Draft OFL CV Decision Criteria Table for Bluefish – July 2023

Decision Criteria	Summary of Decision Criteria Considerations	Assigned OFL CV Bin (60/100/150)
Data quality	**Surveys** • A fishery-dependent measure of abundance is obtained as catch-per-unit effort from the MRIP intercept survey (1985-2022), now based on a Guild approach, which constitutes a large component of data (recreational catch [landings+discards] = 86% of total on average). • Revised historical MRIP catch estimates were used in assessment. The new estimates scale up the entire MRIP catch series. • NEFSC fall survey data are available for all years (except fall 2017 Bigelow) in the assessment. This survey does not cover the southern portion of the species range. Bigelow estimates adjusted for results of cooperative research studies on gear efficiency. • Additionally, seven regional surveys are used in model tuning including the NC PNGSIN 2002-2022. **Landings and discards** • Age data available for all years in surveys (1982-2022), and multinomial age-length keys from surveys were applied to commercial and recreational landings. • Lengths of recreational discards were obtained through angler self-reporting from the Volunteer Angler Survey and minimal information from MRIP. They are now stratified by region and season. • Commercial discards are now included even though ~0.2% • The MRIP discards were below the long-term average. • Live discards are assumed to have a 9.5% discard mortality rate. • Total landings in 2022 were a time-series low.	
Model appropriateness and identification process	• A WHAM state-space model was used with M now age-specific. • The fishery is modeled with two fleets: commercial and recreational with an added selectivity block. • WHAM allows random effects on recruitment and numbers at age. • SSB declined to series low 35,152 MT in 2018 and increased to 52,747 MT in 2022. • Reference pts $F_{35\%}$= 0.239, $SSB_{35\%}$= 88,132 MT, $SSB_{threshold}$= 44,066 MT • Not overfished, overfishing not occurring • Bluefish are under a rebuilding plan, Frebuild,7 recalculated as 0.183 • Short-term projections used WHAM, model uncertainty, autoregressive processes and uncertainty in recruitment and numbers-at-age, full time series of recruitment (1985-2022)	
Retrospective analysis	• Retrospective patterns in the Management track assessment are considered minor, with retrospective errors over the last 7 terminal years averaging -0.14 for F and rho=0.22 for SSB. • New calibrated MRIP data resulted in a rescaling of SSB, F, and R to higher estimates compared with old data. • Retrospective patterns were minor and within 90% CI.	

Comparison with empirical measures or simpler analyses	• Different configurations of WHAM were used. The RTA used a full multinomial ALK. The 2022 MTA used the multinomial ALK to only fill in missing data. • A companion model used a forage fish index as a covariate to determine MRIP CPUE.	
Ecosystem factors accounted	• Aspects of the ecosystem seem to be changing in recent years. • The prior 2015 benchmark assessment used a thermal niche model to assess survey catchability of Bluefish, but thermal niche modeling was not found to improve the assessment. • Bluefish have a low CVA ranking (Hare et al. 2016).	
Trend in recruitment	• For the past decade until 2022 estimates of recruitment have been below average (126 Million). • Recruitment has been approximately 15% below average over the last decade, except in 2013 when recruitment was higher. • The highest recruitment occurred in 1989 and the lowest in 2019 (approximately 3-fold variability). • Terminal year recruitment is estimated at 137 Million, above average and the highest since 2005.	
Prediction error	• Removals in 2023 were considered to be the ABC (13,890 MT) with projection carried forward to 2025 using the Frebuild (2024= 7,929 MT; 2025=9,903 MT) Projections used 5-year average for M, maturity, selectivity and weight-at-age. Not retrospectively adjusted. • The MRIP calibration results in different patterns across the species that rely on this measure, hence increasing uncertainty. Because this stock is a very large recreational utilization (>80% of the catch), it is heavily influenced by MRIP estimates. • Finally, the mode of fishing shows a trend to increasing shore fishing in the most recent years because shore fishing has a larger adjustment in MRIP than the other categories.	
Assessment accuracy under different fishing pressures	• Fishing mortality has varied over a 3-fold range during the assessment period, with a major decline in 2018, and a decrease in 2022 to 0.152, 64% of the overfishing threshold. • Over the past decade F has fluctuated around the series average of F = 0.35, but have been steadily declining since 2018.	
Simulation analysis/MSE	• No formal MSE-type analyses have been conducted for this stock.	NA

Narrative