Proposed Reference Set for the South African hake resource

Rebecca Rademeyer
April 2014

Three aspects have been found to account for most of the uncertainty regarding the key considerations of resource status and productivity: a) pre-1978 species split of the offshore trawl catches; b) natural mortality-at-age specifications; and c) the stock-recruitment relationship.

Pre-1978 species split of the offshore trawl catches:
The RC has a central year for the shift from *M. capensis* to *M. paradoxus* in 1958. We suggest that the RS should be robust to a central year between 1950 and 1965.

Natural mortality-at-age specifications:
The RC fixes the natural mortality vector with M_2=0.75 and M_{5+}=0.375. We suggest the RS should include two further vectors that arguably span the plausible range: a high M scenario of M_2=0.9 and M_{5+}=0.5 and a low M scenario of M_2=0.6 and M_{5+}=0.25.

Stock-recruitment relationships:
A modified Ricker stock-recruitment curve is used for the RC. We suggest to also include in the RS a Beverton-Holt stock-recruitment curve with the steepness parameter *h* estimated or fixed (*h*=0.7).

Initially, a full cross of 3 center-years x 3 natural mortality vectors x 3 stock-recruitment relationship will be run, but the final OMs selected in the RS will be subject to the constraint that a fit with a -lnL difference of more than about 15 from that for the best of the fits will be excluded on the basis of poor compatibility with the data.