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Proposals for a revised Conservation and Management Measure for bottom
fishing within the SPRFMO Convention Area

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1. Purpose of paper

This paper updates the Scientific Committee on progress towards the development of proposals for a new conservation and management measure (CMM) for bottom fishing throughout the SPRFMO Area. The main focus of the paper is on scientific aspects of the work related to current bottom fisheries in the western part of the SPRFMO Area and the Committee's approval for these methods is sought.

Australia and New Zealand updated the Commission in January 2017 on progress as at the end of 2016 (see [Bottom Fishing CMM Information Paper](#)) and this paper records progress against the work anticipated in that update.

2. Elements of a Bottom Fishing CMM

2.1. Fishing areas

Any new conservation and management measure (CMM) for bottom fishing will require the identification of areas where bottom fishing will be permitted in the future.

2.2. Catch limits

Catch limits based on each stock's biological characteristics should be determined to ensure the fisheries' long term sustainability. A tiered stock assessment framework is required to ensure catch limits include the precaution necessary to accommodate for uncertainties in available data and methods. The key target species of orange roughy probably warrants the most work at this stage.

2.3. VME identification/mapping

Because biological information on deep-sea fauna in the SPRFMO Area is sparse, the known and likely distribution of vulnerable marine ecosystems (VMEs) has had to be estimated using predictive models. Such models have been under development for several years at a range of spatial scales.

2.4. Spatial management – open (managed) and closed areas

Guidance for Scientific Committee for several years has been that a spatial management approach to bottom fisheries is preferred. Information on the location and amount of fisheries catch and the known and likely distribution of VMEs can be considered together in the design of such measures. Spatial decision support software has been used to integrate the information and explore the relative benefits of candidate spatial management settings and areas.

3. Progress on each element of a Bottom Fishing CMM

New Zealand has been working for some time on low-information stock assessment approaches, models for predicting the distribution of VMEs, and the application of spatial decision support tools. Periodic updates have been provided to SC. At SC-03, Australia, New Zealand, and Chile agreed to work together on finalising these analyses to underpin a new CMM for bottom fishing and a detailed update was provided to the Commission in early 2017 (see [Bottom Fishing CMM Information Paper](#)). Here we describe progress since the Commission meeting. Relevant high-level papers for SC-05 are as follows:

- Galvez, Nicol, Cryer, Loveridge: Report from the third technical workshop of the Scientific Committee on deepwater bottom fisheries;

3.1. Fishing areas

Only Australia and New Zealand have current bottom fisheries in the SPRFMO Area (these are summarised in the [Australian BFIA](#) and [New Zealand BFIA](#)) and these two Members have been working closely together, with support from Chile and the EU, to develop potential measures. However, substantial work still needs to be done to develop the details of a CMM. There are no new papers for SC-05 on this element

3.2. Catch limits

Catch limits based on each stock's biological characteristics will be determined to ensure the fisheries' long term sustainability. A tiered stock assessment framework has been developed to ensure the catch limits include the precaution necessary to accommodate for uncertainties in available data and methods. Various analyses are underway to assess risks posed by fishing and to determine precautionary catch limits where necessary. This work is most advanced for the main target species, orange roughy, but a range of other assessment approaches are being considered for lesser target species and bycatch species. The following papers to SC-05 relate primarily to this element:

- Nicol & Cryer: A potential stock assessment framework for bottom fisheries in the western SPRFMO Area;
- Roux & Edwards: Spatially disaggregated CPUE analysis and biomass dynamic modelling of orange roughy in the western SPRFMO Area;
- Cordue: Catch history stock assessments of orange roughy in the western SPRFMO Area;
- Cryer, Bock & Nicol: A comparison of stock assessment results for orange roughy in the western SPRFMO Area and possible options for catch limits;
- Duffy, Geange & Bock: Other species of concern (for bottom fisheries), especially deepwater sharks;
- Georgeson et al: A risk assessment for the effects of fishing for sharks;

3.3. VME identification/mapping

Because biological information on deep-sea fauna in the SPRFMO Area is sparse, the known and likely distribution of vulnerable marine ecosystems (VMEs) has had to be estimated using predictive models. Such models have been under development for several years at a range of spatial scales. Habitat suitability models at the New Zealand regional scale are relatively mature and appear sufficiently reliable for use in designing management measures. Fine scale models (at the scale of individual seamounts or other features) would be superior, but have been developed only for the five features where appropriate data exist. SPRFMO-scale models have been found not to be reliable, mainly because of the poor bathymetric information outside of the New Zealand regional area. No new papers are offered to SC-05 on this element because the work is considered mature.

3.4. Spatial management – open (managed) and closed areas

A spatial management approach to bottom fisheries is anticipated and information on the location and amount of fisheries catch and the known and likely distribution of VMEs can be considered together in the design of such measures. Spatial decision support software can be used to integrate the information and explore the likely performance of different spatial management settings and areas to deliver on the objectives of the Convention. New Zealand has been developing such an approach using the *Zonation* package for several years and, recently, working closely with Australia, convened a series of stakeholder workshops to develop the understanding, capacity, and guidance to apply the software in the context of SPRFMO bottom trawl fisheries (mostly for orange roughy). Further workshopping and consultation will be required to finalise a spatial management approach within a CMM that permits bottom fishing within agreed catch limits and protects VMEs from significant adverse impacts. This spatial management approach can also be complemented with other measures, such as an encounter protocol and/or move-on rules, if it is considered that the spatial management approach alone is insufficient or a more precautionary approach is required.

The following papers to SC-05 relate primarily to this element:

- Cryer, Nicol, Geange, Rowden, Lundquist, & Stephenson: Report from a series of stakeholder workshops to gather and document stakeholder views on the nature and content of a revised CMM for bottom fisheries in the western SPRFMO Area
- Cryer, Nicol, Knowles, Geange: Review of SPRFMO's Bottom Fishery Impact Assessment Standard (BFIAS) to take account of developments in the field;
- Cryer & Nicol: The utility of move-on rules within spatial management frameworks;

New Zealand and Australia have agreed that bottom fishing methods with lesser impacts on VMEs than bottom trawling (bottom line methods and midwater trawling for benthic-pelagic species) are more appropriately dealt with outside the *Zonation* analyses. A method has been developed to assess the cumulative bottom impact of each method separately and in combination and this will guide the design of appropriate management measures for fisheries other than the orange roughy bottom trawl fishery.

The following papers to SC-05 relate primarily to this element:

- Mormede et al: Methods development for spatially-explicit bottom fishing impact evaluation within the SPRFMO Area;

3.5. Upcoming work on the new measure

It is anticipated that a new bottom fishing CMM can be prepared for consideration by the Commission meeting in early 2018. The CMM may include or provide linkages to other CMMs regarding matters that are not the main focus of this paper, including exploratory fishing, bycatch mitigation measures for seabirds, etc. Australia and New Zealand have agreed to work very closely together to use the existing and anticipated scientific results to design a new CMM to meet the objectives of the SPRFMO Convention.

4. Recommendations

It is recommended that the Scientific Committee:

- **Notes** the progress that has been achieved in scientific analyses required to underpin a comprehensive bottom fishing CMM for the SPRFMO Area;
- **Notes** that further work is required and New Zealand and Australia will continue to progress the development of a revised bottom fishing CMM in order to submit a proposed draft CMM to the Commission meeting in early 2018;
- **Agrees** that the scientific approaches applied by Australia and New Zealand are appropriate to underpin a revised bottom fishing CMM;
- **Agrees** to convene or otherwise support, if necessary, an additional workshop in October or November 2017 to finalise the Zonation analyses and oversee scientific analyses required to underpin the design of candidate spatial management areas.