Atlantic States Marine Fisheries Commission
1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • www.asmfc.org

Ecological Reference Point Work Group

Check-In Summary

June 25, 2025

Members in Attendance: M. Cieri, M. Celestino, D. Chagaris, A. Buchheister, A. Schueller, M. Dean, A. Sharov, S. Madsen
Staff: K. Drew, J. Patel, J. Boyle
Public: A. Binstock

NWACS-MICE Update

Recent model development and diagnostics centered on improving the representation of Atlantic herring (AH) dynamics and their ecosystem effects. Run 144, a refinement of the tentative base model (run 139), incorporated AH recruitment deviations to force egg production over time. This adjustment was intended to reflect density-independent effects on early life stages. The model was iteratively calibrated and showed a significant improvement in fit, with a sum of squared residuals (SS) of 1,800—the second lowest among 149 evaluated models. Run 144 estimated 93 vulnerability parameters (of 107 total), with 16% on bounds (compared to 12% in run 139).

Equilibrium analyses for run 144 projected stock responses under three AH egg production scenarios: constant, seasonal baseline, and recent low average. Of these, the last yielded the most consistent results, aligning with single-species fishing mortality (F) targets and producing dome-shaped yield curves. The tradeoff analysis showed that striped bass could achieve their biomass target under a broader range of menhaden and striped bass F rates compared to run 139. This improved flexibility is likely attributable to lower estimated vulnerability values, though model sensitivity to predator-prey dynamics, especially between spiny dogfish and striped bass remains a concern.

Runs 139 and 144 had a strong sensitivity to the spiny dogfish predation on striped bass. In run 150, a manual increase in the k_{ij} value for spiny dogfish predation on striped bass (ages 2-5) allowed striped bass to reach their biomass target under their single-species F target (0.934). However, spiny dogfish has very low dietary reliance on striped bass (<1%), but its high biomass amplifies its effect on striped bass. Small changes to spiny dogfish k_{ij} values can cause striped bass biomass to crash or recover. The group acknowledged this modeling lever as potentially unrealistic and discussed either removing this interaction or increasing diet import from outside the modeled system to better distribute predation pressure.

Run 150 was proposed as a proof-of-concept model for the upcoming peer review. It can allow striped bass to reach its biomass target under current assumptions and projects a need for lower menhaden F relative to current levels. This is consistent with a lower M and biomass assumption for menhaden in this framework. The tradeoff for run 150 suggests that at current F values for striped bass and menhaden, SB is just above its biomass threshold, and to hit the biomass target, menhaden F would need to be reduced.

The working group agreed to move forward with run 150 for the peer review, presenting it alongside diagnostics and tradeoff comparisons with runs 139 and 144. While acknowledging the sensitivity of the spiny dogfish and striped bass interaction, the group opted to provide reference points from run 150 to the Technical Committee and peer reviewers, with the understanding that further model refinement will be necessary post-review.

ERP Definitions

Based on the MICE discussion, the group agreed to use the existing definitions of the Menhaden ecological reference points as proof of concept for the peer review, although this may be revisited as work is continued on the model runs and based on feedback from the peer reviewers.

Timeline and Next Steps

The next call for the group will be July 9th to review the draft of the report. Since the report is still missing a VADER section, the group proposed adding a summary of the work that's been done on the VADER model to the report and adding the details to a working paper.

Other Business

For the modelers, any changes to the existing draft of the report can be sent as a separate document to J. Patel, who will then merge the new changes into the most updated version of the report.