

Acceptable Biological Catch Control Rule Modifications

SSC Discussion

- Dr. Shannon Cass-Calay (SEFSC) reviewed an alternative approach to the Council's current Acceptable Biological Catch (ABC) Control Rule, for determining the scientific uncertainty between the overfishing limit (OFL) and the ABC.
- Each regional Council must establish an ABC Control Rule based on scientific advice from its SSC. The current ABC Control Rule has been in place since 2011.
- The SSC can deviate from the ABC Control Rule, but must provide rationale for its decision.
- The ABC Control Rule is used by the SSC to provide catch advice and that catch level cannot be exceeded by the Council when setting the ACL.

- SSC members have regularly expressed a desire to revisit the control rule due to its tendency for generating narrow buffers between the OFL and ABC that is not representative of the scientific uncertainty within the stock assessment.
- Many Councils use a tiered approach for their ABC Control Rule.
- Tier 1 for the Gulf Council is conditioned on the stock assessment estimating maximum sustainable yield (MSY), or its proxy, and produces a probability density function (PDF) of the OFL.
- The OFL equals the yield at the maximum fishing mortality threshold (MFMT), and the ABC equals the yield at the P^* percentile which represents the acceptable risk of overfishing (risk tolerance), from the projection of MFMT (or F_{REBUILD} in the case of stocks subject to a rebuilding plan).

- Under the Council's present ABC Control Rule, the choice of P^* is informed by the performance of the stock assessment to encapsulate the true level of uncertainty in sustainable catch levels.
- A risk determination table is used to categorize criteria for selecting a P^* value which incorporates results from the stock assessment, the use of F_{MSY} (or its proxy; e.g., $F_{SPR30\%}$, $F_{0.1}$), the characterization of uncertainty (e.g., fully integrated, sensitivity runs, none), the severity of any retrospective patterns, and the incorporation of environmental covariates.
- The SEFSC proposes that the risk of overfishing (P^*) and scientific uncertainty (width of the PDF; σ) be considered separately.
- Currently, σ calculations tends to underestimate the true scientific uncertainty (because some model variables are fixed without error, and the variance of some data inputs is predetermined), resulting in buffers between the OFL and ABC that are narrower than the true uncertainty would otherwise suggest.

- To address this issue, a comparison analysis of multiple stock assessments results can be performed to quantify scientific uncertainty over time and this method has been proposed by Ralston et al. 2011.
- Results from the Ralston method indicate a minimum σ (σ_{\min}) of 0.36 is appropriate for data-rich Tier 1 stocks and allows for σ to increase as data quality/quantity declines, resulting in larger buffers between OFL and ABC for lower tiers.
- This is in stark contrast to results from the Gulf Council's ABC Control Rule, which often uses σ values of 0.1 for many Gulf stocks.
- Dr. Cass-Calay noted that the ABC Control Rule could reduce fishing mortality (F) below MFMT proportionally as stock size declines below B_{MSY} .

- Previously, the minimum stock size threshold (MSST) was based on natural mortality (M).
- Rebuilding plans were required when the biomass of the stock (B) was less than $(1-M) \cdot B_{MSY}$.
- MSST is now set to 50% of B_{MSY} for many popular reef fish species (see Reef Fish Amendment 44).
- The stock may then be reduced to a point well below the level that produces MSY before any action is taken to reduce F.

- An update to Ralston et al. 2011 has since been published by Privitera-Johnson and Punt (2020), which suggests using probability-based harvest control rules to incorporate scientific uncertainty and risk tolerance when setting catch limits by scaling buffers between catch limits with scientific uncertainty.
- This revised approach bases the calculation of scientific uncertainty on projected spawning stock biomass (SSB) and OFLs, accounting for uncertainty in recruitment and among-assessment variation.
- OFL projections yielded a higher estimate of uncertainty, assuming a deterministic stock-recruitment relationship, and assuming a stochastic stock-recruitment relationship produced smaller estimates of uncertainty.
- Results from this updated method would result in a σ_{\min} value of 0.5 for Tier 1 stocks.

- The SEFSC proposed using the Ralston method results for calculating σ_{\min} and assigning a default of 0.4 for P^* for Tier 1 Gulf stocks.

Motion: The SSC recommends that the Council request that the SEFSC develop the σ_{\min} using the Ralston et al. 2011 method for Gulf of Mexico Tier 1 (data rich) stocks.

Motion carried without opposition, and with two absent.

Motion: The SSC recommends that the Council request that the SEFSC evaluate the potential for setting ABC at 75% of F_{MSY} , or its proxy, without exceeding OFL, as outlined in Appendix A of the Restrepo et al. 1998 report for Tier 1 stocks.

Motion carried with one opposed and four absent.

Motion: The SSC recommends the Gulf Council to request a management strategy evaluation to better account for scientific uncertainty, including imprecision and bias issues, in reducing ABC from OFL estimated or projected from data-rich Gulf stock assessments. Approaches to be considered should include those of Restrepo et al. (1998), Ralston et al. (2011), and Privitera-Johnson and Punt (2020) among others.

Motion carried with two abstentions and four absent.