

ABSTRACT

The Ricker, Beverton and Holt, and Shepherd stock recruitment models have been fitted to the stock and recruitment data from the Western mackerel stock for the period 1972-86. The stock and recruitment data were estimated from catch-at-age data using VPA by the mackerel Working Group of ICES. The analysis were initially carried out for the period 1972-80 and were then repeated up to 1986, adding one years data for each new analysis time. The Ricker and Beverton and Holt models were fitted to the data using linear regression and non-linear regression. The Shepherd model was fitted by non-linear regression and a graphical method described by Shepherd (1982). A definitive relationship between stock and recruitment has not been found and may be due to the very scattered data. However the evidence supports a stock recruitment relationship close to the asymptotic Beverton and Holt form or weakly domed. A general trend could be obtained from all three models for the left hand side of the curve, which is the more important in management purposes. It shows the present level of mackerel biomass (1.5 million tonnes) produce around 2500-3000 million recruits a year. It is suggested that as a management objective the minimum acceptable spawning stock biomass should not be less than 750,000 tonnes, as below this level there is a real danger of stock collapse due to recruitment failure.