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Summary of Recent Benthic NZ Bycatch Data

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Summary of recent benthic bycatch data

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1. Purpose of paper

The purpose of this paper is to provide a summary of recent bycatch data from New Zealand bottom trawl vessels operating in the SPRFMO Convention Area. Of particular relevance is the relationship between recent bycatch and the new Vulnerable Marine Ecosystem (VME) indicator taxa weight and biodiversity thresholds contained in Conservation Management Measure CMM 03-2019. This CMM was adopted by the SPRFMO Commission in February 2019.

2. Introduction

In February 2019, the Commission of the South Pacific Regional Fisheries Management Organisation (SPRFMO) adopted Conservation Management Measure [CMM 03-2019](#), which came into effect on 28 April 2019. CMM 03-2019 includes a combination of spatial management and complementary encounter protocols to prevent significant adverse impacts of bottom fishing on VMEs. The encounter protocol, which is considered as a “backstop” to spatial management, requires vessels to cease fishing if they catch VME indicator taxa in quantities that exceed either: (1) taxon-specific weight thresholds; or (2) biodiversity (multiple VME indicator taxa) thresholds. Leading into SPRFMO SC-7, it seems timely to evaluate the relationship between the recent bycatch history of New Zealand’s bottom trawl vessels and the VME indicator taxa and associated weight and biodiversity thresholds included in CMM 03-2019.

3. Methods

We extracted bycatch data for the New Zealand bottom trawl vessels operating within the SPRFMO Convention Area in 2018 and 2019 from the New Zealand Centralized Observer Database (accessed 18 August 2019). Data were collected by scientific observers (the New Zealand bottom trawl fleet has 100% observer coverage in the SPRFMO Convention Area) and included 1,076 New Zealand bottom trawl tows (including mid-water trawls) conducted in the Convention Area between 1/1/18 and 28 April 2019 (the date CMM 03-2019 became binding), and 62 trawls conducted between 28 April 2019 and 29 June 2019. These data consisted of tow-by-tow observer data with one record per benthic taxon encountered on each tow, and included trip number, station number, event number, target species, benthic bycatch code, common name, bycatch weight, method of weight analysis and observer comments. For each tow, we used taxonomic designations from the World Register of Marine Species (WoRMS, RRID:SCR_013312) to assign relevant benthic bycatch to the VME indicator taxa groupings listed in Annex 5 of CMM 03-2019.

We applied the encounter protocol described in Annex 6A and 6B of CMM 03-2019 to each of the 1,076 New Zealand bottom trawl tows conducted in the SPRFMO Convention Area over the period between 1 January 2018 and 28 April 2019 to determine how many times the encounter protocol would have been triggered (note the same analysis was not applied to the trawls conducted since CMM 03-2019 came into effect because no bycatch of VME indicator taxa are recorded in the database from scientific observers – see Table 2). The 2018 analysis provides an approximate estimate of the expected number of times the move-on rule is likely to be triggered under the new conservation management measures.

4. Results

For the period between 1 January 2018 to 28 April 2019, the bycatch of three VME indicator taxa (Scleractinia, Antipatharia and Actiniaria) would have exceeded taxa-specific weight thresholds (Table 1), triggering 13 unique move-on events (1.2% of tows) if the encounter protocol specific in CMM 03-2019 had been in place. No move-on events would have been triggered by three or more taxa exceeding lower taxon-specific biodiversity thresholds.

There was no reported benthic bycatch from the 62 bottom trawl tows conducted between 28 April 2019 and 29 June 2019 (Table 2). Consequently, at the time of writing, no move-on events have been reported under the encounter protocol specified in CMM 03-2019.

5. Discussion

The small number of move-on events that would have been triggered over the period 1 January 2018 to 28 April 2019 had the encounter protocol specified in CMM 03-2019 had been in place is consistent with the intention that the threshold for triggering move-on events should be high and triggered only when bycatch indicates the models used to predict the distribution of VME taxa are misleading¹. However, the percent of tows triggering a move-on event (1.2% of tows) is roughly double that estimated Cryer et al. (2018, [SC-06-DW-09](#)), who estimated that 0.6% of bottom trawl tows conducted between 2008 and 2017 might trigger the protocol in an average year, resulting in about 5 encounters each year if New Zealand flagged-vessels maintained the 2008–18 average fishing effort. This difference highlights the need for

¹ SC-05 **agreed** that, should a move-on rule be implemented as part of the revised CMM for bottom fisheries, the threshold for triggering such a rule should be high... involving weights of bycatch of benthic fauna that would indicate the models used to predict the distribution of VME taxa are misleading.

continual evaluation of bottom trawl bycatch to validate the habitat suitability models upon which the spatial management measures have been built, and to present significant adverse impacts on VMEs.

6. Recommendations

We recommend that the Scientific Committee:

- **Note** that a data-informed approach has been used to review recent bycatch data from New Zealand bottom trawl vessels operating in the SPRFMO Convention Area relative to the VME indicator taxa weight and biodiversity thresholds contained in Conservation Management Measure CMM 03-2019;
- **Note** that, at the time of writing, no benthic bycatch has been recorded in New Zealand databases from scientific observers on New Zealand bottom trawl vessels operating in the SPRFMO Convention Area since CMM 03-2019 became binding on 28 April 2019;
- **Note** that had the new encounter protocol been in force between 1 January 2018 to 28 April 2019, 13 unique move-on events would have been triggered.

Table 1: Taxon-specific weight and biodiversity thresholds, and the number of bottom trawls tows between 1/1/2018 and [CMM 03-2019](#) becoming binding on 28 April 2019 reporting bycatch, the median and range of bycatch weights (kg), and the number of times each taxa would have contributed towards either weight or biodiversity thresholds triggering a move-on event had the encounter protocol included in CMM 03-2019 been in place.

FAO Code	VME Indicator taxa	Weight threshold (kg)	Biodiversity threshold (kg)	No. tows recorded as bycatch	Median bycatch weight (kg)	Range of bycatch weight (kg)	Total bycatch weight (kg)	No. times bycatch exceeded weight thresholds if they had been in place*	No. times exceeded biodiversity weight threshold if it had been in place*
PFR	Porifera (Phylum) <i>Sponges</i>	50	5	75	1.0	0.1 – 50.0	178.20	0	0
AJZ	Alcyonacea (Order) <i>Soft corals</i>	60	1	0	NA	NA	0	0	0
-	Gorgonian Alcyonacea <i>Sea fans</i>	15	1	85	1.0	0.03 – 5.4	68.07	0	10
AXT	Stylasteridae (Subclass) <i>Hydrocorals</i>	-	1	3	0.8	0.5 – 1.0	2.3	NA	0
CSS	Scleractinia (Order) <i>Stony corals</i>	250	5	127	1.0	0.03 – 297.0	1064.93	1	29
AQZ	Antipatharia (Order) <i>Black corals</i>	5	1	71	0.5	0.02 – 6.0	53.42	2	7
ATX	Actiniaria (Order) <i>Anemones</i>	30	5	3	8.0	0.1 – 77.0	987.9	10	45

NTW	Pennatulacea (Order) <i>Sea pens</i>	-	1	11	0.8	0.1 – 1.0	8.1	NA	0
CWD	Crinoidea (Class) <i>Sea lillies</i>	-	1	26	1.0	0.04 – 1.0	23.54	NA	0
BHZ	Brsingida (Order) <i>'Armless' stars</i>	-	1	2	1.15	0.3 – 2.0	2.3	NA	1

* Note that the number of times either bycatch or biodiversity weights are exceeded doesn't necessarily correspond to the number of move-on events if: (a) more than one VME indicator taxa within a tow exceeds its weight threshold, or (b) because three or more VME taxa are required to exceed their biodiversity thresholds to trigger a move-on event.

Table 2 | Taxa-specific weight and biodiversity thresholds, and the number of bottom trawls tows between 28/4/2019 (when [CMM 03-2019](#) become binding) and 29/6/2019 reporting bycatch, the median and range of bycatch weights, and the number of times each taxa contributed towards either weight or biodiversity thresholds triggering a move-on event.

FAO Code	VME Indicator taxa	Weight threshold	Biodiversity threshold	No. tows reporting bycatch*	Median bycatch weight	Range of bycatch weight	Total bycatch weight	No. times bycatch exceeded weight thresholds	No. times contributed to biodiversity rule being triggered
PFR	Porifera (Phylum) <i>Sponges</i>	50	5	0	NA	NA	0	0	0
AJZ	Alcyonacea (Order) <i>Soft corals</i>	60	1	0	NA	NA	0	0	0
-	Gorgonian Alcyonacea <i>Sea fans</i>	15	1	0	NA	NA	0	0	0
AXT	Stylasteridae (Subclass) <i>Hydrocorals</i>	-	1	0	NA	NA	0	0	0
CSS	Scleractinia (Order) <i>Stony corals</i>	250	5	0	NA	NA	0	0	0
AQZ	Antipatharia (Order) <i>Black corals</i>	5	1	0	NA	NA	0	0	0
ATX	Actiniaria (Order) <i>Anemones</i>	30	5	0	NA	NA	0	0	0
NTW	Pennatulacea (Order) <i>Sea pens</i>	-	1	0	NA	NA	0	0	0
CWD	Crinoidea (Class) <i>Sea lillies</i>	-	1	0	NA	NA	0	0	0
BHZ	Brsingida (Order) <i>'Armless' stars</i>	-	1	0	NA	NA	0	0	0

*Note that 62 orange roughy (*Hoplostethus atlanticus*) tows were conducted during this period. No encounters occurred and there are no benthic bycatch records in the databases.