7TH MEETING OF THE COMMISSION

The Hague, The Netherlands, 23 to 27 January 2019

COMM 7 – Prop 13.1

A proposal for a continuation of fishing for toothfish by New Zealand-flagged vessels in the SPRFMO Convention Area

New Zealand

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South Pacific Regional Fisheries Management Organisation

7th Meeting of the Commission

A proposal for a continuation of exploratory fishing for toothfish by New Zealand-flagged vessels in the SPRFMO Convention Area

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Purpose

The purpose of this paper is to accompany COMM7-Prop13, a draft CMM to provide for exploratory fishing for toothfish by New Zealand-flagged vessels in the SPRFMO Convention Area between 2019 and 2021, providing further background and rationale for the proposal.

Rationale for a Conservation and Management Measure

New and exploratory fisheries within the SPRFMO Convention Area are governed by CMM13-2016 which summarises the requirements for proposals, the consideration of proposals by Scientific Committee, Compliance & Technical Committee, and Commission, and review procedures. Each new or exploratory fishery requires a separate operational CMM and, to date, there have been two: New Zealand's exploratory line fishery for toothfish governed by CMM 4.14 (now expired); and Cook Islands' exploratory pot fishery for lobster and deepwater crabs governed by CMM 14b-2018 (still active).

Following the successful conclusion of its first exploratory line fishery for toothfish in 2016 and 2017, New Zealand conducted the detailed analyses required to support a continuation of that exploratory fishery. Because of the timing of the fishery and the Scientific Committee, it was not possible to conduct the analyses in time for a proposal for fishing in 2018, but a detailed proposal was submitted to the 6th meeting the Scientific Committee (available at SC-06-DW-03) for its consideration in September 2018. SC6's review was favourable and our paper COMM7-Prop13, therefore, includes a draft CMM to provide for continuation of the exploratory fishery for a further 3 years.

Summary of the proposal

New Zealand proposes the extension of its exploratory fishery for toothfish (by the method of bottom longline) for fishing in 2019, 2020, and 2021. Two specified New Zealand vessels will be involved with a combined annual catch limit of 220 tonnes of toothfish (both species combined). Fishing will occur in four strata bound by longitudes 135 and 155 degrees west and latitudes 52 and 60 degrees south and measures will be in place to spread the catch between these strata to maximise the collection of new information on bathymetry and distribution. The Scientific Committee will review available results each year and advise the Commission on progress. If approved un-amended, this CMM would expire following the regular meeting of the Commission in 2022.

Objectives of the proposal

The proposal is designed to provide for exploratory bottom longline fishing for toothfish in the Convention Area for the purpose of obtaining scientific data to support the following objectives:

a) Continue to map the bathymetry of the fishable area (shallower than about 2500 m) in mid-Pacific to the north of the SPRFMO-CCAMLR boundary;
b) Document the spatial distribution, catch rates, and relative abundance of Antarctic and Patagonian toothfish in apparently suitable habitat to the north of CCAMLR Areas 88.1 and 88.2 by latitude, area, and depth;
c) Characterise the biology, life history and spawning dynamics of toothfish in the area;
d) Tag substantial numbers of toothfish for stock linkage and life history studies, and, potentially, for use in a multi-area CCAMLR stock assessment model and for biomass estimation;
e) Collect information on the distribution, relative abundance, and life history of bycatch and other associated or dependent species, including stable isotope samples;
f) Collect toothfish eggs using plankton net tows if practical;
g) Conduct Continuous Plankton Recorder (CPR) tows for planktonic studies and potentially for fish eggs; and
h) Collect acoustic data using existing procedures as carried out within the CCAMLR Convention Area

Collecting this information will greatly increase our understanding of the distribution, stock structure, biology and ecology of toothfish in the area, especially spawning dynamics, and feed directly into the understanding of the life history and stock assessment models being developed for toothfish in the adjacent CCAMLR Areas 88.1 and 88.2. Annual updates of the fishing to date have been provided for CCAMLR science working group processes (Fenaughty et al. 2106, Cryer et al. 2017, and Fenaughty et al. 2018) and the proposed work dovetails closely with CCAMLR's surveys and science programmes and stock assessment approach for toothfish in adjoining areas.

Information provided to the Scientific Committee

New Zealand's submitted its proposal to the 6th meeting of the Scientific Committee in Puerto Varas, Chile, in September 2018. The proposal was carefully drafted to conform to Article 22 of the Convention and the requirements of CMM-13-2016 on the management of new and exploratory fisheries, CMM-03-2018 on bottom fisheries, and the Bottom Fishery Impact Assessment Standard (BFIAS). The proposal was provided to the Scientific Committee such that it could advise the Commission meeting in early 2019 regarding exploratory fishing in 2019, 2020, and 2021.

The proposal (SC-06-DW-02) included a detailed analysis of the results of fishing in 2016 and 2017 under CMM-4.14 (now expired), a detailed Fisheries Operation Plan for two vessels, a suite of impact assessments for the target species and bycatch, benthic impacts, and potential protected species interactions, and a suggested Data Collection Plan for consideration and development by the committee.

The information collected in 2016 (from 7 sets) and 2017 (12 sets) showed high catch rates of Antarctic toothfish, similar to catch rates in the adjacent north parts of CCAMLR subareas 88.1 and 88.2. The toothfish catch was almost entirely Antarctic toothfish except for two juvenile Patagonian toothfish. Most toothfish caught were males, especially in 2016, and were in poor body condition, consistent with them having spawned recently. Body condition was slightly better in 2017 when sampling occurred more than a month later in the year than in 2016, suggesting a seasonal cycle that can be better described by additional fishing. These results also indicate that Antarctic toothfish spawn north of latitude 60° S, within the SPRFMO Convention Area, and therefore spawn over a wider geographic area than initially hypothesised (e.g., Hanchet et al. 2008, Asford et al. 2012). The proposed fishing will extend the geographical coverage of exploratory sets to the east and north of the fishing in 2016 and 2017 to further extend our understanding of the geographical spread of toothfish spawning in and to the north of the Ross Sea. To maximise consistency with CCAMLR surveys in adjacent areas and to provide a framework for spreading exploratory fishing effort, a geographical stratification was proposed (Figure 1). Exploratory fishing is proposed only in strata L, M, N, and O in 2019–2021.

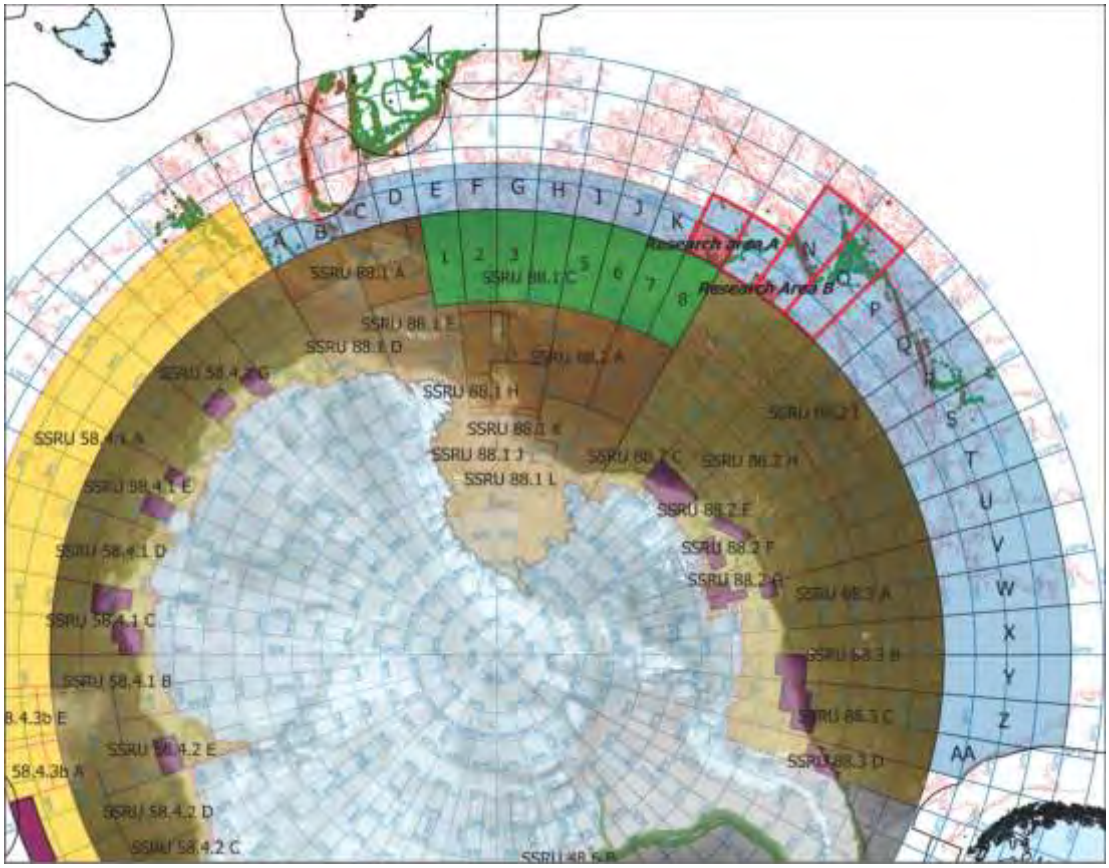

Figure 1. Map showing the survey strata proposed for the exploratory toothfish fishery in the SPRFMO Convention Area (outlined in red) and for the 2019 CCAMLR winter survey (shaded green, numbered 1–8). The two boxes for exploratory fishing in 2016 and 2017 in the SPRFMO Area are shaded red. Bathymetric contours shown at 500 and 3000 m. Also shown are the CCAMLR small scale research units (SSRUs).

The capture of almost 100% Antarctic toothfish extends the pattern of a predominance of that species along the bathymetric features in mid-Pacific from the Ross Sea (Figure 2). However, Patagonian toothfish are often dominant at these more northerly latitudes (Figure 2) suggesting that further work is required to describe the distributions of the two species and determine the factors affecting them.

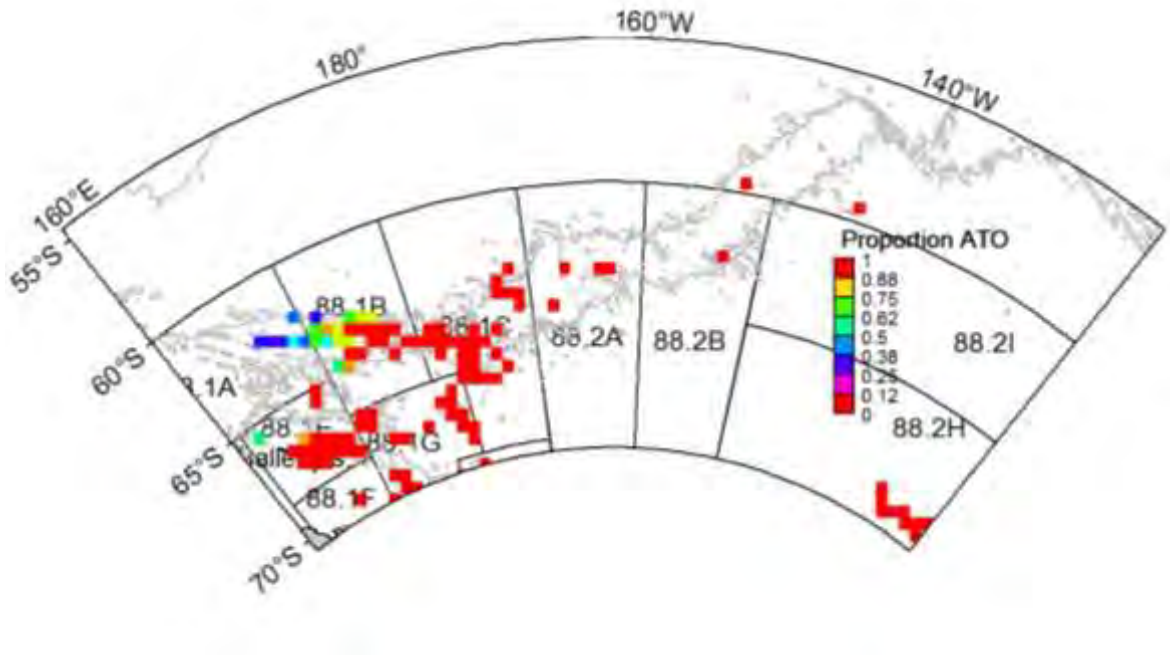

Figure 2. Proportion of Antarctic toothfish (ATO, *D. mawsoni*) as a proportion of the total catch of *Dissostichus* spp. by number. The proposed exploratory fishing will occur to the north of 60° S and between 155° W and 135° W.

In 2016 and 2017, catch rates for toothfish were highest between 1400 m and 1800 m depth but were highly variable (Figure 3). Additional exploratory fishing will help to tease out the temporal and geographical drivers of this variability and assist with the description of the life history and seasonal dynamics of toothfish. The fishing effort required to cover the proposed fishing strata and provide robust information on the distribution of toothfish over the features within those strata, and their seasonal pattern, was determined using the method applied by CCAMLR for its feature-based research surveys in Areas 88.1 and 88.2. Similarly, the proposed catch limit was estimated from the required fishing effort and historical catch rates in 2016 and 2017. The calculation applied was more conservative than the calculation used by CCAMLR because the mean catch rate in 2016 and 2017 was used whereas the CCAMLR method uses the 75th percentile of observed historical catch rates.

It is likely that toothfish in the SPRFMO Area come from a straddling stock that also inhabits CCAMLR Areas 88.1 and 88.2, including the Ross Sea. The report from the 2017 meeting of CCAMLR's fish stock assessment working group (WG-FSA-17) included model estimates

of unfished biomass for that stock of 72 620 tonnes (95% CI: 65 040–81 050 tonnes) and current status of 72% of unfished biomass (95% CI: 69–75% of unfished biomass). Thus, the stock is estimated to be in good shape and the proposed exploratory fishing within the SPRFMO Area will only slightly increase the exploitation rate (by less than 7%).

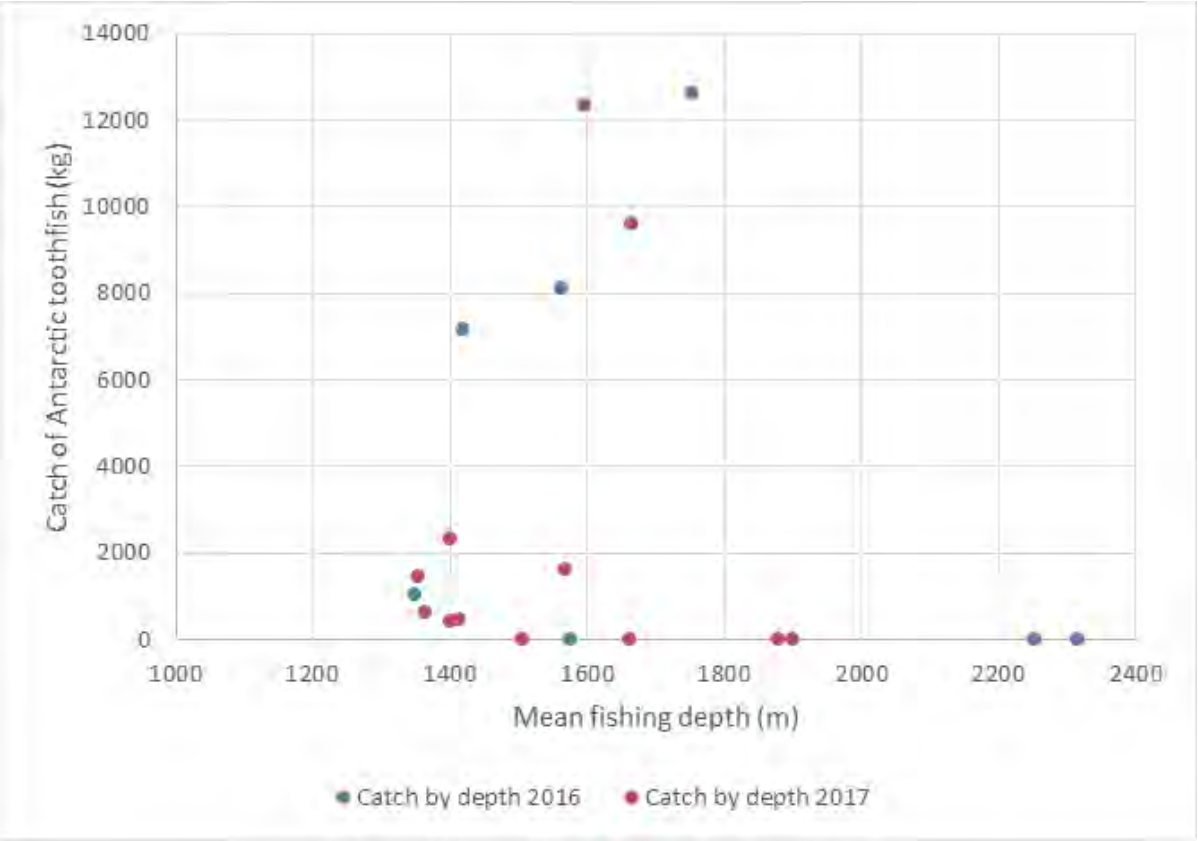

Figure 3: Retained catch of toothfish per set by water depth during exploratory fishing in 2016 and 2017. Additional fish were tagged and released at a rate of three fish per tonne.

The tagging and release of large numbers of toothfish has been pivotal in the development by New Zealand of a robust stock assessment model for Antarctic toothfish in the Ross Sea so tagging was a major focus of the exploratory fishery in 2016 and 2017. Fish were tagged at a minimum rate of 3 fish per tonne of retained catch in both years with high concordance (as indexed by CCAMLR's "overlap statistic") between the sizes of fish tagged and the size of fish in the retained catch (Figure 4). A high overlap statistic is one of the measures used to assess the performance of research fishing activity.

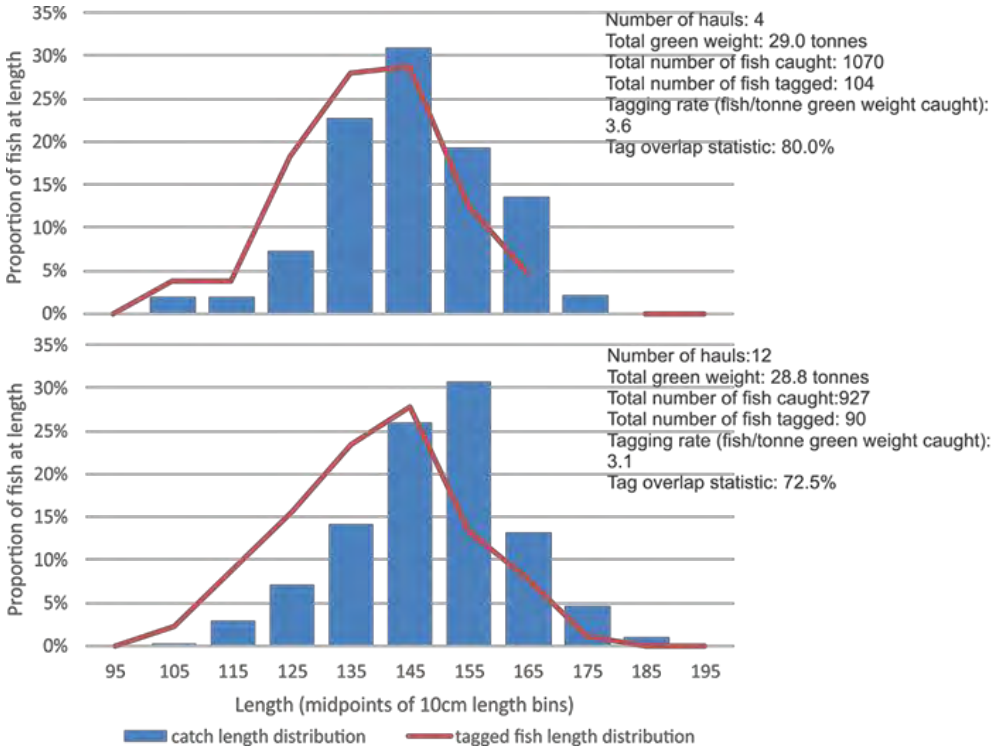

Figure 4: Tagging size overlap statistic for Antarctic toothfish from the SPRFMO exploratory toothfish fishery in 2016 (top) and 2017 (bottom).

In its proposal, New Zealand provided a suite of impact and risk assessments to assess the wider implications of the exploratory fishing based on the guidance in the Bottom Fishery Impact Assessment Standard, BFIAS. Those presented to SC-06 in 2018 (summarised in Table 1) were minor refinements of those presented to SC-03 in 2015, reflecting the additional knowledge gained since. More details are available in the proposal.

Table 1: Summary of risk assessment for New Zealand proposed exploratory bottom longlining for toothfish in the SPRFMO Area in 2019–2021.

	Extent	Duration	Intensity	Cumulative	Overall
Over-exploitation of bottom lined species	Regional-oceanic	Medium	Low	Possible	Low / medium
Loss of bottom line fishing gear	Site-specific	Short	None-low	Unlikely	Low
Direct impact of bottom lines on VMEs	Site-specific	Long	Low	Possible	Low / medium
Incidental mortality of seabirds*	Oceanic	Medium	Low-medium	Possible	Medium

*, depending on species

Bycatch of non-target fish species was less than 1% of the total catch by weight in both years and consisted mostly of caml rattail, Whitson's grenadier, and cosmopolitan rattail. Invertebrate bycatch was less than 1 kg in total for both years and consisted mainly of gorgonian corals, sponges, and crabs. More details on both are given in the proposal. It was not expected that there would be a significant bycatch of benthic invertebrates that would suggest evidence of interactions with VMEs because the fishing area is at the deeper end of the depth range of many VME indicator taxa and the areas fished were outside the area of high habitat suitability for taxa like stony corals (Figure 5).

The risk assessments suggested that incidental mortality of seabirds was the greatest potential risk posed by the exploratory fishery and the Scientific Committee was clear when it reviewed the initial proposal in 2015 that the implementation of appropriate and effective mitigation measures was crucial to preventing seabird impacts. Mitigation methods in 2016 and 2017 included the use of integrated weight line (to facilitate fast sinking of the lines) together with tori (streamer) lines, night-setting, and strict offal management. These procedures have been found to be extremely effective in adjacent CCAMLR fisheries and will continue to be used by both New Zealand vessels in the proposed continuation of the exploratory fishery. No seabirds, marine mammals or other species of concern were captures or killed during the exploratory fishing in 2016 and 2017. Observations were made of seabirds attending the vessel in both years, and the birds identified were mainly common species like Cape petrels, snow petrel, Antarctic petrel, and giant petrels. It is possible that other seabird species could be encountered, include threatened species such as Chatham petrel and antipodean albatross, whose at-sea distributions are known to include the proposed exploratory fishing areas at their margins (e.g., Figure 6), but the strong mitigation reduces the risk of capture to very low levels.

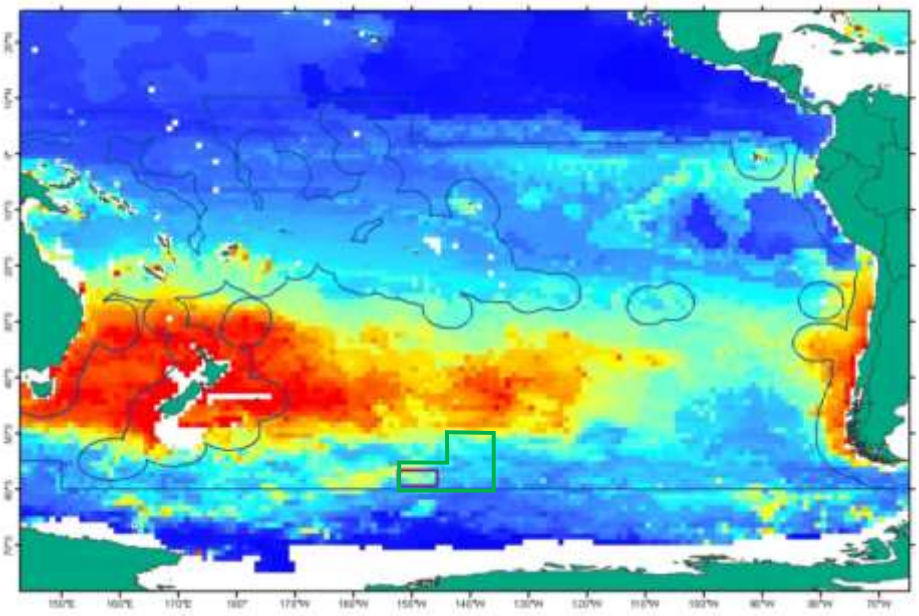

Figure 5: Predicted habitat suitability for stony corals (dark blue=0 to dark red=1) in the 750m to 1,000m depth range, from Tittensor et al. (2009). The general location of the initial and proposed exploratory fishing areas are outlined in purple and green boxes, respectively. The SPRFMO Area and EEZ boundaries are outlined in blue.

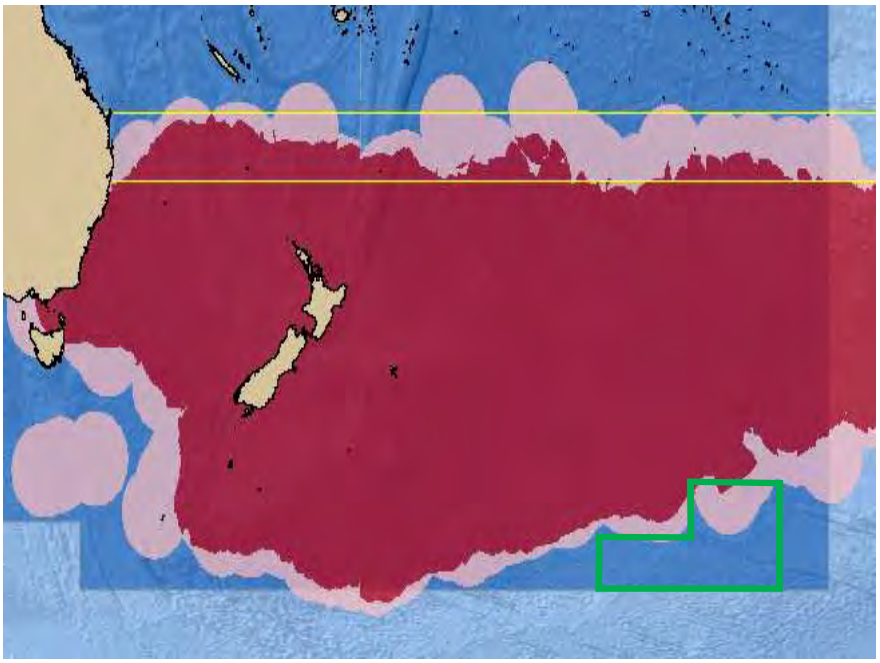

Figure 6: Estimated distributions from tracking data for non-breeding adult female Antipodean albatross (the most wide-ranging individuals) between 2011 and 2015. Red and pink polygons show the 95 and 99% density contours. The approximate location of the proposed exploratory fishing area is shown as a green box.

The Scientific Committee recognised that the broader strata in the proposed continuation of the exploratory fishery include waters of more northerly latitude than the initial fishery in 2016 and 2017, and that it was plausible that there might be a bigger bycatch of deepwater sharks that recent analysis suggests may be at some risk from fishing in the SPRFMO Area (Georgeson et al. 2018). To address this concern, New Zealand has included a move-on rule in the proposal (rev2) and the draft CMM that requires vessels to move away from an area if the catch of deepwater sharks (all species combined) exceeds 250 kg in any set or cluster. This provision will allow time for the Scientific Committee to consider the new information related to any such unexpected captures as part of its annual review of the fishery and make any necessary recommendations to the Commission.

Review by the Scientific Committee

The Scientific Committee assessed New Zealand's updated proposal (SC6-DW03_rev2) at its 6th meeting in Puerto Varas, Chile, in September 2018. In its report, the Scientific Committee:

1. Noted New Zealand's proposal and its Fisheries Operation Plan to extend its exploratory demersal longline fishery for toothfish (limited at 220 tonnes live weight (= greenweight) retained annually);
2. Recognized the cautious, exploratory nature of the proposal;

3. Recognized the scientific benefits of the proposed data collection, especially for understanding the distribution, movement, spawning dynamics, and stock structure of toothfishes and can be used to support the CCAMLR stock assessment models for Antarctic toothfish;
4. Agreed that data and analyses from New Zealand's exploratory fishing continue to be shared in a timely manner with CCAMLR;
5. Agreed that a spatial stratification, consistent with CCAMLR's, should be accepted by SPRFMO for this exploratory fishery for toothfish to facilitate the collection and sharing of data and a similar approach be considered for any future exploratory fisheries for toothfish;
6. Adopted the Data Collection Plan included in the revised (rev 2) proposal;
7. Advised the Commission that the revised proposal is acceptable in terms of Articles 2 and 22, CMM13-2016 (exploratory fisheries), CMM03-2018 (bottom fisheries), and the Bottom Fishery Impact Assessment Standard (BFIAS).
8. Advised that the proposal adequately addressed 5 out of 5 relevant criteria contained in paragraph 10 of CMM13-2016 (which describes the requirements for a Data Collection Plan).
9. Recommended that the assessment is adequate given relevant CMMs and that the revised proposal adequately addressed 8 out of 8 relevant criteria for paragraph 8 of CMM 13-2016 (which describes the aspects of the proposed Fisheries Operation Plans about which the Scientific Committee is required to advise Commission).
10. Recommended that observer data be provided 30 days prior to the Scientific Committee meeting.

Conclusion

New Zealand's proposal to extend the successful exploratory fishery for toothfish is based on a comprehensive analysis of the information collected during the initial 2 years, supported by comprehensive impact and risk assessments as envisioned by the Convention, CMMs 13-2016 and 03-2018, and the BFIAS. The information collected will greatly increase our understanding of the distribution, life cycle, and spawning dynamics of Antarctic toothfish and feed directly into stock assessments and developing assessment models for the adjacent, probably straddling, stock in CCMALR 88.1 and 88.2. Procedures have been developed to share data in a timely manner with CCAMLR to facilitate such work. A comprehensive Fisheries Operation Plan was provided to the Scientific Committee (and is the basis for the draft CMM in COMM7-Prop13) and a detailed Data Collection plan has been developed. Both have been fully endorsed against all criteria developed by the Scientific Committee at its 6th meeting in Chile in September 2018.

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