

## KEY QUESTIONS TO THE PANEL

### **Sardine genetics in the context of a new sardine stock structure model**

Following primarily the work by Teske *et al.* (2021) (MARAM/IWS/2023/Sardine/BG2), the stock structure of South African sardine as modelled previously requires modification. A conceptual framework for a revised stock structure hypothesis was developed by de Moor *et al.* (2022) (MARAM/IWS/2023/Sardine/BG3), with some associated initial results presented to the International Stock Assessment Review Panel in December 2022. **Panel comments are requested on the additional work undertaken since then** (which has, in part, been in response to comments from the 2022 Panel) to describe the sardine stock hypothesis conceptually, together with the implications of initial results from the revised model. This revised model has been developed to reflect the sardine as consisting either of two components distributed between two areas, or of three components (distinguishing between warm temperate sardine originating from spawning off the south and the southwest coasts) distributed between three areas.

### **Squid modelling and management**

The 2022 Panel recommended to replace the current squid assessment model by a population dynamics model in which monthly cohorts are modelled by sex. Unfortunately, it turns out that the catch-at-length data available, both historically and for the short-to-medium term future, are limited to monthly masses taken sorted into four length ranges (bins) that cannot be disaggregated by sex.

- 1) Would such data be sufficient to implement the approach suggested last year, and if not, what alternative assessment approach should be used (likely some variant of that used at present, perhaps)?
- 2) A simulation model exercise to replicate historical industry binned catch-at-length data has not been successful. How might that model be adjusted to achieve better representation of these industry data?

### **Hake genetics and stock structure**

Comment on whether the findings of Forde *et al.*, (2023) require any changes to the current SA hake analytical and/or management approach that considers both species to each comprise a single stock distributed throughout South African waters? If so, what alternatives could be considered?

### **Stock-recruit relationship estimation/modelling with non-stationarity**

Which of the methods for detecting regime shifts from recruitment time series put forward in Sellinger *et al.* (2024) might be the best to try to apply to which local fish stocks to progress work in this area? Comments on other approaches to deal with this overall issue, particularly in the context of climate change, will also be sought if time permits.