAP model with four fishery fleets, three selectivity periods, and a variety of federal, state, and academic fishery surveys. Results of the 2021 MTA indicated the stock is not overfished, and overfishing is not occurring.

New sources of information considered for the 2023 MTA include an update of fishery and survey catches for 2020-2022. CAMS will be queried for commercial landings and discards for these same years; Mark Terceiro noted that preliminary comparisons of SBRM and CAMS for 2018-2021 were within +/- 10%, likely due to differences in stratification, while differences in landings were trivial. Revision of the NEFSC trawl survey indices for the Bigelow years (2009-2020) to include ‘by-tow’ swept area calculations are also proposed. Model configuration changes that are proposed as part of this MTA include changes to survey input CVs and adjustments to input catch ESS; each expected to have minor changes on assessment results, but result in improved model diagnostics. Dr. Terceiro noted that if time allows (depending on exactly when data are available), he will experiment with splitting the terminal fishery selectivity blocks from 2008-2022 to 2008-2015 & 2016-2022 to determine impacts on model performance.

Consistent with past summer flounder assessments, BRPs will be derived from projections that include recruitment estimates that use the entire time series (1982-2022), while OFL projections

will extend the SSC-recommended low-recruitment time series that started in 2011 (2011-2022). For 2024-2025 OFL projections, Dr. Terceiro will assume catch in 2023 = final ABC (15,023 mt), and follow MAFMC risk policy for ABCs (e.g., OFL CV = 60%).

Dr. Terceiro is proposing as a backup assessment plan, should one be necessary, of either recent trends in all normalized survey indices (e.g., the SSC data update procedure) or I-Smooth using the NEFSC Bigelow spring and fall indices.

The AOP further inquired about the source(s) of differences between SBRM and CAMS, to which Dr. Terceiro noted that the differences were not consistent in one direction and that further diagnosis of specific differences will require a line-by-line, stratum-by-stratum examination of discards; he noted there may not be sufficient time to perform that analysis. The AOP noted that highlighting differences to the review panel could be helpful. The AOP supported extending the low recruitment timeseries for OFL projections but inquired as to whether there was a contingency plan if one of the new recruitment estimates (2020-2022) was anomalously high to which Dr. Terceiro indicated that early signs suggest there is a low risk of this happening, but if it should, he is likely to explore an alternate projection run with the anomalous recruitment(s) removed. The AOP also discussed whether exploration of revisions to historical selectivity blocks would elevate the assessment to level 3, but the AOP felt comfortable that should time allow for this exploration, given the other modest changes proposed for this assessment, there would be adequate review time under a level 2 review; moreover, it appears as though past practice has been to maintain level 2 assessments for this type of proposed change (e.g. scup).

The AOP supported a level 2 assessment review for summer flounder. Justification for this recommendation included the notion that the time available for a level 2 review is sufficient to address all proposed changes.

AOP Meeting Conclusions:

The AOP met on February 23, 2023 to review the stock assessment plans for 7 stocks scheduled for the June 2023 Management Track cycle. The panel concluded that a Level 1 review (Direct Delivery) was warranted for Atlantic mackerel; Level 2 reviews (Expedited Review) for bluefish, deep sea red crab, longfin inshore squid, scup and summer flounder; and Level 3 review (Enhanced Review) for spiny dogfish. The Level 2 and 3 reviews will occur during the June 2023 Management Track Peer Review scheduled for June 26-28, 2023. In the case of spiny dogfish, the NRCC decided to delay the review until the September Management Track peer review. 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. In the case of Atlantic mackerel, if the 2022 egg/biomass index is not available, the AOP agreed to raise the review level to Level 2 (Expedited Review) via correspondence. 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 only, no call-in numbers)

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

Abigail Tyrell, NEFSC
Alex Dunn, NEFSC
Andy Jones, NEFSC
Anthony Wood, NEFSC
Brandon Muffley, MAFMC
Charles Adams, NEFSC
Charles Perretti, NEFSC
Chelsea Tuohy, ASMFC
Chris Kellogg, NEFMC
Chris Legault, NEFSC
Cynthia Jones, Old Dominion University (June MT peer review chair)
David McCarron, NEFMC
Dvora Hart, NEFSC
Emily Bodell, NEFMC
Eric Reid, Fisheries Consultant
Greg DiDomenico, Lund's Fisheries
Haley Clinton, NC Division of Marine Fisheries
Hannah Hart, MAFMC
James Boyle, University of Miami
Jamie Cournane, NEFMC
Jason Boucher, NEFSC
Jason Didden, MAFMC
Jeff Kaelin, Lund's Fisheries
Jon Deroba, NEFSC
Jui-Han Chang, NEFSC
Julie Nieland, NEFSC
Karson Cisneros, MAFMC
Kathy Sosebee, NEFSC
Katie Almeida, Town Dock
Katie Drew, ASMFC
Kiersten Curti, NEFSC
Lisa Hendrickson, NEFSC
Mark Terceiro, NEFSC
Meghan Lapp, Sea Freeze
Melanie Griffin, MA Marine Fisheries Institute
Michael Waine, American Sportfishing Association
Paul Nitschke, NEFSC

Steve Cadrin, SMAST
Susan Wigley, NEFSC
Toni Chute, NEFSC

Key:

NEFSC - Northeast Fisheries Science Center

NEFMC - New England Fisheries Management Council

MAFMC - Mid-Atlantic Fisheries Management Council

ASMFC - Atlantic States Marine Fisheries Council

SMAST - University of Massachusetts School of Marine Science and Technology

Appendix B. Management Track Stock Assessment Terms of Reference

1. Estimate catch from all sources including landings and discards.
2. Evaluate indices used in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, etc.).
3. Estimate annual fishing mortality, recruitment and stock biomass (both total and spawning stock) as possible (depending on the assessment method) for the time series using the approved assessment method and estimate their uncertainty. Include retrospective analyses if possible (both historical and within-model) to allow a comparison with previous assessment results and projections, and to examine model fit.
 - a. Include bridge runs to sequentially document each change from the previously accepted model to the updated model proposed for this peer review.
 - b. Prepare a backup assessment approach that would serve as an alternative for providing scientific advice to management if the analytical assessment were to not pass review
4. Re-estimate or update the BRP's as defined by the management track level and recommend stock status. Also, provide qualitative descriptions of stock status based on simple indicators/metrics (e.g., age- and size-structure, temporal trends in population size or recruitment indices, etc.).
5. Conduct short-term stock projections when appropriate.
6. Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

* Major changes from the previous stock assessment require pre-approval by the Assessment Oversight Panel.

Appendix C. June 2023 Management Track Peer Review meeting attendees.

ASMFC - Atlantic States Marine Fisheries Commission
GARFO - Greater Atlantic Regional Fisheries Office
MA DMF - Massachusetts Division of Marine Fisheries
MAFMC - Mid-Atlantic Fisheries Management Council
NEFMC - New England Fisheries Management Council
NEFSC - Northeast Fisheries Science Center
NC DMF - North Carolina Division of Marine Fisheries
SMAS - University of Massachusetts School of Marine Science and Technology
UMASS - University of Massachusetts

Cynthia Jones - Chair
Alexei Sharov - Panel
John Wiedenmann - Panel
Katie Drew - Panel

Russ Brown - NEFSC
Michele Traver - NEFSC

Alan Bianchi - ND DMF
Alex Dunn - NEFSC
Alex Hansell - NEFSC
Allison Murphy - GARFO
Ben Levy - NEFSC
Brandon Muffley - MAFMC Staff
Brian Linton - NEFSC
Charles Adams - NEFSC
Charles Perretti - NEFSC
Chelsea Tuohy - ASMFC
Chris Kellogg - NEFMC Staff
Chris Legault - NEFSC
Cynthia Ferrio - GARFO
Gary Nelson - MA DMF
Greg DiDomenico - Lund's Fisheries
Hannah Hart - MAFMC Staff
Jason Boucher - NEFSC
Jessica Blaylock - NEFSC
Jon Deroba - NEFSC

Jose Montanez - MAFMC Staff
Karson Cisneros - MAFMC Staff
Kate Wilke - Nature Conservancy (Virginia)
Kathy Sosebee - NEFSC
Kiersten Curti - NEFSC
Kiley Dancy - MAFMC Staff
Kristan Blackhart - NMFS Office of Science and Technology
Lauran Brewster - UMASS Dartmouth
Lisa Hendrickson - NEFSC
Mark Grant - GARFO
Mark Terceiro - NEFSC
Michael Waine - American Sportfishing Association
Mike Celestino - NJ Bureau of Shellfisheries
Lisa Hendrickson - NEFSC
Paul Nitschke - NEFSC
Rachel Feeney - NEFMC Staff
Sefatia Romeo Theken - Deputy Commissioner, MA Department of Fish and Game
Sharon Benjamin - GARFO
Steve Cadrin - SMAST
Susan Wigley - NEFSC
Toni Chute - NEFSC
Tony Wood - NEFSC
Willy Goldsmith - Pelagic Strategies LLC
Will Poston - American Saltwater Guides Association

Appendix D. Realized Agenda for June 2023 Management Track peer review

Monday, June 26, 2023

<u>Time</u>	<u>Subject</u>	<u>Presenter</u>
9:30 a.m. - 9:45 a.m.	Welcome/Logistics/Conduct of Meeting	Michele Traver, Russ Brown, Cynthia Jones, Chair
9:45 a.m. - 11:15 a.m.	Deep Sea Red Crab Discussion/Questions	Toni Chute Panel
11:15 a.m. - 11:30 a.m.	Break	
11:30 a.m. - 12:00 p.m.	Morning Wrap Up Summary/Discussion	Panel
12:00 p.m. - 12:15 p.m.	Public Comment	Public
12:15 p.m. - 1:15 p.m.	Lunch	
1:15 p.m. - 3:30 p.m.	Scup Discussion/Questions	Mark Terceiro Panel
3:30 p.m. - 3:45 p.m.	Break	
3:45 p.m. - 4:15 p.m.	Afternoon Wrap Up Summary/Discussion	Panel
4:15 p.m. - 4:30 p.m.	Public Comment	Public
4:30 p.m.	Adjourn	

Tuesday, June 27, 2023

<u>Time</u>	<u>Subject</u>	<u>Presenter</u>
9:30 a.m. - 9:35 a.m.	Welcome/Logistics	Michele Traver Cynthia Jones, Chair
9:35 a.m. - 11:15 a.m.	Longfin Inshore Squid Discussion/Questions	Lisa Hendrickson Panel
11:15 a.m. - 11:30 a.m.	Break	
11:30 a.m. - 12:00 p.m.	Morning Wrap Up Summary/Discussion	Panel
12:00 p.m. - 12:15 p.m.	Public Comment	Public
12:15 p.m. - 1:15 p.m.	Lunch	
1:15 p.m. - 3:30 p.m.	Summer flounder	Mark Terceiro

<u>Time</u>	<u>Subject</u>	<u>Presenter</u>
	Discussion/Questions	Panel
3:30 p.m. - 3:45 p.m.	Break	
3:45 p.m. - 4:15 p.m.	Afternoon Wrap Up Summary/Discussion	Panel
4:15 p.m. - 4:30 p.m.	Public Comment	Public
4:30 p.m.	Adjourn	

Wednesday, June 28, 2023

<u>Time</u>	<u>Subject</u>	<u>Presenter</u>
9:00 a.m. - 10:00 a.m.	Closed Session	Panel
10:00 a.m. - 12:00 p.m.	NO SESSION	
12:00 p.m. - 1:00 p.m.	Lunch	
1:00 p.m. - 2:30 p.m.	Bluefish Discussion/Questions	Tony Wood Panel
2:30 p.m.- 2:45 p.m.	Break	
2:45 p.m. - 3:15 p.m.	Afternoon Wrap Up Summary/Discussion	Panel
3:15 p.m. - 3:30 p.m.	Public Comment	Public
3:30 p.m. - 4:30 p.m.	Report Writing	Panel
4:30 p.m.	Adjourn	