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Management procedures for South Pacific albacore

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Introduction

The harvest strategy approach provides a framework for taking the best available information about a stock or fishery and applying an evidence- and risk-based approach to setting harvest levels. A key element of the harvest strategy approach is the management procedure (MP) that determines future fishing levels. Candidate MPs should be tested, prior to adoption, to determine the extent to which they achieve defined management objectives through simulation analysis (management strategy evaluation; MSE). The MSE simulation framework models two main components; the dynamics of the fish population and its associated fishery (i.e., the operating models (OMs)), and the procedure by which the fishery will be managed (i.e., a candidate MP). In this background paper two areas are covered for SMD consideration: options for the OMs; and recent progress to develop MPs for South Pacific albacore.

Under the workplan for the development of harvest strategies for WCPO stocks and fisheries, SC18 is scheduled to agree the OM grid for South Pacific albacore, and WCPFC19 is to review and adopt a management procedure. However, as detailed in this paper, technical challenges have been encountered in developing the harvest strategy framework for this stock, and guidance is sought from managers on some more fundamental issues to assist in further work.

Management objectives

The primary management objective for South Pacific albacore longline fisheries has focussed on profitability. To this end, an interim target reference point was agreed that reflected an objective of achieving longline catch rates 8% higher than those in 2013. However, recalibration of the iTRP based upon the 2021 stock assessment indicated that a greater reduction in catch was required to achieve the iTRP than previously estimated. At WCPFC18, it was clear that those fishery reductions were not acceptable to managers, and that achieving the specified change in CPUE is an important – but not the only – objective for managers. Further work has been performed to examine the stock and fishery outcomes of different potential future changes in longline and troll catches (WCPFC-CA or South Pacific-wide), highlighting the trade-offs between levels of catch reduction and CPUE gains (see SC18-MI-WP-04). To assist in the development of South Pacific albacore harvest strategies, it would be useful to gain greater clarity in the trade offs managers are comfortable with. However, we note that the acceptable trade off, and hence the TRP, may be identified through the evaluation of management procedures.

Operating model considerations

Stock assessments for South Pacific albacore are subject to modelling challenges associated with uninformative data and data conflicts to a greater extent than other stock assessments for tunas and tuna fisheries in the WCPO, and a substantial amount of work has been conducted to evaluate the performance of these models within an MSE framework. This has focussed on the grid of models within the 2018 stock assessment, which focussed on the WCPO region only. For 2021, managers requested that that year's stock assessment be performed on a Pacific-wide basis, thereby including the eastern Pacific Ocean (EPO) area of the southern region.

Either the 2018 or the 2021 assessment model grids could be considered as the basis for the South Pacific albacore OM grid. The choice largely depends on whether EPO fishing activity is considered important and necessary to include in the MSE framework, which requires advice from managers. The impact of exclusion of EPO management action is demonstrated through the evaluation of South

Pacific albacore objectives and TRP levels (see SC18-MI-WP-04). In turn, managers should consider whether compatible management measures to those in the WCPFC can be implemented for this stock in the EPO (and/or overlap area).

Update on management procedures

Initial work on management procedures for South Pacific albacore focussed upon the use of longline albacore catch rates as an index of stock size. However, it proved technically challenging to identify a time series that provided a good and consistent reflection of the underlying stock size. Following guidance from SC17, recent work has therefore investigated the use of model-based MPs for South Pacific albacore. This work, presented to SC18, has shown encouraging results. Additional work will be undertaken to further develop this approach (see SC18-MI-WP-05).

Current assumptions

To progress the modelling framework for South Pacific albacore some necessary assumptions have been made, which require consideration by managers. These include:

- A 3 year management period is assumed (based upon the output of the management procedure the level of fishing is set for a 3 year period, before the MP is again run to define the level of fishing for the next 3 year period);
- Both longline and troll fisheries are controlled by the outputs of the management procedure;
- These represent all fisheries operating south of the equator within the WCPFC-CA;
- The fisheries are currently controlled through limits on catch (noting management through effort control can be modelled within the current framework, but not simultaneously for an individual fleet);
- The reference years for catch scaling are the average over 2014-16 (this year range has been used primarily to demonstrate the modelling framework);
- A consideration of constraints on the level of change in catch (or effort) between management periods (in one example tested, a 5% maximum change was applied to catch reductions, while catch increases were unconstrained).

Key areas for SMD consideration

To progress development of harvest strategies for South Pacific albacore and noting the findings of SC18, feedback is sought on the following issues:

- advice on the preferred set of assessment models (2018 or 2021) to form the basis of the underlying OM uncertainty grid;
- advice on the desired future conditions for the stock and fishery to be achieved under the management procedure;
- input into candidate HCR designs to inform alternative management procedures for testing;
- advice on the definition of fisheries and fishery controls within the harvest strategy, as well as a view on the other assumptions described above.