

2025 September Management Track Peer Review Panel Report

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Executive Summary

The September 2025 Management Track (MT) peer review panel (Panel) reviewed six stock assessments. Three of these assessments were Level 2 Expedited Reviews: Cape Cod/Gulf of Maine Yellowtail Flounder (*Limanda ferruginea*), Georges Bank Yellowtail Flounder (*L. ferruginea*), and Southern New England/Mid-Atlantic Yellowtail Flounder (*L. ferruginea*). The remaining three assessments were Level 3 Enhanced Reviews: Acadian Redfish (*Sebastes fasciatus*), White Hake (*Urophycis tenuis*), and Georges Bank Winter Flounder (*Pseudopleuronectes americanus*). The Assessment Oversight Panel (AOP) recommended the levels of review (Appendix A) at its May 2025 meeting.

The Panel met in person in Woods Hole, MA with hybrid capabilities on September 15-18, 2025. The Panel was to determine whether each completed MT Assessment was technically sufficient to a) evaluate stock status, b) provide scientific catch advice, and c) successfully address the assessment Terms of Reference (TORs; Appendix B). Table 1 presents a list of the stocks, name of the assessment lead, and conclusions about stock status. Attendance at the meeting is provided in Appendix C, and the agenda for the peer review is available in Appendix D.

The Panel noted that most of the assessments reviewed used new methodology relative to previous stock-specific management track assessments. The Panel recognized the challenges associated with transitioning to a new modeling framework and was impressed and appreciative of the collegial approaches through which the broader assessment team helped answer the Panel's questions and describe these transitions and approaches.

Cape Cod/Gulf of Maine Yellowtail Flounder

The Panel concluded that the 2025 Management Track Assessment for Cape Cod/Gulf of Maine Yellowtail Flounder met all the TORs and represented the BSIA for this stock. This assessment represents the first management track implementation following the transition to WHAM (Woods Hole Assessment Model; a state-space model that integrates fleet and/or survey catch composition data and is capable of estimating multiple types of random effects) as described in the 2024 research track. There were only minor changes between the 2024 research track and the 2025 management track reviewed here, and the Panel found these changes were well-justified. The Panel discussed the time series of weight-at-age data coming from the commercial fleet—which affects Biological Reference Points (BRPs) and projections—and which had shifted substantially over the last decade. The Panel recommended future assessments consider projections that use survey (as opposed to fleet) weight-at-age. The Panel also suggested approaches for considering and addressing possible changes and differences in catchability among the different survey indices used.

Georges Bank Yellowtail Flounder

The Panel concluded that the 2025 Management Track Assessment for Georges Bank Yellowtail Flounder met all the TORs and represented the BSIA for this stock. This management track assessment updated the 2024 research track WHAM model with a slight adjustment of the maturity schedule and additional data. The Panel found these adjustments were appropriate. The Panel discussed the numbers-at-age (NAA) deviations described under TOR 3 and recommended that future research consider best practices for bounding the Coefficients of Variation (CVs) of the random effects. The Panel suggested future work might consider if there were conditions under which the estimation of such random effects, while improving model fit, might obscure inferences regarding the relative influence of fishery and environmental effects on populations. The Panel also discussed the possibility of using forecasted bottom temperatures in the projection of recruitment, and suggested this might be considered in future assessments.

Southern New England/Mid-Atlantic Yellowtail Flounder

The Panel concluded that the 2025 Management Track Assessment for Southern New England/Mid-Atlantic Yellowtail Flounder met all the TORs and represented the BSIA for this stock. This management track updated the 2024 research track

WHAM model with minor model changes and with additional years of data. The model changes included turning off lognormal adjustments (following best practice) and removing Independent and Identically Distributed (IID) random effects on fleet selectivity to improve model convergence. The Panel considered these changes appropriate and well-justified. The model used recruitment informed by an environmental index (Gulf Stream Index; GSI) and the panel discussed how this approach might be explored in future assessments to consider environmental forecasting.

Acadian Redfish

The Panel concluded that the 2025 Management Track Assessment for Acadian Redfish met all the TORs and represented the BSIA for this stock. The most important change from previous management tracks was the bridging from ASAP (Age Structured Assessment Program; an assessment model that is structurally simpler than WHAM and offers no option to estimate random effects) to an ASAP-like WHAM model with modifications following the implementation of the redfish assessment in WHAM as a case study in the 2023 State Space research track assessment. The switch in model structure included changing the starting year from 1913 to 1963, switching the selectivity from logistic to age-specific, changing the likelihood of age compositions from multinomial to logistic-normal, and changing the recruitment model from a Beverton-Holt-based approach to a mean recruitment with an Auto-Regressive first order (AR1) random effect. The projection of recruitment is based on the estimated mean recruitment from the assessment model. These changes were well described and justified.

White Hake

The Panel concluded that the 2025 Management Track Assessment for White Hake met all the TORs and represented the BSIA for this stock. The most important change to this assessment was the addition of the Bottom Long Line Survey (BLLS) index of white hake. This change was well described and its effect on the assessment outputs was evaluated. Approaches to reconcile short and long-term projections were discussed at length by the panel.

Georges Bank Winter Flounder

The Panel concluded that the 2025 Management Track Assessment for Georges Bank Winter Flounder met all the TORs and represented the BSIA for this stock. This assessment updated and refined the WHAM model approved during the 2024 State Space Research Track Assessment. The most impactful change to this

assessment was the revision of the historical catch time-series, which corrected a mistake in the input data used for the previous Management Track assessments. The lower time-series of removals for 1982-2003 resulted in lower estimates of Spawning Stock Biomass (SSB) and recruitment for all years, while Fishing mortality (F) was lower during the revised period and higher afterwards compared to using the catch data from previous Management Track assessments. The lower estimates of recruitment also resulted in a lower SSB_{MSY} proxy. Other changes were decoupling the recruitment random effects from the numbers-at-age random effects for ages-2+, as recommended by the 2024 Research Track Peer Review Panel, and adding two additional years of data. These changes had a negligible effect on estimates of SSB, F, and stock status.

Cross-Cutting Topics

The Panel identified several topics that were discussed across multiple stocks reviewed, and provided recommendations that future Management or Research Track Assessments should address.

- **Declining port sampling effort**, in combination with low abundance of some stocks, results in uncertain estimates of catch-at-age in the best case and missing years of data in the worst case. The transition to the WHAM framework has improved the retrospective pattern and other diagnostics for the stocks it was applied to, but the state-space approach relies on robust information on catch-at-age to estimate appropriately the random effects on survival and recruitment. If port sampling efforts are not increased, the performance of these models may degrade, potentially to the point where they are no longer as useful for management.
- **Best practices for projections in the WHAM framework have not been fully explored.** Either through the Projections Research Track or through the next Research or Management Track assessment for individual species, a retrospective analysis should be conducted to evaluate the performance of short-term projections wherein the projected estimates of biomass, recruitment, and stock status from the methods and data used in this assessment are compared to the realized biomass, recruitment, and stock status under different methods and assumptions, once additional years of data have been added. This analysis would require updating the projections from this assessment with realized catch over the intervening years, not just comparing the original projection results. It could help assessment scientists and managers better understand the uncertainty in projections made with this new model framework.
- **Best practices for reviewing model changes.** The Panel sometimes struggled to understand how the outputs of the reviewed assessments were affected by (i)

additional data, (ii) current modeling updates and/or changes, and (iii) previous model updates. The Panel suggested that greater clarity regarding relative effects of each would facilitate focusing on the appropriateness of the model currently reviewed. The Panel noted that this information was very clear for some stocks they reviewed but less so for others, and suggested that developing best practices for conveying this information could improve review processes in the future.

Table 1. Stocks reviewed at the September 2025 Management Track Assessment Peer Review meeting.

Stock	Assessment Lead	Peer Review Panel Conclusion on Stock Status
Level 2 – Expedited Review		
Cape Cod/Gulf of Maine Yellowtail Flounder	Larry Alade	Stock is overfished and not subject to overfishing
Georges Bank Yellowtail Flounder	Alex Hansell	Stock is overfished and not subject to overfishing is
Southern New England/Mid-Atlantic Yellowtail Flounder	Cameron Hodgdon	Stock is overfished and not subject to overfishing
Level 3 – Enhanced Review		
Acadian Redfish	Brian Linton	Stock is not overfished and not subject to overfishing
White Hake	Chuck Adams	Stock is not overfished and not subject to overfishing
Georges Bank Winter Flounder	Alex Hansell	Stock is not overfished and not subject to overfishing

Level 2 – Expedited Reviews

Cape Cod/Gulf of Maine Yellowtail Flounder

Summary

The Panel concluded that the 2025 Management Track Assessment for Cape Cod/Gulf of Maine Yellowtail Flounder met all the TORs and represented the BSIA for this stock. This assessment represents the first management track implementation following the transition to the WHAM as described in the 2024 research track, and there were only minor changes between the 2024 research track and this 2025 management track, and these were well-justified. The panel discussed the time series of weight-at-age from the commercial fleet, which was used in the projections, and which the assessment team indicated had undergone recent (last 10 year) changes related to likely both biological and fishery changes. The panel recommended future assessments should consider projections that use survey weight-at-age, either instead of or in addition to fleet weight-at-age. The panel also suggested approaches for considering and addressing possible changes and differences in catchability among the different survey indices used.

TOR 1. Estimate catch from all sources including landings and discards.

This TOR was met.

The assessment updated the catch data through 2024 (covering 1985-2024). There were no major changes in methods or treatment of the catch, including landings and discards, between the 2024 research track assessment and this 2025 management track assessment. The Panel discussed the fleet weight-at-age time series, which appeared to show both compression and decreasing weight at ages 4+ over the last 10 years. The assessment team noted that these changes seemed to be both based on changing condition factors as well as shifts in fishing practices. In particular, the commercial fleet has been operating closer to shore to avoid Atlantic Cod protection closures, interaction with fixed gear and to adjust to changes in cod allocations, which have influenced fishing behavior and spatial effort patterns.

TOR 2. Evaluate indices used in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, etc.).

This TOR was met.

The panel discussed the use of essentially six indices realized through the disaggregation of the New England Fisheries Science Center (NEFSC) surveys by vessel (Albatross and Bigelow) and by season, in addition to the Massachusetts Division of Marine Fisheries (MADMF) and Maine New Hampshire (MENH) fall surveys. The Panel discussed that there are some inherent risks of fitting to greater numbers of indices that models could artificially fit a trend that was not reflective of the stock, but noted there was no evidence of that here from the diagnostics. The panel discussed that a future research recommendation might consider spatiotemporal modeling of the trends, potentially outside of the WHAM model.

TOR 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

This TOR was met.

The assessment team described changes from the 2024 research track model, which included changes in how fleet selectivity and recruitment effects were handled in the 2025 management track model. The fleet selectivity was modeled with two temporal blocks. The first temporal block (1985-1993) included 2DAR1 (two-dimensional autoregressive first order) effects (i.e. year- and age-specific effects following an AR1 (autoregressive first order) process). The second block (1994-2024) included age-specific but time-invariant effects. Recruitment random effects were considered decoupled from the numbers-at-age (NAA) random effects. The Panel discussed how vessel and/or survey selectivity was considered, and suggested that future research consider the merits of estimating random effects of catchability instead of or in addition to selectivity effects. The assessment team suggested future research might also consider temporal changes in catchability in surveys as there were concerns that

inshore/offshore movements of the stock may not always align with the timing of the spring inshore survey which is not currently used in the assessment.

TOR 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.).

This TOR was met.

The Panel noted substantial increases in the Biological Reference Points (BRPs) relative to the 2022 management track assessment, which was conducted using substantially different modeling methods (VPA) and data inputs prior to the recent research track assessment for Yellowtail Flounder. The increase in F40% from 0.32 to 0.497 was attributed to changes in assumed natural mortality, declines in weight-at-age and earlier maturity. The Panel discussed the use of the weight-at-age values in the BRP's, and noted that changing from using the weight-at-age from the fleet to using the weight-at-age from the survey would likely alter the reference points. This discussion was based on the understanding that changes to the fleet-based weight-at-age were partially a function of the fleet operating in different and generally more inshore waters, as well as the recent changes (decreases, especially at older ages) of actual stock weight-at-age.

Based on this Management Track Assessment, the recommended stock status is overfished and not subject to overfishing.

TOR 5. Conduct short-term stock projections when appropriate.

This TOR was met.

The Panel discussed the confidence intervals for the projected catch, and understood that these wide bounds were expected. The panel also clarified that the recruitment was projected forward, but following an IID reversion to the long-term mean—an approach which was consistent with the BRP estimation.

TOR 6. Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

This TOR was met.

The Panel agreed that previous comments regarding (i) consideration of catchability associated with state surveys, and (ii) exploration of environmental effects on recruitment and natural mortality remained worth considering.

The Panel's research recommendations included those described above, especially:

- Consider using survey weight-at-age rather than fleet landings weight-at-age, especially if no new landings weight-at-age is available.
- Consider assessing possible changes in catchability among spring inshore survey indices.
- Consider spatiotemporal modeling of survey trends.

Georges Bank Yellowtail Flounder

Summary

The Panel concluded that the 2025 Management Track Assessment for Georges Bank Yellowtail Flounder met all the TORs and represented the BSIA for this stock. This management track assessment updated the 2024 research track model with a slight adjustment of the maturity schedule and additional data. The Panel discussed the NAA deviations described under TOR 3 and recommended that future research consider best practices for bounding the CVs (coefficients of variation) of NAA random effects, and to consider if there were conditions under which the estimation of such random effects, while improving model fit, might obscure inferences regarding the relative influence of fishery and environmental effects on populations. The Panel also discussed the possibility of using forecasted bottom temperatures in the projection of recruitment, and suggested this might be considered in future assessments.

TOR 1. Estimate catch from all sources including landings and discards.

This TOR was met.

The Panel discussed that the total removals from 2019 forward were exceptionally low compared to historical values (2019-2024 removals ranged from 8-68 mt, whereas landings pre-1975 were greater than 15,000 mt). Removals in these recent years were

composed almost wholly of discards from the scallop dredge fishery, with very little targeted catch or catch from Canada. The fishery catch-at-age revealed very low proportions for ages 1-2 since the early 1990's. The Panel discussed the recent weight-at-age data and the assessment team explained that these were primarily due to recent low sample sizes related to low stock sizes.

TOR 2. Evaluate indices used in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, etc.).

This TOR was met.

The model used four sources of fisheries-independent data: spring NEFSC survey, fall NEFSC survey, Canada's Fisheries and Oceans (DFO) survey, and bottom water temperature. Bottom temperature was included as a covariate for estimating recruitment deviations based on the 2024 research track assessment (Hansell et al. 2025). The three survey indices (spring and fall NEFSC, DFO) all showed comparatively very low index values since 2012, with most confidence intervals of post-2020 indices overlapping zero. These low survey indices were consistent with low catch shown in TOR 1. The bottom temperature showed change from 2009 forward that was confirmed by change point analyses conducted during the research track assessment.

TOR 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

This TOR was met.

The assessment model used ages 1-6+ with AR1_Y (an auto-regressive first order

process applied to year, not age) random effects on age-based selectivity for a single commercial fleet), IID random effects on NAA, three survey indices, a Beverton-Holt stock recruit relationship (affected by bottom temperature) and age-dependent natural mortality. Model runs included (i) the 2024 research track, (ii) a bridge run to add 2023 and 2024 data, and (iii) a final run in which the maturity-at-age schedule was altered slightly from the research track. The Panel understood that the change in the maturity schedule was a change only in the maturity of age 2 from 0.49 to 0.61 and corrected an error in the research track, and that the AR1_Y NAA random effects were helpful to accommodate the changing selectivity of the fleet accompanying a switch from a targeted fishery to generally a bycatch/discard fishery. The Panel discussed the NAA deviations, which appeared generally more negative in recent years, and the assessment team indicated that it was not readily possible to identify if these effects corresponded to changes in ecological or biological processes (e.g., survival, growth, movement, etc.) or fishery/survey processes (fisher behavior, gear efficiency, etc.). The panel suggested a possible research recommendation would be to consider best practices for potentially limiting or bounding the CV of the NAA random effects.

TOR 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.).

This TOR was met.

The assessment model produced the first reference points since 2014, indicating F_{MSY} of 0.09 and SSB_{MSY} of 7,072 mt, which corresponded to an MSY of 597mt. F_{MSY} was considered the overfishing threshold. The Panel understood that this low F_{MSY} value was related to the very low productivity of the bottom-temperature-mediated Beverton-Holt stock-recruit relationship. The Panel discussed the importance of recognizing that this low overfishing threshold did not imply such a low threshold existed historically during a time when the productivity was and still remains understood to have been greater.

Based on this Management Track Assessment, the recommended stock status is overfished and not subject to overfishing.

TOR 5. Conduct short-term stock projections when appropriate.

This TOR was met.

The projections were made assuming a time-invariant but age-based natural mortality and maturity, and the averages of the two most recent years for selectivity and weights at age. Recruitment was projected as the 2010-and-forward Beverton Holt relationships, which was informed by the corresponding temperature change. The Panel and assessment team discussed the possibility of projecting forward bottom temperatures, and suggested this was a possible research recommendation.

TOR 6. Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

This TOR was met.

The previous research recommendations included (i) improved biological sampling, (ii) confirming assumptions regarding the current productivity conditions, (iii) exploring projecting environmental covariates into the future, and (iv) continued exploration of the environment on other population dynamic processes. The Panel understood that the exceptionally low landings made (i) challenging, and that the 2024 research track assessment used a change-point analysis to address (ii). The panel agreed that recommendations (iii-iv) would be interesting and suggested they be considered in the future, along with these additional recommendations:

- Develop best practices for assessing if or under what conditions multiple random effects (e.g., NAA, recruitment, selectivity) could potentially obscure inferences regarding relative effect of fishery and/or environment on stock.
- Consider using forecasted bottom temperature as input to recruitment used in projections.

Southern New England/Mid-Atlantic Yellowtail Flounder

Summary

The Panel concluded that the 2025 Management Track Assessment for Southern New England/Mid-Atlantic (SNEMA) Yellowtail Flounder met all the TORs and represented the BSIA for this stock. This management track updated the 2024 research track WHAM model with minor model changes and with additional years of

data. The model changes included turning off lognormal adjustments (following best practice) and removing IID random effects on fleet selectivity to improve convergence, and the panel considered these changes appropriate and well-justified. The model used recruitment informed by an environmental index (Gulf Stream Index; GSI) and the panel discussed how this approach might be explored in future assessments to consider environmental forecasting. The Panel discussed the recruitment approaches used in the projections, and specifically the possible consequences of using a long-term mean estimated recruitment that was environmentally modified, particularly in the context of a stock that appeared to have transitioned to a much lower productivity state.

TOR 1. Estimate catch from all sources including landings and discards.

This TOR was met.

The assessment updated the catch data used to 1973-2024, and there were no major changes in approaches to handling catch, including landings and discards, between the 2024 Research Track assessment and this 2025 Management track assessment. The Panel discussed the lack of weight-at-age samples in recent years, which the assessment team indicated was due to lack of fish sampled, and that accordingly the 2019 weight-at-age data were used for 2020-2024.

TOR 2. Evaluate indices used in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, etc.).

This TOR was met.

The assessment model incorporated the three NEFSC trawl surveys. The spring and fall surveys were updated to 2024, while the winter survey remains useful for the intermediate years when it was conducted. The Panel discussed the possibility that the index will eventually return “true” zeros owing to very few SNEMA Yellowtail Flounder being encountered by the sampling gear. The assessment team is aware of this concern and is considering options for incorporating these into the model.

TOR 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

This TOR was met.

The Panel discussed the changes in the estimated exploitation between this current management track assessment and the previous management track assessment in 2022. The Panel understood that these changes were driven by the many changes between the model used for the 2022 management track and the 2024 research track, as well as the additional data and slight changes between the 2024 research track model and the current 2025 management track. The Panel noted differentiating between these changes and their effects on model output—particularly changes from the 2024 research track to the 2025 management track—was important and not always easy to identify. Changes from the 2024 research track to the 2025 management track included removing the IID random effects on selectivity and turning off lognormal adjustment.

TOR 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.).

This TOR was met.

The Panel understood that the methodology used for the BRP's was consistent with the approaches reviewed and approved from the 2024 Research Track Assessment. The assessment team indicated that while there was not a specific change-by-change documentation of the BRP consequences, changes in natural mortality and selectivity were influential. The Panel discussed how understanding the general extents to which

reference points changes were owing to the changed model platform/structure (2022 management track to 2024 research track) versus changes from the 2024 research track to 2025 management track would be helpful for reviewing the 2025 management track. The Panel noted that the weight-at-age, which has changed over the last decade, would theoretically be influential in the BRP's, but that this vector has not been updated since 2019 owing to lack of sampling.

Based on this Management Track Assessment, the recommended stock status is overfished and not subject to overfishing.

TOR 5. Conduct short-term stock projections when appropriate.

This TOR was met.

The Panel discussed how recruitment was used in the projections. The methodology used for the projections was consistent with the assessment model and BRPs. Recruitment was modeled as a deterministic component consisting of a long-term mean which was modified annually by environmental conditions (lag-1 GSI), with an annual stochastic component of a random effect. In the projections, the deterministic component includes the same long-term mean as the model, and the arithmetic mean GSI of 2012-2024. The Panel discussed that this formulation was reasonable and well-justified, and also that an unexpected environmental change (e.g., a persisting decrease in GSI) might cause recruitment to be estimated and/or projected at greater levels than were biologically likely if the spawning stock remained at exceptionally low levels. This is possible because the modeled and projected recruitment is decoupled from current spawning stock (i.e. not driven by a stock-recruit function) but connected to the environment. The panel suggested that research on this might be considered, especially if the projections research track were re-started.

TOR 6. Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

This TOR was met.

The panel considered the progress of past research recommendations to be appropriate. The Panel suggested future research consider:

- Approaches for WHAM handling “true” zeros in fleet landings or survey indices, which is relevant for a stock thought to exist at such low population levels
- Consider forecasting the environmental index (GSI) used to inform recruitment as opposed to carrying forward the mean
- Consider assessing the possibility that recruitment modeled and projected as an environmentally modified long-term mean might yield unrealistic predictions should an unexpected environmental change occur (in this case, a decreased GSI) while the stock remains at very low levels. The Panel understood that the assessment team tested modeling environmentally dependent stock-recruit functions, and that these were problematic for model convergence. The panel discussed whether future work could explore this further, including focusing random effects on components of stock recruitment (e.g., alpha or beta parameters of the Beverton-Holt).

Level 3 – Enhanced Reviews

Acadian Redfish

Summary

The Panel concluded that the 2025 Management Track Assessment for Acadian Redfish met all the TORs and represented the BSIA for this stock.

The most important change from previous management tracks was the bridging from ASAP (Age Structured Assessment Program; an assessment model that is structurally simpler than WHAM and offers no option to estimate random effects) to an ASAP-like WHAM model with modifications following the implementation of the redfish assessment in WHAM as a case study in the 2023 State Space research track assessment. The switch in model structure included changing the starting year from 1913 to 1963, switching the selectivity from logistic to age-specific, changing the likelihood of age compositions from multinomial to logistic-normal, and changing the recruitment model from a Beverton-Holt-based approach to a mean recruitment with an Auto-Regressive first order (AR1) random effect. The projection of recruitment is based on the estimated mean recruitment from the assessment model. These changes were well described and justified.

TOR 1. Estimate catch from all sources including landings and discards.

This TOR was met.

The Panel discussed the low catch period from 1990 to 2010 and the related management policy changes. According to the meeting participants, there were changes in minimum mesh size regulations and spatial closures beginning in the mid-1990s. These changes indicated possible shifts in selectivity in the past. Ageing remains incomplete for some years, creating gaps in the catch-at-age matrix used. Length-frequency data for these missing years are available but not used because of the WHAM setup; they might be presented and considered in the future either by completing ageing or by incorporating length-frequency modeling into the redfish WHAM model.

TOR 2. Evaluate indices used in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, etc.).

This TOR was met.

The Panel discussed the potential range changes and differences in the survey trends. The differences between spring and fall survey indices are hard to explain, but possibly because of movement between U.S. and Canada waters. The same weight-at-age matrix was used for the catch fleet, Spawning Stock Biomass (SSB) estimation and projection. There are obvious sex-specific differences in growth for Acadian redfish, which suggest that future assessment may consider their differences in catch and SSB. The length and weight-at-age changes from catch and survey over time are suggested for the future.

This species showed variations in productivity in the past based on the assessment model, which further suggests that examining the changes in maturity and growth over time is valuable and should be considered both in the assessment data and in future projections. Such information, derived from state surveys, is also recommended if available. The panel also recommended looking into the influence of environmental and spatial-temporal factors on redfish survey abundance.

TOR 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

This TOR was met.

The assessment team explained the background, the previous model, the bridging models, and the new base run step by step, with a clear rationale for model selection. The Panel agreed with the assessment team's decision to limit the scope of structural model changes implemented within this management track that produced a model built in WHAM with assumptions facilitating comparisons to previous models developed in ASAP. Following the bridging period, the assessment team may explore other options that could better explain the data.

The Panel discussed:

- Sensitivity runs could be conducted to further examine the influence of the starting year in the model. Though the start year of 1963 appears to be in the middle of a period of greater catch, this is the first year for which survey data was available (age composition data was not available until 1969), and so the Panel found this start year justifiable. The Panel discussed that inclusion of the earlier years could be useful for exploring potential changes in productivity, while also recognizing that the sequence of model runs seemed to suggest the changed start year did not greatly alter model results.
- Selectivity time blocks as an option in the future. The Panel suggested future work could consider increasing the age of the plus age group in selectivity for both the fishery fleet and surveys due to the abrupt changes in selectivity between the plus group and the one-year-younger group.
- Future research should assess alternative models in natural mortality (M), including time-varying M. Some panel members recommended exploring this earlier in the modeling process, i.e., before adding a random effect in NAA to prevent confounding.
- The lack of fit to the most recent fall survey indices. The Panel noted that the fit to the spring index was reasonably good in recent years and the Panel and

assessment team agreed that future modeling that included adding NAA random effects could improve fit and/or decrease the retrospective issues.

- The influence of treating zeros as pooled versus missing, and the likelihood functions of age compositions, on how they may affect the AICs and the interpretation of the estimated numbers (N) and F.
- The value of developing models that include sex-specific growth, maturity, and potential selectivity, particularly when using age-specific selectivity.

TOR 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.).

This TOR was met.

The discussion focused on the recruitment (R) modeling and the estimated productivity changes over time. The new assessment model has an R submodel that is a mean with an AR1 random effect, compared with the past one, which was a BH model. The BRPs are then changed to F_{msy} and SSB_{msy} proxy based on $F_{50\%}$. The Panel discussed the options for formulating recruitment as used in the BRPs and projections—specifically that since recruitment is modeled as an AR1 process around a mean, it is possible to use either the mean recruitment estimated by the model or the mean of the individual realized recruitment events over the time series. The assessment team opted for the latter and used this consistently through the BRPs and projections. The Panel discussed the concern that because the model estimated mean recruitment and the mean of the realized recruitment were slightly different, using the mean of the realized recruitment with the AR1 process in the projections might create a disconnect between the recruitment process in the model and the recruitment process in the projections; the projections would essentially be reverting back to a different mean. The Panel agreed that what was done was acceptable, given the justification of trying to maintain consistency with the previously approved approach, and the assessment team agreed that future work could assess best approaches for how recruitment is handled in the reference point calculations and short-term projections. There was a retrospective pattern but the stock status is robust with and without the rho adjustment, and the Panel understood the retrospective pattern likely persisted owing to the assessment team's well-justified approach of using the WHAM platform in a manner most consistent with the previous ASAP management track. The panel understood that the retrospective pattern would likely not persist once NAA random effects were added.

Based on this Management Track Assessment, the recommended stock status is not overfished and the stock is not subject to overfishing.

TOR 5. Conduct short-term stock projections when appropriate.

This TOR was met.

The Panel discussed again options for handling recruitment in the projections, and noted that the recruitment used in the projections aligned with that in BRPs. The panel also recognized the value of the comparison of past inter-assessment estimated SSB and the bias in the projections. Finally the Panel discussed at great length the challenge that (1) NEFSC guidance indicated a retrospective adjustment should be applied to stock status and projections, as the rho-adjusted terminal year estimates of SSB and F were outside the 90% confidence intervals of the unadjusted values, and (2) that the projections were not adjusted (rho-adjusted) for this pattern. The Panel understood that the assessment team did not readily have a sound and implementable approach for applying a retrospective adjustment in the projections within the WHAM framework. The Panel accepted the projection without rho adjustment because the retrospective pattern was not severe, with the estimates of rho being within the bounds recommended as acceptable by other authorities (e.g., ICES 2020), the adjustment does not alter stock status, and the un-adjusted projections represented a reasonable upper-bound from which the PDT, SSC, and finally the Council could provide catch advice accounting for other concerns.

TOR 6. Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

This TOR was met.

The Panel discussed the bridging steps from ASAP to ASAP-like WHAM and potential future model improvements through alternative model structure and functions on selectivity, maturity, growth, and random effects in NAA. The Panel also endorsed the recommendations that were not accomplished by this management track assessment. Additionally, the Panel discussed the future Research Track, which is currently paused.

The panel recommended that future research track assessments should:

- Re-evaluate assumptions and functions in the model, including natural mortality, selectivity time blocks or changes, maturity, and WAA variation over time and between males and females.

- Explore treating NAA with random effects and evaluate it as a potential approach to reduce retrospective patterns in this assessment, as proposed by the assessment team.
- Use the length-frequency data for the years with age gaps and continue the ageing.
- Evaluate the surveys used in the assessment and how they are handled. Specifically, examine the environmental and spatial-temporal factors affecting redfish distribution, and whether there was spatial heterogeneity in the temporal variation.
- Endorse the previous suggestion that “a genetic study and/or tagging study be conducted to investigate transboundary stock movements, but initial explorations could look for signals in age frequencies or Canadian Survey data”.
- Conduct post-hoc stock-recruitment analyses with either Beverton-Holt or Ricker models.
- Consider evidence for time-varying changes in productivity.

White Hake

Summary

The Panel concluded that the 2025 Management Track Assessment for White Hake met all the TORs and represented the BSIA for this stock. The most important change to this assessment was the addition of the Bottom Long Line Survey (BLLS) index of white hake. This change was well described and its effect on the assessment outputs was evaluated.

TOR 1. Estimate catch from all sources including landings and discards.

This TOR was met.

The Panel discussed changes in the estimated catch at age since the last assessment. Incorporation of the BLLS provides more information about the age composition of larger white hake. There was discussion of the age-length keys used in years with length-composition data but no age composition. Since no age composition data were available prior to 1989, a pooled age-length key was applied to the catch for those years.

The apparent change in age composition since 2010 was noted, resulting in discussion of whether this represents a change in selectivity or the availability of younger fish? To answer this question, the Panel suggested comparing the age composition of the survey data and considering declining recruitment patterns in the recent period.

TOR 2. Evaluate indices used in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, etc.).

This TOR was satisfactorily addressed.

The Panel supported the addition of the Bottom Long Line Survey (BLLS). The spatial footprint of the BLLS is consistent with the survey strata that are used from the bottom trawl survey as well as the statistical areas containing the bulk of the catch. Abundance trends in the BLLS over the past 10 years are consistent with those in the bottom trawl and shrimp surveys. The time series average of positive occurrence of white hake in the BLLS is 82% in the fall survey and 54% in the spring. Output of the assessment model indicates that the BLLS has a higher catchability for white hake than the bottom trawl or shrimp surveys.

The ASMFC shrimp survey was retained in the assessment because its inclusion resulted in smaller Mohn's rho values. The Panel felt that ASAP was able to account for differences in the age selectivity and catchability of the five surveys. Given that there are now five surveys with differing time spans, selectivities and seasonal timing, the panel suggested that a spatio-temporal model of white hake in the Gulf of Maine could be investigated.

TOR 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

This TOR was satisfactorily addressed.

The existing ASAP model was updated with three new years of data.

The stock assessment lead provided a table explaining the sequence of bridge runs that led to the accepted baseline model. The maximum gradient was one criterion used for model selection; it was unclear from the table of bridge runs which model parameter resulted in the maximum gradient. Adding both the spring and fall BLLS improved the

model performance more than just adding the fall BLLS alone. Specifically, the Mohn's rho decreased in the model with both spring and fall indices.

The Panel discussed the change in scale between the 2022 and 2025 assessments. After comparing the bridge runs (Model 001 and 005), it was concluded that the change in scale resulted primarily from the addition of three years of data, not the addition of new survey indices (BLLS).

The Panel questioned why the retrospective pattern increased (historical and within-model) with the new years of data? The model is attempting to fit the recent drop in abundance so it needs to change the past year estimates to do so. There is a decline in catch long-term but recently we see a decline in indices, so the model creates a retrospective effect to address that tension. **The Panel recommended** some retrospective pattern research, specifically with respect to M, growth, maturity changes around during the 1990s.

There was continued discussion regarding the merits of including a third selectivity block for the commercial fishery starting in 2010, which was the start of the sector system. The model diagnostics of Run 6 with the additional selectivity block were similar to those of the base run, but Mohn's rhos were much higher. All the model runs and surveys indicate declining recruitment since 2010, suggesting that the changes in age composition are due more to availability than selectivity.

TOR 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.).

This TOR was satisfactorily addressed.

In this assessment maturity is held constant at the time-series mean. The Panel noted that the rebuilding target (proxy SSB_{msy}) was calculated based on the full recruitment time series (1963-2022) following the SAW56 protocol. Given the apparent decline in productivity, this rebuilding target may be difficult to achieve.

The new assessment did not change the stock status. The white hake stock is not overfished and overfishing is not occurring. Stock biomass is above the overfished threshold but remains below the rebuilding target.

TOR 5. Conduct short-term stock projections when appropriate.

This TOR was satisfactorily addressed.

There was lengthy discussion about the inconsistency between the recruitment windows used for short and long-term projections. Specifically, the assessment lead asked for a recommendation on whether to continue with the SAW56 methodology or adopt a lognormal recruitment model with temporal autocorrelation (AR1). The Panel listed the strengths and weaknesses of each approach before reaching a decision.

SAW56 (current approach)

Weaknesses:

There was no clear break in the timeseries to define recruitment windows. Recruitment per se is not a measure of productivity because low recruitment can result from low SSB or low survival per unit SSB. Per-capita recruitment (e.g. R/SSB) is a better measure of productivity.

The SAW56 approach holds recruitment at a lower level than the full time series but actually higher than the most recent recruitment estimates.

Strengths:

The shorter recruitment window recognizes the decline in productivity and may be appropriate for short-term projections.

Autocorrelated recruitment model (AR1)

Weaknesses:

This model assumes a stationary process that is inconsistent with observed declines in productivity. Over time, recruitment is expected to revert to the long-term mean, which may be unrealistic and provide overly optimistic catch advice.

There was some concern about the actual correlation coefficient used. There was little information provided on the strength of the AR1 process that was being assumed. Although step changes in productivity were not detected, continuous changes in productivity have been detected with dynamic recruitment models (Collie 2023).

Strengths:

The AR1 approach makes the short-term projections consistent with the long-term projections.

Starting the projections from a negative recruitment deviation provides a more realistic short-term projection than starting from a time series mean.

The AR1 model did not provide a sufficient enough improvement and had substantial enough drawbacks to prevent wholly pivoting to this approach. In conclusion, the

SAW56 approach is sufficient for providing short-term management advice. The Panel's willingness to use the SAW56 approach should not be taken as a full endorsement of it; rather it did not believe the AR1 model to be the ideal approach going forward.

Other projection approaches could be used but they were not considered in this assessment. For example, changing productivity could be treated as a continuous process (Collie 2023) as opposed to a step function. The Panel was not overly concerned about using the recent recruitment window for short-projections; it was more concerned about whether the SSB rebuilding target is attainable. Therefore, the Panel recommended retaining the SAW 56 protocol until an acceptable approach is evaluated and adopted.

Research recommendation: use objective approaches to evaluate the performance of the different projection approaches, including SAW56, AR1 (Cadrin 2023), and dynamic recruitment models (Collie 2023). This evaluation would include calculating the prediction error variance of the different approaches. What is the forecast gain associated with switching from one approach to another?

In the context of short-term projections, the Panel noted that white hake has a high socio-economic value. Given the high utilization rate of the ACL, it could constrain the catches of other species in a mixed-species fishery.

TOR 6. Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

This TOR was satisfactorily addressed.

Research recommendations from the previous assessment were addressed and new recommendations were added to each ToR above.

Georges Bank Winter Flounder

Summary

The Panel concluded that the 2025 Management Track Assessment for Georges Bank Winter Flounder met all the TORs and represented the BSIA for this stock. This assessment updated and refined the WHAM model approved during the 2024 State Space Research Track Assessment. The most impactful change to this assessment was the revision of the historical catch time-series, which corrected a mistake in the input data used for the previous Management Track assessments. The lower time-series of removals for 1982-2003 resulted in lower estimates of SSB and

recruitment for all years, while F was lower during the revised period and higher afterwards compared to using the catch data from previous Management Track assessments. The lower estimates of recruitment also resulted in a lower SSB_{MSY} proxy. Other changes were decoupling the recruitment random effects from the numbers-at-age random effects for ages-2+, as recommended by the 2024 Research Track Peer Review Panel, and adding two additional years of data. These changes had a negligible effect on estimates of SSB , F , and stock status.

TOR 1. Estimate catch from all sources including landings and discards.

This TOR was met.

During the transition of the Georges Bank Winter Flounder assessment model from the VPA to the WHAM platform, it was discovered that the total catch used in the VPA was significantly higher than the total catch reported in the 2022 Management Track assessment report and the total catch derived from the NEFSC databases of landings and discards for 1982-2003. Estimates of total removals from the NEFSC databases were 42%-49% lower than what was used in the VPA input file for those years. From 2004 onwards, the differences were minimal, ranging from 0%-3% difference between the two datasets. The difference appeared to be caused by an error in developing the catch-at-age for the VPA in an earlier assessment where the estimates of discards from the scallop dredge were scaled incorrectly by the landings-at-age. The analytical team that investigated the issue concluded this error did not affect any other stocks beyond Georges Bank Winter Flounder. The Panel requested that some additional explanation of this issue be included in the summary report, and that the table comparing the two datasets that was part of the assessment presentation be included in the revised catch supplemental materials to better document the issue.

The Panel discussed the changes in weight-at-age over time in the port sampling. Weight-at-age declined significantly for ages 2-7+ starting in the late 2000s before increasing again around 2015, although ages 5-7+ did not return to their previous levels. This decline was believed to be a genuine signal in the data, as several other groundfish stocks showed similar patterns around the same time, although the drivers of this change are not known at this time. There was also a sharp drop in weight-at-age for ages 1 and 3-7+ in the most recent few years, while weight-at-age for age 2 increased sharply. This was believed to be a result of low sample sizes in this time period; port sampling rates have declined since 2020, and it has been difficult in recent years to obtain samples from vessels that have fished only in the Georges Bank stock area.

The Panel recommended that additional work to understand the changes in weight-at-age be conducted as part of a larger investigation into the environmental

drivers of population dynamics for winter flounder for the next assessment. In addition, the Panel recommended that survey weight-at-age should be explored to verify the trends in weight-at-age seen in the port samples and potentially to supplement port sampling for the stock and/or catch weight-at-age matrix.

TOR 2. Evaluate indices used in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, etc.).

This TOR was met.

The Panel noted that the indices (the NEFSC Spring and Fall Bottom Trawl indices and the Canada DFO Spring Bottom Trawl index) were noisy – showing both high interannual variability and frequent years with high CVs – and not fully consistent with each other. The NEFSC surveys showed similar patterns of decreasing in the early 1980s, the early 2000s and the mid-2010s, each followed by an increasing trend, although the degree of contrast in the changes varied across the two surveys. However, the DFO survey showed a period of variable but high abundance from 1985-2005 followed by a period of lower abundance from 2006 to the present. All three surveys showed an expansion of the age structure from the late 2000s to the mid-2010s.

There is currently no explanation for the differences in trends across surveys. The Panel suggested that the expanding age structure in the DFO survey despite the low, flat total index during this time could indicate a change in availability of winter flounder to this survey, but more work is needed to address this issue. The Panel recommended that the next assessment explore model-based approaches for standardizing the indices, both spatial and non-spatial, to determine if differences in trends could be driven by differences in availability or catchability. This analysis could be part of the larger investigation into environmental drivers of winter flounder population dynamics.

TOR 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

This TOR was met.

During the 2024 State Space Research Track assessment, a WHAM model for Georges Bank Winter Flounder was developed and approved for further development and use in the Management Track process. This WHAM model was based on the VPA used in previous Management Track assessments and provided generally similar results in scale and trend. For the 2025 Management Track Assessment, the approved WHAM model was updated and refined based on the Review Panel comments from the 2024 Research Track assessment. Changes included moving from the original single-region version of WHAM to the multi-region/stock version (the preferred development version), correcting the historical time-series of catch to resolve the issue noted in TOR 1, adding two new years of catch and survey data, and de-coupling the random effects on recruitment and age-2+ numbers-at-age. The analytical team did explore adding random effects to capture time-varying selectivity, but that model failed to converge.

The Panel appreciated the step-by-step approach to implementing the changes in the WHAM model, so that the effect of each change on the estimates could be understood. Moving from the single-stock version of WHAM to the multi-stock version resulted in no changes to the estimates or the diagnostics, as would be expected. Using the revised historical time-series of catch had the most significant impact on the results. The lower time-series of removals for 1982-2003 resulted in similar diagnostics but lower estimates of SSB and recruitment for all years, compared to using the 2022 Management Track catch data in the multi-WHAM framework. Estimates of F were lower during the revised period and higher afterwards.

Adding two new years of data had a minimal effect on estimates of F, SSB, and recruitment. This was consistent with the minimal retrospective pattern in the WHAM model, which was significantly improved compared to the retrospective pattern present

in the VPA used in previous Management Track assessments. The Panel discussed whether the retrospective pattern present in the previous Management Track was caused in part by the mistake in the historical catch data; the NEFSC Retrospective Work Group found that overestimating catch in the early years of the time-series would produce this kind of retrospective pattern, but the VPA models would have to be re-run with the revised data to evaluate the effect.

De-coupling the recruitment random effects from the age-2+ numbers-at-age random effects, as recommended by the 2024 Review Panel, also had a minimal effect. The Panel noted that the deviations around recruitment showed significantly more contrast than the deviations around the numbers-at-age for age-2+ for both the coupled and decoupled models, meaning estimates of recruitment deviated from the mean more than estimates of abundance-at-age deviated from what would be predicted from our deterministic estimate based on our understanding of M-at-age and F-at-age. The Panel considered that this is generally expected. The Panel discussed whether state-space models like WHAM can distinguish between variability in recruitment and variability in survival from year-to-year. For a stock like Georges Bank Winter Flounder, where age-1 and age-2 fish are captured by the surveys, it will be easier for the model to make that distinction than models where external information on recruitment is more limited or non-existent.

Time-varying selectivity was explored by turning on random effects on selectivity, but the models did not converge. The Panel recommended that a simpler approach like adding selectivity blocks should be explored in the next Management Track assessment, given the significant changes in regulations for the groundfish fishery over the time-series.

SSB showed an increasing trend since a time-series low in 2017. Fishing mortality has generally shown a decreasing trend over the time-series but ticked up slightly in 2023 and 2024. Recruitment also continued the generally increasing trend in recent years, with 2022-2024 values near the long-term time-series mean.

TOR 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.).

This TOR was met.

This assessment used the same approach to reference points used in the 2024 Research Track assessment, only updating the 5-year averages of weight- and maturity-at-age.

The estimate of the FMSY proxy (F40%SPR) for the 2025 Management Track Assessment was very similar to the estimate from the 2022 Management Track Assessment. The Panel noted that the time-varying estimates of the FSPR reference points were trending higher in recent years, which was likely due to the lower weights-at-age in recent years. Estimates of the SSBMSY proxy were lower for the 2025 Management Track Assessment than for the 2022 Management Track due to the lower mean recruitment over the time-series caused by the revision of the historical catch data.

Stock status has not changed since the 2022 Management Track Assessment: Georges Bank Winter Flounder was not overfished and not experiencing overfishing in 2024.

The Panel noted that interpretation of the required plots in the assessment report (i.e., Figures 1 and 2) that compare the results of the current and previous assessments are challenging to interpret when there has been a change in modeling platform or other substantial changes in modeling configuration, such that plotted BRPs from the current assessment do not apply to the results of the previous assessment. For instance, the estimate of SSB in 2021 from the 2022 Management Track Assessment was above the biomass target from the 2025 Management Track Assessment, but that is because the updated biomass target is lower than the target from the 2022 Management Track Assessment. The 2022 Management Track Assessment found that SSB in 2021 was between the biomass target and the biomass threshold as estimated for that assessment, which is consistent with the findings of this assessment.

Spawning stock biomass (SSB) has continued to increase since the terminal year of the 2022 Management Track, and in 2024, SSB was above both the target and the threshold.

The difficulty of comparing across assessments is noted in the caption of Table 2, and the Panel recommended that similar text be added to the captions for these figures. The Panel also recommended that the calculation of weight-at-age for the reference points be reconsidered during the next Management Track Assessment to reduce the noise caused by the low sample sizes in recent years. Potential approaches could include pooling data across years instead of averaging, using an autoregressive approach to smooth variability across years or into the future, and/or incorporating survey weight-at-age data into the SSB weight-at-age matrices.

Based on this Management Track Assessment, the recommended stock status for Georges Bank Winter Flounder is not overfished and not subject to overfishing.

TOR 5. Conduct short-term stock projections when appropriate.

This TOR was met.

The Panel recommended clarifying in the assessment report that recruitment was modeled as an autocorrelated process in the projections, meaning that recruitment in the projections will start out close to the recruitment in the terminal year of the assessment model and revert over time to the long-term mean recruitment as calculated from the model estimated recruitment for the full time-series. This was the method approved during the 2024 Research Track assessment, which was slightly different from how projections were done for the 2022 Management Track, where median recruitment in the projections would start at the long-term median in the first year. This process was also applied to numbers-at-age random effects, so that the recent deviations in survival would be carried through to the projections, but over time, the deviations would trend to zero and numbers-at-age would be projected deterministically.

For Georges Bank Winter Flounder, the deviations from mean recruitment and deterministic abundance-at-age were near zero in the terminal year of the assessment and the correlations across years were weak, so recruitment returned to the mean and abundance of ages-2+ returned to the deterministic trajectory relatively quickly. The Panel discussed this issue and noted that the NAA deviation figures as presented did not visually represent this process clearly, and it was not clear from the figure label or the initial discussion what the “deviations” in the figure actually represented. As clarified by the analytical team, this approach was appropriate and acceptable, but the Panel recommended considering additional and/or alternative figures that more clearly demonstrated the processes used, especially considering how this information is conveyed in the standard output plots and in reports for public consumption.

TOR 6. Respond to any review panel comments or SSC concerns from the most recent prior research or management track assessment.

This TOR was met.

The recommendation to move the Georges Bank Winter Flounder assessment out of the VPA framework and into WHAM was fully addressed with the 2024 State Space Research Track and 2025 Management Track Assessments. This switch also made the recommendation to explore the source of the retrospective pattern and recent poor

recruitment moot, as the current model has a minimal retrospective pattern and recruitment in recent years has been near or above the long-term average.

Similarly, the move to WHAM has lowered the priority of the recommendation on improving the calibration coefficients for winter flounder, although there could still be some benefit to exploring this for a back-up assessment approach.

Work on environmental drivers of population dynamics for winter flounder is ongoing at the University of Maine but was not ready to be incorporated into this assessment.

Biological sampling levels remain low.

The Panel agreed that the previous recommendations on improving biological sampling levels and exploring environmental drivers were high priority research recommendations, and recommended that they be carried forward and addressed for the next Research or Management Track Assessment.

The Panel had other research recommendations related to TOR 1-5, which are described in the sections above; high priority recommendations from those TORs included:

- Analyzing the survey weight-at-age to verify the trends in weight-at-age seen in the port samples
- Exploring time-varying selectivity through simpler approaches like selectivity blocks
- Considering different approaches to estimate weight-at-age for reference points and projections, given the recent low sample size, including different ways to calculate the average and incorporating survey weight-at-age data
- Exploring model-based approaches for standardizing the indices, both spatial and non-spatial, to understand potential changes in availability or catchability over time; this could also contribute to the work on environmental drivers affecting stock dynamics

References

ICES. 2020. Workshop on Catch Forecast from Biased Assessments (WKFORBIAS; outputs from 2019 meeting). ICES Scientific Reports. 2:28. 38 pp. <http://doi.org/10.17895/ices.pub.5997>

Appendix A. Summary of May Assessment Oversight Panel Meeting for September 2025 Management Track Stock Assessments

The Northeast Region Coordinating Council (NRCC) Assessment Oversight Panel (AOP) met on May 22, 2025 to review the Management Track Assessment plans for Acadian Redfish, White Hake, Winter Flounder (Georges Bank, Gulf of Maine, and Southern New England/Mid-Atlantic stocks), and Yellowtail Flounder (Cape Cod/Gulf of Maine, Georges Bank, and Southern New England/Mid-Atlantic stocks). An additional Management Track Assessment scheduled for September, for Atlantic Mackerel, was previously discussed at the AOP in February 2025; plans for the Mackerel assessment remain unchanged and the discussion did not need to be revisited. The NRCC has removed Management Track Assessments for Atlantic Wolffish, Monkfish, Ocean Pout, Skates, and Windowpane Flounder previously from the September 2025 schedule; data updates including aggregate U.S. catch and Northeast Fisheries Science Center (NEFSC) survey indices will be provided to the New England Fishery Management Council (NEFMC) to support catch specifications and other management actions. No discussion for these data updates was required at the AOP meeting.

The assessments for Winter Flounder – Gulf of Maine, Winter Flounder – Southern New England/Mid-Atlantic, Yellowtail Flounder – Cape Cod/Gulf of Maine, and Yellowtail Flounder – Southern New England/Mid-Atlantic were recommended for Level 1 Review (Direct Delivery); these assessments will undergo internal review at the NEFSC before being delivered to the NEFMC. The remaining assessments were recommended for Level 2 and 3 peer reviews and will be reviewed during meetings scheduled for September 15-19, 2025.

Assessment Oversight Panel Members

- Kristan Blackhart (Chair), Northeast Fisheries Science Center, Woods Hole, Massachusetts
- Richard Merrick, Ph.D., NOAA Fisheries (retired), representing the Atlantic States Marine Fisheries Commission (ASMFC)
- Lisa Kerr, Ph.D., University of Maine, Chair of the New England Fishery Management Council (NEFMC) Scientific and Statistical Committee
- Paul Rago, Ph.D., NOAA Fisheries (retired), Chair of the MAFMC Scientific and Statistical Committee

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 plan for their Management Track Assessment. The plan 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 should their analytical assessment be rejected during 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
Acadian Redfish	Brian Linton	Level 3	Rationale: ASAP-like WHAM bridge model developed/accepted during 2024 Applying State Space Models RT – will be the first application of WHAM for redfish in MT; conservative approach will leave moving to full state space for the next MT iteration to focus on base WHAM configuration – planning on a variety of evaluations to improve model fits, including using different assessment starting year, alternative fishery/survey age composition likelihood distributions, alternative recruitment models, alternative NAA-in-first-year models, and using age-specific fishery/survey selectivity parameters; will update existing data series through 2024 and include new years of historic age composition data; backup Ismooth if WHAM adjustments fail
White Hake	Chuck Adams	Level 3	Rationale: Existing ASAP model; planning to re-age catch using a combined BTS/BLLS age-length key; investigate adding selectivity block starting in 2010, adding BLLS, dropping ASMFC shrimp index; sensitivity projections that assume long-term distribution of recruitment with autocorrelation; backup Ismooth

Stock	Assessment Lead	Review Level	Rationale and Comments
Winter Flounder – Georges Bank	Alex Hansell	Level 3	Rationale: Case study model developed during Applying State Space Models RT included numbers-at-age random effects – will be the first application of WHAM for this stock in MT; update all existing data, no new data series; explore alternative model configurations that may lead to improved diagnostics; backup approach LOESS smooth of spring/fall NEFSC surveys
Winter Flounder – Gulf of Maine	Paul Nitschke	Level 1	Rationale: Area-swept methods (Plan B from SARC 52); no new sources of information; no changes to existing methods; plan to update average q with new survey info (small expected change); no changes to BRPs; simple, straightforward update
Winter Flounder – Southern New England/ Mid-Atlantic	Tony Wood	Level 1	Rationale: Existing ASAP model; no new sources of information; no changes to existing methods; backup Ismooth; Level 1 conditional – lead to flag for elevated review ASAP if major changes to the model or retrospective adjustments are required based on updated data
Yellowtail Flounder – Cape Cod/Gulf of Maine	Larry Alade	Level 1	Rationale: New WHAM model accepted at RT peer review in late 2024; update existing time series through 2024; use RT model configuration with no changes to methods; explore decoupling recruitment (minor change); backup is empirical approach; disagreement among AOP regarding need for external peer review, but ultimately no justification for elevated review could be offered within NRCC Assessment Process
Yellowtail Flounder – Georges Bank	Alex Hansell	Level 2	Rationale: New WHAM model accepted at RT peer review in late 2024; update existing time series through 2024; use RT model configuration with no changes to methods; changing from unknown stock status under previous assessment methods (The Limiter) to known status with this new MT; backup is The Limiter
Yellowtail Flounder – Southern New England/	Cameron Hodgdon	Level 1	Rationale: New WHAM model accepted at RT peer review in late 2024; update existing time series through 2024; use RT model configuration with no changes to methods; explore lognormal adjustment setting (was on during RT; anticipated to be a minor change); backup

Stock	Assessment Lead	Review Level	Rationale and Comments
Mid-Atlantic			modified limiter approach; disagreement among AOP regarding need for external peer review, but ultimately no justification for elevated review could be offered within NRCC Assessment process; Level 1 conditional – lead to flag for elevated review ASAP if there are indications that changes to the lognormal adjustment setting are more than minimal (i.e. larger than the confidence limits of the base estimate)

Individual Stock Discussion Summaries

Acadian Redfish (AOP Lead: Lisa Kerr)
Recommendation: Level 3

The assessment model for this Management Track originates from the 2024 State Space Models Research Track (SSRT), where an ASAP-like implementation of the Woods Hole Assessment Model (WHAM) was developed and formally accepted for advancement and use in future Management Tracks. This WHAM configuration represents a bridge from the previous ASAP model used in the 2023 Management Track and will be applied for the first time in a Management Track. The model extends back to 1913 and includes one fishery fleet (commercial landings and discards) with one selectivity block and two trawl survey indices (NEFSC fall and spring). The current status is not overfished and overfishing is not occurring.

The assessment lead proposed a Level 3 Enhanced Review for this stock. The proposed Management Track work will include: 1) update of fishery independent and dependent data through 2024, 2) new years of historic age composition data, 3) treatment of the 2023 NEFSC spring survey index as missing data, 3) evaluation of some of the existing WHAM configurations (e.g., start year of 1963 vs. 1913), 4) evaluation alternative fishery and survey age composition likelihood distributions, 5) evaluation of alternative recruitment models, 6) evaluation of alternative NAA-in-first-year models, and 7) evaluation of use of age-specific fishery and survey selectivity parameters. Biological reference points will be updated using WHAM per-recruit-based approach with SPR target of 50% and projections will be performed assuming catch in 2025 is equal to the estimated 2025 catch provided by the NEFMC Groundfish Plan Development Team. The proposed back-up assessment for Acadian redfish is an Ismooth model.

The assessment lead recommended a Level 3 - Enhanced Review due to the use of a new modeling framework for a case study stock developed in the SSRT. The AOP supports the transition to the WHAM model platform for Acadian Redfish and the updates and explorations proposed by the assessment lead. The AOP agreed with the recommended **Level 3 - Enhanced Review** for this stock given the extensive changes proposed and supported the outline of work

for this stock.

White Hake (AOP Lead: Lisa Kerr)

Recommendation: Level 3

White Hake is currently assessed using the ASAP model which was accepted in 2013 at SAW 56 and was last updated in 2022. The model extends back to 1963 and includes one fishery fleet (commercial landings and discards) with two selectivity blocks and three trawl survey indices (NEFSC fall and spring and ASMFC shrimp survey). Catch at age information is not well characterized for this stock due to possible misidentification of species in the commercial and observer data, particularly in early years, low sampling of commercial landings in some years, and sparse discard length data. Pooled age length keys (ALKs) have been used during periods with deficient age data. The current status is not overfished and overfishing is not occurring.

The assessment lead proposed a Level 3 Enhanced Review for this stock. The management track assessment will update all fishery and survey data through 2024. In addition, changes to the indices of abundance will be considered in the management track. The current ASAP model configuration will be used with the following changes and explorations: 1) re-estimation of age of catch with age-length key based on combination of data from the bottom trawl and bottom long line surveys, 2) addition of selectivity block in 2010, 3) addition of bottom long line survey index, and 3) removal of ASMFC shrimp index. Biological reference points will be updated using the approach prescribed through SAW 56 and projections will be performed assuming catch in 2025 is equal to the estimated 2025 catch provided by the NEFMC Groundfish Plan Development Team. Sensitivity projections will be done that assume the long-term (1963–2024) distribution of recruitment with autocorrelation. The AOP suggested future work to evaluate potential changes in weight-at-age over time and the treatment of recruitment in projections and noted contracted work on this topic by the NEFMC. The alternative assessment plan is Ismooth using NEFSC spring & fall survey indices.

This management track assessment will involve substantial changes, including the potential inclusion of a new survey index and removal of an existing index. The AOP agreed with the assessment lead's suggestion of a **Level 3 – Enhanced Review** for this stock.

Winter Flounder – Georges Bank (AOP Lead: Paul Rago)

Recommendation: Level 3

The assessment of this stock currently relies on a VPA accepted at SARC 52 in 2011 and was last updated at a Management Track (MT) in 2022. A strong retrospective pattern was present which required rho adjustment of both fishing mortality and spawning stock biomass (SSB). The stock is not overfished (65% of the SSB_{MSY} proxy) and overfishing is not occurring (17% of the F_{MSY} proxy). A Research Track for all three Winter Flounder stocks was underway but had to be postponed due to recent staffing changes and future funding uncertainty.

For the upcoming MT the model will be implemented in the state space model WHAM using the formulation developed at the February 2024 Research Track (RT) on state-space models. Survey and catch data through 2024 will be updated. Port sampling rates in 2023 and 2024 were above recent averages, so no problems of insufficient age samples are anticipated. The process of model identification will be based on methods developed at the State Space RT with a focus on finding configurations with the best diagnostics. Inclusion of random effects on numbers-at-age will be considered as this was part of the model parameterized at the State-Space RT. Biological reference points will be updated and three-year projections through 2028 will be provided. Time-varying selectivity will also be considered.

The initial implementation of WHAM did not have a significant retrospective pattern. The AOP inquired about other model features including an age-based natural mortality rate, development of a stock-recruitment model, and inclusion of environmental covariates. There was general consensus that development of an acceptable WHAM model should be the first priority. Additional features should be considered at future MT assessments or at the RT if it resumes.

As in previous assessments, the backup model for this stock will be the iSmooth (loess) model.

The AOP recommended that the assessment of the Georges Bank Winter Flounder stock be reviewed at **Level 3 – Enhanced Review**.

Winter Flounder – Gulf of Maine (AOP Lead: Paul Rago)
Recommendation: Level 1

Assessments of this stock have been model resistant despite multiple attempts to apply age-based models. Much of the stock occurs nearshore and no single fishery-independent survey covers the entire stock. The current assessment is based on a modified swept area model in which information from three non-overlapping surveys are aggregated to derive biomass estimates for the stock. Estimates of catchability (q) are based on experimental studies of the effects of sweeps and wing spread on relative trawl efficiency. The response variable in each survey is the biomass of winter flounder greater than 30 cm.

No reference points for spawning stock biomass exist. Comparison of current exploitation rates but a fishing mortality rate reference point is obtained from a length-based SSB per recruit analyses. The SSB/R estimator is parameterized with $M=0.3$, a knife-edge selection at 30 cm, and current maturity and weights at length. Current exploitation, defined as the ratio of catch to the swept area biomass estimate, suggests that overfishing is not occurring.

The AOP inquired if variability of the biomass estimates was considered in the assessment process. Since 2011 this has not been included and is not currently considered as part of the catch advice. There has been no trend in the biomass indices over the period in which this assessment approach has been used to provide scientific advice. Alternative age-based analytical methods

were being investigated in the RT prior to its postponement. Under the current guidelines, a change from an index-based assessment to an analytical model is not allowed within the MT and must be done in an RT. In light of current resource constraints, this policy could be revisited by the NRCC.

In the absence of any new methods and the relative simplicity of the approach, the AOP agreed that a **Level 1 review** (direct delivery NEFMC following an NEFSC internal review) was appropriate.

Winter Flounder – Southern New England/Mid-Atlantic (AOP Lead: Richard Merrick)
Recommendation: Level 1

The most recent SNE/MA winter flounder Management Track (MT) assessment in 2022 determined that the stock was not overfished and not experiencing overfishing. The 2022 MT was conducted in ASAP (ages 1-7+, $M = 0.3$), used one fishery fleet, 3 fishery selectivity blocks, and 12 fishery independent indices (Spring/Fall/Winter NEFSC bottom trawl survey, NEAMAP/MADMF/RIDFW/CTDEP spring trawl, NJDEP Ocean/River trawl, MADMF/CTDEP YoY surveys, and URI/GSO trawl) with a terminal year generally of 2021.

The backup assessment plan applies the LOESS smoothing of NEFSC spring and fall indices.

The AOP discussed several elements of the proposed plan. The revision to reference points and recruitment stanza has made the assessment more responsive to changes in productivity. However, the changes in BRPs led to the stock being considered rebuilt. These changes challenged the SSC's ability to set the stock's ABC. Using the traditional ABC control rule for the stock would have doubled the ABC, despite the stock being near the all-time low in abundance for the time series. As a result, the NEFMC SSC had to make an ad hoc adjustment to ABC catch advice which was outside of the normal ABC control rules for the stock.

The assessment lead was asked if a stock recruitment model could be developed to test whether F_{40} remains an appropriate proxy for F_{MSY} or to adopt direct estimation of F_{MSY} . This would be considered as part of the currently postponed Research Track effort for winter flounder, but is not feasible to consider for the current MT assessment. Should the RT continue to be paused, it is possible this could be addressed in a future MT.

The assessment lead was also asked about what factors might be encountered during assessment development that would be sufficient to request an upgrade to a Level 2 review. The most obvious factor would be a significant retrospective pattern. AOP members also expressed some concern about the utility of using 12 survey indices in the assessment. The assessment lead concurred this was worth further investigation, but noted this was not included in the plan for this MT assessment.

Based on the proposal, discussion, and public comment, the AOP agreed that a **Level 1 – Direct**

Delivery was appropriate for the 2025 Southern New England Winter Flounder MT assessment.

Yellowtail Flounder – Cape Cod/Gulf of Maine (AOP Lead: Richard Merrick)

Recommendation: Level 1

The most recent CC/GoM yellowtail flounder Management Track (MT) assessment was in 2022. The stock was determined not to be overfished and was not experiencing overfishing. The 2022 MT was conducted in ASAP (ages 1-6+, age-specific M) used one fishery fleet, 2 fishery sensitivity blocks, and 6 fisheries independent indices (Spring/Fall Albatross/Bigelow NEFSC bottom trawl survey, MADMF fall survey and MeNH inshore fall survey) with a terminal year generally of 2022.

The proposed work plan for the 2025 CC/GoM yellowtail flounder MT is to update all data through 2024, using the WHAM model that was peer reviewed in the yellowtail flounder 2024 Research Track (RT) with no changes. Biological reference points will be updated using the assumptions from the 2024 RT. Projections will use WHAM with the 2025 bridge year catch provided by the NEFMC groundfish PDT for 2026-2028.

The backup assessment plan uses chain sweep-expanded biomass estimates from NEFSC spring and fall bottom trawl surveys. This approach applies a constant exploitation rate, calculated as catch divided by the mean expanded biomass from paired survey years. The stable reference period selected was 2010–2022.

Members of the AOP expressed concerns about the significant amount of change introduced to the assessment during the stock's RT peer review, namely the changes to the candidate models to use age-based M based on "biological plausibility" resulting in the adoption of new final models during the peer review panel. In particular, this change resulted in large absolute changes for this stock's Biological Reference Points, which is likely to prove challenging during SSC review and development of management advice. Several AOP members suggested some level of external review would help facilitate SSC acceptance of the assessment and add confidence to the management advice. However, the summary report from the RT peer review notes that "the new "Candidate Models" with an age-based M were carefully evaluated with comprehensive diagnostic analyses and comparisons with the outputs from the original "Candidate Model" for all three stocks" and that "the Panel agrees that the WHAM is an appropriate tool for the Yellowtail Flounder assessment". Other AOP members expressed strong concerns about "re-reviewing" previously accepted methods, given there are no changes proposed for this assessment. The AOP was not able to reach consensus on a recommendation for a review level for this stock and relied on the NRCC Assessment Process document to guide assignment. On this basis, a **Level 1 – Direct Delivery** was assigned given the assessment plan includes only simple updates to existing data series and no changes to the existing methodologies.

Yellowtail Flounder – Georges Bank (AOP Lead: Kristan Blackhart)

Recommendation: Level 2

Georges Bank Yellowtail Flounder was last assessed in 2024 as part of the Transboundary Resources Assessment Committee process using “The Limiter”. The Limiter is a data-limited assessment approach that produces annual biomass estimates from three surveys (NEFSC spring and fall bottom trawl and DFO spring bottom trawl) to recommend catch advice. No biological reference points (BRPs) are available using this approach, so status of the stock has been unknown.

The stock recently completed a Research Track (RT) assessment in late 2024 where a state space model was peer reviewed and approved for operational use. The WHAM model accepted at the RT started in 1973 for ages 1-6+; utilized age-based M; had one fishery fleet (USA and Canada) with time-varying selectivity; included three surveys (NEFSC spring/fall bottom trawl, DFO spring bottom trawl); and used a Beverton-Holt stock recruit relationship fit to bottom temperature. The plan for the 2025 Management Track (MT) is to utilize the methods approved in the RT with data series updated through 2024 and no changes to the existing methodology. MSY biological reference points will be updated using the RT methods, and projections developed through 2028 also using the RT methods. The backup plan, as approved in the RT, is The Limiter.

Because this assessment has advanced from a data-limited approach to an analytical assessment with the implementation of the RT methods in this MT and development of new BRPs, this will be a ‘change’ in status for this stock from unknown to known which requires a **Level 2 – Expedited Review**. The panel concurred with this recommendation from the assessment lead.

Yellowtail Flounder – Southern New England/Mid-Atlantic (AOP Lead: Kristan Blackhart)

Recommendation: Level 1

Southern New England/Mid-Atlantic Yellowtail Flounder was last assessed in a 2022 Management Track (MT) assessment using the Age-Structured Assessment Program (ASAP). The stock recently completed a Research Track (RT) assessment in late 2024 where a state space model was peer reviewed and approved for operational use. The WHAM model presented at the RT started in 1973 for ages 1-6+; utilized age-based M; included 2dar1 numbers-at-age random effects; had one fishery fleet (commercial landings + discards); used one fishery selectivity time block; included an environmental covariate (Gulf Stream Index – GSI) on recruitment; and included three surveys (NEFSC spring/fall/winter bottom trawl). The plan for the 2025 Management Track (MT) is to utilize the methods approved in the RT with data series updated through 2024 and no changes to the existing methodology. Methods approved in the RT will be followed for reference point calculation and development of projections. The assessment lead plans to explore the effects of lognormal adjustment, but anticipates this change (if adopted) will have minor impacts on results. The backup plan is as approved in the RT and uses a modified Limiter approach.

During AOP discussions, several issues were flagged by panelists:

- Although the assessment lead indicated initial sensitivity runs show the impacts of lognormal adjustment are minor, this change has had large impacts for some other stocks and could merit additional review. After further discussion, a “trigger” was suggested to help the assessment lead identify if/when to flag this as a “major” change in need for more substantial review. During discussions, it was suggested that if the sensitivity to lognormal adjustment exceeds the confidence limits of the base estimate, the assessment lead should make a request to the AOP for a higher level of review.
- Updating of assessments that include environmental covariates is “untested” for the NEFMC and the SSC would be more comfortable with a higher level of review. However, no changes to the GSI input or how it is utilized in the model are planned for this assessment, so further review is required only if significant departure from anticipated results occurs.
- As with the Cape Cod/Gulf of Maine Yellowtail Flounder stock, some AOP members felt that although the RT peer review was thorough and clearly stated the methodologies are best science information available and suitable for use to support management, additional review “to confirm” would be useful. However, without clear scientific justification for why additional review was necessary, this request was deemed outside the guidelines described in the NRCC Assessment Process document.

There was not agreement among AOP members on review level for this stock, but it was identified as **Level 1 – Direct Delivery** based on the criteria identified in the [NRCC Assessment Process document](#).

Meeting Conclusions

The AOP met on May 22, 2025 to review the stock assessment plans for eight stocks scheduled for the September 2025 Management Track cycle. The panel concluded that Level 1 reviews (Direct Delivery) were warranted for Winter Flounder – Gulf of Maine, Winter Flounder – Southern New England/Mid-Atlantic, Yellowtail Flounder – Cape Cod/Gulf of Maine, and Yellowtail Flounder – Southern New England/Mid-Atlantic; Level 2 reviews (Expedited Review) for Yellowtail Flounder – Georges Bank; and Level 3 reviews (Enhanced Review) for Acadian Redfish, White Hake, and Winter Flounder – Georges Bank. An additional Level 3 review for Atlantic Mackerel is also scheduled for September after being delayed from the June Management Track; its review assignment was made at the February 2025 AOP meeting.

The Level 2 and 3 reviews will occur during the September 2025 Management Track Peer Review scheduled for September 15-19, 2025. 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.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northeast Fisheries Science Center
166 Water Street
Woods Hole, MA 02543-1026

Date: June 20, 2025

Memorandum For: Northeast Region Coordinating Council

From: Jon Hare, Science and Research Director, NEFSC

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Subject: Peer review levels for two September 2025 stock assessments

At their 22 May 2025 meeting, the Assessment Oversight Panel reviewed assessment plans for Acadian Redfish, White Hake, Winter Flounder (Georges Bank, Gulf of Maine, and Southern New England/Mid-Atlantic stocks), and Yellowtail Flounder (Cape Cod/Gulf of Maine, Georges Bank, and Southern New England/Mid-Atlantic stocks). In their report, the AOP recommended that three assessments receive Level 3 peer reviews (Acadian redfish, White hake, and Winter Flounder - Georges Bank), one assessment receive Level 2 peer review (Yellowtail flounder - Georges Bank), and two assessments be provided as direct delivery (Level 1, Winter flounders - Gulf of Maine and Southern New England-Mid Atlantic). The AOP also provided a non-consensus recommendation for direct delivery (Level 1) for two assessments (Yellowtail flounders - Cape Cod/Gulf of Maine and Southern New England-Mid Atlantic); this recommendation was based on the guidelines provided in the Assessment Process Document. The counter view was Level 2 peer review for both assessments.

After the AOP, the NEFSC met internally and with NEFMC leadership to discuss the two non-consensus recommendations (the two yellowtail flounder stocks are managed by the NEFMC). These follow up meetings discussed: the different perspectives that led to lack of consensus as described in the AOP report, how much time was available for Level 2 and Level 3 reviews at the September Peer-Review, and the NRCC's intention to avoid duplicative peer review, where two peer review panels review the same scientific changes and potentially come to different conclusions.

Based on these discussions, and consideration by the full NRCC, I have decided to include the two assessments in the September Management Track peer review with Level 2 peer review, and to provide direction to the peer review panel to avoid re-review of decisions made by the previous (Research Track) peer review panel.

Appendix B. Management Track 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.

Appendix C. September 2025 Management Track Peer Review meeting participants (names only, no call-in numbers)

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### 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

Edward Camp - Chair  
Jeremy Collie - Panel  
Katie Drew - Panel  
Yan Jiao - Panel

Abrielle Remick, University of Maine  
Alex Hansell, NEFSC  
Alexander Dunn, NEFMC  
Amanda Hart, NEFSC  
Andrew Applegate, NEFMC  
Angelina Miller, Maris Collaborative  
Brian Alper, University of Maine  
Brian Determan, University of Southern Maine  
Brian Hooper, NEFSC  
Brian Linton, NEFSC  
Cameron Hodgdon, NEFSC  
Cate O'Keefe, NEFMC  
Catriona Regnier-McKellar, Fisheries and Oceans Canada  
Charles Adams, NEFSC  
Charles Peretti, NEFSC  
Chris Legault, NEFSC  
Claire Mussells, Environment Canada  
Corrin Flora, North Carolina Division of Marine Fisheries  
Daniel Salerno, NEFMC  
Dave McElroy, NEFSC  
Emma Dullaert, University of Mine  
Emily Bodell, NEFMC  
Emily Liljestrand, NEFSC  
Gareth Lawson, Conservation Law Foundation  
Garrett Klee, Fisheries Observer  
Hannah Jacobs, University of Maine

Irene Andrushchenko, Fisheries and Oceans Canada  
Jacqueline Odell, Northeast Seafood Coalition  
Jamie Cournane, NEFMC  
Jason Boucher, NEFSC  
Jennifer Couture, NEFMC  
Jerelle Jesse, University of Maine  
Jessica Blaylock, NEFSC  
Jonathan Deroba, NEFSC  
Joseph Dello Russo, University of Maine  
Julia Barron Luddy, University of Maine  
Julie Nieland, NEFSC  
Kathy Cooper-MacDonald, Fisheries and Oceans Canada  
Katrina Zarrella Smith, University of Massachusetts  
Kaylyn Zipp, University of Maine  
Kelly Whitmore, Massachusetts Division of Marine Fisheries  
Kiersten Curti, NEFSC  
Kristan Blackhart, NEFSC  
Larry Alade, NEFSC  
Laura Smith, GARFO  
Leona Burgess, NEFSC  
Liz Brooks, NEFSC  
Liz Sullivan, GARFO  
Megan Ware, Maine Department of Marine Resources  
Melanie Barrett, Fisheries and Oceans Canada  
Melisa Uyar, University of Maine  
Michael Waine, American Sportfishing Association  
Miguel Barajas, Gulf of Maine Research Institute  
Paul Nitschke, NEFSC  
Rachel Feeney, NEFMC  
Robin Frede, NEFMC  
Ruby Krasnow, University of Maine  
Samuel Truesdall, NEFSC  
Sefatia Romeo Theken, Massachusetts Department of Fish and Game  
Spencer Talmage, GARFO  
Steve Cadrin, SMAST  
Tara Dolan, Massachusetts Division of Marine Fisheries  
Tony Wood, NEFSC  
Zoe Alexander, University of Maine

## Appendix D. September 2025 Management Track Peer Review Agenda

### AGENDA (v. 9/5/2025)

*\* All times are approximate, and may be changed at the discretion of the Peer Review Panel chair. The meeting is open to the public.*

*\*\*A previous version of the agenda included review of an Atlantic mackerel assessment that used a new model (WHAM). Due to data availability issues (egg index), inclusion of the mackerel assessment in this meeting was not possible. After consultation with the Mid-Atlantic Fishery Management Council and the Assessment Oversight Panel, the Northeast Fisheries Science Center plans to update the existing ASAP model and deliver the assessment directly to the Council in October.*

#### Monday, September 15, 2025

| Time       | Stock                                  | Subject                                                        | Presenter                                               |
|------------|----------------------------------------|----------------------------------------------------------------|---------------------------------------------------------|
| 9:00 a.m.  |                                        | Welcome/Logistics<br>Conduct of Meeting                        | Brian Hooper<br>Kristan Blackhart<br>Edward Camp, Chair |
| 9:15 a.m.  | White Hake                             | Terms of Reference (TOR) Review &<br>Panel Questions           | Charles Adams<br>Panel                                  |
| 11:15 a.m. |                                        | <b>Break</b>                                                   |                                                         |
| 11:30 a.m. | White Hake                             | Public Comment                                                 | Panel                                                   |
| 11:45 a.m. | White Hake                             | Panel Deliberations                                            | Panel                                                   |
| 12:30 p.m. | White Hake                             | Panel Conclusions / Recommendations<br>and Final Stock Wrap Up | Panel                                                   |
| 1:00 p.m.  |                                        | <b>Lunch</b>                                                   |                                                         |
| 2:00 p.m.  |                                        | Overview of the Woods Hole<br>Assessment Model (WHAM)          | Jonathan Deroba                                         |
| 3:00 p.m.  | Georges Bank<br>Yellowtail<br>Flounder | TOR Review & Panel Questions                                   | Alex Hansell<br>Panel                                   |
| 4:00 p.m.  | Georges Bank<br>Yellowtail<br>Flounder | Public Comment                                                 | Public                                                  |
| 4:15 p.m.  |                                        | <b>Break</b>                                                   |                                                         |



| <b>Time</b> | <b>Stock</b>                           | <b>Subject</b>                                                 | <b>Presenter</b> |
|-------------|----------------------------------------|----------------------------------------------------------------|------------------|
| 4:30 p.m.   | Georges Bank<br>Yellowtail<br>Flounder | Panel Deliberations                                            | Panel            |
| 4:45 p.m.   | Georges Bank<br>Yellowtail<br>Flounder | Panel Conclusions / Recommendations<br>and Final Stock Wrap Up | Panel            |
| 5:00 p.m.   |                                        | <b><i>Adjourn</i></b>                                          |                  |

### **Tuesday, September 16, 2025**

| <b>Time</b> | <b>Stock</b>       | <b>Subject</b>                                                 | <b>Presenter</b>                   |
|-------------|--------------------|----------------------------------------------------------------|------------------------------------|
| 9:00 a.m.   |                    | Welcome/Logistics                                              | Brian Hooper<br>Edward Camp, Chair |
| 9:05 a.m.   | Acadian<br>Redfish | TOR Review & Panel Questions                                   | Brian Linton<br>Panel              |
| 10:45 a.m.  |                    | <b><i>Break</i></b>                                            |                                    |
| 11:00 a.m.  | Acadian<br>Redfish | TOR Review & Panel Questions,<br>continued                     | Brian Linton<br>Panel              |
| 12:30 p.m.  |                    | <b><i>Lunch</i></b>                                            |                                    |
| 1:30 p.m.   | Acadian<br>Redfish | TOR Review & Panel Questions,<br>continued                     | Brian Linton<br>Panel              |
| 2:45 p.m.   | Acadian<br>Redfish | Public Comment                                                 | Public                             |
| 3:00 p.m.   |                    | <b><i>Break</i></b>                                            |                                    |
| 3:15 p.m.   | Acadian<br>Redfish | Panel Deliberations                                            | Panel                              |
| 4:15 p.m.   | Acadian<br>Redfish | Panel Conclusions / Recommendations<br>and Final Stock Wrap Up | Panel                              |
| 5:00 p.m.   |                    | <b><i>Adjourn</i></b>                                          |                                    |

### **Wednesday, September 17, 2025**

| <b>Time</b> | <b>Stock</b>                 | <b>Subject</b>                                              | <b>Presenter</b>                   |
|-------------|------------------------------|-------------------------------------------------------------|------------------------------------|
| 9:00 a.m.   |                              | Welcome/Logistics                                           | Brian Hooper<br>Edward Camp, Chair |
| 9:05 a.m.   | Georges Bank Winter Flounder | TOR Review & Panel Questions                                | Alex Hansell<br>Panel              |
| 10:45 a.m.  |                              | <b>Break</b>                                                |                                    |
| 11:00 a.m.  | Georges Bank Winter Flounder | TOR Review & Panel Questions, continued                     | Alex Hansell<br>Panel              |
| 12:30 p.m.  |                              | <b>Lunch</b>                                                |                                    |
| 1:30 p.m.   | Georges Bank Winter Flounder | Public Comment                                              | Public                             |
| 1:45 p.m.   | Georges Bank Winter Flounder | Panel Deliberations                                         | Alex Hansell<br>Panel              |
| 2:45 p.m.   | Georges Bank Winter Flounder | Panel Conclusions / Recommendations and Final Stock Wrap Up |                                    |
| 3:00 p.m.   |                              | <b>Break</b>                                                |                                    |
| 3:15 p.m.   |                              | Closed panel writing session                                | Panel                              |
| 5:00 p.m.   |                              | <b>Adjourn</b>                                              |                                    |

**Thursday, September 18, 2025**

| <b>Time</b> | <b>Stock</b> | <b>Subject</b>    | <b>Presenter</b>                   |
|-------------|--------------|-------------------|------------------------------------|
| 9:00 a.m.   |              | Welcome/Logistics | Brian Hooper<br>Edward Camp, Chair |

| <b>Time</b> | <b>Stock</b>                                                         | <b>Subject</b>                                                 | <b>Presenter</b>         |
|-------------|----------------------------------------------------------------------|----------------------------------------------------------------|--------------------------|
| 9:05 a.m.   | Southern<br>New<br>England-Mid<br>Atlantic<br>Yellowtail<br>Flounder | TOR Review & Panel Questions                                   | Cameron Hodgdon<br>Panel |
| 9:30 a.m.   | Southern<br>New<br>England-Mid<br>Atlantic<br>Yellowtail<br>Flounder | Public Comment                                                 | Public                   |
| 9:40 a.m.   | Southern<br>New<br>England-Mid<br>Atlantic<br>Yellowtail<br>Flounder | Panel Deliberations                                            | Panel                    |
| 9:55 a.m.   | Southern<br>New<br>England-Mid<br>Atlantic<br>Yellowtail<br>Flounder | Panel Conclusions / Recommendations<br>and Final Stock Wrap Up | Panel                    |
| 10:05 p.m.  | Cape<br>Cod/Gulf of<br>Maine<br>Yellowtail<br>Flounder               | TOR Review & Panel Questions,<br>continued                     | Larry Alade<br>Panel     |
| 10:30 a.m.  | Cape<br>Cod/Gulf of<br>Maine<br>Yellowtail<br>Flounder               | Public Comment                                                 | Public                   |
| 10:40 a.m.  | Cape<br>Cod/Gulf of<br>Maine                                         | Panel Deliberations                                            | Panel                    |

| <b>Time</b> | <b>Stock</b>                                           | <b>Subject</b>                                                 | <b>Presenter</b> |
|-------------|--------------------------------------------------------|----------------------------------------------------------------|------------------|
|             | Yellowtail<br>Flounder                                 |                                                                |                  |
| 10:55 a.m.  | Cape<br>Cod/Gulf of<br>Maine<br>Yellowtail<br>Flounder | Panel Conclusions / Recommendations<br>and Final Stock Wrap Up | Panel            |
| 11:05 a.m.  | All stocks                                             | Final Meeting Wrap Up, if needed                               | Panel            |
| 12:00 p.m.  |                                                        | <b><i>Lunch</i></b>                                            |                  |
| 1:00 pm     |                                                        | Closed panel writing session                                   | Panel            |
| 3:00 p.m.   |                                                        | <b><i>Adjourn</i></b>                                          |                  |