Study of the performance of data-poor fish stock assessment methods

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Stock assessment models are mathematical and statistical techniques implemented to analyze and understand changes of fish populations. However, many of these models require a lot of information that is usually deficient for the vast majority of fish stocks. For this reason, in recent years there has been great interest in the use and development of new methods for data-poor stocks. This study focuses on two of the most used length-based methods: (1) Length Based Indicators (LBI), and (2) Length Based Spawning Potential Ratio (LBSPR). In particular, our aim is to design a specific case simulation study for the common Sole (*Solea solea*) for evaluating the LBI and LBSPR sensitivity to the uncertainty of the required life history parameter estimates and the assumptions made (selectivity, recruitment,...). To carry out the analysis the stock dynamics is simulated through operating models (OMs) which fit all relevant aspects of the fisheries system as well as how the data is collected. Our OMs follow the ideas in Fisher et al. (2020) considering plausible hypotheses about the biology of the stock, such as recruitment and growth processes, and aspects of the fishery (i.e., effort and selectivity). The performance of the LBI and LBSPR methods, in the simulation study, have led to a clear guide of how the results can be affected by the non-fulfillment of the model assumptions or by input data and life history parameters uncertainty.

Keywords: common sole, data-poor, population dynamics, simulations, uncertainty

1. Bibliography

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