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Initial results for comparing three approaches to set TACs for the  
major fisheries in the SIOFA area of the Southern Indian Ocean  
(Project SER 2021-05, ToR1)

*Relate to agenda item: 7.1*

Working paper  Info paper  Restricted

## MARAM Consultants Report

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### Abstract

Simulation studies are used to provide a generic comparison of three approaches to set TACs for a selected stock of each of alfonsino, orange roughy and toothfish in the SIOFA region. These are reduction in the TAC only if there is a high probability of a recent downward trend in the abundance index (APR1), a TAC that fluctuates up or down proportional to recent changes in that index (APR2), and a fitted population model-harvest control rule combination (APR3). To achieve sensible target depletions after 20 years, case-specific selections of initial upward or downward trends in TACs are found to be needed. For technical reasons, the toothfish stock selected proves an unsatisfactory choice for this exercise. Furthermore, results for the orange roughy stock are dominated by the need to reduce current catches substantially to achieve sustainability, rendering comparisons of the approaches problematic. For alfonsino, APR1 is preferred to APR2 because of future TACs show smoother trends in the future; however, consideration of APR3 would need further robustness tests to be investigated to offset its current advantage of equivalence between the testing model and the population model fitted within the procedure. It seems, however, that certain control parameter value choices (especially the size of the initial trend in the TAC) are likely to need to vary substantially from stock to stock, requiring stock-specific as well as generic analyses to proceed further with this investigation. Consequently, the prospects for developing entirely generic approaches/harvest strategies able to cover the major resources in the SIOFA region do not appear promising. A roadmap with suggestions about how SIOFA might best move forward towards adopting such harvest strategies in these circumstances will be put forward as the second part of this project

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