MoP-07-18

7th Meeting of the Parties of the South Indian Ocean Fisheries Agreement (MoP7)

17-20 November 2020 (online)

Report of 5th Scientific Committee

Relates to agenda item: 4 Working paper ☒ Info paper ☐

SIOFA Scientific Committee

Abstract

This paper is the report of the 5th Scientific Committee held online in July 2020

Recommendations *(working papers only)*

The MoP to consider the SC5 report

Report of the Fifth Meeting of the Scientific Committee (SC5) of the Southern Indian Ocean Fisheries Agreement (SIOFA)

Held via Online Forum and WebEx Videoconferences on 7-31 July 2020

Table of Contents

Items that are not addressed this year due to the reduced format and postponed to 2021 are in grey.

List of Annexes

Annex A	Opening Statement of the Executive Secretary
Annex B	List of meeting participants
Annex C	Agenda
Annex D	List of meeting documents and related items
Annex E	Table of agenda items and related papers
Annex F	Overview of SIOFA fisheries 2019
Annex G	PAEWG workplans for cumulative BFIA
Annex H	SERAWG work plan for stock assessment and reference point and harvest control rules
Annex I	SIOFA Scientific Committee operational work plan 2019-2022
Annex J	Gap analysis of CCP BFIAs against BFIA standards
Annex K	Summary of BFIAs submitted by CCPs
Annex L	Activities budget

Agenda item 1 – Opening

Agenda item 1.1 Opening statement from the Chair

1. The Chair, Dr Ilona Stobutzki of Australia, opened the fifth SC meeting via email on 7 July 2020.
2. The Executive Secretary made an opening statement at the start of the first videoconference, held on 22 July 2020. (The full statement is attached as Annex A).

Agenda item 1.2 Introduction of participants

3. The list of participants is attached (Annex B).

Agenda item 2 – Administrative arrangements

Agenda item 2.1 Adoption of the agenda

4. The agenda was adopted via email when the meeting was opened on 7 July 2020 (Annex C).

Agenda item 2.2 Confirmation of meeting documents

5. The list of meeting documents and related items (Annex D) was confirmed.
6. The Chair explained that access to some of the documents is restricted for confidentiality reasons, which limits observers' ability to engage on issues. The Chair **requested** the Secretariat address this issue ahead of the next SC meeting, so as to facilitate the full participation of observers, while still maintaining confidentiality.

Agenda item 2.3 Appointment of rapporteurs.

7. Mr Alexander Meyer (Urban Connections, Tokyo) was appointed to act as rapporteur, with assistance from delegations.

Agenda item 3 – Annual National Reports

8. The annual report discussion was undertaken through an online forum, between 10 to 21 July 2020.
9. Annual reports were submitted by Australia, China, Comoros, Cook Islands, European Union, France (Territories), Japan, Korea, Seychelles, Chinese Taipei and Thailand. An annual report was not submitted by Mauritius.

Australia Annual Report: SC-05-09

10. Australia presented its annual report. The report provides an update on Australia's fishing activities in the SIOFA Area. Australian operators are currently authorised by the Australian Government to target various species with midwater trawl, demersal trawl and demersal line gears. One trip was undertaken by a single vessel using line fishing methods in 2019. The vessel recorded 48,300 demersal longline hooks (54 sets) and 5900 dropline hooks (11 sets), with the majority of catches being comprised of *Polyprion* species. All catch and effort data for fishing operations during 2019 will be submitted to SIOFA in accordance with CMM 2019/02 (Data Standards). All data presented in the report comply with Australia's domestic policy associated with the dissemination of fisheries data and the report does not disclose any non-public domain data within the meaning of SIOFA CMM 2016/03 (Data Confidentiality).

China Fishing Activities Report: SC-05-08

11. China presented its annual report. In the SIOFA Area, China used to operate three different types of fishing intermittently from 2000 to 2017: Light seining targeting mackerel and *Bramidae* family, bottom longlining targeting ruby snapper, etc. and demersal trawling targeting dories and orange roughy. According to the regulation issued by the Chinese fisheries authority, no Chinese-flagged fishing vessels targeting SIOFA species have operated in SIOFA Area since 2018. Based on historical data and statistics, the report summarises fishing activities by Chinese-flagged vessels in the area from 2000 to 2017. China has also been authorising squid jigging since 2003 in the Indian Ocean, but since then there have been no squid jigging vessels fishing in the SIOFA Area. Hence, the report does not include data and statistics on squid jigging in the Indian Ocean. In 2019 China acceded to SIOFA as a CCP but so far the fisheries authority in China has not approved any fishing vessel that may target SIOFA species to operate in the SIOFA Area.

12. China clarified that it engaged in demersal trawling from 2000 to 2002. As there was no specific domestic requirement for vessels to keep fishing records at the time, the vessel operator recorded the catch in its own fishing logbook. Furthermore, there were no domestic regulations or laws requiring Chinese fishing companies to file their fishing logbooks for a certain period. As a result, the fishing logbooks have not been kept. China fully recognises the importance of having accurate spatial location data for bottom trawl fisheries but is unable to submit such data due to the aforementioned historical reasons. It will therefore also have great difficulty providing a bottom fishing impact assessment.

13. China explained that it has length frequency data for only some of the species it catches. All such data are included in the annual report. The Secretariat confirmed that orange roughy catch data from the trawl fishery had been submitted in 2018 and were provided for the orange roughy assessment work.

14. China explained that, as described in the section 7.1 Observer Program in its annual report, it did not conduct an observer program for light seining from 2014 to 2017 and it has conducted only one observer program for bottom longliners in 2005.

Comoros Annual Report: SC-05-14

15. Comoros presented its annual report. The report covers the activities carried out by the Diego Star 2 from 17 October to 18 December 2019 and provides an impact assessment of deep-sea fishing activities on vulnerable marine ecosystems (VMEs) and deep-sea fish stocks in the SIOFA Area, covering the last quarter of 2019. The report is based on historical information from the Diego Star 2 available through logbooks. No information is collected from observers.

Cook Islands Annual Report: SC-05-11_Rev1

16. Cook Islands presented its annual report. In 2019 the Cook Islands authorised two to undertake fishing in the SIOFA Area in 2019. These vessels target deepwater finfish species, primarily alfonsino (*Beryx Splendens)* and orange roughy (*Hoplosthethus atlanticus*) using bottom and midwater trawl fishing methods. The report captures catch and effort data, fishing data collection, research activities, VME thresholds for bottom fishing activities, observer, port sampling and inspection programme and Vessel Monitoring System. Appendices were also provided on the Cook Islands to FAO species codes and list of Benthic Protected Areas (BPAs) closed to Cook Island flagged vessels.

17. Cook Islands explained that the BPAs that SIODFA had proposed to SIOFA (five of which have subsequently been designated as protected areas by SIOFA) are the areas closed to fishing by Cook Islands vessels.

18. Clarification was requested on the VME thresholds being implemented and the training of observers on identification of ‘substantial’ VME structures.

EU Annual Report: SC-05-18

19. The EU presented its annual report. The report presents an overview of the fishery data available from the EU fleets operating at SIOFA Area. It includes data from the EU Member States active in SIOFA (France and Spain). Two EU-France longliners, less than 25m, have a demersal fishery history in the SIOFA Area, in the Saya de Malha Bank, in addition to their tuna directed activities. They did not request any authorisation in 2019 and did not fish in the SIOFA Area. EU-Spain fishing activities within the SIOFA Convention Area have been focused in three fishing grounds, namely Walter Shoals (Area 2), Del Cano Rise (Area 3b) and more recently in Williams ridge (Area 7). Historically there have also been some activities in the Mozambique plateau (Area 1). In 2019 one vessel has been present fishing with autoline system (282 fishing days). Only bottom longlines have been used from April 2015 up to now, mainly using the autoline system, but in 2018 a second vessel has participated using the Spanish longline system.

20. Following clarifications requested in the Forum, the EU explained that EU-Spain fishing vessels have not targeted any shark species since the entry into force of CMM 2019/12 (Sharks) in October 2019. Figure 3 of the EU national report shows species catch by area (left) and year (right) of the eight most abundant species taken from the EU-Spain fleet by year, rather than month, during the period 2014- 2019. If Figure 3 would have shown catches by month it would show zero catch of sharks from October 2019. Details about shark bycatch can be found on Figures 3 and 4 of the EU report, where targeted species and bycatch are shown.

21. The EU further explained that, although, as indicated in its annual report, the main target species in area 2 were deepwater sharks, this will change in line with the EU's compliance with the latest CMM (2019/12 (Sharks)). Furthermore, as part of efforts to assess the status of SIOFA's key target and bycatch shark species, EU-Spain has provided necessary data used in developing the ecological risk assessment (ERA) for these species.

22. Regarding the request from the SC, as stated in para 28 of the SC4 report, for details on how the EU-Spain 2018 fishing effort and/or catch levels compare to the average annual levels in active years over a representative period as described in paragraph 9(1)(a)i of CMM 2018/01 (Interim Management of Bottom Fishing), the EU explained that annual levels are shown in Figure 4 of the EU report. Furthermore, although average levels have not been included in the figure this year, other relevant statistical parameters have been included, such as median, mode, confidence limits, etc., per year. Next year the EU report will include the average annual levels as requested.

23. Regarding the request from the SC, as stated in para 144 of the SC4 Report, that the EU provide its fishing data from 2018 and 2019 to Australia so these data can be included in the stock assessment for the Patagonian toothfish on the Kerguelen Plateau undertaken in 2019, the EU explained that it has submitted to the SIOFA Secretariat all available fishing data. Furthermore, the EU has not received a request from Australia or the SIOFA Secretariat to provide the data referred to in para 144 of the SC4 Report.

24. The EU reported that during 2019 there has been no fishing in any of SIOFA's five protected areas.

25. Noting the updated BFIA submitted by the EU with relevance to Williams Ridge area, the EU was asked to confirm if fishing had occurred in this area before the SC had provided advice on the updated BFIA, in accordance with CMM 2019/01 (Interim Management of Bottom Fishing). It was also noted that the area fished to the far east (~99E) of area 7 was included in the updated BFIA but not in the annual report. The EU clarified that although there seems to be a discrepancy between the areas fished (1. Williams Ridge, 2. ~99^{o} E of area 7) as indicated in its national report and in the BFIA EU-Spain report, this was due to the different periods covered by the two reports.

Specifically, the EU annual report covered the period until the end of 2019 while the BFIA EU-Spain report covered the period from 2017 until January 2020.

26. Regarding the statement in its report that the information should be considered merely informative, as some inconsistencies continue to be detected regarding species identification and fishing data recollection is in process, the EU clarified that this is a general statement referring mostly to the identification of species. The data provided to the Secretariat are correct and the statement refers only to the potential fine-tuning in the data validation process.

France (Territories) Annual Report: SC-05-20

27. France (Territories) presented its annual report. The report summarises and updates fishing activity by France for French Territories-flagged vessels in the SIOFA Area for 2019. The fishing activity has been very low in 2019, with only one longliner vessel operating in the area during two cruises for a total of 11 days. It conducted a total of 40 fishing operations with 200 000 hooks set. No VME indicator thresholds were triggered during 2019. The report also provides an overview of the French observer program implemented on bottom longline fishery. The observer coverage is 100%, meaning that observers are on vessels for every fishing event. Data (including both from the observer and skipper) are entered daily in an electronic logbook and their consistency is checked on a daily basis by observers at sea and on a weekly basis by the Muséum National d'Histoire Naturelle.

Japan Annual Report: SC-05-22

28. Japan presented its annual report. The report describes Japan's 1. Fisheries, 2. Catch, effort and catch per unit effort (CPUE), 3. Fisheries data collection and research activities, 4. VME thresholds, 5. Biological sampling and length/age composition of catches, 6. Data verification mechanisms and 7. Observer program. In the SIOFA Area Japan has been operating two different types of fisheries discontinuously for 44 years (1977-2019), i.e., trawl fisheries targeting splendid alfonsino and bottom longline fisheries targeting Patagonian toothfish. Based on accumulated information, the seven items are described for the trawl and bottom longline fisheries, respectively, highlighting the recent 5 years (2015-2019).

Korea Annual Report: SC-05-12

29. Korea presented its annual report. Korean longline fishery in the high seas of the Indian Ocean started in 1999, and Korean trawl fishery initiated operations in the SIOFA area from 2000. The number of trawlers and longliners that operated in the SIOFA Area between 2011 and 2013 were one and one-to-three vessels respectively; however, none of the fishing vessels have been operating in the SIOFA Area since 2014. Major target species for Korean trawlers in the area have been pelagic armorhead and splendid alfonsino, while those of Korean longliners have been Patagonian toothfish and hapuka. Korean fishing vessels have caught less than 400 tons yearly in 2009-2011. The catch increased up to about 1,000 tons in 2012 and 2013, due to the increased catch by the trawl fishery. The annual observer coverage has been 100% for bottom fishery since 2009. Korea established a procedure to protect VMEs from bottom fishing in the high seas in 2009. It consists of threshold of VME organisms, move on rule, etc. In terms of the verification of catch data and landing and transhipment information, measures to cross-check information collected by different authorities (e.g. National Institute of Fisheries Science, National Fishery Products Quality Management Service, Fisheries Monitoring Center) are specified.

30. Korea clarified that it is preparing haul-by-haul (or set-by-set) data that have been collected by Korean scientific observers from 2009 to 2013. These data will be submitted to the Secretariat once they are completed.

31. Korea explained that the VME threshold specified in its annual report is that from 2009 to 2013 when Korea operated fisheries in the SIOFA Area. Korean flagged vessels

have not operated in the area since 2014 and would comply with the VME encounter protocol in CMM 2019/01 (Interim Management of Bottom Fishing) if it were to resume operations there.

32. Korea was encouraged to record data for *Polyprion* spp. at a higher resolution (e.g. species) to inform future ERA or stock assessment.

Seychelles Annual Report: SC-05-33

33. Seychelles presented its annual report. The report describes Seychelles' fishing activities within the SIOFA Area. The Seychelles has no locally flagged vessels operating in the SIOFA Area. Seychelles flagged vessels operating on the high seas consists of mostly purse seiners and longliners that targets tuna and tuna-like species and are therefore operating in the Indian Ocean Tuna Commission (IOTC) area of competence. The majority of local vessels operates within the Seychelles exclusive economic zone (EEZ) and targets mostly demersal and pelagic species using a range of fishing gears such as traps, handline, dropline and pelagic longlines.

Chinese Taipei Annual Report: SC-05-10

34. Chinese Taipei presented its annual report. Oilfish, including *Ruvettus pretiosus* and *Lepidocybium flavobrunneum*, was a bycatch species of large-scale Chinese Taipei tuna longline fleet prior to 2005. Some tuna longliners started shifting to the southwest Indian Ocean fishing for oilfish seasonally after 2005 to obtain extra earnings. The numbers of longliners that fished for oilfish seasonally were between 9 to 45 from 2000 to 2018, and there were 42 authorised ones fishing for oilfish within the SIOFA Area in 2019. The average catch in recent 5 years (2015 to 2019) by this fleet was at around 6,100 metric tons.

35. Chinese Taipei explained that it has submitted operational data, i.e. haul by haul data, of oilfish harvested by vessels authorised to target the species, and supported their use in scientific analysis, such as the SIOFA teleosts ERA, in accordance with the work plan and rules of the SC. Furthermore, Chinese Taipei has submitted, to the IOTC, 5-degree-square data aggregated by periods of month and areas of 5◦longitude and 5◦latitude from all fishing vessels authorised to operate in the IOTC area of competence.

36. Chinese Taipei reported that it is planning to collect size, weight, and gonad of both *Ruvettus pretiosus* and *Lepidocybium flavobrunneum*. The sampling work will be implemented by scientific observers. Chinese Taipei has not yet conducted a stock assessment of oilfish, but will start by conducting CPUE standardisation.

37. Chinese Taipei explained that, according to the scientific observers' records, the most common species of shark its vessels have encountered in the Indian Ocean are blue shark, shortfin mako, longfin mako and crocodile shark, while for seabirds, the most common species are white-chinned petrel, shy albatross, wandering albatross and shearwaters nei.

Thailand Annual Report: SC-05-13

38. Thailand presented its annual report. Thailand has begun authorising Thai-flagged overseas fishing vessels to operate in the SIOFA Area. The 1st Thai oversea fishing vessel ported out for fishing in May 2019 and the 2nd Thai oversea fishing vessel ported out for fishing in October 2019. The main fishing grounds were distributed around Saya de Malha Bank, between 9-11^{o} S latitude and 60 to 62^{o} E longitude. The fishing gear were otter board trawl and handline. The fishing information were recorded during May 2019 – January 2020. There were 358.12 tons caught by otter board trawl and 304.80 tons caught by handline. For the otter board trawler, there were 176 hauls and the average CPUE was 494.08 kg/hr. The dominant species comprised *Decapterus* spp., *Saurida* spp., *Nemipterus* spp., *Upeneus* spp., and *Sphyraena* spp. For handline, there were 110 fishing days and the average CPUE was

2,770.90 kg/day. The major species consisted of *Carangoides* spp., *Gnathanodon speciosus*, *Epinephelus* spp., *Aprion virescens*, and *Lutjanus* spp.

39. Thailand provided additional information about the configuration of the line gears of its fisheries. The maximum length of the line is around 100 m. During fishing operations, the line is released around 20-80 m depending on the water depth. There are 2-4 hooks per line. The hook is J-shaped and the length is 3 inches. The sinker is made from lead or metal, with each weighing around 1-2 kg. Round scad is used as bait. One fisher operates one line at a time. The fishing period varies from 2 to 8 hours a day.

40. Thailand explained that one reptile, a sea turtle, was incidentally caught by a Thai fleet as bycatch. It was caught around mid-December and released alive. At the time when Thailand wrote its annual report, the trip during which the reptile was caught was not yet complete. The vessel in question landed at a Thai port at the end of January 2020. When all information from the observer was submitted to the authorities and double-checked, the reptile was later found from the observer's logbook. Because of the timing, this information could not be included in the annual report but it has since been reported to the Secretariat in the incidental bycatch spreadsheet of Catch and Effort data. This is the only reptile incidentally caught by a Thai fleet in 2019.

41. Thailand clarified that the VME encounter protocol being implemented followed CMM 2019/01 (Interim Management of Bottom Fishing).

Agenda item 4 – Current and historical status of fishing activities

Agenda item 4.1 Spatial Extent of Historic Catch Data, Bottom Fishing Footprint

42. The Chair reminded that, in accordance with CMM 2019/01 (Interim Management of Bottom Fishing), para 20, CCPs shall submit to the Secretariat relevant data on the spatial extent of its historical bottom fishing effort in the SIOFA Area. In accordance with CMM 2019/01 (Interim Management of Bottom Fishing), para 3c, the bottom fishing footprint is defined as a map of the spatial extent of historical bottom fishing in the SIOFA Area. Furthermore, in accordance with CMM 2019/01 (Interim Management of Bottom Fishing), para 7, the SC 2020 shall develop and provide advice on an appropriate SIOFA bottom fishing footprint based on the data provided by CCPs to the Secretariat under para 20.

43. The Data Manager presented the SIOFA Fishing Footprint r2 (SC-05-31). He explained that the Secretariat has tested several ways to produce fishing footprints that have different outputs. He requested that the SC adopt a methodology to produce the footprint using fisheries data provided at various level of resolutions, choose which gear-specific footprints would be relevant to produce, and agree on what can be excluded from the footprint area (insignificant fishing events or records, unfishable depths, etc.).

44. The Chair of the Protected Area and Ecosystems Work Group (PAEWG) summarised the PAEWG's discussions on developing the SIOFA bottom fishing footprint, as reported in the PAEWG2 Report. The PAEWG **noted** the need to take into account the fact that CCPs have historically collected data at different levels of resolution from one another and that it may be necessary to use different methods for developing footprints for different objectives and different gears. The PAEWG **agreed** to hold further discussions on: how to exclude unfished areas from footprints; whether or not to include depth exclusions; how to handle grids with a single fishing event including the need to check the underlying data of these grids to verify they are true fishing events; and specific criteria for determining 'significant intensity'.

45. Regarding grids with single fishing events, the Data Manager explained that it is possible to track these events back from the database and identify where the fishing occurred and which CCP conducted the event. However, they noted that updating footprints based on this approach would require substantial work.

46. The Chair pointed out that it is possible for the SC to provide a bottom fishing footprint according to the definition in CMM 2019/01 (Interim Management of Bottom Fishing)—that it is a map of the spatial extent of historical bottom fishing—but recognised that there is uncertainty in how the MoP intends to use the footprint.

47. The SC recognised that the selection of a footprint is partly a management question that depends on the objective to be achieved. The SC **noted** that the PAEWG discussed the technical issues identified and that further discussions would require additional input from the MoP. To facilitate the discussions of the MoP, the SC suggested that the PAEWG could prepare a paper for the MoP outlining options for methodologies for different gear types and objectives, as well as options for addressing the aforementioned technical issues and the associated consequences/trade-offs.

48. Deep Sea Conservation Coalition (DSCC) supported seeking clarification from the MoP regarding the objective of the footprint, but also expressed concern about the process potentially being delayed. DSCC encouraged the SC to seek to resolve this matter as soon as possible.

49. The SC **requested** that the MoP provide clarification on the intended use of the SIOFA bottom fishing footprint so the SC can provide methods for developing footprints for that purpose.

50. The SC **requested** that the PAEWG prepare a paper outlining options for methodologies for different gear types and objectives, as well as options for addressing the aforementioned technical issues and the associated consequences/trade-offs, to facilitate the discussions of the MoP.

51. The SC **requested** that the PAEWG develop a work plan, including timeframe to progress this work as quickly as possible, to address the issues identified in the PAEWG2 Report, specifically:

    - exploring approaches to integrating historic CCP data collected at different spatial resolutions;
    - recommending whether depth exclusions should be used to remove unfished areas;
    - recommending the approach to grids with a single fishing event or record, including verifying that these represent fishing events and are not data errors; and
    - specifying criteria for determining ‘significant intensity’.

Agenda item 4.2 Overview of SIOFA fisheries 2019

52. The SIOFA Data Manager presented a draft Overview of SIOFA fisheries in 2019 (SC-05-26), by compiling information on active fleet composition; fisheries operating in the SIOFA Area; fishing effort; total catches and catch composition; VME thresholds, response and measures, and encounters; observer and port sampling programs; and biological sampling; from National Reports (as at 28 Feb 2020) and the Secretariat’s databases.

53. The draft overview was discussed through an online forum, between 10 to 21 July 2020. The SC reviewed and finalised the Overview of SIOFA fisheries in 2019 (Annex F).

Agenda item 5 – Scientific data standards

Agenda item 5.1 Templates for data submission

Agenda item 5.2 Historical Catch and Effort Data

54. The Chair reminded the SC that it has requested the Secretariat provide an annual data holdings report and data inventory (SC4 Report, para 77) and work to refine and consolidate this (SC4 Report, para 78). SC-05-INFO-04 (historical catch and effort data inventories), along with INFO-02 (SIOFA observers data) and INFO-05 (historical data inventory), contribute to developing the type of report that would be used by the SC to consider issues and gaps in the data collection and submissions that underpin stock assessments and other work.

55. The discussion of SC-05-INFO-05 started through an online forum, between 10 to 21 July 2020. The Secretariat had revised the document in response to comments, with the final document being SC-05-INFO-05 Historical data inventory rev5.

56. The SC **noted** the importance of CCPs clarifying in their data submission when no data is provided whether it is a true 0 or if there is no monitoring. The SC **requested** the Secretariat resolve this issue with individual CCP data submissions.

57. Cook Islands expressed concern over data security and the protocols applied by the Secretariat, given that Cook Islands fine scale data had been displayed inappropriately. Secure management of fine scale resolution data is of great importance, given their sensitivity and the fact that they hold commercial intellectual property that has been built over many years. The Cook Islands is still collecting fine scale data and has those data available. It is willing to continue providing them for scientific purposes, but would like to be assured about the access and use of these data, and that they would be provided for SC activities where it is confirmed as necessary to fulfil agreed tasks assigned to the SC only.

58. The Data Manager asked in what circumstances Cook Islands data has been displayed inappropriately and requested Cook Islands liaise with the Secretariat via email about this event.

59. The SC **noted** that China operated a light seine fishery in the SIOFA Area before 2018 and that CMM 2019/02 (Data Standards) does not include a standard for the submission of such data. The SC **requested** China propose draft changes to CMM 2019/02 (Data Standards) for the submission of light seine fishery data for SC6 consideration.

60. Chinese Taipei clarified that it has submitted annual catch data from 2015 to 2019, aggregated catch and effort data from 2015 to January 2017, and haul-by-haul data from February 2017 to 2019.

Agenda item 5.3 Annual Catch and Effort Data

61. The discussion of SC-05-INFO-04 started through an online forum, between 10 to 21 July 2020. The SC encouraged the Secretariat and CCPs to work to resolve data submission gaps or clarify interpretation of data submissions. The Chair encouraged the use of the report to track identified data issues and their resolution, noting the format used in other RFMOs as a useful model. The Secretariat revised the document in response to comments through the forum with the final version being SC-05-INFO-05 Catch and effort data submission 2018 summary_rev2.

62. The SC discussed the fact that both observer data and logbook data on associated and dependent species such as marine mammals, marine reptiles, seabirds or other species of concern, are required to be submitted by CMM 2019/02 (Data Standards). Some CCPs regarded this as submission of the same data twice.

63. The SC recognised that it had been tasked to review Annex B (Observer Data) of CMM 2019/02 (Data Standards) but was not conducting the review this year due to the reduced meeting format.

64. DSCC commented that all appropriate data need to be provided, so as to facilitate stock assessment for ensuring sustainable fishing and to prevent significant impact on VMEs. If such data cannot be provided, fishing should not occur.

65. The SC **agreed** that, at SC6, when it undertook the review of Annex B (Observer Data) the issue of logbook and observer data on associated and dependent species such as marine mammals, marine reptiles, seabirds or other species of concern, would be considered.

66. The SC **noted** that Chinese Taipei operates a pelagic longline fishery in the SIOFA Area and that CMM 2019/02 (Data Standards) does not include a standard for the submission of such data. The SC **requested** Chinese Taipei propose draft changes to CMM 2019/02 (Data Standards) for the submission of pelagic longline fishery data for SC6 consideration.

Agenda item 5.4 Observer data

Agenda item 5.4.1, 5.4.2, Observer data and database

67. The discussion of SC-05-INFO-02 started through an online forum, between 10 to 21 July 2020. The Secretariat revised the document in response to comments through the forum with the final version being SC-05-INFO-02 SIOFA Observers data rev2.

68. The SC discussed the importance of updating the SIOFA observer database, recognising that the lack of such data created an issue in the alfonsino stock assessment, whereby it was only possible for the consultant to obtain size data from one fleet and for one year (2018), even though more size data were available. The SC also recognised that the delay in updating this database had been in part due to the limited time and resources of the Secretariat in 2019.

69. The SC **requested** the Secretariat update the database with the incorporation of the submitted data as soon as possible.

Agenda item 6 – Vulnerable Marine Ecosystems

Agenda item 6.1 Protected Areas and Ecosystems Working Group (PAEWG)

70. Due to the reduced meeting format, the Chair of the PAEWG, Mr Patrice Pruvost (France (Territories)), summarised the related discussions and advice of the PAEWG under the relevant agenda items.

Agenda item 6.2 VME mapping

Agenda Item 6.3 VME indicator species and responses to VME encounters

Agenda item 6.3.1 VME indicator taxa list

Agenda item 6.3.2 Encounter threshold level for trawl gears

71. The Chair reminded the SC that the MoP has tasked it with providing advice on what constitutes evidence of a VME encounter, particular threshold levels and indicator species for the implementation of CMM 2019/01 (Interim Management of Bottom Fishing). At SC4, the SC reached consensus on a threshold for longlines, but not on trawl gears, and also recommended a response for VME encounters.

72. The PAEWG Chair summarised the PAEWG's discussions on setting VME encounter thresholds (PAEWG2 Report). The PAEWG discussed possible approaches for setting the threshold, including: adopting a precautionary but arbitrary approach; determining the threshold based on historical benthic bycatch data (but that these data are limited); and the pros and cons of modifying the current threshold without additional data to support such a modification. The PAEWG **noted** that the setting of thresholds must be considered holistically, in the context of the full range of management measures, the SIOFA fishing footprint, and spatial habitat modelling. The PAEWG discussed the advantages and disadvantages of thresholds and move-on rules. The PAEWG **agreed** to form a small working group comprising CCPs that participate in SIOFA trawl fisheries to work intersessionaly to characterise, and if possible compile and analyse benthic bycatch data, with a view to exploring the potential to quantitatively inform the setting of a VME threshold for trawl gears in SIOFA, including reviewing the approaches that CCPs have used previously. The PAEWG **agreed** that, if adequate data are available, the most appropriate method to set VME thresholds for trawl gears would be to use historical benthic bycatch data.

73. The SC recognised that there is a limited amount of information available on indicator species in the SIOFA Area and discussed the need to collect more data, including via the use of photographic surveys.

74. The SC **noted** that the existing threshold value should be maintained as agreed by MoP6 (2019) (MoP6 Report, para 11bis) until the SC provides advice for the setting of a new optimum value.

75. DSCC commented on the importance of deep-sea sponges to the ecosystem, noting that they are identified in the International Guidelines for the Management of Deep-sea Fisheries in the High Seas as vulnerable and sensitive. SIOFA has an obligation to protect VMEs, including sponges, and should place more priority on the protection of VMEs than fishing interests. The threshold should be set at a level that protects the species, rather than the fishing. Therefore, an appropriate threshold would be a maximum of 50 kg, in line with the South Pacific Regional Fisheries Management Organisation protocol for sponges. If SIOFA is unable to set such a threshold, it should consider prohibiting the use of destructive trawling gear.

76. The SC **requested** the CCPs involved in the trawl fisheries collaborate on this work.

77. The SC **noted** that, if adequate data are available, the most appropriate method to set VME thresholds for trawl gears would be to use historical benthic bycatch data.

78. The SC **requested** CCPs collect more data on VME indicator species.

79. The SC **requested** that the PAEWG develop a work plan, with a timeframe, to progress the work to set VME encounter thresholds and report to SC6, including:

    - reviewing the approaches that CCPs have used previously, and
    - characterising, and if possible compiling and analysing benthic bycatch data, towards potentially setting a quantitatively-informed VME threshold for trawl gears.

Agenda item 6.3.3 Weight Conversion of VME indicators

Agenda Item 6.4 SIOFA Standard protocols for future protected areas designation

Agenda Item 6.5 Bottom Fishing Impact Assessments (BFIA)

Agenda item 6.5.1 Submitted BFIA

80. The discussion of updates to the Gap Analysis of CCP BFIAs against BFIA Standards (SC4 Report, Annex R) and the Summary of BFIAs submitted by CCPs (SC4 Report, Annex S) started through an online forum, between 15 to 21 July 2020. The drafts were revised with input from the CCPs submitting revised BFIAs (Australia, EU and Comoros) and the videoconference discussion. The final documents are attached as Annex J and Annex K respectively.

81. Australia presented SC-05-17, which revises the historic Australian fishing footprint to include a small amount of fishing effort which was not included in the original footprint presented to SIOFA (Williams et al*.* 2011; Delegation of Australia 2018), and takes into account updated bathymetric data. The updated BFIA also provides an assessment of Australia's intention to undertake fishing using pots for spiny lobsters (*Palinurus* spp. and *Jasus paulensis*) within Australia's historical fishing footprint, and using integrated weight longline to target Patagonian toothfish (*Dissostichus eleginoides*) on Williams Ridge, according to CMM 2019/15 (Management of Demersal Stocks).

82. The SC acknowledged the work done by Australia and recognised that it meets an appropriate standard in light of international standards and the SIOFA BFIA Standard (BFIAS).

83. The EU presented SC-05-19, which provides an update (2020) to the preliminary assessment of bottom fishing impact for the EU fisheries in the SIOFA Area. From 2017, two EU-Spain fishing vessels have had activities within the SIOFA Area, one with a Spanish bottom longline system with a secondary floating line and the other with a Mustad-autoline system with a single line with integrated weights. In 2019, 4,862 km of bottom longlines were deployed by the EU-Spain fleet in areas 2, 3b and 7, a decrease to 68% of the effort released the previous year in 2018. Almost 75% of the fishery is deployed on shallow mid-continental slopes. Most of the fishing activity took place in areas 2 and 3b, and most of the grids have been moderately fished. New fishing has started on Williams Ridge in area 7. The impact on VME taxa is considered to be low. Data on VME by-catch taxa and their quantification have improved over the last few years with the implementation of the scientific observation on board. Four fishing surveys with scientific observers on board have been conducted from 2017 to 2019 and the threshold of 10 or more VME indicator units by segment was never reached.

84. The SC acknowledged the work done by the EU. However, the SC pointed out that, as has been indicated previously by the SC and the MoP (SC3 Report, para140; Mop6 Report, para 75) there continues to be a gap in the EU's BFIA, specifically information on the impact on target and bycatch species.

85. The EU expressed its commitment to providing the relevant information at SC6.

86. The SC sought clarification on the use of wire snoods, and whether nylon snoods could be used instead to reduce shark bycatch, in accordance with CMM 2019/12 (Sharks). Noting CMM 2018/09 (Control), para 9, the EU explained that the EU-Spain vessels use wire snoods because they are more resistant than nylon snoods and that the use of nylon snoods would result in loss of fishing gear and increase in marine pollution.

87. The SC **noted** that there is a possible trade-off between potential gear modifications that may result in small amounts of plastic pollution and fishing gear loss, and the potential conservation of deep-sea sharks and mitigation of shark bycatch in accordance with CMM 2019/12 (Sharks) (and particularly paragraph 5 thereof, which states that CCPs shall, where possible, undertake research to identify ways to make all relevant fishing gears more selective to minimise deep sea shark bycatch and shall provide relevant information to the SC).

88. DSCC suggested that the EU's statement, in SC-05-19, that 'the impact on VME taxa is considered to be low' should be supported by quantitative or qualitative metrics.

89. The Chair explained that Comoros had submitted an updated BFIA (SC-05-14) but was unable to attend the meeting.

90. The Executive Secretary shared a statement from Comoros: Comoros wishes to remind all participating parties of SC5 that Comoros remains committed to respecting the provisions of CMM 2018/1 (Interim Management of Bottom Fishing) concerning fisheries management. Comoros' BFIA report was presented at SC4 and at MOP6 and no comments were raised. The fishing activity of the Comoros-flagged vessel Diego Star 2 has no impact on bottom fishing as it uses handline.

91. DSCC commented that CCPs could be encouraged to apply the Food and Agriculture Organization of the United Nations (FAO) International Guidelines for the Management of Deep-sea Fisheries in the High Seas, particularly paragraph 18, when making an assessment of overall impact.

92. DSCC asked that gaps in the BFIAs be identified and reported to the MoP. DSCC also reminded the SC that paragraph 75 of the MoP6 Report states that the EU indicated that the SC had identified a range of gaps in several BFIAs and encouraged other CCPs to update and resubmit their BFIAs to address the gaps identified by the SC. DSCC considered that lack of progress on this sets an unacceptable precedent.

93. The Chair recalled paragraph 151 of the SC3 Report, which stated that the SC noted the efforts made by CCPs to comply with the BFIAS; noted large differences in terms of the interpretation of, and methods used to determine, 'impact' and 'risk'; noted varying levels of alignment between the submitted BFIA and the SIOFA BFIAS and FAO International Guidelines for the Management of Deep-sea Fisheries in the High Seas; reiterated that the overarching objective is to consider the cumulative impact and risk by all fleets/methods of fishing across the entire SIOFA Area; and reiterated the need to review the SIOFA BFIAS. The Chair noted the link between improving individual BFIA and progressing the cumulative BFIA.

94. The SC **noted** the need to make further progress on improving individual impact assessments and developing a cumulative BFIA for SIOFA.

Agenda item 6.5.2 Cumulative BFIA

95. The Chair reminded the SC that CMM2019/01 (Interim Management of Bottom Fishing) tasked the SC to provide advice on the likely cumulative impacts of bottom fishing activity by its 2018 meeting. At the time, the SC3 was not able to provide advice but developed a work plan for that purpose. The following year, the SC4 was still not able to progress the work, but revised the work plan and requested a budget for such work, with CCPs committing to work together with other CCPs using the same gear types.

96. The PAEWG Chair summarised the PAEWG's discussions on developing a cumulative BFIA (PAEWG2 Report). The PAEWG discussed a number of methods that can be used for assessing the impact of trawl and line gears, including the Sharp-Mormede method, the Relative Benthic Status (RBS) method, the International Council for the Exploration of the Sea (ICES) method based on physical disturbances, the swept-area seabed impact (SASI) method, and the photograph-based survey method employed by France (Territories). The PAEWG **noted** that the cumulative impact for longlines has already been assessed for CCAMLR using the same framework as SIOFA. The PAEWG **noted** that work to collect and organise CCPs' data is progressing. The PAEWG **requested** the Secretariat prepare a characterisation of the trawl data available, towards collation of spatial trawl data at finest resolution. The PAEWG **noted** that, given the paucity of data available, particularly the lack of detailed VME distribution data, the Sharp-Mormede method may be the most useful method for an initial BFIA. As more data become available, subsequent BFIAs could be conducted

using more sophisticated methods, such as the RBS or photograph-based survey methods. The PAEWG **agreed** to continue intersessional correspondence regarding methods for assessing the cumulative SIOFA BFIA.

97. The SC discussed the paucity of VME distribution data and **noted** the need to collect more such data. The SC **noted** assessment methods that use real bycatch data, such as the method applied by France (Territories) based on photographic surveys. Methods such as the Sharp-Mormede method, which do not necessarily incorporate actual VME data and use footprints and environmental data at different resolutions, may include large uncertainties. Nevertheless, in the absence of sufficient information on the distribution of VMEs, these methods may be useful for understanding the relative status or naturalness of bottom habits, which would help in the assessment of bottom fishing impacts.

98. The SC discussed the urgent need to progress towards a cumulative BFIA. The SC **noted** that the PAEWG has identified a method for assessing the cumulative impact of the longline fisheries and that CCPs have agreed to use it. The SC **noted** that the PAEWG has held discussions on different methods for assessing the cumulative impact of the trawl fisheries.

99. The SC suggested that progress in developing a cumulative BFIA has been partially constrained by lack of funding. The SC **noted** and welcomed the voluntary funding contribution made by Australia to assist in progressing the cumulative trawl fishing impact assessment and **recommended** that the funding be used to hire a consultant to lead and conduct the work.

100. The SC **requested** that the PAEWG develop a work plan, with a timeframe, to progress the work and report to SC6, including:

- continuing intersessional correspondence regarding methods for assessing the cumulative SIOFA BFIA, and
- hiring a consultant to undertake the cumulative trawl and longline BFIAs.

101. The SC **noted** the commitment from all CCPs to engage in the relevant work and to provide the necessary data in a timely manner.

102. The Data Manager said that work to develop a cumulative BFIA would rely on historical data, particularly historical observer data, and encouraged CCPs to provide such data to the Secretariat.

103. The FAO commented that the second phase of the Areas Beyond National Jurisdiction (ABNJ) Deep Seas Project would begin in early 2022 and offered to work with SIOFA to help coordinate the work to develop a cumulative BFIA.

104. The SC **requested** the PAEWG Chair follow up on possible collaboration with the ABNJ Project.

Agenda item 7 – Stock assessment and ecological risk assessment

105. The Chair reminded the SC that CMM 2019/01 (Interim Management of Bottom Fishing) tasks the SC with developing and providing advice and recommendations to the MoP on the status of stocks of principal deep-sea fishery resources targeted, and that the SC has previously provided such advice on orange roughy and Patagonian toothfish. In addition, CMM 2019/15 (Management of Demersal Stocks) tasks the SC with providing annual reports on the status of demersal fisheries resources targeted, relative to available and/or relevant reference points. The reports shall include, where possible, projections of stock status over a period no less than 20 years. Furthermore, the SC shall provide management advice relative to available and/or relevant

reference points. MoP5 requested that the SC provide advice based on MSY until specific reference points are adopted.

Agenda item 7.1 Stock Assessment and Ecological Risk Assessment Working Group (SERAWG)

106. Due to the reduced meeting format, the Co-Chairs of the SERAWG, Mr Lee Georgeson (Australia) and Dr Tsutomu Nishida (Japan), summarised the related discussions and advice of the SERAWG under the relevant agenda items.

Agenda item 7.2 SIOFA stock assessment framework

Agenda item 7.3 Alfonsino

107. The Chair reminded the SC that in addition to the requirements of CMM 2019/01 (Interim Management of Bottom Fishing), CMM 2019/05 (Management of Demersal Stocks) tasks the SC with assessing the *Beryx splendens* stocks in 2020, providing advice on assessment time frames, and providing advice and guidance on any necessary changes to data collection to reduce future assessment uncertainty.

108. The consultant, Marine Resource Assessment and Management Group (MARAM), presented SC-05-28, which provides a number of standardised CPUE series for the alfonsino resource in the SIOFA Area. The data are divided into two management unit areas: West and East, and three fleet series: S1 (trawl including both mid-water and bottom ones), S2 (mid-water trawl) and S3 (mid-water trawl). The basic analysis approach was to bifurcate on the basic model chosen depending on the magnitude of the proportion of zero catches, and the covariate selection was determined using the Akaike Information Criterion (AIC). The data are such that the results have poor precision. Fit diagnostics were checked and found to be reasonable. In general, sensitivities did not give results that differed greatly, apart from allowance for bycatch (as a surrogate for accounting better for targeting). Further approaches could have been explored, but this was not seen to be a high priority because the stock assessment analyses showed estimates of stock status and productivity to be rather insensitive to different CPUE standardisation approaches.

109. The SERAWG Co-Chair (Japan) summarised the SERAWG's discussions on the CPUE standardisation work. The SERAWG was tasked with evaluating if the standardised CPUE data would be useful for stock assessment. However, the SERAWG initially could not identify appropriate methods for doing so, and proceeded with conducting a stock assessment using the standardised CPUE. After the stock assessment was conducted, an evaluation was conducted using residual analysis to some extent, and it was found that the use of the standardised CPUE data was indeed suitable. For future stock assessments, the SERAWG discussed using tow-by-tow data, considering other definitions of fishing effort such as swept area, and developing data catalogues to understand what kinds of variables and attribute data are available for effective standardisation work. The SERAWG discussed the possibility of improving future abundance estimation by applying acoustic data; these might provide either a relative or an absolute measure of abundance. However, many issues need to be clarified, such as time-area coverage, the complex behaviour of alfonsino, target strength and vessel calibration. A feasibility study of the cost-benefit of collecting acoustic data should be conducted. However, even if the use of acoustic data is feasible, the process can nevertheless be costly and time-consuming.

110. The SC **noted** the uncertainties around the use of CPUE data, but recognised that, in the absence of other more suitable indices of abundance, the standardised CPUE data was the best information that was currently available.

111. The SC **noted** the possibility of hydro-acoustic data being a potential index of abundance or a basis to verify trends in CPUE data. The SC **recommended** conducting a feasibility assessment of the cost-benefit of collecting acoustic data,

including clarifying target strength, vessel calibration, inter-vessel comparison and spatio-temporal coverage.

112. The SC **agreed** that future CPUE standardisations could be improved by using tow-by-tow data, considering other definitions of fishing effort such as swept area, and developing data catalogues to understand what kinds of variables and attribute data are available for effective standardisation work. The SC **requested** the Secretariat progress the data catalogues.

113. MARAM presented SC-5-29, which provides Age-Structured Production Model (ASPM) assessments of the alfonsino resource in the SIOFA Area.

- Data used: Total catch for each fleet, other member countries and non-member countries, with catches starting from 1977; relative abundance indices from the CPUE standardisation excluding the series for S2 (East); and length distribution data for the S1 fleet in 2018.
- Key assessment model features: Assessments are carried out separately for West and East management units, a deterministic spawner-recruit relation of the Beverton-Holt form is used due to the limited data in the SIOFA database, and the same selectivity is assumed for all fleets and all years due to the limited length data.
- Model: The choice of model was limited by the paucity of size composition data, and an ASPM was chosen to make allowance for time-lags arising from age-structure effects due to the relatively long-lived nature of alfonsino.
- Key assumptions: Beverton-Holt spawner-recruitment relation (deterministic), steepness (h) of 0.75, natural mortality (M) of 0.2, and age at maturity of 6 years.
- Sensitivities: A number of sensitivity analyses were considered for the East and West management units. The model was insensitive in most cases but was highly sensitive to the value specified for M for both the East and West.

Basic results:

- There is some spawning biomass reduction below the pre-exploitation level (the ratio of this biomass to its pre-exploitation level is referred to as “depletion”) for the West and East for both the base (reference) case and sensitivities.
- A comparison was conducted of the spawning biomass depletion for the West and East for the base case and two retrospective analyses. Hardly any change was shown in the East. In the West, with more data and time, the situation seems to be slightly better than in the past; this warrants monitoring.
- Spawning biomass depletion projections were conducted for the base case for the West and East at the current catch level (2018) and +/-10%, 20%, 30% and 40%. For the West, the spawning biomass is projected to remain steady and above SSB_{MSY} if catches continue at the 2018 level. For the East, however, for catches at the 2018 level, the spawning biomass is projected to decline slightly, though remaining above SSB_{MSY} for the next 20 years.
- One sensitivity case of concern is if M is reduced to 0.15. In that case, in the West, if the catch level is increased by 40%, spawning biomass will drop below SSB_{MSY} within 10 years, while in the East, even at the current catch level, spawning biomass will drop below SSB_{MSY} within 10 years.
- Average fishing proportion (F*) projections were conducted. In the West, F* will remain the same if the catch level remains the same. In the East, under the current catch level, F* will increase slightly and if the catch level is increased, F* will increase more rapidly.

Key outcomes:

- The assessment model results indicate that the stocks are both at about 60% of their pre-exploitation spawning biomasses in West and East. Neither stock is overfished, where overfished is defined as $SSB<SSB_{MSY}$, nor is overfishing, where overfishing is defined as $F>F_{MSY}$, taking place. The low M (M=0.15) sensitivity has the most influence on the assessment results. The selection of catch levels (i.e. 2018 catches or the last 5-year average) has a marked influence on projections of depletion (more so for the West than for the East).

Additional analyses:

- Uncertainties around the estimates of depletion SSB/SSB_0: With only one year of length distribution data used in this assessment, there is no basis to estimate variations about the spawner-recruitment relationship that exist in reality. Furthermore, the constraint of a deterministic model restricts the range of alternative possible inferences. Therefore, a realistic estimation of the statistical precision and variance of quantities such as current spawning biomass depletion is not possible.

- Projection of catches using the last 5-year (2014-2018) average catch level: In the East, the 5-year average catch amount is 706 tonnes, which is within the results of the catch scenarios used in the stock assessment projections. In the West, the 5-year average catch amount is 3,436 tonnes, which is above the level projected at the 2018 catch level +40%.

- Kobe plots of a base case where M=0.15: In the West, the model indicates that the stock is not overfished (using the definition $SSB<SSB_{MSY}$) and overfishing (using the definition $F^*>F^*_{MSY}$) is not taking place. In the East, the model indicates that the stock is not overfished (using the definition $SSB>SSB_{MSY}$) but the level of fishing is very close to F^*_{MSY}.

- Spawning biomass depletion for the West and East with a Santamaria growth equation: The spawning biomass depletion is around 80% for both West and East, up from around 60% under the original growth curve, indicating that the model is sensitive to the growth curve assumed.

Recommendations for future work:

- Add available size data from CCPs to the SIOFA database.
- Develop data catalogues or characterisations for future assessments so that CCPs can ensure that all data are being used.
- Estimates of abundance in absolute terms, for example by using acoustic data, would help reduce uncertainties associated with the value of M.

114. The SERAWG Co-Chair (Japan) summarised the SERAWG's discussions on the alfonsino stock assessment. The SERAWG discussed uncertainties around data, age and growth, stock assessment and projections.

- Data: The SERAWG **noted** the need to compile the available biological information, such as sex, size, weight, gonad, genetic tissue, otoliths for estimating the SIOFA-specific age, length-weight, maturity at age, etc. The SERAWG **noted** the need to develop a data catalogue of available variables and attribute data in SIOFA.

- Age and growth: For the East management area, the SERAWG **advised** using age with readability scores 1-3, improving ageing and growth functions, assessing whether change in growth at around age 9 coincides with the onset of maturity or is due to other factors, verifying the annual deposition of zones and determining the zone formation timing, and verifying longevity by bomb radiocarbon. For the West management area, the SERAWG **advised**

developing growth equations based on the completed age estimates, while also incorporating the abovementioned points.

- Stock assessment: The SERAWG **noted** various uncertainties in the assessment, including SSB_{MSY} in relation to M (M=0.2 or 0.15), growth equations, stock status as it relates to M (M=0.2 or 0.15), and the use of CPUE for abundance indices.
- Projections: The SERAWG **noted** various uncertainties in the projections, including what catch level to use (2018 or 5-year average catch), F* and SSB depletion as it relates to M (M=0.2 or 0.15).

115. The SC **agreed** with the SERAWG's decision to divide the stock into two management units: West and East, split along 80°E, until new scientific information becomes available.

116. In relation to the stock assessment, the SC **noted:**

- that although the precision of the assessment results appears high, this was a consequence of necessary model simplicity given the limited data, and in reality, the precision is low.
- the uncertainties in the assessment, including being constrained by limitations related to the CPUE standardisation and catch at length data available.
- the sensitivity of the results to the assumed value of M. The base case assumes M=0.2; this was informed by a literature review. The SC **agreed** that there was no information available to determine whether M in the SIOFA area should be higher or lower.

117. The SC **agreed** that the assessment results (SERAWG2 Report, Kobe plots) indicate:

- that the current spawning stock biomass (SSB_{2018}) in both the East and West, was higher than the biomass associated with MSY (SSB_{MSY}) and higher than 60%SSB_0, where SSB_0 is the spawning biomass prior to fishing. Regardless of the sensitivity considered, the current biomass does not appear to be depleted to an extent that would raise immediate concern.
- that for both stocks the level of fishing mortality is less than that associated with MSY. However, the fishing mortality is higher in the East than the West.

118. In considering the results of projections (SERAWG2 Report, Projection plots), the SC **agreed**:

- that the projections were sensitive to the constant catch scenario and the value of M assumed. The projections were sensitive to the use of the 2018 or 5-year average catch, showing more rapid depletion under the latter scenario. Furthermore, the M=0.15 sensitivity in combination with the 5-year average catch scenario provides the least optimistic scenarios for both management units, although spawning stock biomass remains above SSB_{MSY}, and fishing mortality remains below F_{MSY} over 10 years.
- that the projections for the East stock were less optimistic, particularly for the M=0.15 scenario.

119. The SC **recommended** that the MoP, in light of the uncertainties around the stock assessment, should take a cautious approach when applying the results.

120. The SC **recommended** continuing to work towards improving the stock assessment, in particular:

- incorporating CCPs' available data, particularly on catch-at-length,
- investigating further information on catch composition and targeting,

- investigating the use of acoustic data to provide an index of absolute abundance, and
- conducting research towards better estimating M.

121. DSCC commented that it is very clear that there is a lack of critical data, including catch-at-length data and acoustic data. Given the uncertainty in the data on which the assessment is based and the uncertainty in the assessment, DSCC recommended that the SC take a precautionary approach in its advice to the MoP. DSCC also recommended that the SC develop a timeline for developing fishery-specific precautionary target and limit reference points to replace those related to MSY. Furthermore, DSCC highlighted the need to collect more data, including acoustic data, noting that United Nations General Assembly (UNGA) resolution 64/72 in 2009 has called for parties not to authorise bottom fishing activities until the necessary measures have been adopted and implemented.

122. FAO commented that the ABNJ Project is interested in the assessment of such data poor stocks and suggested that ABNJ and SIOFA could collaborate on identifying why there is so little supporting data on alfonsino and assisting in collecting more of these data; reviewing the interpretation of assessment models using limited data to help scientists and managers understand them; and developing frameworks for advice and the management of data-poor stocks.

Agenda item 7.4 Patagonian toothfish

123. The Chair recalled that, in addition to the requirements of CMM 2019/01 (Interim Management of Bottom Fishing) and CMM2019/15 (Management of Demersal Stocks), the SC had been tasked with making recommendations for building an area wide habitat model, a spatial and temporal CPUE analysis, an estimate and map of local abundances, and a local population assessments, and providing any necessary improvements to data collection, as well as addressing issues of depredation and providing advice on appropriate limits for relevant species caught as bycatch.

124. The EU presented SC-05-30, which provided a preliminary analysis of Patagonian toothfish fishing data from the Del Cano Rise in the SIOFA Area.

Context:

- The analysis was based on fishing data from vessels flagged to Spain, France, Japan, and Korea.
- It was conducted to provide a better understanding of the impact of these fisheries and two events of higher fishing effort identified on the Del Cano Rise Patagonian toothfish stock and involved developing preliminary proxies of fish biomass based on depletion analysis and exploring temporal trends of fish biomass based on CPUE standardisation and data poor modelling approaches using the Catch-MSY approach of Stock Reduction Analysis and Just Another Bayesian Biomass Assessment (JABBA), a state-space surplus production model.
- The time series data are from the past 17 years at different levels of information detail and aggregation (improved in recent years with the development of standardised data collection templates).
- Due to the large variability of the densities with depletion analyses, estimates of fish densities and pristine abundances are not likely to be accurate without specific sampling design.
- Combined effect of soak time and fishing depth by country shows important discrepancies in the CPUE relationship.
- More data are needed to estimate sustainable catch limits.

Results:

- Both data poor modelling approaches show that the local biomass of toothfish responded to the exerted fishing effort.
- Preliminary analysis suggests that had this level of fishing pressure been maintained over a longer time period, the stock would likely have decreased beyond the point of recovery.

Recommendations:

- Consider including in the longline observer data template a record sheet for tag releases/recaptures, and develop a tagging protocol for observers/vessels and to coordinate, likely with CCAMLR, about tagging supplies;
- Encourage fishing effort to be spread spatially and stratified across depth over as large a range as possible for the Del Cano Rise region; and
- Develop a longer-term fishery-based research plan for the Del Cano Rise fishery.

125. The SERAWG Co-Chair (Japan) summarised the SERAWG's discussions on the Patagonian toothfish analysis. SERAWG **advised** considering including a record sheet for tag releases/recaptures in the longline observer data template; developing a tagging protocol and coordinating with CCAMLR on tagging work; and considering a longer-term fishery-based research plan. The EU suggested that fishing efforts cover wider areas and depths to collect more scientific data for robust analyses.

126. The SC acknowledged the work done by the EU and **noted** that the results are preliminary and rely on the limited data available.

127. The SC recalled the SC4 advice on stock status and management advice (SC4, paras 141-144 and 146-147) and, with respect to the Del Cano area, **agreed** that the results from SC-05-30 indicated that high effort periods and catches appear to have had an effect on local density in the region.

128. The SC **noted** that finer spatial-scale resolution data from Korea would be valuable for improving future analyses and **requested** that Korea provide this data to the Secretariat and future analyses.

129. DSCC recommended that the SC develop a more ambitious timeline for developing fishing-specific precautionary catch limits and reference points, noting that CCAMLR has equivalent target reference points for toothfish. DSCC encouraged SIOFA to collaborate on data collection and analysis with CCAMLR.

130. France (Territories) presented SC-05-21, which provides a study of whale interactions with fishing activities targeting Patagonian toothfish.
Results:

- Whale depredation results in decreased fishing yields for vessels and also uncertainty around the depredated part of the catch, which can affect the accuracy of stock assessments of the Patagonian toothfish population and the management of stocks.
- From 2009-2019, the interaction rate was 28% and 43.8% for killer whales and sperm whales, respectively. The mean depredation rate over the same period was estimated to be 7.5%.
- Some of the whales observed in the Del Cano Rise area were also observed interacting with fishing activities in Crozet/Kerguelen.

Recommendations:

- Acknowledge the existence of depredation in the SIOFA Area and the impact that depredation can have on toothfish assessment and estimated biomass in the SIOFA Area;
- Adopt a mandatory protocol for documenting all interaction with marine mammals for all longliner vessels operating in the SIOFA Area;
- Adopt the following actions for longline fishing vessels subject to killer whale interactions in order to reduce the risk of spreading depredation behaviour:

i. stop hauling and buoy off the line when killer whales are sighted,

ii. steam away at least 30 nautical miles,

iii. not haul any line within a radius of 30 nautical miles around the initial observation point, and

iv. restart hauling of the buoyed-off line once killer whales are absent.

131. The SERAWG Co-Chair (Japan) summarised the SERAWG's discussions on the interaction between whales and fisheries. The SERAWG **advised** acknowledging the existence of depredation in the SIOFA Area and the impact that it can have on toothfish catches in the SIOFA Area. France (Territories) suggested adopting operational actions to reduce the risk of depredation and to adopt a mandatory protocol for documenting marine mammal interactions with all fishing vessels.

132. The SC **acknowledged** the existence of depredation in the SIOFA Area and **noted** the potential scale of impact on toothfish catches, thereby affecting toothfish assessment and estimated biomass in the SIOFA Area, and the commercial viability of fishing operations.

133. The SC **noted** that there is evidence that the depredation behaviour is spreading from the Crozet population and could become a significant issue for fishing operations in the SIOFA Area.

134. The SC **recommended** the MoP:

- request CCPs adopt a protocol for documenting all interactions with marine mammals for all longliner vessels operating in the SIOFA Area.
- encourage CCPs to adopt operational actions to mitigate such interactions and report on the results of those actions at SC6.

Agenda item 7.5 Orange Roughy

135. The Chair recalled that the SC had been tasked with reporting on the status of the orange roughy stocks, that SC3 had reported the stock assessment results and that SC4 had provided advice on the use of MSY reference points. In addition, the SC has since been tasked with providing annual reports on the status of the stock, including projections if possible. The SC has also been tasked with providing advice on any improvements to data collection to reduce future assessment uncertainty and to provide a summary on the progress against the orange roughy work plan.

136. The SERAWG Co-Chair (Japan) summarised the discussions of the SERAWG on orange roughy. He explained that, due to the lack of working papers and time constraints, there was no discussion during SERAWG2.

137. The SERAWG Co-Chair (Japan) pointed out that, in accordance with CMM 2019/01 Conservation and Management Measure for the Interim Management of Bottom Fishing in the Agreement Area (Interim Management of Bottom Fishing), para 6, the SC is to develop and provide advice and recommendations whenever a substantial change to the fishery has occurred, but no such substantial change has occurred. He also explained that, in accordance with CMM 2019/15 (Management of Demersal Stocks), para 3, the SC is to provide annual reports on the status of the orange roughy

stocks. There has been no change to the stock status and the biomass was likely above 50% of the virgin biomass in all seven sub-regions. Furthermore, the 2018 catch was at its lowest level in the past seven years. The SERAWG Co-Chair (Japan) also pointed that there are four tasks related to orange roughy in the work plan, concerning the stock structure, age frequency, target strength and data collection protocol, but no activity has been conducted in these regards over the past year.

138. The SC recalled the SC3 and SC4 advice to the MoP (SC3 Report, para 234), in particular:

- All three assessment approaches indicated that spawning stock biomass in 2017 (ss17) for the 7 sub-regions assessed was likely to be above 50%SSB_0.
- Projections for the Walters Shoal Region indicate that the stock in this sub-region is unlikely to be depleted to levels below 60%SSB_0 in the next 5 years if future catches in these years do not exceed those reported in 2017.
- The SC noted that it would annually review orange roughy catch and effort statistics to inform future timing for the cycle of assessments. A 3-5 year assessment schedule was considered appropriate but if catch or effort change by 20% or more in any year this would trigger SC discussion on the timing of a new assessment.

139. The SC recalled the SC4 advice to the MoP (SC4 Report, paras 150-153), in particular:

- The SC agreed that deterministic estimates of BMSY were highly uncertain and therefore not suitable to be used as a reference point for management advice for this stock.

140. The SC **noted** that 2018 trawl effort was lower than 2017 and the 2018 catch was substantially lower than the 2017 catch.

141. The SC **agreed** that given the trend in effort and catch, the status of the orange roughy stock is unlikely to have changed substantially since its previous advice.

142. DSCC highlighted the need for precautionary catch limits and prioritisation of the work in the work plan. Furthermore, it would be beneficial to have assurances that the catch levels will remain the same when making projections about the stock.

SIODFA commented that the current CMMs prohibit expansion of effort and new entrants are regulated.

Agenda item 7.6 Deepwater chondrichthyans

143. Australia presented SC-05-16, which provides the final SIOFA deepwater chondrichthyans ERA. This work has since been published in the ICES Journal of Marine Science (Georgeson et al. 2020). The main conclusions are that several species that are reported to have been commercially targeted in SIOFA were assessed as being at high or extreme risk to fishing, based on which SC4/SERAWG1 developed a list of 'species of concern'; better catch, effort and biological information is needed to inform assessment and management; and if there is targeted shark fishing in the Southern Indian Ocean, improved assessments and estimates of sustainable yields are urgently required to mitigate risk of overexploitation.

144. The SERAWG Co-Chair (Australia) summarised the discussions from the SERAWG on deepwater chondrichthyans. The SERAWG recalled that CMM 2019/12 (Sharks) tasked the SC with advising the MoP on the need to adopt any appropriate bycatch limits for relevant SIOFA deep sea shark species and fleets. The SERAWG discussed the large removals of low-productivity and potentially highly vulnerable species and **agreed** that precautionary bycatch limits are necessary if the removals continue. The Co-Chair (Australia) noted that the majority of catches of deepwater sharks in SIOFA are being taken by one CP using longline gears. Regarding CMM 2019/12 (Sharks),

the SERAWG suggested that, in the absence of any other attempts or methods to inform the setting of SIOFA-specific bycatch limits, the deepwater chondrichthyan bycatch and move-on rules used by CCAMLR would be a sensible way to mitigate bycatch of deepwater sharks in SIOFA.

145. The SC discussed the post-release survival of deepwater sharks caught in both trawl and longline fisheries. It was discussed that some studies suggest low post-release survival from trawl fisheries, while research from longline fisheries in shallower depths than SIOFA fisheries suggests there may be higher post-release survival. Careful handling of the species may be required to maximise their chance of post-release survival.

146. SIODFA suggested that observers and crews need to be sensitised to the importance of shark survival, while recognising that releasing the sharks in time can be difficult as this needs to be done at what is usually a very critical time during fishing operations. SIODFA also suggested that it may be worthwhile to explore tagging studies of deepwater sharks.

147. DSCC pointed out that CCAMLR has undertaken tagging research on skates that shows that skates survive in longline fisheries. For deepwater sharks, the survival rate is very low in trawl fisheries but some do survive releases from shallow fisheries.

148. The SC **noted** that the work represents a positive and successful collaborative effort between SIOFA CCPs, the Secretariat and various other institutions and individuals, and on behalf of all co-authors and contributors, accepted Australia's expression of gratitude for the outcomes achieved.

149. The SC **noted** the importance of cooperation among CCPs for conducting such research and **requested** that CCPs submit the appropriate data, particularly effort data on trawl and longline gears, to the Secretariat, for facilitating future research.

150. The SC **noted** that there is considerable uncertainty around the characteristics of SIOFA deepwater chondrichthyan fisheries and that resolving these uncertainties would greatly assist future scientific research and management of these fisheries, and **requested** that SIOFA CCPs catching deepwater chondrichthyans (whether defined as 'targeted' or 'bycatch') collaborate to provide a paper to SC6 on the characteristics of these fisheries.

151. The SC **noted** the key findings of the ERA, specifically that:

- uncertainties in ERA analyses and the input data should not prevent a precautionary approach being taken by SIOFA to prioritise species for further research, data collection and/or stock assessment to estimate sustainable yields;
- information on the identification, distribution, stock structure, biology and life history of many deepwater chondrichthyans is lacking and needs to be improved;
- at-sea identification protocols need to be improved and efforts should be made to collect information on deepwater chondrichthyans at a species level in logbook and observer records, with these data being recorded at the best possible resolution in the SIOFA databases;
- research on species' post-capture mortality and selectivity would be useful to reduce uncertainties in this assessment, as well as to inform mitigation strategies to minimise vulnerability associated with susceptibility; and
- more quantitative assessments are urgently required for deepwater shark species which are reported to be commercially targeted or retained in relatively high volumes in the Southern Indian Ocean to minimise the risk of overexploitation that has occurred in other fisheries globally.

152. The SC **noted** the measures implemented in SIOFA partly in response to the ERA, including the implementation of CMM 2019/12 (Sharks) and the recommendation for SIOFA vessels to carry and use the relevant FAO guides to the Deep-sea Cartilaginous Fishes of the Indian Ocean (Volumes 1 and 2).

153. The SC **recommended** that until more rigorous estimates of fishing mortality can be derived, the ERA for SIOFA deepwater chondrichthyans be updated every five to ten years, or whenever there is a substantial change in the fishery (e.g. large changes in catch and/or effort), and that these periodic updates be reflected in the SIOFA SC workplan.

154. The SC recalled the advice of SC4 (SC4 Report, para 164), in particular:

- that the Productivity-Susceptibility Analysis (PSA) and Sustainability Assessment for Fishing Effects (SAFE) analyses identified a number of species of deepwater chondrichthyans at high or extreme relative vulnerability to fishing using demersal trawl, demersal longline and demersal gillnet gears; and
- that based on the results of the ERA and the understanding of the vulnerability of many deepwater chondrichthyans species to fishing, four 'key species of concern' for which catch data are available (*C. coelolepis*, *C*. *granulosus*, *D*. *calcea* and *D*. *licha*) are caught in relatively high volumes.

155. Regarding CMM 2019/12 (Sharks), para 4, the SC **requested** the MoP to urgently consider additional precautionary measures to mitigate bycatch of deepwater chondrichthyans. The SC **noted** the absence of any attempts or methods to inform the setting of SIOFA-specific bycatch limits and discussed potentially useful bycatch mitigation measures such as:

- Longline gear modifications, such as the use of nylon snoods instead of wire snoods, noting paragraphs 86 and 87 that discuss potential trade-offs with such an approach
- Prohibition on the retention of deepwater chondrichthyans
- Live release, where possible, of all shark bycatch (see, for example, CCAMLR conservation measure (CM) 32-18)
- Move-on rules such as those used by CCAMLR (for example, as per CCAMLR CM 33-03), whereby vessels are required to move-on if bycatch of certain species (including deepwater sharks) exceeds a percentage of the catch limit for that fishery, or exceeds a particular weight/number threshold per fishing operation (e.g. set or tow).

156. The Cook Islands noted that the targeting and/or retention of any shark or shark parts by Cook Islands flagged vessels is prohibited as per the special licensing conditions under the Cook Islands High Seas Trawl Authorisation. All sharks must be released dead or alive in the best manner for the sharks' survival.

157. The SC **noted** that, if bycatch mitigation measures for SIOFA Area are developed based on those used in CCAMLR, it will be necessary to account for the different catch composition in each area, as well as potential differences in biomass and ecological characteristics that serve as the basis for setting bycatch limits,. In addition, the fishery-specific and gear-specific effects of possible mitigation measures need to be accounted for.

158. FAO commented that the ABNJ Deep Seas Project is planning to work with RFMOs on impacts of fishing on deepwater sharks. RFMOs are using different approaches, and there is value in learning from the different approaches and results. The ABNJ Project would be interested in collaborating with SIOFA on its deepwater shark assessments, particularly on the data collection relating to identification, catch and distribution of deepwater sharks, and the spatial distribution of fishing effort by gear.

159. The SC **agreed** that collaboration with the ABNJ Deep Seas Project would be beneficial to informing SIOFA's management of deepwater shark species and **requested** relevant CCPs collaborate with the ABNJ Deep Seas Project to contribute to the project development on this issue.

160. DSCC expressed its support for SIOFA using the bycatch and move-on rules of CCAMLR, such as those of CM 32-18. DSCC recognised the value of taking additional time to consider the fundamental elements of the CCMLR CM as it would be useful for the SC. However, it also expressed concern by the potential additional delay in taking measures.

161. DSCC suggested ending the use of steel tracers in longline fisheries as a precautionary measure to reduce the bycatch of sharks, especially deepwater sharks. This would also help prevent the bycatch of sharks by ghost fishing when any longline gear is lost.

Agenda item 7.7 Saya de Malha Bank species

Agenda item 7.8 Other teleosts

162. Australia presented SC-05-15, which provides an update on the ERA for the effects of bottom fishing gears on SIOFA teleosts.

- Update: There have been no major changes to the results. However, the species list is still incomplete as a number of species codes in the SIOFA database correspond to species that do not occur in SIOFA. There are also issues with resolution in the database relating to group codes and catches by gear. A number of red flags were identified, such as an F estimate for alfonsino of 0 for midwater trawl gears, indicating a problem with the distribution and/or effort data.
- Response to the issues raised at SC: The presenter (Australia) decided against constraining the species list for each gear type until distribution data issues are resolved. It has also concluded that there would be limited benefit in exploring biological/life history data gaps as the objective of the ERA is to prioritise species requiring more attention.
- Future work: Suggested future work includes reviewing effort data quality, coverage and currency; reviewing and refining the species list; looking at database coding and gear type issues; running sensitivities on the distribution data or looking for alternative sources; and reviewing and refining selectivity assumptions for certain gears. Australia noted that it can continue this work.

163. The SC **noted** that ERA can be a useful method for prioritising species that may require further data collection, assessment and/or management actions, particularly when results are considered against relevant conservation and management measures and in the context of information on catches, fishing effort and species biology.

164. The SC **noted** that these ERA tools could be extended to cover other taxa in SIOFA, including marine mammals, marine reptiles, seabirds and other species of concern.

165. The SC **noted** that the uncertainties around the results indicate the need for additional work on the species list, species distribution, fishing effort data and selectivity assumptions.

166. The SC **noted** that until these uncertainties are reduced, results should be viewed with caution.

167. The SC **requested** the Secretariat work collaboratively with each CCP to resolve species coding and database issues (particularly whether catch data for 'unspecified trawl' gears can be disaggregated into specific trawl gear types) before SC6 in 2021.

168. The SC **requested** Australia continue to lead this work in collaboration with the Secretariat and CCPs.

169. The SC **agreed** to reflect an update to this work to resolve the aforementioned uncertainties in SIOFA SC's and SERAWG's workplans.

170. The SC **recommended** that the MoP note the ongoing issues around data provision to the Secretariat that had delayed or constrained SC work, including the ERA on other teleosts and the CPUE analyses for toothfish. The SC **recommended** the MoP request CCPs facilitate timely provision of data to the Secretariat and SC so that the SC can undertake its work.

Agenda item 7.9 Harvest strategies

171. No papers were provided for this agenda item. The SC **agreed** to progress this work, in line with the agreed work plan (SC4 Report, Annex X) and reflected in the SC Operational work plan, **noting** the MoP6 had approved funding for this work in 2020 (MoP6 Report, Annex Q, EUR 15,000 in 2020, of a requested EUR 30,000 across two years).

Agenda item 8 – Proposals to bottom fish in the Agreement Area in a manner at variance with established measures

Agenda item 9 – Scientific impact assessments

Agenda item 9.1 Demersal gillnet operations

Agenda item 10 – Cooperation with other RFMOs and international bodies

Agenda item 10.1 FAO ABNJ Deep Seas Project

Agenda item 10.2 Southwest Indian Ocean Fisheries Commission (SWIOFC)

Agenda item 10.3 The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)

172. The discussion of cooperation with CCAMLR started through an online forum, between 7 to 21 July 2020.

173. The Chair reminded the SC that, in accordance with CMM 2019/15 (Management of Demersal Stocks), para 11, CCPs with an interest in this stock shall cooperate to ensure scientific collaboration between CCAMLR and SIOFA. The SC had previously supported an increased engagement with CCAMLR and welcomed the arrangement between the MoP and Commission signed in 2018. CCAMLR's participation in previous SC meetings has added value on relevant issues. At SC4 it was agreed that an increased level of interaction was timely given the increased interest in fishing for Patagonian toothfish in SIOFA areas adjacent to CCAMLR fisheries with full assessments.

174. The SC **agreed** that CCAMLR remains an important international body for the SC and CCPs to collaborate with as reflected in the obligations within CMM 2019/15 (Management of Demersal Stocks).

175. CCAMLR expressed its support for continued and increased cooperation with SIOFA, including data sharing, scientific collaboration and information sharing at the Secretariat level.

176. DSCC noted the usefulness of having respective representatives of SIOFA and CCAMLR attending each other's meetings but suggested that more concrete measures should be considered, such as joint assessment and ensuring compatibility of measures.

Agenda item 10.4 Agreement on the Conservation of Albatrosses and Petrels

Agenda item 11 – Review and development of Conservation and Management Measures (CMMs)

Agenda item 11.1 Draft CMM on fishing research and exploratory fisheries

177. The discussion of the draft CMM on fishing research and exploratory fisheries started through an online forum, between 7 to 21 July 2020.

178. The EU presented SC-05-24, which provides a draft CMM to establish a framework for scientific research.

179. The SC discussed the draft CMM and issues of concern or requiring clarification.

180. The SC reviewed the proposal and **recommended** that a revised draft is provided to the SC for review, taking into account:

- The recommendations from the SC3 Report, para 289, that have not yet been addressed.
- The purpose and intent of the proposed framework should be more clearly stated.
- Care should be taken to avoid creating unnecessary barriers to conducting research. In particular, paragraphs 6 and 7 seem overly restrictive. CCPs should have the flexibility to conduct both fishery dependent and fishery independent research or direct their observers to collect data different from the 'usual data collection' that aligns with their scientific management or strategic priorities. Being required to seek approval and report on all scientific research can pose a significant administrative burden on CCPs without a clear justification.
- The proposal confuses 'surveys' with 'scientific research' and uses the two terms interchangeably, when they should be treated as different things.
- The proposal assumes that SIOFA has adopted total allowable catches (TACs), when that is not the case and offers no alternative for addressing the apparent concern of fisheries research resulting in excessive catch of species.
- The template for research activities could be based on 'CCAMLR CM 24-01 (2019): Format for submitting finfish research proposals'.
- With respect to paragraph 8: Some research analyses can take months to process samples, so a 15-day report back time is unrealistic.
- With respect to paragraph 9: some CCPs suggest the survey catch allowance of 2% should be separate from any TAC.
- With respect to paragraph 13: Some research activities can be undertaken by an observer while also doing their normal job. A second observer seems to be unnecessary in some circumstances e.g. for biological data collection. It

should be mandatory to have one observer on board, and possible to have a second.

- Paragraph 14 seems to be specific to surveys and not research in general, while the objective of this proposed CMM is stated as being to 'govern the undertaking of fisheries-related scientific research in the SIOFA Area'.

181. The SC **requested** that the MoP provide clarification on the intended purpose of the framework for scientific research to facilitate its further development.

182. The EU presented SC-05-25, which provides a draft CMM that outlines a framework on new fisheries.

183. The SC discussed the draft CMM and **recommended** that the following points be considered in revising the draft:

- The proposed measure may be premature as the SC has not yet agreed on a bottom fishing footprint. Some CCPs noted that there is currently little stopping the expansion of non-trawl fishing efforts into new areas targeting new species.
- It is difficult to see the difference between the draft CMM's requirement for a fisheries operation plan and the BFIAS. Noting that there are gaps in CCPs' submitted BFIAs, there is concern about potential gaps in the proposed fisheries operation plans.
- A clear distinction should be made between new fisheries and exploratory fisheries. A possible definition of exploratory fishery could be one based on CCAMLR CM 21-01 (2016), incorporating stock information, e.g. 'information on distribution, abundance, demography, potential yield and stock identity from comprehensive research/surveys or exploratory fisheries has not been submitted to SIOFA.'
- The framework should include conditions for upgrading new fishing grounds to existing fishing grounds.
- Paragraph 5 should be deleted, as it is not a definition but a statement about establishing boundaries. Furthermore, it provides a loophole to conduct commercial fishing in closed areas under the auspices of new fisheries development.

184. The SC **requested** the EU engage with CCPs through intersessional discussions and further refine the proposals.

Agenda item 11.2 CMM 2019/01 Interim Management of Bottom Fishing

Agenda item 11.3 CMM 2016/03 Data Confidentiality

Agenda item 12 – Scientific Committee Work Plan

Agenda item 12.1 Long term research plan

Agenda item 12.2 Operational work plan and budget 2019 – 2022

185. The SC discussed the progress against the operational work plan 2018-2021 (SC4 Report, Annex W) and adopted an updated operational work plan 2019-2022 (Annex I). The updated operational work plan includes updates from the PAEWG (including Annex G, the updated cumulative BFIA workplan) and SERAWG (including Annex H, the updated stock assessment and harvest control rules workplan).

186. The SC noted MoP6 Annex Q which included the 2019 research activities that would use the remaining 2019 research activities budget and for the 2020 budget, the MoP had allocated EUR 12,000 for *EU Voluntary fund – match funding for additional work contributing to the SC Work Plan* and allocated funding for two research activities prioritised by the SC in 2020, specifically:

    - *Development of T+L Reference points and Harvest strategies Year 1 (2 years total EUR 30,000)* – allocated budget for 2020 was 15,000
    - *BFIA Trawl and Longline consultancy [3 months trawl and 2 months longline]* (EUR 66,900) – allocated budget for 2020 was EUR 25,900 and EUR 41,000 identified from 2019 funds

187. The Secretariat provided an update on the funding for research activities in 2019 and 2020, advising that the activities identified in paragraph 34 had not yet been commissioned. The Secretariat advised that the EU had provided a grant (EUR 54,866) for the VME habitat mapping activity in 2019 and 2020 and that this work had commenced and that AUS had provided a voluntary contribution (EUR 33,567) in 2020, for the cumulative BFIA for trawl fisheries.

188. The SC **requested** the Secretariat commission the research activities identified for 2020 as soon as possible, so that the outcomes could be reported to SC6.

189. The SC **agreed** to finalise its advice to the MoP on research activities intersessionally by August 20. The SC **requested** the PAEWG and SERAWG Chairs provide updated advice on research priorities, including potential matching funds for grants, which will be collated and distributed by the Secretariat for the SC's consideration and finalisation of advice.

Agenda item 12.3 Review of consultant's recruitment procedure

Agenda item 13 – Advice to the Meeting of Parties

Consolidation of advice to the Meeting of the Parties

In relation to Agenda item 4.1 Spatial Extent of Historic Catch Data, Bottom Fishing Footprint:

The SC **noted** that the PAEWG discussed the technical issues identified and that further discussions would require additional input from the MoP. To facilitate the discussions of the MoP, the SC suggested that the PAEWG could prepare a paper for the MoP outlining options for methodologies for different gear types and objectives, as well as options for addressing the aforementioned technical issues and the associated consequences/trade-offs. (Paragraph 47)

The SC **requested** that the MoP provide clarification on the intended use of the SIOFA bottom fishing footprint so the SC can provide methods for developing footprints for that purpose. (Paragraph 49)

The SC **requested** that the PAEWG prepare a paper outlining options for methodologies for different gear types and objectives, as well as options for addressing the aforementioned technical issues and the associated consequences/trade-offs, to facilitate the discussions of the MoP. (Paragraph 50)

The SC **requested** that the PAEWG develop a work plan, including timeframe to progress this work as quickly as possible, to address the issues identified in the PAEWG2 Report, specifically:

- exploring approaches to integrating historic CCP data collected at different spatial resolutions;
- recommending whether depth exclusions should be used to remove unfished areas;
- recommending the approach to grids with a single fishing event or record, including verifying that these represent fishing events and are not data errors; and
- specifying criteria for determining 'significant intensity'. (Paragraph 51)

In relation to Agenda item 5.2 Historical Catch and Effort Data:

The SC **noted** the importance of CCPs clarifying in their data submission when no data is provided whether it is a true 0 or if there is no monitoring. The SC **requested** the Secretariat resolve this issue with individual CCP data submissions. (Paragraph 56)

The SC **noted** that China operated a light seine fishery in the SIOFA Area before 2018 and that CMM 2019/02 (Data Standards) does not include a standard for the submission of such data. The SC **requested** China propose draft changes to CMM 2019/02 (Data Standards) for the submission of light seine fishery data for SC6 consideration. (Paragraph 59)

In relation to Agenda item 5.3 Annual Catch and Effort Data:

The SC **agreed** that, at SC6, when it undertook the review of Annex B (Observer Data) the issue of logbook and observer data on associated and dependent species such as marine mammals, marine reptiles, seabirds or other species of concern, would be considered. (Paragraph 65)

The SC **noted** that Chinese Taipei operates a pelagic longline fishery in the SIOFA Area and that CMM 2019/02 (Data Standards) does not include a standard for the submission of such data. The SC **requested** Chinese Taipei propose draft changes to CMM 2019/02 (Data Standards) for the submission of pelagic longline fishery data for SC6 consideration. (Paragraph 66)

In relation to Agenda item 5.4.1 Observer data:

The SC **requested** the Secretariat update the database with the incorporation of the submitted data as soon as possible. (Paragraph 69)

In relation to Agenda item 6.3.2 Encounter threshold level for trawl gears:

The SC **noted** that the existing threshold value should be maintained as agreed by MoP6 (2019) (MoP6 Report, para 11bis) until the SC provides advice for the setting of a new optimum value. (Paragraph 74)

The SC **requested** the CCPs involved in the trawl fisheries collaborate on this work (on the encounter threshold level for trawl gears). (Paragraph 76)

The SC **noted** that, if adequate data are available, the most appropriate method to set VME thresholds for trawl gears would be to use historical benthic bycatch data. (Paragraph 77)

The SC **requested** CCPs collect more data on VME indicator species. (Paragraph 78)

The SC **requested** that the PAEWG develop a work plan, with a timeframe, to progress the work to set VME encounter thresholds and report to SC6, including:

- reviewing the approaches that CCPs have used previously, and
- characterising, and if possible compiling and analysing benthic bycatch data, towards potentially setting a quantitatively-informed VME threshold for trawl gears. (Paragraph 79)

In relation to Agenda item 6.5.1 Submitted BFIA:

The SC **noted** that there is a possible trade-off between potential gear modifications that may result in small amounts of plastic pollution and fishing gear loss, and the potential conservation of deep-sea sharks and mitigation of shark bycatch in accordance with CMM 2019/12 (Sharks) (and particularly paragraph 5 thereof, which states that CCPs shall, where possible, undertake research to identify ways to make all relevant fishing gears more selective to minimise deep sea shark bycatch and shall provide relevant information to the SC). (Paragraph 87)

The SC **noted** the need to make further progress on improving individual impact assessments and developing a cumulative BFIA for SIOFA. (Paragraph 94)

In relation to Agenda item 6.5.2 Cumulative BFIA:

The SC discussed the paucity of VME distribution data and **noted** the need to collect more such data. The SC **noted** assessment methods that use real bycatch data, such as the method applied by France (Territories) based on photographic surveys. Methods such as the Sharp-Mormede method, which do not necessarily incorporate actual VME data and use footprints and environmental data at different resolutions, may include large uncertainties. Nevertheless, in the absence of sufficient information on the distribution of VMEs, these methods may be useful for understanding the relative status or naturalness of bottom habits, which would help in the assessment of bottom fishing impacts. (Paragraph 97)

The SC discussed the urgent need to progress towards a cumulative BFIA. The SC **noted** that the PAEWG has identified a method for assessing the cumulative impact of the longline fisheries and that CCPs have agreed to use it. The SC **noted** that the PAEWG has held discussions on different methods for assessing the cumulative impact of the trawl fisheries. (Paragraph 98)

The SC suggested that progress in developing a cumulative BFIA has been partially constrained by lack of funding. The SC **noted** and welcomed the voluntary funding contribution made by Australia to assist in progressing the cumulative trawl fishing impact assessment and **recommended** that the funding be used to hire a consultant to lead and conduct the work. (Paragraph 99)

The SC **requested** that the PAEWG develop a work plan, with a timeframe, to progress the work and report to SC6, including:

- continuing intersessional correspondence regarding methods for assessing the cumulative SIOFA BFIA, and
- hiring a consultant to undertake the cumulative trawl and longline BFIAs. (Paragraph 100)

The SC **noted** the commitment from all CCPs to engage in the relevant work and to provide the necessary data in a timely manner. (Paragraph 101)

The SC **requested** the PAEWG Chair follow up on possible collaboration with the ABNJ Project. (Paragraph 104)

In relation to Agenda item 7.3 Alfonsino:

The SC **noted** the uncertainties around the use of CPUE data, but recognised that, in the absence of other more suitable indices of abundance, the standardised CPUE data was the best information that was currently available. (Paragraph 110)

The SC **noted** the possibility of hydro-acoustic data being a potential index of abundance or a basis to verify trends in CPUE data. The SC **recommended** conducting a feasibility assessment of the cost-benefit of collecting acoustic data, including clarifying target strength, vessel calibration, inter-vessel comparison and spatio-temporal coverage. (Paragraph 111)

The SC **agreed** that future CPUE standardisations could be improved by using tow-by-tow data, considering other definitions of fishing effort such as swept area, and developing data catalogues to understand what kinds of variables and attribute data are available for effective standardisation work. The SC **requested** the Secretariat progress the data catalogues. (Paragraph 112)

The SC **agreed** with the SERAWG's decision to divide the stock into two management units: West and East, split along 80^{o}E, until new scientific information becomes available. (Paragraph 115)

In relation to the stock assessment, the SC **noted:**

- that although the precision of the assessment results appears high, this was a consequence of necessary model simplicity given the limited data, and in reality, the precision is low.
- the uncertainties in the assessment, including being constrained by limitations related to the CPUE standardisation and catch at length data available.
- the sensitivity of the results to the assumed value of M. The base case assumes M=0.2; this was informed by a literature review. The SC **agreed** that there was no information available to determine whether M in the SIOFA area should be higher or lower. (Paragraph 116)

The SC **agreed** that the assessment results (SERAWG2 Report, Kobe plots) indicate:

- that the current spawning stock biomass (SSB_{2018}) in both the East and West, was higher than the biomass associated with MSY (SSB_{MSY}) and higher than 60%SSB_0, where SSB_0 is the spawning biomass prior to fishing. Regardless of the sensitivity considered, the current biomass does not appear to be depleted to an extent that would raise immediate concern.
- that for both stocks the level of fishing mortality is less than that associated with MSY. However, the fishing mortality is higher in the East than the West. (Paragraph 117)

In considering the results of projections (SERAWG2 Report, Projection plots), the SC **agreed**:

- that the projections were sensitive to the constant catch scenario and the value of M assumed. The projections were sensitive to the use of the 2018 or 5-year average catch, showing more rapid depletion under the latter scenario. Furthermore, the M=0.15 sensitivity in combination with the 5-year average catch scenario provides

the least optimistic scenarios for both management units, although spawning stock biomass remains above SSB_{MSY}, and fishing mortality remains below F_{MSY} over 10 years.

- that the projections for the East stock were less optimistic, particularly for the M=0.15 scenario. (Paragraph 118)

The SC **recommended** that the MoP, in light of the uncertainties around the stock assessment, should take a cautious approach when applying the results. (Paragraph 119)

The SC **recommended** continuing to work towards improving the stock assessment, in particular:

- incorporating CCPs' available data, particularly on catch-at-length,
- investigating further information on catch composition and targeting,
- investigating the use of acoustic data to provide an index of absolute abundance, and
- conducting research towards better estimating M. (Paragraph 120)

In relation to Agenda item 7.4 Patagonian toothfish:

The SC acknowledged the work done by the EU and **noted** that the results are preliminary and rely on the limited data available. (Paragraph 126)

The SC recalled the SC4 advice on stock status and management advice (SC4, paras 141-144 and 146-147) and, with respect to the Del Cano area, **agreed** that the results from SC-05-30 indicated that high effort periods and catches appear to have had an effect on local density in the region. (Paragraph 127)

The SC **noted** that finer spatial-scale resolution data from Korea would be valuable for improving future analyses and **requested** that Korea provide this data to the Secretariat and future analyses. (Paragraph 128)

The SC **acknowledged** the existence of depredation in the SIOFA Area and **noted** the potential scale of impact on toothfish catches, thereby affecting toothfish assessment and estimated biomass in the SIOFA Area, and the commercial viability of fishing operations. (Paragraph 132)

The SC **noted** that there is evidence that the depredation behaviour is spreading from the Crozet population and could become a significant issue for fishing operations in the SIOFA Area. (Paragraph 133)

The SC **recommended** the MoP:

- request CCPs adopt a protocol for documenting all interactions with marine mammals for all longliner vessels operating in the SIOFA Area.
- encourage CCPs to adopt operational actions to mitigate such interactions and report on the results of those actions at SC6. (Paragraph 134)

In relation to Agenda item 7.5 Orange Roughy:

The SC **noted** that 2018 trawl effort was lower than 2017 and the 2018 catch was substantially lower than the 2017 catch. (Paragraph 140)

The SC **agreed** that given the trend in effort and catch, the status of the orange roughy stock is unlikely to have changed substantially since its previous advice. (Paragraph 141)

In relation to Agenda item 7.6 Deepwater chondrichthyans:

The SC **noted** that the work represents a positive and successful collaborative effort between SIOFA CCPs, the Secretariat and various other institutions and individuals, and on behalf of all co-authors and contributors, accepted Australia's expression of gratitude for the outcomes achieved. (Paragraph 148)

The SC **noted** the importance of cooperation among CCPs for conducting such research and **requested** that CCPs submit the appropriate data, particularly effort data on trawl and longline gears, to the Secretariat, for facilitating future research. (Paragraph 149)

The SC **noted** that there is considerable uncertainty around the characteristics of SIOFA deepwater chondrichthyan fisheries and that resolving these uncertainties would greatly assist future scientific research and management of these fisheries, and **requested** that SIOFA CCPs catching deepwater chondrichthyans (whether defined as 'targeted' or 'bycatch') collaborate to provide a paper to SC6 on the characteristics of these fisheries. (Paragraph 150)

The SC **noted** the key findings of the ERA, specifically that:

- uncertainties in ERA analyses and the input data should not prevent a precautionary approach being taken by SIOFA to prioritise species for further research, data collection and/or stock assessment to estimate sustainable yields;
- information on the identification, distribution, stock structure, biology and life history of many deepwater chondrichthyans is lacking and needs to be improved;
- at-sea identification protocols need to be improved and efforts should be made to collect information on deepwater chondrichthyans at a species level in logbook and observer records, with these data being recorded at the best possible resolution in the SIOFA databases;
- research on species' post-capture mortality and selectivity would be useful to reduce uncertainties in this assessment, as well as to inform mitigation strategies to minimise vulnerability associated with susceptibility; and
- more quantitative assessments are urgently required for deepwater shark species which are reported to be commercially targeted or retained in relatively high volumes in the Southern Indian Ocean to minimise the risk of overexploitation that has occurred in other fisheries globally. (Paragraph 151)

The SC **noted** the measures implemented in SIOFA partly in response to the ERA, including the implementation of CMM 2019/12 (Sharks) and the recommendation for SIOFA vessels to carry and use the relevant FAO guides to the Deep-sea Cartilaginous Fishes of the Indian Ocean (Volumes 1 and 2). (Paragraph 152)

The SC **recommended** that until more rigorous estimates of fishing mortality can be derived, the ERA for SIOFA deepwater chondrichthyans be updated every five to ten years, or whenever there is a substantial change in the fishery (e.g. large changes in catch and/or effort), and that these periodic updates be reflected in the SIOFA SC workplan. (Paragraph 153)

Regarding CMM 2019/12 (Sharks), para 4, the SC **requested** the MoP to urgently consider additional precautionary measures to mitigate bycatch of deepwater chondrichthyans. The

SC **noted** the absence of any attempts or methods to inform the setting of SIOFA-specific bycatch limits and discussed potentially useful bycatch mitigation measures such as:

- Longline gear modifications, such as the use of nylon snoods instead of wire snoods, noting paragraphs 86 and 87 that discuss potential trade-offs with such an approach
- Prohibition on the retention of deepwater chondrichthyans
- Live release, where possible, of all shark bycatch (see, for example, CCAMLR conservation measure (CM) 32-18)
- Move-on rules such as those used by CCAMLR (for example, as per CCAMLR CM 33-03), whereby vessels are required to move-on if bycatch of certain species (including deepwater sharks) exceeds a percentage of the catch limit for that fishery, or exceeds a particular weight/number threshold per fishing operation (e.g. set or tow). (Paragraph 155)

The SC **noted** that, if bycatch mitigation measures for SIOFA Area are developed based on those used in CCAMLR, it will be necessary to account for the different catch composition in each area, as well as potential differences in biomass and ecological characteristics that serve as the basis for setting bycatch limits,. In addition, the fishery-specific and gear-specific effects of possible mitigation measures need to be accounted for. (Paragraph 157)

The SC **agreed** that collaboration with the ABNJ Deep Seas Project would be beneficial to informing SIOFA's management of deepwater shark species and **requested** relevant CCPs collaborate with the ABNJ Deep Seas Project to contribute to the project development on this issue. (Paragraph 159)

In relation to Agenda item 7.8 Other teleosts:

The SC **noted** that ERA can be a useful method for prioritising species that may require further data collection, assessment and/or management actions, particularly when results are considered against relevant conservation and management measures and in the context of information on catches, fishing effort and species biology. (Paragraph 163)

The SC **noted** that these ERA tools could be extended to cover other taxa in SIOFA, including marine mammals, marine reptiles, seabirds and other species of concern. (Paragraph 164)

The SC **noted** that the uncertainties around the results indicate the need for additional work on the species list, species distribution, fishing effort data and selectivity assumptions. (Paragraph 165)

The SC **noted** that until these uncertainties are reduced, results should be viewed with caution. (Paragraph 166)

The SC **requested** the Secretariat work collaboratively with each CCP to resolve species coding and database issues (particularly whether catch data for 'unspecified trawl' gears can be disaggregated into specific trawl gear types) before SC6 in 2021. (Paragraph 167)

The SC **requested** Australia continue to lead this work in collaboration with the Secretariat and CCPs. (Paragraph 168)

The SC **agreed** to reflect an update to this work to resolve the aforementioned uncertainties in SIOFA SC's and SERAWG's workplans. (Paragraph 169)

The SC **recommended** that the MoP note the ongoing issues around data provision to the Secretariat that had delayed or constrained SC work, including the ERA on other teleosts

and the CPUE analyses for toothfish. The SC **recommended** the MoP request CCPs facilitate timely provision of data to the Secretariat and SC so that the SC can undertake its work. (Paragraph 170)

In relation to Agenda item 7.9 Harvest strategies:

The SC **agreed** to progress this work, in line with the agreed work plan (SC4 Report, Annex X) and reflected in the SC Operational work plan, **noting** the MoP6 had approved funding for this work in 2020 (MoP6 Report, Annex Q, EUR 15,000 in 2020, of a requested EUR 30,000 across two years). (Paragraph 171)

In relation to Agenda item 10.3 The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR):

The SC **agreed** that CCAMLR remains an important international body for the SC and CCPs to collaborate with as reflected in the obligations within CMM 2019/15 (Management of Demersal Stocks). (Paragraph 174)

In relation to Agenda item 11.1 Draft CMM on fishing research and exploratory fisheries:

The SC reviewed the proposal (SC-05-24) and **recommended** that a revised draft is provided to the SC for review, taking into account:

- The recommendations from the SC3 Report, para 289, that have not yet been addressed.
- The purpose and intent of the proposed framework should be more clearly stated.
- Care should be taken to avoid creating unnecessary barriers to conducting research. In particular, paragraphs 6 and 7 seem overly restrictive. CCPs should have the flexibility to conduct both fishery dependent and fishery independent research or direct their observers to collect data different from the ‘usual data collection’ that aligns with their scientific management or strategic priorities. Being required to seek approval and report on all scientific research can pose a significant administrative burden on CCPs without a clear justification.
- The proposal confuses ‘surveys’ with ‘scientific research’ and uses the two terms interchangeably, when they should be treated as different things.
- The proposal assumes that SIOFA has adopted total allowable catches (TACs), when that is not the case and offers no alternative for addressing the apparent concern of fisheries research resulting in excessive catch of species.
- The template for research activities could be based on 'CCAMLR CM 24-01 (2019): Format for submitting finfish research proposals’.
- With respect to paragraph 8: Some research analyses can take months to process samples, so a 15-day report back time is unrealistic.
- With respect to paragraph 9: some CCPs suggest the survey catch allowance of 2% should be separate from any TAC.
- With respect to paragraph 13: Some research activities can be undertaken by an observer while also doing their normal job. A second observer seems to be unnecessary in some circumstances e.g. for biological data collection. It should be mandatory to have one observer on board, and possible to have a second.
- Paragraph 14 seems to be specific to surveys and not research in general, while the objective of this proposed CMM is stated as being to ‘govern the undertaking of fisheries-related scientific research in the SIOFA Area’. (Paragraph 180)

The SC **requested** that the MoP provide clarification on the intended purpose of the framework for scientific research to facilitate its further development. (Paragraph 181)

The SC discussed the draft CMM (SC-05-25) and **recommended** that the following points be considered in revising the draft:

- The proposed measure may be premature as the SC has not yet agreed on a bottom fishing footprint. Some CCPs noted that there is currently little stopping the expansion of non-trawl fishing efforts into new areas targeting new species.
- It is difficult to see the difference between the draft CMM's requirement for a fisheries operation plan and the BFIAS. Noting that there are gaps in CCPs' submitted BFIAs, there is concern about potential gaps in the proposed fisheries operation plans.
- A clear distinction should be made between new fisheries and exploratory fisheries. A possible definition of exploratory fishery could be one based on CCAMLR CM 21-01 (2016), incorporating stock information, e.g. 'information on distribution, abundance, demography, potential yield and stock identity from comprehensive research/surveys or exploratory fisheries has not been submitted to SIOFA.'
- The framework should include conditions for upgrading new fishing grounds to existing fishing grounds.
- Paragraph 5 should be deleted, as it is not a definition but a statement about establishing boundaries. Furthermore, it provides a loophole to conduct commercial fishing in closed areas under the auspices of new fisheries development. (Paragraph 183)

The SC **requested** the EU engage with CCPs through intersessional discussions and further refine the proposals. (Paragraph 184)

In relation to Agenda item 12.2 Operational work plan and budget 2019 – 2022:

The SC **requested** the Secretariat commission the research activities identified for 2020 as soon as possible, so that the outcomes could be reported to SC6. (Paragraph 188)

The SC **agreed** to finalise its advice to the MoP on research activities intersessionally by August 20. The SC **requested** the PAEWG and SERAWG Chairs provide updated advice on research priorities, including potential matching funds for grants, which will be collated and distributed by the Secretariat for the SC's consideration and finalisation of advice. (Paragraph 189)

In relation to Agenda item 14 – Election of Chairperson and Vice Chairperson:

The SC **requested** the Secretariat work intersessionally towards the election of a new Chair and Vice Chair, in line with the SC Rules of Procedure. (Paragraph 193)

In relation to Agenda item 15 – Future meeting arrangements:

The SC, **noting** the unpredictable impact of the global pandemic, requested the Secretariat develop a contingency plan for the SC and associated working groups, in the event that face-to-face meetings are not possible. (Paragraph 198)

Agenda item 14 – Election of Chairperson and Vice Chairperson

190. The Chair noted that the 12-month extension had ended for the current Chair (Dr Ilona Stobutzki) and Vice Chair (Dr Tsutomu Nishida) and that neither can serve any additional terms.

191. Dr Sebastian Rodriguez Alfaro was nominated as Chair. However, he was unable to accept the position.

192. Mr Lee Georgeson was nominated as Vice Chair. However, he was unable to accept the position.

193. There being no further nominations, the SC **requested** the Secretariat work intersessionally towards the election of a new Chair and Vice Chair, in line with the SC Rules of Procedure.

194. The Chair thanked the Vice Chair of the SC, the Chairs of the SERAWG and PAEWG, all SC participants, rapporteurs and the Secretariat, for their support during her time as SC Chair. She reflected on the progress made by the SC and wished the SC all the best for its future meetings. She expressing her hope that it would continue to build collaboration amongst CCPs and progress the SC work plan as custodians of the scientific processes that underpin science-based advice to the MoP to ensure the long-term conservation and sustainable use of the fishery resources in the SIOFA Area.

195. The SC thanked the Chair for her guidance, leadership and professionalism.

196. The SC recognised and commended the commitment and hard work of the SC Chair and Vice Chair.

Agenda item 15 – Future meeting arrangements

197. The SC initially recommended holding the PAEWG3 meeting, the SERAWG3 meeting, and the SC meeting in the first half of March, if face-to-face meetings are possible. The SC requested the Secretariat work intersessionally with CCPs to identify preferred dates as soon as possible.

198. The SC, **noting** the unpredictable impact of the global pandemic, requested the Secretariat develop a contingency plan for the SC and associated working groups, in the event that face-to-face meetings are not possible.

199. The SC initially recommended that 2.5 days be allocated for the PAEWG3 meeting, 2.5 days for the SERAWG3 meeting and 5 days for the SC6 meeting.

Agenda item 16 – Other business

16.1 SIOFA Scientific Committee official contacts

Agenda item 17 – Adoption of the meeting report

200. The report of the 5th meeting of the SIOFA SC was adopted at 7:58 a.m. (UTC), 31 July 2020.

Agenda item 18 – Close of meeting

Annex A: Opening Statement of the Executive Secretary

Ladies and Gentlemen,

First and foremost, let me extend a very warm welcome to all foreign representatives, alternate, experts and advisers who went through a lot of troubles to attend this remote 5th meeting of the Scientific Committee.

This is my first intervention in front of the Scientific Committee of the Southern Indian Ocean Fisheries Agreement, and I am very happy to be here today. The work of the Scientific Committee is central to SIOFA's proper operation and is a great example of international scientific cooperation in the field of fishery regulation. As you all know, today and for the next week and a half, you will be tasked to provide the most relevant advice to the 7th Meeting of the Parties, based on the assessments of the working groups and CCPs.

As you all know, COVID19 pandemic has created a very challenging situation for international organizations such as the SIOFA. Every one of us went through very unpleasant moments and I sincerely hope you coped well with it. Despite the damage, we now need to take this exceptional situation as an opportunity for the whole SIOFA organization to prove its flexibility and capacity to adapt.

For the first time in the history of our organization and most of RFMOs, the Scientific Committee, but also the Compliance Committee and the Meeting of the Parties are held remotely, thanks to the use of modern technologies. It took us all a fair amount of time to come up with this new format, supported by a mix of written forum exchange and video-conference but you all showed willingness to cooperate and I thank you sincerely for that.

Prior to this meeting, the 2nd Stock and Ecological Risk Assessment Work Group and 2nd Protected Area and Ecosystems Work Group were held remotely for the first time in the history of our organization. This has certainly required everyone some adaptation skills, but the meetings brought advances to the continuing work of the scientific committee. The participants took part in discussions through video and the possibility to use a direct chat device appeared to be a of a great use to support oral comments.

The setting up of an exchange forum has also been a novelty for SIOFA, and the exchanges I have been able to read prove that this tool is also operational. Thanks to Mr. Pierre Peries, our data manager, for setting it up.

I would like to thank you all for the work, time and attention you are devoting us. Whether it is early in the morning, the afternoon or the beginning of the evening where you are, I wish you all a good series of meetings and am convinced that they will result with great advice on fishery management.

Thank you for your attention.

Annex B: List of participants

chair	Name	Email
SC Chairperson	Ilona STOBUTSKI	Ilona.Stobutzki@dfat.gov.au
Delegation (CCPs, NGO, Institute, Company)	Name	Email
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Rapporteur		
Urban Connections	Alex MEYER	Meyer@urbanconnections.jp

Annex C: AGENDA

The agenda for the 5th meeting of the SIOFA Scientific Committee (SC) has been developed to focus on the areas of work identified in SIOFA CMM 2019/01, CMM 2019/02, CMM 2019/03,CMM 2019/12, CMM 2019/13, CMM 2019/15, Meetings of the Parties (MoP) and the Scientific Committee Operational Work Plan.

Note: Items which will not be addressed or became irrelevant this year due to the reduced format and postponed in 2021 are in grey/italic

1. *Opening*
   - *1.1 Opening statement from the Chair*
   - *1.2 Introduction of participants*

2. Administrative arrangements
   - 2.1 Adoption of the Agenda
   - 2.2 Confirmation of Meeting Documents
   - 2.3 Appointment of rapporteurs

3. Annual National Reports

   In accordance with CMM 2019/02 para 9, each CCP[1] shall provide to the SC an annual National Report. Guidelines for the annual National Reports can be found on the SC page of the SIOFA website https://www.apsoi.org/scientific-committee.

   Review of Annual Report template (annex D, and para 50 of SC4 report)

4. Current and historical status of fishing activities

   4.1 Spatial Extent of Historic Catch Data, Bottom Fishing Footprint

   In accordance with CMM 2019/01 para 20, CCPs shall, at least 30 days prior to the commencement of the ordinary meeting of the SC in 2018, submit to the Secretariat relevant data on the spatial extent of its historical bottom fishing effort in the Agreement Area.

   In accordance with CMM 2019/01 para 7, the SC 2020 shall develop and provide advice on an appropriate SIOFA bottom fishing footprint based on the data provide by CCPs to the Secretariat under para 20. SC4 agreed steps for the work to be undertaken by the Secretariat under the PAEWG prior to SC5 (SC4, para. 59 – 64).

   4.2 Overview of SIOFA fisheries 2019

   To produce the Overview of SIOFA fisheries report incorporating the latest information provided in 2019 National Reports and the SIOFA databases. Secretariat to provide first draft of the Overview.

5. Scientific data standards

   - *5.1 Templates for data submission*

[1] Collectively refers to Contracting Party, cooperating non-Contracting Party, participating fishing entity or cooperating non-participating fishing entity.

Secretariat to report on the use of the data submission templates.

5.2 Historical Catch and Effort Data

In accordance with 2019/02 para 10, CCPs shall provide to the Secretariat, by 31 January 2018, historical catch, effort data and, if available, observer data for period 2000 to 2015 and any previous years where available. Any State or fishing entity that becomes a party to the Agreement, CNCP or PFE after date of CMM adoption shall provide this data within 12 months of becoming Party to the Agreement or becoming a CNCP or PFE.
Secretariat to prepare Historical data report.

5.3 Annual Catch and Effort Data

SC4 asked the Secretariat to continue to refine and consolidate the annual data holdings report and data inventory into one document. MoP6, para 35, requested the Secretariat develop a process to evaluate the completeness and identify any outstanding gaps in annual data submission by each CCP.
Secretariat to prepare Annual data report.

5.4 Scientific Observer data

In accordance with CMM 2019/02 para 15, CCPs shall, for all observed trips, collect observer data in accordance with the relevant sections of Annex B. All observer data collected by CCPs shall be reported to the Secretariat by 31 May each year for the previous calendar year. Annex B will be reviewed by the SC at its ordinary meeting in 2020.

5.4.1 Observer data collection and reporting

Inventory of observer data by CCP based on the Annual Data Holdings Report.

5.4.2. Scientific Observer database status

The SIOFA Data Manager to provide an update on the SIOFA Observer Database

5.4.3 Scientific observer coverage definition
MoP6, para 38, requested the SC harmonize an approach to understanding observer coverage levels. SC5 to propose definition of observer coverage levels.

5.4.4 Review of Annex B, observer data of CMM 2019/02

5.4.5. Observer data collection forms.
In accordance with CMM 2019/02 para 16: by 2023, the Scientific Committee shall develop and adopt a template for the observer reports, and a template for an observer data collection form that may be used by observers in subsequent years. The Secretariat will present the CCAMLR observer data forms.

6. Vulnerable Marine Ecosystems

6.1. Protected Areas and Ecosystems Working Group (PAEWG)

PAEWG Chairperson to present report from PAEWG2, addressing the following agenda items as appropriate.

6.2. VME mapping
In accordance with CMM 2019/01, para 5, the SC, by the close of the SC 2020, shall provide advice and recommendations to the MoP on maps of where VMEs are known to occur, or likely to occur, in the agreement area. SC4, Annex I, provides the workplan to complete this work. Update from PAEWG on the progress and consultant ongoing work.

6.3. VME indicator species and responses to VME encounters

6.3.1. VME indicator taxa list

MoP6, para 39, adopted a SIOFA VME taxa list (SC4 Annex J). Update on development of pictorial guides to indicator species as per SC4 para 104.

6.3.2. Encounter threshold level for trawl gears

In accordance with CMM 2019/01, para 6, the SC 2020 shall develop and provide advice and recommendations to the MoP on criteria for what constitutes evidence of an encounter with a VME, in particular threshold levels and indicator species. MoP6, para 42, requests the SC progress the work to identify a suitable threshold for trawl gear (SC4, para 111). This should include a review of the methods used by CCPs to establish their existing thresholds, as well as development of a consistent threshold based on consolidated records of benthic bycatch data for trawl gears.

6.3.3. Weight Conversion of VME indicators

MoP6 para 43, requests CCPs to provide information on how they convert volume units of benthic bycatch to weight units in trawl fisheries to the Secretariat and for the Secretariat to prepare a summary for review in order to provide advice on a standardised approach of conversion.

6.4. SIOFA Standard protocol for future protected areas designation

In accordance with CMM 2019/01 para 6, the SC 2020 shall provide advice and recommendations to the MoP on the interim SIOFA Standard Protocol for Future Protected Areas Designation adopted by MoP5; and research and management plans for each protected area. SC4, para 115 – 123 provided recommendations on the interim protocol and research and management plans.

6.5. Bottom Fishing Impact Assessment (BFIA)

6.5.1. Submitted BFIA

In accordance with CMM 2019/01, para 23, the SC shall consider and provide advice on BFIA submitted under para 22b or 27b, whether each BFIA meets an appropriate standard in light of international standards and the SIOFA BFIAs.

6.5.2. Cumulative BFIA

In accordance with CMM 2019/01, para 23, the SC by the end its ordinary meeting in 2018, shall provide advice on the likely cumulative impacts of bottom fishing activity from CCP vessels. SC4, para 128 and Annex T requests the PAEWG work plan to progress the cumulative BFIA.

7. Stock assessment and ecological risk assessment

In accordance with CMM 2019/01 para 6, SC 2020 shall, develop and provide advice and recommendations to the MoP on the status of stocks of principal deep-sea fishery resources targeted, and, to the extent possible, taken as bycatch and caught incidentally in these deep-sea fisheries, including straddling fishery resources.

In accordance with CMM 2019/15 para 3, SC shall provide annual reports on the status of demersal fisheries resources targeted, relative to available and/or relevant reference points. The reports shall include, where possible, projections of stock status over a period no less than 20 years, with 5 years steps, relative to a range of fishing mortality. In addition to the annual report on stock status, SC will provide management advice relative to available and/or relevant reference points.
Additionally, MoP5, para 51, requests SC provide advice on the status of stocks in relation to MSY until specific reference points are adopted (MoP5 Report, para 51).

7.1. Stock Assessment and Ecological Risk Assessment Working Group (SERAWG)

SERAWG Co-chairpersons to present report from SERAWG2, addressing the following agenda items as appropriate.

7.2. SIOFA stock assessment framework

SC4 report, para 131, further work was needed on the SIOFA databases and species to continue the categorisation of SIOFA species into the framework tiers with more confidence.

7.3. Alfonsino

In addition to the directions noted above in CMM 2019/01 para 6 and CMM 2019/15 para 3, in accordance with CMM 2019/15 para 54-55, the SC 2020 shall assess the Beryx splendens stocks and provide advice on assessment time frames.

The SC shall provide advice and guidance on any necessary changes to data collection to reduce future assessment uncertainty.
SC4, para 135 and Annex V outline the work plan for the alfonsino assessment under the SERAWG.

7.4. Patagonian toothfish

In addition to the directions noted above in CMM 2019/01 para 6 and CMM 2019/15 para 3, in accordance with CMM 2019/15 para 28-30, SC 2020, for the Del Cano Area, the SC shall make recommendations to build an area wide habitat model, a spatial and temporal CPUE analysis, an estimate and map of local abundancies and a local population assessment. It shall advise on any necessary improvements to data collection to reduce future assessment uncertainty. The SC shall address the issues related to depredation and advise on appropriate limits for relevant species caught as bycatch in Dissostichus *spp. fisheries*

7.5. Orange Roughy

Address the directions noted above in CMM 2019/01 para 6, in CMM 2019/15 para 3 and in accordance with CMM 2019/15 para 6, the SC shall provide a summary of future data needs to improve assessment accuracy, as well as provide a summary to MoP-7 on progress against the orange roughy workplan.

7.6. Deepwater sharks

In addition to the directions noted above in CMM 2019/01 para 6 and CMM 2019/15 para 3, progress elements identified in SC4 and the SC Work Plan 2018-2021.

7.7. Saya de Malha Bank species

In addition to the directions noted above in CMM 2019/01 para 6 and CMM 2019/15 para 3, progress elements identified in SC4 and the SC Work Plan 2018-2021.

7.8. Other teleosts

In addition to the directions noted above in CMM 2019/01 para 6, progress elements identified in SC4 and the SC Work Plan 2018-21.

7.9. Harvest strategies

MoP5 para 52-53 requested the SC provide advice on candidate target and limit reference points for orange roughy, alfonsino and toothfish and develop a framework and workplan for the establishment of harvest strategies for key SIOFA stocks. SC4 para 174-175 and Annex X outline the work plan to progress this work.

8. Proposals to bottom fish in the Agreement Area in a manner at variance with established measures

In accordance with para 29 of CMM 2019/01 a Contracting Party, CNCP and PFE seeking to authorise any vessel flying its flag shall submit to the SC, at least 30 days prior to an ordinary meeting of the SC, a proposal to undertake that activity or activities.
Review of CCP's proposals to bottom fish at a variance by the SC.

9. Fishing gear impact scientific assessments

In accordance with SIOFA SC Operational Work Plan 2018-2021

9.1. Demersal gillnet operations

In accordance with CMM 2016/05 para 2, Contracting Parties, CNCPs and PFEs recommend that deep-water gillnets not be used in the Agreement Area by any vessel flying the flag of a Contracting Party, CNCP or PFE until such time as the Meeting of the Parties has received a recommendation from the SC.

10. Cooperation with other RFMOs and international bodies

10.1. FAO ABNJ Deep Sea Project

Food and Agriculture Organization of the United Nations, Areas Beyond National Justification Deep Seas Project update. Report of the Area Beyond National Jurisdiction Deep Seas Project - Fourth Project Steering Committee Meeting

10.2. Southwest Indian Ocean Fisheries Commission (SWIOFC)
An update on coordination with SWIOFC and in accordance with MoP5 Report (para 118), SC to provide advice on scientific activities that could be conducted on straddling demersal stocks of the Saya de Malha bank.

10.3. The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)
In accordance with CMM 2019/15 para 11, CCPs with an interest in this stock shall cooperate to ensure scientific collaboration between CCAMLR and SIOFA to ensure long-term sustainable management for D. eleginoides stocks. Update on any intersessional coordination underpinned by the 2018 Agreement between SIOFA and CCAMLR (VME taxa list, Catch Documentation Scheme, etc.).

10.4. Agreement on the Conservation of Albatrosses and Petrels
ACAP to present a paper introducing ACAP, its work with RFMOs, and outlining potential opportunities for collaboration with SIOFA.

11. Review and development of Conservation and Management Measures (CMMs)

SC to consider reviews of CMMs and development of any new CMMs requiring input from the Scientific Committee.

11.1. Draft CMMs on fishing research and exploratory fisheries
EU's proposal for a CMM to regulate fisheries research in the Agreement Area was considered and discussed at SC3. SC3 recommended that a revised draft be provided taking into guidance and requests provided in SC3 Report para 289. Draft CMM on exploratory fisheries.

11.2. CMM 2019/01 Interim Management of Bottom Fishing
This review shall take into account, inter alia, the latest advice of the Scientific Committee, including advice on those matters listed in paragraphs 5 to 7 and appropriate catch levels for principal target species, in accordance with the objective described in paragraph 1 (CMM 2019/01, para 41).

11.3. CMM 2016/03 Data Confidentiality
MoP6 para 163, the MoP agreed to undertake an intersessional review of CMM 2016/03, with the SC Chair leading this work.

12. Scientific Committee Work Plan

12.1. Long term research plan
Review and update if required

12.2. Operational work plan and budget 2019 – 2022
Review and update if required. Discussion on potential projects and collaborations. Discussion on the science budget to provide advice to the MoP. Discussion will include the process for developing project cost estimates and terms of reference, noting the need to align with budget years.

12.3. Review of consultant's recruitment procedure
Secretariat to propose amendments to the current recruitment procedure.

13. Advice to the Meeting of Parties

A consolidation of SC5 advice to the MoP

14. Election of Chairperson and Vice Chairperson

The SC Chairperson and Vice-Chairperson will come to the end of their terms at the end of this meeting. The election of a new Chairperson and Vice-Chairperson needs to be undertaken.

15. Future meeting arrangements

The SC is asked to agree to (approximate) dates and location for the 6th meeting of the SIOFA SC.

16. Other business

16.1. SIOFA Scientific Committee official contacts

Yearly update of the SC contact points in each CCP.

17. Adoption of the meeting report

18. Close of meeting

Annex D: List of meeting documents

Document reference and title	Category	Agenda item
SC-05-01 General Notice	admin	n/a
SC-05-02 Meetings Registration Form	admin	n/a
SC-05-03 Template for Papers to SC5	admin	n/a
SC-05-04 Agenda	admin	2
SC-05-05 Table of agenda items and related papers	admin	2
SC-05-06 List of meeting documents	admin	2
SC-05-07 Participants	admin	n/a
SC-05-08 National Report China	working doc	3
SC-05-09 National Report Australia	working doc	3
SC-05-10 National Report Chinese Taipei	working doc	3
SC-05-11 National Report Cook Islands SIOFA Rev1	working doc	3
SC-05-12 National Report Republic of Korea	working doc	3
SC-05-13 National Report Thailand	working doc	3
SC-05-14 Comoros Annual Report 2019 Bottom Fishing	working doc	3 6.5.1
SC-05-15 [RESTRICTED] Update on an ecological risk assessment for SIOFA teleosts	working doc	7.8
SC-05-16 [RESTRICTED] Ecological risks on deep-water chondrichthyan populations in the SI and SP oceans	working doc	7.6
SC-05-17 BFIA-update-Australia	working doc	6.5.1
SC-05-18 National Report European Union	working doc	3
SC-05-19 BFIA EU ES FISHERIES IN THE SIOFA CA 2020	working doc	6.5.1
SC-05-20 National Report French Territory	working doc	3
SC-05-21 No boundaries for whales interacting with fishing activities targeting Patagonian toothfish	working doc	7.4
SC-05-22 National Report of Japan	working doc	3
SC-05-23 SIOFA Guidelines for remote work SC and WG	admin	n/a
SC-05-24 EU proposal to establish a Framework for Scientific Research	working doc	11.1
SC-05-25 EU proposal for a Framework on New Fisheries	working doc	11.1
SC-05-26 Overview of SIOFA Fisheries 2019	working doc	4.2

SC-05-27 [restricted] SIOFA Fishing Footprint r1	working doc	4.1
SC-05-28 [restricted] Alfonsino CPUE standardization	working doc	7.3
SC-05-29 Age-structured production model assessments of Alfonsino	working doc	7.3
SC-05-30 [RESTRICTED] Preliminary analysis of the Patagonian toothfish data of Del Cano Rise	working doc	7.4
SC-05-31 [RESTRICTED] SIOFA Fishing Footprint r2	working doc	4.1
[NOT PROVIDED] National Report Mauritius		
SC-05-33 National Report Seychelles	working doc	3
SC-05-INFO-01 ACAP paper SIOFA_SC5_final.	info doc	not processed
SC-05-INFO-02 SIOFA Observers data rev.2	info doc	5.4.1
SC-05-INFO-03 Cooperation ABNJ project and SIOFA	info doc	not processed
SC-05-INFO-04 Catch and effort data submission 2018 summary	info doc	5.3
SC-05-INFO-05 Historical data inventory rev.4	info doc	5.2
BFIA gap analysis	draft	6.5.2
Summary of BFIA submitted by CCP	draft	6.5.2

Annex E: Table of agenda items and related papers

Agenda Item	Related Papers
1. Opening *1.1 Opening statement from the Chair* *1.2 Introduction of participants*	
2. Administrative arrangements 2.1 Adoption of the Agenda 2.2 Confirmation of Meeting Documents 2.3 Appointment of rapporteurs	 SC-05-04 Provisional Agenda SC-05-05 Table of agenda items and related papers n/a
3. Annual National Reports	SC-05-09 National Report Australia SC-05-08 National Report China SC-05-11 National Report Cook Islands SIOFA Rev1 SC-05-18 National Report European Union SC-05-20 National Report French Territory SC-05-22 National Report of Japan SC-05-12 National Report Republic of Korea SC-05-13 National Report Thailand SC-05-10 National Report Chinese Taipei SC-05-14 Comoros Annual Report 2019 Bottom Fishing Assessment [not provided] National Report Mauritius SC-05-33 National Report Seychelles
4. Current and historical status of fishing activities 4.1 Spatial Extent of Historic Catch Data, Bottom Fishing Footprint 4.2 Overview of SIOFA fisheries 2019	*SIOFA PAEWG2 Report* SC-05-27 [restricted] SIOFA Fishing Footprint r1 SC-05-31 [restricted] SIOFA Fishing Footprint r2 PAEWG2 Report [Draft] SC-05-26 Overview of SIOFA Fisheries 2019
5. Scientific data standards *5.1 Templates for data submission* 5.2 Historical Catch and Effort Data 5.3 Annual Catch and Effort Data 5.4 Scientific Observer data 5.4.1 Observer Data collection and reporting 5.4.2. Scientific Observer database status *5.4.3 Scientific observer coverage definition* *5.4.4 Review of Annex B, observer data of CMM 2019/02* *5.4.5. Observer data collection forms.*	 SC-05-INFO-05 Historical data inventory rev.4 SC-05-INFO-04 Catch and effort data submission 2018 summary SC-05-INFO-02 SIOFA Observers data rev.2

Agenda Item	Related Papers
6. Vulnerable Marine Ecosystems 6.1. Protected Areas and Ecosystems Working Group (PAEWG) *6.2. VME mapping* 6.3. VME indicator species and responses to VME encounters *6.3.1. VME indicator taxa list* 6.3.2. Encounter threshold level for trawl gears *6.3.3. Weight Conversion of VME* indicators 6.4. SIOFA Standard protocol for future protected areas designation	 *SIOFA PAEWG2 Report*
6.5. Bottom Fishing Impact Assessment (BFIA) 6.5.1. Submitted BFIA 6.5.2. Cumulative BFIA	 SC-05-14 Comoros Annual Report 2019 Bottom Fishing Assessment SC-05-17 BFIA-update-Australia SC-05-19 BFIA EU ES FISHERIES IN THE SIOFA CA 2020 [Draft] BFIA gap analysis [Draft] Summary of BFIAs submitted by CCP
7. Stock assessment and ecological risk assessment 7.1. Stock Assessment and Ecological Risk Assessment Working Group (SERAWG) *7.2. SIOFA stock assessment framework* 7.3. Alfonsino 7.4. Patagonian toothfish 7.5. Orange Roughy 7.6. Deepwater sharks *7.7. Saya de Malha Bank species* 7.8. Other teleosts 7.9. Harvest strategies	 SERAWG2 Report SC-05-28 [Restricted] Alfonsino CPUE standardisation SC-05-29 Age-structured production model assessments of Alfonsino SC-05-30 [Restricted] Preliminary analysis of the Patagonian toothfish data of Del Cano Rise SC-05-21 No boundaries for whales interacting with fishing activities targeting Patagonian toothfish n/a SC-05-16 [Restricted] Ecological risks on deepwater chondrichthyan populations in the SI and SP oceans SC-05-15 [Restricted] Update on an ecological risk assessment for SIOFA teleosts n/a

Agenda Item	Related Papers
8. Proposals to bottom fish in the Agreement Area in a manner at variance with established measures	
9. Fishing gear impact scientific assessments *9.1. Demersal gillnet operations*	
10. Cooperation with other RFMOs and international bodies *10.1. FAO ABNJ Deep Sea Project* *10.2. Southwest Indian Ocean Fisheries Commission (SWIOFC)* 10.3. The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) *10.4. Agreement on the Conservation of Albatrosses and Petrels*	n/a
11. Review and development of Conservation and Management Measures (CMMs) 11.1. Draft CMMs on fishing research and exploratory fisheries *11.2. CMM 2019/01 Interim Management of Bottom Fishing* *11.3. CMM 2016/03 Data Confidentiality*	SC-05-24 EU proposal to establish a Framework for Scientific Research SC-05-25 EU proposal for a Framework on New Fisheries
12. Scientific Committee Work Plan *12.1. Long term research plan* 12.2. Operational work plan and budget 2019 – 2022 *12.3. Review of consultant's recruitment procedure*	
13. Advice to the Meeting of Parties	
14. Election of Chairperson and Vice Chairperson	
15. Future meeting arrangements	
16. Other business *16.1. SIOFA Scientific Committee official contacts*	
17. Adoption of the meeting report	
18. Close of meeting	

Annex F: Overview of SIOFA Fisheries 2019

The information presented below has been extracted from the reports submitted to Scientific Committees (SC2, SC3, SC4 and SC5). Where the information from the national reports is insufficient, data has been extracted from SIOFA databases.
The figures are incomplete as some CCPs did not provide a National Report about their fishing activities. In addition, 2019 catch and effort data are scheduled to be submitted by May 31 2020.

1. Active Fleet Composition

Table 1: Summary of active vessels operating by flag/gear and by year in the SIOFA area

		Year						
CCP*	**Gear**	2013	2014	2015	2016	2017	2018	2019
AUS	Multipurpose	0	0	1	1	0	0	1
	Longlines	0	0	0	0	0	1	0
	Trawls	1	1	0	0	0	0	0
CHN	Longlines	3	0	0	0	0	0	0
	Seine nets	0	6	6	8	5	0	0
COOK	Trawls	2	2	2	2	2	2	2
COM	Handlines	?	?	?	?	?	2	1
EUF	Longlines	2	1	0	1	1	0	0
EUS	Gillnets	1	1	1	0	0	0	0
	Longlines	0	0	1	1	1	2	1
FR-OT	Pots/Traps	0	0	0	1	0	1	0
	Longlines	2	2	2	0	2	0	1
JPN	Longlines	1	0	0	0	1	0	0
	Trawls	2	1	2	2	2	1	1
KOR	Longlines	3	0	0	0	0	0	0
	Trawls	1	0	0	0	0	0	0
MUS		?	?	?	?	?	?	?
SYC		0	0	0	0	0	0	0
CT*	Longlines	?	?	21	40	45	35	42
THA	Pots/Traps	0	0	1	2	0	0	0
	Multipurpose (trawl/handline)	0	0	56	60	13	0	2
	Total	18	14	93	118	72	44	51

*CCP stands for Contracting Parties, Non-Contracting Participating Parties and Participating Fishing Entities
? no information provided
Note: Thailand fleet was mainly composed of small tonnage vessels. Comoros fleet is composed of 1 mother vessel for a fleet of many small boats operated by 2-3 fishermen. Chinese Taipei fleet are tuna longliners fishing also for oilfish.

2. Main fisheries operating in the SIOFA area

Table 2. SIOFA fisheries

Key species	Gear	Participants (reported in national reports between 2000 and 2019)	SIOFA Sub-area
Patagonian toothfish	Demersal longline Traps	EU-Spain, France (Territories), Japan, Korea	3b, 7
Orange roughy	Demersal trawl	Australia, Cook Islands, China (2000-02)	Associated with seafloor features
Alfonsino	Midwater trawl	Australia, Cook Islands, Japan, Korea	Associated with seafloor features
Sauries and scads	Demersal trawl Traps	Thailand	8, Saya de Malha Bank
Shallow-water (<200m) snappers, emperors and groupers	Demersal longline Hook and line Demersal trawl Traps	EU-France, Mauritius (?) Thailand, Comoros	8, Saya de Malha Bank
Deeper water snappers, lutjanids, Hapuku	Demersal longline Dropline	Australia China EU	
Deepwater sharks – Portuguese dogfish	Demersal longline	EU-Spain	
Mackerel and *Brama* spp	Purse seine with lights	China	
Oilfish	Longline	Chinese Taipei	

3. Fishing Effort

Table 3. Fishing effort by CCP, main gear and year.

			Year						
Flag	**Gear**	**Effort unit**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
AUS	Trawl	hours	62	106	15	26	0	0	0
	Longline/Vertical line	x1000 hooks	0	0	2	40	0	28	54.2
CHN	Seine net	hours	0	4500	10000	4000	300	0	0
	Longline	x1000 hooks	2050	0	0	0	0	0	0
COK	Trawl	shots	1601	1971	2729	1985	2230	1667	1468
EU-ESP	Gillnet	Km	5442	5000	1200	0	0	0	0
	Longline	x1000 hooks	0	0	2300	3200	3200	4940	3440
EU-FRA	Longline	x1000 hooks			0	np	np	0	0
FR-OT	Longline/Vertica line	sets	126	103	66	13	33	30	40
	Longline	x1000 hooks	731.9	634.6	443.5	1.2	150.7	2.6	200
	Pot/Trap	number				40		50	0
JPN	Trawl	hours	1000	750	2250	2500	3250	1091	1512
	Longline	x1000 hooks	96				64	0	0
KOR	Longline	hooks	1023	0	0	0	0	0	0
	Trawl	hours	233	0	0	0	0	0	0
MUS			?	?	?	?	?	?	?
SYC	*no fishing*		0	0	0	0	0	0	0
THA	Trawl	shots	0	0	4090	4552	795	0	176
	Handline	days							110
	Pot/Trap	number	0	0	0	8	10	0	0
CT	Longline	x1000 hooks			8756	22083	26557	20773	23145
COM	Handline	hours	0	4500	10000	4000	300	?	?
TOTAL	longline *	hooks (x1000)	3169		2302	3240	3264	4971	26840
	trawl **	shots	2896	2827	9084	9063	6275	1667	1644
		hours	1295	856	2265	2526	3250		1512

* does not include potential hooks number from sets

** total trawl effort should take into account both shots number and hours.

? no information provided

Note: 2019 fishing effort are incomplete as 2019 data have not yet been provided by all CCPs.

4. Catches

4.1. Total catches

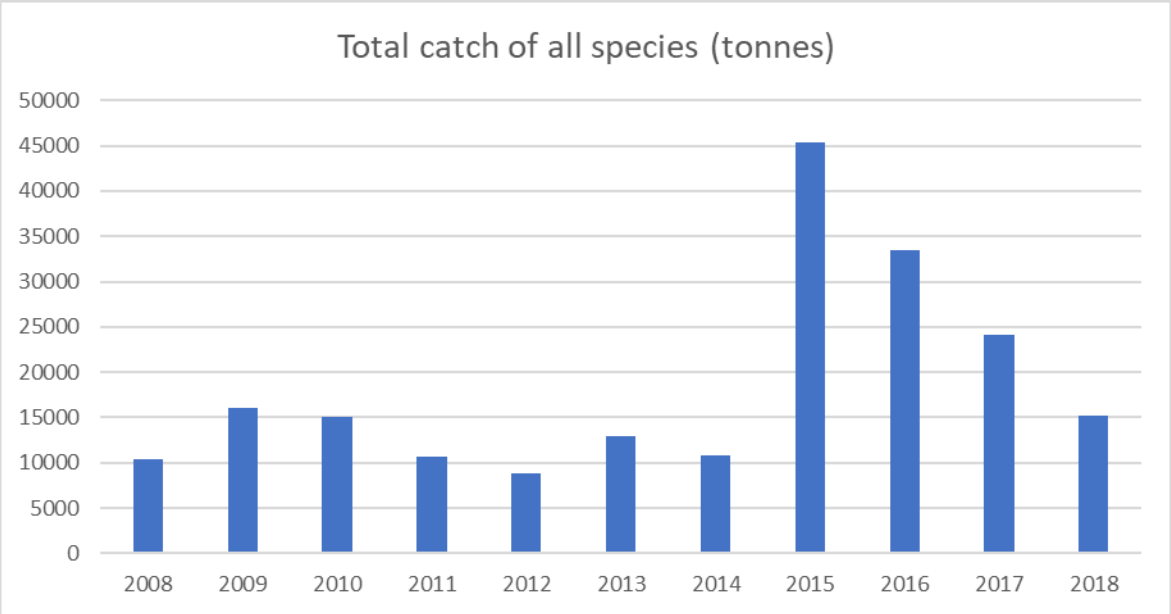

Figure 1: total yearly catch (tonnes) in SIOFA area

The increase in reported catch since 2015 was contributed by the reported catch from Thailand (2015-17) and Chinese Taipei catches. Thailand catches were mostly made from squads (*Decapterus sp*.) and lizardfish (*Saurida sp.*) and Chinese Taipei are oilfish catch from its tuna fishery. The 2019 catch is not displayed as the complete data was not available at the date the report was produced.

4.2 Catch Composition

The catch of trawl vessels is predominantly alfonsino (figure 2) and orange roughy (figure 3). Species also caught by trawling include pelagic armourhead, bluenose warehou, violet warehou, ocean blue-eye trevalla and oreo dories, cardinal fish, hapuku wreckfish.

The addition of Thailand's fishery added Lizardfish and scads as a major catch from small trawlers since 2015.
The catch of longline vessels differs between three groups. There are longline vessels (reported by EU, Japan, Korea and France Overseas Territories) that catch Patagonian toothfish (figure 4) and associated species, such as blue antimora. The second group catch hapuku wreckfish and ocean blue-eye trevalla, pelagic armourhead, deep-water sharks (Squalidae, figure 5), rubyfish and common mora. The third group is the Chinese Taipei tuna longline fleet that catch oilfish (figure 6).
The catch of the gillnet vessels was predominantly deep-water sharks (Squalidae, figure 5). China's light seining fishery targetted mackerel and *Brama* species (such as *Brama japonica*) and its bottom longline fishery targeted ruby snapper and other species in the Lutjanid family.

Alfonsinos (Beryx sp.)

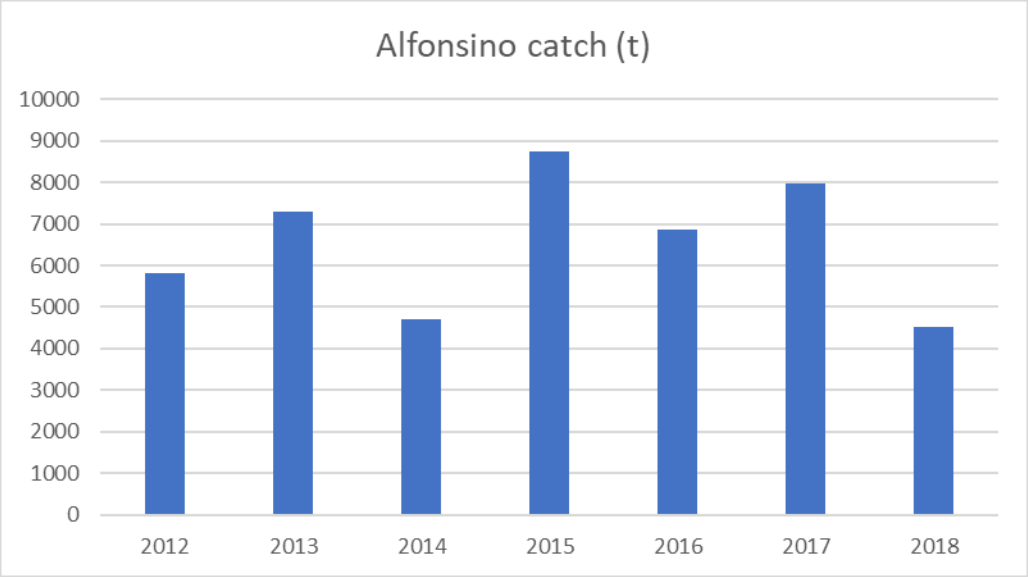

Figure 2: Total annual catch of alfonsinos (tonnes)

Orange roughy (Hoplostethus atlanticus)

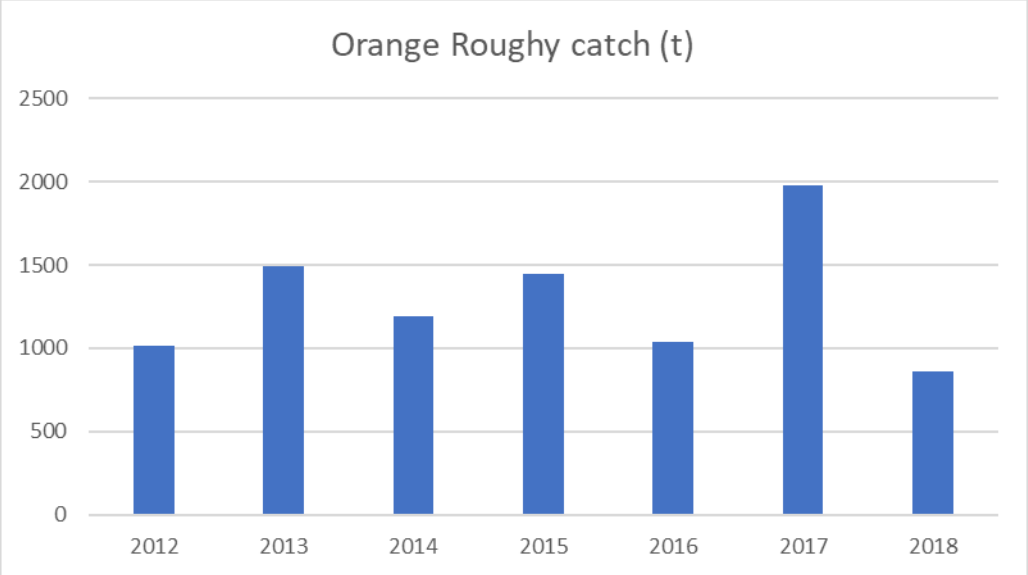

Figure 3: Total annual catch of orange roughy (tonnes)

Patagonian toothfish (Dissostichus eleginoides)

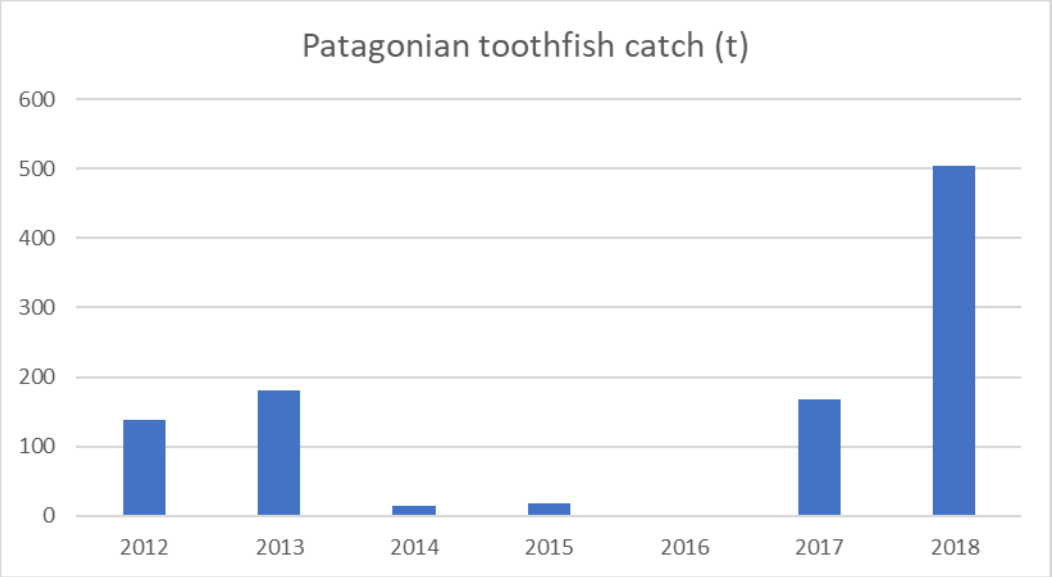

Figure 4: Total annual catch of Patagonian toothfish (tonnes)

Deep-water sharks catch by species (t)

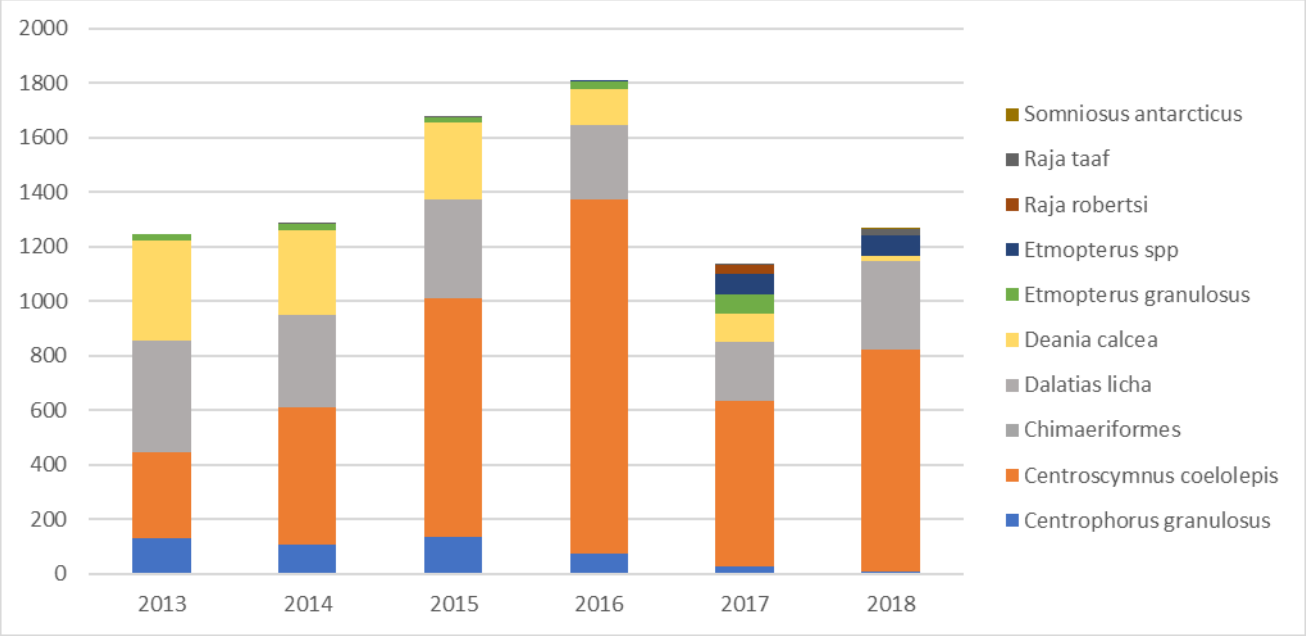

Figure 5: Total annual catch of deep-water sharks' species (tonnes)

Oilfish (Ruvettus pretiosus and Lepidocybium flavobrunneum) catch (t)

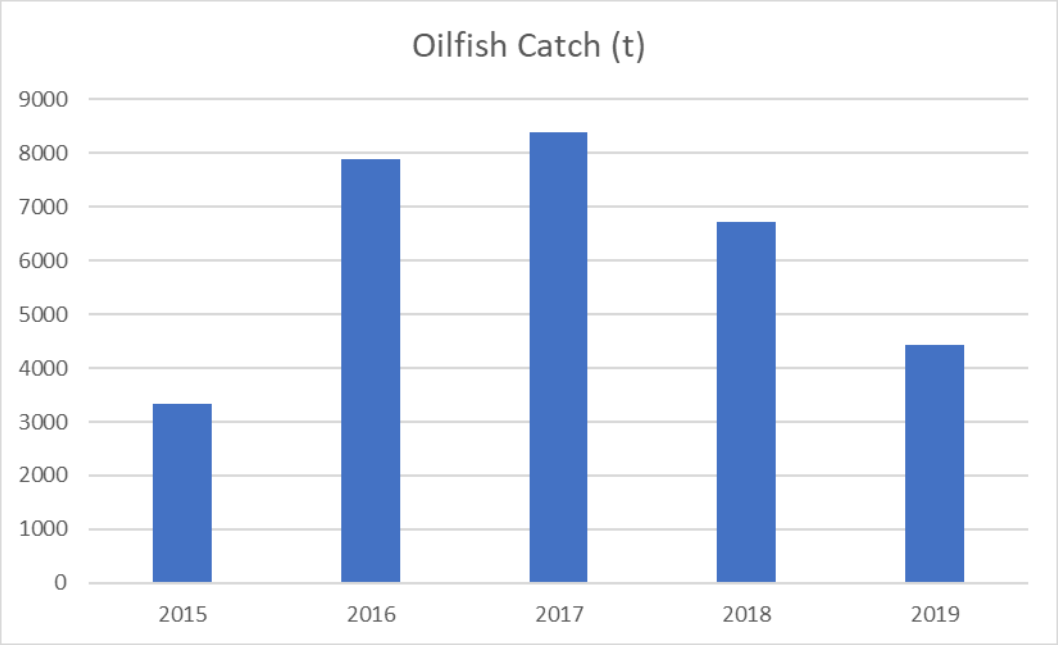

Figure 6: Oilfish Catch (tonnes)

5. Vulnerable Marine Ecosystems (VME)

5.1. Benthic bycatch summary

Table 4 summarizes the weight of benthic organisms' bycatch reported to the Secretariat in the National Reports, catch and efforts data and observer's data in 2018 (2019 data are not available at the date of processing this document)

Table 4: Weight (kg) of benthic organisms bycatch reported, 2018

		Weight (kg)									
Code	Scientific Name red=VME taxon	AUS	COK*	COM	EUS**	FR-OT	JPN	KOR	MUS	SYC	THA
AQZ	**Antipatharia**		1.022		0.005						
ATX	**Actiniaria**		0.21								
AXT	**Stylasteridae**		0.525								
BWV	Paragorgiidae		0.09								
CGW	Coreobagrus ichikawai		0.055								
CNI	Cnidaria		0								
CSS	**Scleractinia**		492.03		1.558						
DMO	**Demospongiae**				2.406						
ECH	Echinodermata		0.4								
GDV	Goniocorella dumosa		0								
GGW	**Gorgoniidae**				0.5983						
HQZ	Hydrozoa		0.322								
HXY	**Hexactinellida**		26.63								
IQO	Isididae		15.82								
JEL	Rhopilema spp		8.06								
NTW	**Pennatulacea**		0.01								
OEQ	**Euryalida**				0.452						
PFR	Porifera		26.34								
STF	Asteroidea		0.14								
Total number of operations (sets, tows, including 0 benthos catch)		73	1667	n/p	588	34	1091	0	n/p	0	0
Total (Kg)		0	571.65	?	5.01	0	0	0	?	0	0

* data from observers' reports, ** data from catch and effort database, n/p=not provided

5.2. VME management rules

One of the tools SIOFA implements to manage impacts on Vulnerable Marine Ecosystems (VME) from fishing is the application of move-on rules when thresholds of VME indicators are reached. Table 5 summarises the thresholds and move-on rules applied by each CCP.

Table 5: Summary of VME thresholds and move-on rules, from National Reports

Flag	Threshold	Response and Management	Encounter
COK	Cook Island-flagged vessels observe the thresholds and move-on rules specified in CMM 2019/01.	Cook Island-flagged vessels observe the thresholds and move-on rules specified in CMM 2019/01.	No threshold breached out of 581 bottom trawls in 2019
KOR	Korea established a procedure to protect Vulnerable Marine Ecosystems from bottom fishing in the high seas, in accordance with UNGA Resolution 61/105, adopted in 2006, and 64/72, adopted in 2009. Korean domestic laws request all Korean bottom fishing vessels clearly mark the start and end of each haul on each fishery, and monitor all hauls to record the quantity of VME indicator organisms recovered during that haul. The fishing vessel, during its operation, shall submit the information with regard to its operation (e.g. position, date) to NIFS if it was confirmed that the vessel encountered VMEs. The threshold of the encounter of VMEs is over 60kg of coral per set or over 800kg of sponges per set.	If the amount of VME that exceeds the weight specified in the criteria, the vessel shall apply a 2 nmiles move-on rule to resume its fishing operation. Furthermore, the vessel shall relocate its fishing position until it reaches a point where no VMSs are confirmed.	no fishing in 2019
AUS	Australian-flagged vessels observe the thresholds and move-on rules specified in CMM 2019/01. Australian-flagged vessels are required to record any evidence of a Vulnerable Marine Ecosystem (VME) such as coral or sponges encountered in a fishing shot in logbooks.	Australian-flagged vessels observe the thresholds and move-on rules specified in CMM 2019/01. Australian-flagged vessels are required to record any evidence of a Vulnerable Marine Ecosystem (VME) such as coral or sponges encountered in a fishing shot in logbooks.	No thresholds were triggered by any Australian-flagged vessels in 2019.
JPN	From the middle of the 2019 fishing season, Japanese fishing vessel have applied Article 12, CMM 2019/01, which establish VME thresholds and the move-on-rule in the encounter protocol, i.e., for trawl fisheries, it is 60 kg of live corals and/or 300 kg of sponges and for the bottom longline fisheries, it is 10 or more VME-indicator units.	If by-catch amount of VME indicators reached the threshold values, Japanese fishing vessels will follow the protocols stipulated in Article 12 to 19, CMM 2019/01, i.e., fishing vessels will move away 2 and 1 nm for trawl and longline fisheries respectively then report to the Secretariat.	No VME bycatch in 2019
EUS	The EU-Spain bottom longline fleet is applying the rules adopted by the Fishing Administration, like those applied in SEAFO and CCAMLR in the definition of the VME encounter and thresholds, together with the protocols adopted in the CMM 2016-01.	According to point 13b of CMM 2019-01, stop fishing and separation of at least 1 nautical mile from the midpoint of the operation, in the direction least likely to lead to an additional encounter. The captain will use his best judgment based on all available sources of information. "	no threshold reached from 2017 to 2019.

Flag	Threshold	Response and Management	Encounter
	It is considered an encounter with Vulnerable Marine Ecosystems (VME) when 10 or more indicator units of a VME have been recovered in a single line section		
THA	Trawler: Stop fishing when catching living corals more than 60 kg of corals or 300 kg of sponges per one time of operation and move at least 2 nautical miles from that area. Longliner: Stop fishing when catching living corals or sponges more than 10 kg per 1,000 hooks or per 1,200 meters of longline and move at least 1 nautical mile from the centre of the line segment.	1.Stop fishing operations and move: -for bottom trawl: at least 2 nautical miles from area, -for longline: at least 1 nautical mile away from centre of line segment, 2.Report to Department of Fisheries within 24 hours	
FR-OT	Ref. CCAMLR protocol. Crew must collect and retain all benthic organisms for each segments in numbered buckets, those buckets will be made available for observers. The observers record benthic organisms composition and abundance for each set. This information are also recorded in a digital logbook and transferred to the MNHN fishing database “PECHEKER”.	Ref. CCAMLR protocol.	No VME indicator thresholds were triggered for the period 2011-2019. The move-on protocol didn’t need to be applied.

6. Observers and port sampling programs

CMM 2019/01 and CMM 2019/02 require CCPs to implement scientific observer programs. Table 6 provides a summary of the observer programs implemented by each CCP and information on port sampling.

Table 6. Summary of Observers and Ports Sampling programs in 2018.

Flag	Item	Description
Australia	Coverage	100% on trawl vessels, 20% of hooks observed on line vessels
	Training	AFMA recruits and trains the observers. Observers have a scientific background and/or experience in the fishing industry or other maritime industries and must demonstrate skills in collecting biological data at sea, fisheries research methodologies and collection of associated scientific data. Observers also hold a sea safety certificate and medical certificate, and have completed an AFMA observer training course. Some observers hold a marine radio operators certificate of proficiency (or similar qualifications).
	Collection	Observers collect a range of data on vessel characteristics, fishing activity, catch composition, discarding and bycatch. Observer data are provided to the SIOFA Secretariat in accordance with CMM 2019/02.
	Port sampling	Australia does not have a port sampling program for vessels that fish in the SIOFA area.
China	Coverage	China did not conduct an observer program for demersal trawling from 2000 to 2002 in the Indian Ocean. Neither did China for light seining from 2014 to 2019. Since 2005 China has been conducting an observer program for bottom longliners.
	Training	
	Collection	
	Port sampling	
Cook is.	Coverage	100% of trips, 87% of hauls
	Training	in 2019 MMR has also trained two additional Observers from the Pacific Islands Regional Fisheries Observers (PIRFO) Programme to carry out placements on Cook Island vessels.
	Collection	
	Port sampling	The Cook Islands does not have a port sampling programme as sampling is conducted onboard the vessel by the observer.
EU France	Coverage	*No fishing in 2019*
	Training	*two observers trained in 2018, domiciled in Reunion Island, will be ready to embark on a 20-day cruise (duration of the trip) in international waters on the Saya of Malha Bank (ref. national Report for SC3-2017)*
	Collection	
	Port sampling	EU France do not have a port sampling program for vessels fishing SIOFA species.
EU Spain	Training	The scientific observer (Biologist or Marine Science degree) are part of the personnel trained at the Instituto Español de Oceanografía, specific training is also adapted for all fleets.
	Collection	Scientific observers have been deployed on board the one EU-Spain fishing vessels operating in the region in 2019. Reports on the scientific observations were prepared and provided to SIOFA Secretariat, and also information on toothfish fishery tag recovering were delivered.

	Coverage	The observers were on board during 282 fishing days, which means 100% of observation coverage.
	Port sampling	EU-Spain do not have a port sampling program for vessels fishing within the SIOFA CA.
France Oversea Territories	Port sampling	Landed box of catch are weighted in port
	Coverage	100% trips. 100% Hauls. 25 % for bird 100 % for mammal
	Collection	Observers are provided with a comprehensive tool box in order to check the entire data set's consistency on a daily basis allowing them to correct errors in real times at sea rather than after vessel's return which is far more difficult. On top of this, a checking routine is run by the MNHN on the entire data set received on a weekly basis. Observer's logbook (electronic version as well as hard copies) are returned to the MNHN for perennial storage. Hard copies are referenced and stored in the MNHN's official archives and electronic versions are validated and then uploaded into a secured server linked to several external synchronised copies. Data security is thus met and data can be queried.
	Training	
Flag		Description
Japan	Training	The observer trainings have been held annually since 2016. The scientific observer scheme and manuals have been improved based on information and feedback from the scientific observers through the debriefing held during the scientific observer trainings. From 2017, there is no major improvement for Japanese scientific observer scheme for trawl fisheries.
	Collection	According to CMM2018/02 for trawl fisheries. Use CCAMLR template for longline fisheries.
	Coverage	100% coverage.
	Port sampling	There are no port sampling programs.
Korea	Training	Korean scientific observer program for distant water fisheries started in 2002. National Institute of Fisheries Science (NIFS) is responsible for implementing and developing the observer program. The qualification for a person to be an observer is: a person who is a college graduate whose major field is nature science, or else, a fisheries high school graduate who accompanies at least 2-year experience on board having a certificate of qualification to deck officer. Candidates for observer who have passed the paper review (including medical check-up) and oral interview have to take training programs for 3 weeks. Observer training programs include basic safety training for seafaring, operations of navigation devices, biological information training for target and non-target species and data collection method for fishing activities. During the training program they have two types of test. One is the test on a technical term of fisheries and biology, and the other is the test on species identification. The person who scored above 70 in both tests and attended 100% of the course timetable can be qualified and deployed on board as a scientific observer. NIFS trains observers again before dispatching them to each RFMO area. The training includes the conservation and management measure of each RFMO, how to collect the data and sample, specific task needs to be done and more.
	Coverage	No fishing in 2019
Mauritius		*no information provided*
Chinese Taipei	Training	For purposes of collecting fisheries data and bycatch data, Chinese Taipei launched the pilot observer program in 2001 and deployed observers on vessels fishing in the Indian Ocean commenced in 2002. Our observer program had received interim authorization in 2009 and received full authorization after auditing in November 2011 and October 2017, respectively.
	Collection	The forms used in our observer program are fully conformed to the standards set by WCPFC which include the fishing activities, catch number and weight, species identification, bycatch species and status. In addition, length frequency of major species and the sighting and incidental catch of ecological species were recorded, and biological samplings were collected for biological research. To fulfill the

		obligation of distant waters fishing state, the observer data has been provided to t-RFMOs, including CCSBT, IATTC, ICCAT and WCPFC, per their requirements, and the trip reports of individual observer of the Indian Ocean has been submitted to IOTC per its resolution on regional observer program.
	Coverage	In 2019, there were 1,935 fishing day observed by 17 observers dispatched to the large-scale tuna longline vessels in the Indian Ocean. Table 6 summarises the observer coverage rate of Chinese Taipei oilfish longline fishery from 2015 to 2019 which ranges from 8.19% to 15.49% between 2015 and 2018, and it should be noted that the observer coverage rate of 2019 is still in preliminary.
	Port sampling	A port sampling program has conducted in domestic ports aims at collecting the size data of tuna and tuna-like species.
Thailand	Training	Training provided according to FAO guideline. 22 observers trained for SIOFA area
	Coverage	5% of tows
	Collection	
	Port sampling	All landings are monitored, fish identified by sampling. Declaration checked against the samples
Seychelles		*no fishing*
Comoros		*The Union of the Comoros has a national observation plan which was developed and validated in 2018. The said Plan has been operational since that date.*

7. Summary of biological sampling

Table 8 summarizes the number of fish sampled in 2018 by on-board observers on CCP fishing vessels. The 2019 data were not available at the time of compiling this report.

Table 8: Summary of biological sample collection by scientific observers, total number of samples made in 2018

Species	AUS	FR-OT	COK	JPN
Alfonsino (BXD - *Beryx* spp)		1		
Splendid Alfonsino (BYS - *Beryx splendens*)			10097	2203
Orange roughy (ORY - *Hoplostethus atlanticus*)			9727	
Rosefishes (ROK - *Helicolenus* spp)		26		
Hapuku wreckfish (WHA - *Polyprion oxygeneios*)	7	3		
Wreckfish (WRF - *Polyprion americanus*)	9	23		
Eels, morays, congers nei (XAX - Anguilliformes)		1		
Pelagic armourhead (EDR - *Pseudopentaceros richardsoni*)	13			
Bluenose warehou (BWA - *Hyperoglyphe antarctica*)	1			
Violet warehou (SEY - *Schedophilus velaini*)	1			
Common mora (RIB - *Mora moro*)	8			

Appendix - FAO species codes and common names

FAO common name	FAO code	Scientific name	Alternative common name
Alfonsinos	ALF	*Beryx* spp.	Alfonsino
Splendid alfonsino	BYS	*Beryx splendens*	Alfonsino
Bluenose warehou	BWA	*Hyperoglyphe antarctica*	Blue-eye trevalla, Antarctic butterfish
Orange roughy	ORY	*Hoplostethus atlanticus*	
Violet warehou	SEY	*Schedophilus velaini*	Indian Ocean trevalla
Pelagic armourhead	EDR	*Pentaceros richardsoni*	Southern boarfish
Patagonian toothfish	TOP	*Dissostichus eleginoides*	
Common mora	RIB	*Mora moro*	Ribaldo
Wreckfish	WRF	*Polyprion americanus*	
Portuguese dogfish	CYO	*Centroscymnus coelolepis*	
Hapuka	HAU	*Polyprion spp.*	
Rubyfish	RYG	*Plagiogeneion rubiginosum*	
Smooth oreo dory	SSO	*Pseudocyttus maculatus*	
Spiky oreo	ONV	*Neocyttus rhomboidalis*	
Blue antimora	ANT		
Hapuku wreckfish	WHA	*Polyprion oxygeneios*	Hapuku
Cardinalfishes nei	APO	*Apogonidae*	
Cardinal fishes nei	CDL	*Epigonus spp*	Deepwater cardinalfishes
Oreo dories nei	ORD	*Oreosomatidae*	
Black bellied rosefish	BRF	*Helicolenus dactylopterus (fam. Sebastidae)*	
Lizardfish	SZX	*Saurida spp.* *Saurida undosquamis (fam. Synodontidae)*	
Scads	SDX	*Decapterus russelli*	Round scad
Ruby snapper	ETC	*Etelis coruscan*	
Oilfish	OIL	*Ruvettus pretiosus*	
	LEC	*Lepidocybium flavobrunneum*	Escolar

Annex G: PAEWG workplans for cumulative BFIA:

Task	Responsibility	Timeframe	Days	Resourcing
1. Review and agree to methods for estimating spatial footprint and cumulative impacts, including for example those used in other R(F)MOs	Aus, CKI, Jpn, Tha, Secretariat	May 2020		Nil (in-kind)
2. Collate historical spatial trawl data and at finest possible resolution for historic footprint reference period (2000-2015), in collaboration with Secretariat (if required). Collate historical spatial trawl data and at finest possible resolution for recent years (2016-2019), in collaboration with Secretariat (if required).	Aus, CKI, Jpn, Tha	June 2020		Nil (in-kind)
3. Develop terms of reference advertise for tenders to carry out work	Secretariat	August-October 2020		
4. Implement agreed methodology and prepare draft report in accordance with SIOFA BFIAS	Consultant and Secretariat	October 2020-January 2021	57	Up to $50, 000 AUD
5. Finalise report and provide cumulative trawl BFIA to SC6 in accordance with SIOFA BFIAS	Aus, CKI, Jpn, Tha	January-February 2021		Nil (in-kind)

Longline cumulative BFIA workplan

Task	Responsibility	Timeframe	Days	Resourcing
1. Collate historical spatial longline data and at finest possible resolution for historic footprint reference period (2000-2015), in collaboration with Secretariat (if required)	EU, FR-OT	May 2020		Nil (in-kind)
2. Review and agree to methods for estimating spatial footprint and cumulative impacts, including for example those used in other R(F)MOs	EU, FR-OT	June 2020		Nil (in-kind)
3. Implement agreed methodology and prepare draft report in accordance with SIOFA BFIAS	Consultant	October-November 2020	50	26 370 €
4. Finalise report and provide cumulative trawl BFIA to SC5 in accordance with SIOFA BFIAS	EU, FR-OT	November-March 2021		Nil (in-kind)

Cumulative BFIA cost

SC ACTIVITY - Trawl cumulative BFIA		
Daily consultant rate (High, Medium or Base)	527,40 €	*
Max number of days (inc. meeting and travel days)	57	
Consultant costs	*30 061,00 €*	
Travel costs (if applicable)		
Maximum flight costs		
Travel/meeting days		
UN DSA day rate including accommodation	278,64 €	**
Travel costs	*0,00 €*	
Outsourcing costs		
Outsource cost 1: *identify*	0,00 €	
Outsource cost 2: *identify*	0,00 €	
Outsourcing costs	*0,00 €*	
Total Maximum Budget	**30 500,00 €**	

SC ACTIVITY - Longline cumulative BFIA workplan				
Daily consultant rate (High, Medium or Base)	527,40 €	*		
Max number of days (inc. meeting and travel days)	50			
Consultant costs	*26 370 €*			
Travel costs (if applicable)				
Maximum flight costs				
Travel/meeting days				
UN DSA day rate including accommodation	278,64 €	**		
Travel costs	*0,00 €*			
Outsourcing costs				
Outsource cost 1: *identify*	0,00 €			
Outsource cost 2: *identify*	0,00 €			
Outsourcing costs	*0,00 €*			
Total Maximum Budget	**27 370,00 €**			
Total cost : Trawl + Longline	**57 870 €**			

* Based on FAO Guidelines Honoraria for Category A High Level Consultants USD 600 per day					
USD 600,00	conversion rate	0,879	equals	527,40 €	
* Based on FAO Guidelines Honoraria for Category B Medium Level Consultants USD 450 per day					
USD 450,00	conversion rate	0,879	equals	395,55 €	
* Based on FAO Guidelines Honoraria for Category C Base Level Consultants USD 600 per day					
USD 300,00	conversion rate	0,879	equals	263,70 €	
** Based on UN DSA rate for France Elsewhere				https://icsc.un.org/	
USD 317,00	conversion rate	0,879	equals	278,64 €	
The employment of Consultants under MS 317 and Subscribers to Personal Services Agreements under MS 319 Guidelines -Revised 15 Feb 2018.					

Annex H: SERA-WG work plan for stock assessment and reference point and harvest control rules (HCR), updated at SC5

		2020							2021									2022		
		9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
								WG3 +SC6												WG4 +SC7
Orange roughy	acoustic data								Acoustic data (2018-2020) process											
	stock assessment															Consultant				
Alfonsino	Age validation using bomb calorimetry			Consultant																
Reference Points + HCR				Consultant																

Indicative budget proposal

Budgest proposed			
		EURO	
Activities		2020	2021
orange roughy	acoustic data process (2018-20) (Consultant)		20K
	SA(Consultant)		25K
Alfonsino	Age validation using bomb calorimetry (Consultant)	20K	
Reference Points + HCR (Consultant)		15K	
total		35K	45K

Annex I: SIOFA Scientific Committee Operational Work Plan 2019-2022

The SIOFA SC Work Plan is agreed by the MoP and provides direction to the SC activities. The SC Operational Work Plan contains research priorities that are in progress or to be proposed for 2019-2022.

The Operational Work Plan will be reviewed annually by the SC.

Theme	Research activities	Timeline	Responsibility
1. Scientific data standards for the collection, reporting, verification and exchange of data	• Review of current data holdings and other relevant research - through an annual data holdings report from the Secretariat that would include information on the quality control process and any issues identified; data inventories in support of species assessments	• SC4 - annual data holdings report completed by Secretariat • SC4 - data inventory for Alfonsino and Patagonian toothfish completed by scoping studies • Ongoing – annual data holdings report to be provided prior to each SC	• Secretariat

	• Consolidation of historical data from non-CPs, this includes the historical catch data identified through the orange roughy stock assessment	• SC4 – report on progress for data sources identified with respect to orange roughy, alfonsino and species from the Saya de Malha Bank not yet progressed	• Secretariat to write to relevant non-CPs • SERAWG and CPs
Theme	**Research activities**	**Timeline**	**Responsibility**
	• Evaluation of proposed e-monitoring programs for scientific data collection	• SC – if a CP makes a proposal against the Guidelines • SC5 – Thailand to present a proposal for evaluation of e-monitoring	• Relevant CP to make a proposal, SC to review against the Guidelines. • Thailand and consultant (SC4 Budget request)
	• Completion of the database to hold observer data and population from submissions	• SC4 – Complete • Submitted observer data entered into database and included in data inventory and holdings report (ongoing)	• Secretariat
	• Development and adoption of standard protocols for data collection, such as age frequency information. Including drawing on the FAO guidelines for protocols for fisheries research and the FAO Deep seas Bottom Fisheries Guideline	• SC4 (not yet progressed) and ongoing	• CPs to propose to protocols to SC for consideration

	• Review of observer data coverage requirements and observer data standards: • Collate background information to consider types and levels of observer coverage in relation to specific research, scientific committee work.	• Data inventory to be completed prior to SC4 – inventory to be completed after submission of observer data and presented at SC5. Updated observer data inventory to be presented at SC6. • PAEWG3 and SEAWG3 to provide advice on observer coverage requirements	• Secretariat to provide inventory prior to SC6 • PAEWG and SERAWG to provide advice to SC6 • SC6 and CPs

Theme	Research activities	Timeline	Responsibility
	• Review of observer data holdings (inventory) of CPs in a consistent template, including collection protocols in place • Investigation of observer coverage type and levels against the requirements of the SC workplan •	• SC6 – finalise advice considering information provided through work plan	
	• Broaden use of identifications guides for deepsea sharks to enable better collection of data	• As soon as possible – MoP adopted use of guides (CMM 2018/02)	• CPs to ensure identification guides are in use by observers and crew
	• Smart forms for collection of deepsea shark and benthos data	• SC4 - Progress report on trials – trials on going	• CI to report on outcomes of trials once trials are complete • CPs to consider potential use of Smart forms
	• Periodic review of scientific data standards as and when required	• SC, ongoing as required	• • CPs to propose potential amendments as required, through papers to the SC
2. Advice on vulnerable marine ecosystems	• Contribute information to FAO VME database	• Ongoing	• Secretariat and CPs as appropriate
	• Develop SIOFA definition of VME indicator species: • Consider VME indicator species identified in	• SC5 – SC4 completed with recommendation of VME indicator species	

Theme	Research activities	Timeline	Responsibility
	other relevant RFMOs or other bodies (e.g. CCAMLR, SPRFMO, etc.) • Test whether these are appropriate for SIOFA area • Development of pictorial guides to VME indicator species		• Secretariat and CPs
	• Mapping of areas where VMEs are known or likely to occur. Work plan for taxa habitat mapping (SC4 Report, Annex I)	• PAEWG2 and PAEWG3 • SC6	• Consultancy commenced (2020) • PAEWG and consultant (Budget request)
	• Bioregionalisation of the SIOFA area according to a spatial analysis approach. Work plan provided (SC4 Report Annex I)	• PAEWG2 and PAEWG3 • SC6	• PAEWG and consultant (Budget request)
	• Consider benthic sampling protocol for mapping distribution of VME indicator species and predicting benthic community structure	• SC6	• France (Territories) to lead and report to SC for discussion

	• Cumulative impact assessment of SIOFA fisheries:
	  • Refine process to advance, given the disparate nature of information available.
	  • Undertake cumulative impact assessment for
		• SC4 – report on progress on cumulative impact assessments for fisheries/gears – work plans developed to progress cumulative assessment of trawls and longline gear (SC4 Report, Annex T)
		• SC5 – updated work plans (Annex I)
		• SC6
			• Relevant CPs to progress cumulative impact assessments, including data provision, agreement on methods and implementation ; longline (Australia, EU, France(Territories), Japan, Korea), trawling (Australia, Cook Islands, Japan, Thailand)
			• PAEWG3 to review and monitor progress intersessionally
			• Review of cumulative impact assessments by SC6

Theme	Research activities	Timeline	Responsibility
	groups of fisheries/gear (eg orange roughy bottom trawling, long lining, Saya de Malha trawl) using a consistent methodology across the gear. • Work plans updated at SC5 (SC5 Report, Annex I)		
	• Assessment of likely impact of specific gear types – potential collaboration with ABNJ Deep Seas Project	• Dependent on ABNJ Deep Seas Project timeframe • SC4 advised that this work will be completed in 2019	Secretariat will seek report from ABNJ Deep Seas Project on this work
	• Revise and improve the SIOFA BFIAS	• SC4 – if proposed changes are brought forward – no changes proposed	• CPs to submit papers to propose changes as required
	• Consider proposals for protected areas against the Standard protocol	• As per process in PAEWG ToR	• Proposals from CPs • PAEWG and SC
	• Review of trawl fisheries threshold levels for VME encounters	• SC6	• Relevant CPs (Australia, Cook Islands, Japan and Thailand) • PAEWG3
3. Current and historical status of fishing activities	• Scientific impact assessments on demersal gillnet operations	• When provided by the CP proposing to commence demersal gillnet operations	• Relevant CP
	• Spatial extent of historical and current fishing – SC5	• SC4 reviewed Secretariat's data inventory describing the spatial	• Secretariat and PAEWG

Theme	Research activities	Timeline	Responsibility
	specified the maps to be generated by the Secretariat and the work plan	resolution of the historical fishing effort data that has been submitted.	
	• Develop advice on reference periods for effort, footprints and spatial control	• SC5 – Asked for recommendations to the MoP on appropriate SIOFA bottom fishing footprint (by 2020) • SC4 - Recommendations to the MoP on the most appropriate response to the VME encounter (by 2019), SC4 provided advice on the encounter response	• CPs and SC
	• Characterisation of historical and current deepsea shark fisheries (see also theme 5 below)	• If required to refine the ERA for deepsea chondrichthyans	• SERAWG and CPs
4. Stock assessments for key targeted species	• Implement the tiered assessment framework, supported by scoping analyses	• SC4 – consideration of progress on scoping analyses, Scoping analyses completed for toothfish and alfonsino, SC4 reviewed the process made and the link to refining the SIOFA species list • SC6 – consideration of progress on implementation	• SERAWG and CPs
	• Orange roughy: • Stock structure delineation • Age frequency data • Target strength for acoustic data • Development of a draft protocol for the collection of orange roughy	• Annually review catch and effort trends • SC4 – progress reports, SC4 reviewed progress • SC5 – consideration of outcomes	• Stock structure delineation – AUS and CI in collaboration with Victoria University (Approved MoP) • Age frequency data – CI and AUS • Target strength –Draft protocol - CI

Theme	Research activities	Timeline	Responsibility
	age/length frequencies and otoliths		
	• Alfonsino: • Data inventory • Acoustic data preparations (target strength evaluation and acoustic data analysis and review) • Scoping analysis • Age frequency data (otolith aging) • CPUE evaluation • Decision on assessment approach • Stock assessment analysis • Updated work plan provided (SC4 Report, Annex V)	• SC4, to provide advice in line with CMM Bottom Fishing (2019), scoping study complete • SC5 undertook initial assessment • Secretariat to ensure available data available for an updated assessment	• SERAWG, relevant CPs and SC
	• Patagonian toothfish: • Data inventory • Scoping analysis • Decision on assessment approach • Stock assessment analysis	• SC4, to provide advice in line with CMM Bottom Fishing (2019), scoping study complete	• Relevant SERAWG, relevant CPs and SC • SC Chair, France (Territories) and relevant CPs to work with the Secretariat to progress collaboration with CCAMLR and relevant states (France, South Africa)
	• Other teleost species, in particular those caught in the Saya de Mahla Bank:	• SC4, to provide advice in line with CMM Bottom Fishing (2019), SC4 reviewed progress on the teleost ERA work with	• SERAWG, relevant CPs

Theme	Research activities	Timeline	Responsibility
	• Apply PSA and SAFE approaches to assess these species	particular focus on the Saya de Malha Bank	

	• Deepwater chondrichtyans:
	  • Ongoing review of sharks catch/bycatch data, including spatial and/or catch rate trend analyses
	  • Review implementation of FAO sharks ID guides
	  • Review effectiveness of measures put in place by MoP, if applicable
	  • Work towards more quantitative assessment of key species of concern
	  • Development of harvest strategies and reference points for species taken in large volumes
		• SC4, to provide advice in line with CMM Bottom Fishing (2019), SC4 reviewed progress
		• SC5 reviewed progress
			• SERAWG, relevant CPs

	• Collection, analysis and reporting of essential biological and fisheries information, including: • Age composition data • Length and age • Growth • Reproductive biology	• Ongoing, with priorities determined by species scoping analyses and assessment research plan	• Guidance on priorities from SERAWG

Theme	Research activities	Timeline	Responsibility
	• Maturity ogives • Natural mortality		
	• Determination of biological reference points and associated development of harvest strategies • Work plan at SC4 Report, Annex X, that includes the scientists – fishery managers dialog	• SC6 and SC7 as per the work plan (SC4 Report, Annex X and SC5 Report Annex I)	• SC6
5. Advice on the impacts of fishing on associated and dependent species	• Risk assessment of effects of fishing on non-target, associated and dependent species (see also theme 2 above) – through implementation of the tiered assessment framework	• Ongoing	• SERAWG
	• Seek advice from expert groups, such as Birdlife International and the Agreement for the Conservation of Albatross and Petrels, CCAMLR and IOTC, in relation to risk assessments completed for species in the SIOFA Area • Report on seabird bycatch observed in SIOFA fisheries	• SC6, review information on risk of seabird bycatch in the SIOFA Area • ACAP provided a paper to SC5 but it wasn't considered given reduced agenda	• Request input prior to SC6– Secretariat invite to update paper and engage with SC6 • Secretariat to prepare a report on observed seabird bycatch prior to the SC6

Theme	Research activities	Timeline	Responsibility
6. Climate change impacts on fishery resources and ecosystems	• Identification of research activities and development of work plan	• SC5	• CPs • Secretariat to provide advices on ABNJ new phase assistance
7. Any other advice that the Meeting of the Parties (MoP) requests	*This may be updated following the MoP*		

Annex J: Gap Analysis of CCP BFIAs against BFIA standards

BFIAS section	Requirement	Status of completion (in BFIA)	Comments
5.1 Description of the proposed fishing activities	General	BFIAs not received from Korea, Mauritius, Seychelles	
	Details of the vessels to be used	ALL except those not submitting BFIAs,	All complied
	Data Standards for vessel data, and confirmation that they appear on the SIOFA record of authorised vessels	ALL	Since 2019, the Comoros vessel, DIEGO STAR 2, has been registered on the SIOFA list of authorized ships.
	Detailed description of fishing methods, range in fishing height off bottom, net opening and any factors affecting gear selectivity	All	
	Seabed depth range to be fished	Yes Not Comoros	Comoros identify the high seas banks to be fished but not seabed depth range
	Target species, and likely or potential by- catch species	Yes	

BFIAS section	Requirement	Status of completion (in BFIA)	Comments
	Intended period and duration of fishing	Yes	
	Effort indices: How many vessels, how many tows (cumulative effects), estimated tow	EU	Cumulative effects not clearly described. Length of static gear as measure of effort needs to be specified. Soak time, number of traps for trap gear not available (Thailand). Effort indices not always clear
	durations or distance (ranges)		
	Estimated total catch and discard quantities by target and bycatch species	EU, Not (always?) cumulative – i.e. the entire catch history.	
5.2 Mapping and description of proposed fishing areas	General		
	Maps of the (intended) fishing areas, at the appropriate resolution in relation to the most recent SIOFA maps of historically fished areas	AUS, CKI, JPN, EU, THA, FR(OT), Comoros	Resolution required not defined but 20' is the minimum specified requirement. Is important to specify if this is not used for whatever reason. Some JPN fishing intentioned reported by 30' resolution.
	Area, or topographic features ***likely*** to support such VMEs	AUS, CKI,	CKI notes that the UN implied method is not suitable for addressing this issue. References conflict in advice they give.
	Mapping of all known VMEs, or evidence of VMEs	AUS, CKI, EU, JPN	FR(OT) noted that got one 'VME' organism. Thailand report that they found no VMEs. EU Data on VME by-catch taxa and its quantification have improved the last years with the implementation of the scientific observation on board. JPN can make map available. Comoros handline fishery assessment does not address VMEs.
	Mapping of the results of predictive habitat modelling for VMEs	None	EU suggests that there is insufficient data to do this, but with a coordinated approach could make it possible. CKI believes that this activity gives inaccurate results and is unjustifiable. FR(OT) is of a contrary view – but need a common data collection framework to do.

BFIAS section	Requirement	Status of completion (in BFIA)	Comments
	Baseline data and description of the proposed fishing areas	AUS, CKI, FR(OT); EU, Comoros &THA - at least in part	
5.3 Impact assessment	Scoping of issues of concern	AUS, CKI	
	Risk assessment	AUS, CKI, EU - 1,2,3, & 4; FT(OT)	FT(OT) had such little effort that a risk effort was scarcely useful Comoros handline fishery risk not assessed
	Determination of the level of risk posed by an activity, against 1.		FR(OT) had few data; it did not enable a detailed assessment Comoros handline fishery risk not assessed
	Intensity, 2. Duration, 3. Spatial extent and 4. Cumulative impact		
	Overall risk	AUS (qualified), CKI, FT(OT), JPN, THA (general statement)	NB: is risk both to environment and to the stocks including bycatch. Difficult/impossible/meaningless to combine qualitative and quantitative components of the risk assessment within and among fishing countries. Parties concluded that their own operations had 'low' risk but these assessments are not comparable among parties, a difficulty that may be unavoidable. Comoros risk not assessed
	Interactions with VMEs: Impacts ***likely*** to result from the fishing gears to be used	AUS, CKI, JPN, THA, FT(OT)	FT(OT) - not possible with available data. EU used CCAMLR standards to assess. Comoros VME handline fishery impacts risk not assessed
	Interactions with VMEs: The probability, likely extent (% of habitat targeted) and intensity of the interaction between the proposed fishing gear/targeting practices on the VMEs	AUS, CKI, FT(OT), THA	Can map and calculate % habitat but not of all this area will contain VMES – %s must be overestimate. FR(OT) concludes low level of fishing activity must result in negligible impact. Comoros handline fishery VME interactions not assessed

BFIAS section	Requirement	Status of completion (in BFIA)	Comments
	Interactions with VMEs: Characteristics of the habitats and benthic communities that may be impacted	AUS, CKI, JPN, THA	JPN longline fishery, EU and FR(OT) had insufficient data. Comoros handline fishery VME interactions not assessed
	Interactions with VMEs: Diversity of the ecosystem in the proposed fishing areas, and will fishing reduce this biodiversity?	AUS, CKI, JPN, THA (partial)	JPN longline fishery, EU and FR(OT) had insufficient data. Comoros handline fishery VME interactions not assessed
5.4 impact on the status of deep sea stocks to be fished		CKI, THA (partial)	Comoros handline fishery impacts not addressed. EU has not addressed.
5.5 Mitigation measures		All	Comoros handline fishery, mitigation measures not addressed (shallow bank fishery)

Annex K: Summary of BFIAs submitted by the SIOFA individual CCPs

CCPs	BFIA submitted	Interpretation of BFIA requirements	Method/data used and results	Overall assessment of impact/risk
Australia	Y	This BFIA has focused primarily on the risk of direct impacts by bottom fishing on VMEs characterised by benthic fauna because of the potential for widespread and long-lasting effects. There is less emphasis on the status of deep water stocks because impacts assessment requires knowledge of total catch by all fleets in the SIOFA Area. Assessing the potential for SAI on VMEs needs to consider 'impact' and 'risk' (the intensity, duration, spatial extent and cumulative effects of fishing activities), and define the dependency of these elements on spatial and temporal scales. In this BFIA, the 'overall risk' is considered as the risk remaining after monitoring, management and mitigation measures are accounted for. This BFIA used a qualitative framework because data paucity and knowledge uncertainties preclude a quantitative analysis of risk – especially of cumulative impacts. Semi-quantitative metrics are incorporated for fishing intensity, and the overlap of	Operations for the SIOFA Area were selected from general high seas logbook data if the spatial location of the start coordinates of fishing operations occurred within the SIOFA Area boundary as defined by its GIS shape file (FAO 2010). Operations represent the unit of logbook recording which is equal to one trawl shot or one longline/dropline set. Gridded analysis for two spatial scales, 20' x 20' (the standard SPRFMO footprint grid cell) and 0.1° x 0.1° (6 minutes – approaching the limit of logbook resolution of 1 minute) was generated in Oracle using Oracle spatial intersect functions SDO_RELATE. To map fishing footprint and effort distribution, fishing operations reported in AFMA logbooks from 1999-2009 were assigned to grid cells based on their start position only if no end point was reported. Where an end point was reported, and the length of a straight line between start and end points was <6 km, all grid cells (of either scale) touching any segment of the straight line were retained as part of the footprint and the fishing effort distribution; where the distance to the end point was >6 km only the start position was used. Six kilometres is used in domestic Australian deepsea fisheries as a limit for filtering tow lengths as part of data quality assurance; it was assumed to be a realistic limit for high seas data. Fishing effort distribution will be underestimated by logbook records that lack an end position. For the creation of the 20'x20' permit footprint these records were mapped and examined individually. Four blocks were added by AFMA because the reported start position was within close vicinity (within a margin of reporting error) of the block boundary and related trawl tracks and seabed features were such that it was more than likely that the added block had been fished within the relevant period. An additional block was added by AFMA to ensure the footprint is able to be implemented in permit conditions. Furthermore, any part of the 20' grid-cells overlying national EEZs or the BPAs (voluntary closed	This BFIA conducted for Australian vessels fishing in the area to be managed under the SIOFA (SIOFA Area), concludes that the current overall risk of SAI on VMEs by Australian vessels fishing with bottom trawls, bottom-set auto-longlines and demersal potsis low. The BFIA concludes that the current overall risk of SAI on VMEs from mid-water trawling, drop-lining and potting by Australian vessels is negligible. Despite the potential for demersal trawling and auto-longlining to severely impact VME fauna at fine ('site') scales, and for impacts to persist and to accumulate through time, the current risk of SAI at the scale of the fishery was considered as low when the following factors are accounted for: - low current fishing effort by Australian vessels - few areas of high fishing intensity - restriction of fishing to a 'footprint' area – although this permits access to 45% of deep upper slope depths (700-1000 m) and 45% of seamounts most likely to support VMEs - limited spatial extent of Australian fishing effort: mostly low spatial overlap with the bathomes most likely to support VMEs, but medium overlap on the deep upper slope (700-1000 m depths) and on seamounts - management arrangements to monitor and mitigate impacts and risks.

		fishing with the predicted locations of VMEs in bathomes and on seamounts.	areas, see section 3.1.4) were excluded from the permit footprint. Overlap analyses between the 0.1º mapped fishing distribution and depth zones (at 30 arc seconds, 0.2 n.m. resolution) were performed in ArcGIS using the Intersect analysis function. Areas for calculating the proportion overlap between fished grid cells and depth zones were calculated using a Lambert Azimuthal Aqual Area projection centred on the SPRFMO Area (PROJECTION: Lambert Azimuthal Equal Area, DATUM: WGS84, SPHEROID: WGS84, Central_Meridian: 75.0, Latitude_Of_Origin: -20.0). Where grid cells containing fishing effort crossed the SIOFA boundary they were clipped to the boundary extent. It should be noted that the depths reported here refer to the centroid depths of the grid-cells, derived from the bathymetry grid, not the reported operation depth. The form of the analytical result is therefore limited by the resolution of the underlying data (also see Section 4.1.4). For area and overlap analyses of seamount features, the Yesson et al. (2011) seamounts and knoll polygons were combined into one flat (planar) polygon area classified as 'area under seamounts', this polygon was subdivided into the bathomes and intersected with the 1º mapped fishing distribution. The footprint covers 0.84% of the SIOFA Area, but overlays up to 45% of the area of individual fishable bathomes (Table 3.1.2.1). The historical Australian fishing effort has been focussed on two distinct and separate regions: (1) the southern Madagascar Plateau and the Southwest Indian Ridge; (2) the intersection of Ninety East Ridge and Amsterdam Fracture Zone. Fishing distribution has been mapped separately for nine 'fishing grounds' within these two fishing regions (see section 4.2.3).	The current risk of SAI from potting at the scale of the fishery was considered as very low, considering the low level of contact between pots and seafloor and the limitation of potting effort.
Cook Islands	Y	This report is a bottom fisheries impact assessment on the operations of Cook Islands vessels in SIOFA. The BFIAS also specifies that elements of risk, management and mitigation be considered. Many elements of the ecological and fishery risk in this	The assessment took into account habitat mapping which provided a full dataset on the fishable region between 1 and 1500 metres in the entire SIOFA region. This provided a quantitative assessment. The fine scale bottom trawl data for the FV Will Watch was used to develop a bottom fished footprint for the SIOFA area using data from 1997 to 2016. In total 5,139 fine scale bottom trawl shots with both start and end position were available for spatial analysis from a total of 11,051 bottom trawl	**Intensity** - The crux of this criterion is 'what is the specific site being affected'? The sea floor that is affected is where there is contact with the bottom trawl. As indicated in sections 2.2, 4.2 and 4.5 of this BFIA, tows are usually undertaken on highly-defined lanes. In general, where fishing occurs, the impact will be intense, chronic and have severe impacts. However, of relevance is the intensity or severity of the impact of the

		assessment are quantitative, as result of the extensive data collection and research programs undertaken by the Cook Islands, including habitat mapping prior to fishing. The status of deep water stocks is described, based on the stock assessment work promoted by the Cook Islands for orange roughy. The UN requirement to monitor the status of harvested fishstocks to ensure the CP is fishing sustainably, has been followed throughout the history of the fishery. However other elements are qualitative, as it was not possible to take account of the cumulative impacts of other threatening activities in the SIOFA region, such as bottom longlining impacts on deepwater sharks	shots, and these were assumed to cover all of the historical fishing grounds in SIOFA. For midwater trawling a further 5,673 trawls were available with both start and finish position, out of 11,945 trawls. To generate estimates of actual seabed swept area from the tow-by- tow data, all tows were buffered assuming a 25 metres swept area of the groundrope. The trawl doors and sweeps do not touch the bottom in normal trawling operations in the SIOFA region, thus this was considered the appropriate swept width. However, analyses with a 160 metre swept width between trawl doors were also done, which is the maximum door spread normally achieved by these vessels, as measured by door sensors. The buffering was carried out by implementing an ArcGIS spatial buffer of 12.5 m either side of each tow.1 The resulting 25 m wide polygon trawl tracks were dissolved (ArcGIS / Dissolve) by fishing area for the whole period, to produce complex merged polygons of swept area as shown in Figure 18. The result of dissolving is a full fine-scale analysis of actual true footprint impact. Fine scale data accurate to within 10 metres of the actual position, have been used. The results of the analysis are shown in Table 5. Ninety East Ridge and Broken Ridge are not included in the analysis, as the bottom fished area in this region is insignificant (<.001%). Using the swept area of the groundrope for the Southwest Indian Ridge, the fished habitat is 0.74% of the total. If the distance between the doors is used, it increases to 3.31%. For the Walter's Shoal region, the bottom trawl impact is only 0.16%, increasing to 2.61%. If the whole region of SIOFA is considered, only 0.16% of the potential fishable habitat from 0 metres to 1500 metres has ever been potentially impacted by bottom trawling. If we assumed that all midwater trawling touched the bottom for the entire tow, this increases to 0.28%. It is not possible to calculate the bottom area impact of midwater trawls by the Cook Islands vessels, as noted earlier. This is because only a relatively small (21.7%) proportion of the tows actually touch the bottom, and of these 36.3% had bottom contact for I minute or less. The actual contact point cannot generally be recorded, as the skipper are usually	bottom trawl on the ecosystem, community, habitat or population as a whole. These concepts are frequently confounded, even though they are different and raise different considerations. The FAO Guidelines refer to 'ecosystem integrity', i.e. the state of being whole and undivided, which again raises immediate difficulties in interpretation. The intensity can be set at severe at the local scale, but this is not appropriate for the BFIA, which should consider the wider VME impact, and is indeed noted in paragraph 18 of the Guidelines that notes that when determining the scale and significance of an impact, among the factors to be considered is "the spatial extent of the impact relative to the availability of the habitat type affected". **Duration** – The duration of the impact, depending on the species, may be long, if a VME is actually impacted. This is well documented in a range of studies that are not reported in this BFIA. However, recent research shows that it is not uncommon to find VMEs that have been destroyed naturally. **Spatial extent** – The spatial impact relative to the distribution of any VMEs has been described quantitatively in this assessment as being extremely small. For the seamounts and ridges of the Southwest Indian Ridge, 99.29% of the fishable habitat is untouched, and much is untouchable. And for the slopes, banks and knolls of Walter's, large areas are impossible to fish with a bottom trawl. **Cumulative impact** - The risk from cumulative impact is low, as most trawls are carried out on repeat trawl lines. If the trawl removes the benthos, the duration will be long for that site, but it is not possible to remove what is not there. Hence the impact remains constant, not cumulative. All known VMEs are closed to fishing by Cook Island trawl

			very intent on keeping the gear clear of the bottom as the fish are positioned in the mouth of the net. If the net does touch the bottom, the groundrope parts as the breakaway link does its job, and the net will need to be repaired. Hence it is an accident when the bottom is touched, but is a possibility. The method has been rated as low impact in SPRFMO. An assessment of likely VME habitat and the low likelihood of overlap with the trawl fisheries was presented. A large proportion of the habitat, in depths of 400-1500 m is simply unfishable by bottom trawl. If the potential VME habitat was considered to be 100% of the fishable depths down to 1500 metres, which is what early predictive models suggested, then the analysis indicates that 99% of the VME habitat is not at risk from the fishery. The stock status of key harvested species has been monitored throughout the history of the fishery by conducting and analysing research surveys to assess the status of these stocks. The stock status results from these surveys were confirmed in the 2017 SAWG by the stock assessment for the orange roughy fishery.	vessels, which reduces risk even further. Management arrangements to monitor and mitigate impacts and risks are in operation
European Union – Spain	Y	This BFIA presents estimates of the i) accumulated historical impact and ii) the recent impact over the seabed of the Spanish longline fleet. These two information sets are the input required for the future estimation of the potential impact of this fleet. To address this latter objective the data on the total extension of the fishing gear over the bottom for each fishing haul was included in the report. The area impacted by the longline fishery is presented and mapped. The maps were constructed based on georeferenced data on a set-by-set basis. Information on the	The assessment uses data from April 2015 to the end of 2019, period where only bottom longline have been operating, taking into account that this is the only gear that it is expected to be operating within the SIOFA CA in the future. Table 1 shows the number of vessels and the total effort (in km of length) of the longlines by year and SIOFA area, from 2015 to 2019. The length has been calculated with ArcMap as the length of the drawn line from the start to the end of the setting. In 2019, 4862 km of bottom longlines were deployed by the EU-Spain fleet in areas 2, 3b and 7, a 68% decrease compared to the 2018 effort. Fishing grounds for this fleet are mainly located between 1000 and 1500 m depth (73% of the total sets). **Estimation of footprint index and impact** The EU-Spain historical footprint from 2003 to 2017 has been defined by an area where the bottom longline are distributed in 10' square grids, considering the total length of fishing sets to define grid intersections (Fig. 3). Most of the fishing activity took place in the areas 2 and 3b of SIOFA CA, and most of the grids has been moderately fished (1-25 sets per grid). In 2018 and 2019 the footprint has	Although the impact on VME taxa is considered to be low, the preliminary data on taxa potentially impacted are: Sponges (Demospongia (DMO) and Hexactinellida (HXY), Cnidarians from the Order Gorgonacea (family Isidiidae and others-GGW), Cnidarians from the order Actiniaria (ATX) or Echinodermata from the Euryalidae family (OEQ) among others. Data on VME by-catch taxa and its quantification have improved the last years with the implementation of the scientific observation on board. The Spanish fleet in the SIOFA area is following the same protocol for encounters with VMEs taxa than CCAMLR and similar catch thresholds. Vessels are marking their fishing lines into line segments and collecting segment-specific data on the number of VME indicator units. It is required that if 10 or more VME indicator units are recovered in one line segment, to complete hauling any lines intersecting with the Risk Area without delay and not to set any

		relative area impacted by the longline fishery is also presented. It is proposed that both the footprint index and the impact index estimated by CCAMLR for autoline be used in SIOFA area for this fishing fleet and gear.	changed when comparing with previous years (Figure 4). A new fishing has started in the Williams ridge located in area 7 (Figure 4b). The overlap of the EU-Spanish footprint (10'x10' grid) in the SIOFA Area has been calculated for the historical data as well as for the last fishing year (2019). The historical footprint overlap covers 0.43% of the total SIOFA area, being the footprint of the last year 0.12%. When comparing the same data using the SIOFA area up to 2000m, the overlap results are 24.9% for the historical data and 6.9% for the 2019 data (Table 3). As there are not SIOFA official surface areas available, it has been used the estimations provided by Australia in the 2011 report for SIOFA (CSIRO, 2011). However, this approach overestimates the impacted bottom surface because in our estimation we have considered the whole grid (10*10) as an impacted area even when a single portion of a line is crossing a grid. Effort density estimations (longline km/km2 of fishable area) reach values of 0.0102, 0.0102, 0.0096, 0.0193 and 0.0104 for the five years respectively. These estimations consider the effort impact as lineal, without taking into account the seabed cumulated impact. Estimates of fishing "footprint index" (km2 per unit of fishing effort) and "impact index" have been developed for Autoline systems in CCAMLR (SC-CAMLR XXX, Annex 7, Appendix D) and for the Spanish Longline by the Spanish CCAMLR delegation (SC-CAMLR-XXXV/BG/05) Footprint index: mean = 4.3 x 10–3 (km2 of seabed area per km of longline deployed) Impact index: mean = 3.3 x 10–3	further lines intersecting with the Risk Area. The vessel shall immediately communicate to the Spanish directorate the location of the midpoint of the line segment from which those VME indicator units were recovered along with the number of VME indicator units recovered. Four fishing surveys with scientific observers onboard have been monitored from 23/09/2017 to 29/09/2019 following the CCAMLR encounters with VMEs protocol. The maximum encounters (in kg) by taxa* in a line segment randomly selected for sampling following the CCAMLR protocol, from the last Spanish surveys (from 2017 to 2019) by SIOFA convention area is shown in Table 4*. The threshold of 10 or more VME indicator units by segment has never been reached (the maximum has been 6 units of Euryalida in the 3b area). .

European Union – France	Y	**This BFIA presents the historical footprint for the EU-France longline Fishery. The fishing areas are concentrated on the Saya de Malha Bank, north east of La Réunion (SIOFA area 8).** A semi-quantitative assessment of the impact of two the EU-France fisheries is presented. This is based on the Impact ratings for different gears proposed by Chuenpagdee et al. (2003). Considerations on the rating as proposed by (Williams et al. 2011b) are also given..	The historical footprint of EU_france longline fishery overlap covers 0.64% of the total SIOFA area. Although this footprint surface overestimates the impacted area when using 1ºx1º, which are not fully impacted by the longlines.	The ratings of benthic habitat and by-catch impacts for each gear class are: Longline-demersal: Physical 2 Biological 2 Hook and line (dropline): Physical 1 Biological 1 The ratings scale is from 1 (very low) to 5 (very high).
France (Territories)	Y	The French BFIA report was realized using the framework provided by the SIOFA. All the required items have been checked and provided in the report, when available. The BFIA calculation was obtained using a spatial analysis, in accordance to the	From 2013 to 2017 6 vessels obtain authorization for their fishing activities using longline or pot gear (Table 1). Impact ratings for different gears were by Chuenpagdee et al. (2003) with rating considerations proposed by (Williams et al. 2011b). The BFIA is evaluated using both a spatial analysis approach and the fishing effort data available for French fleet within the period 2013-2017. Spatial analysis Firstly, the surface of the different bathomes in the whole SIOFA area is considered (Table 5). Secondary, the area of each bathome within each French fishing zone (Table 6) and the area of the fishable bathomes in the	The rattings of benthic habitat and by-catch impacts for each gear class are : : Longline-demersal : Physical 2 Biological 2 Pots and traps : Physical 3 Biological 2 The ratings scale is from 1 (very low) to 5 (very high).

		requirements of the framework. The main limit of the French BFIA is due to the little activity of the French vessels in the SIOFA area. The analysis possibilities, such as stock assessment approaches or VME mapping, are limited due to the data gaps.	whole French fishing zones (Table 7) are calculated. We have considered the limit of 500 meters, upper depth where longline fishing is not allowed. Finally, a French theoretical fishing footprint is obtained (Table 8) which corresponds to the maximum area potentially impacted. Furthermore, the percentage of each bathome of French fishing zones in the SIOFA area is provided. The French theoretical fishing footprint comparing to the whole SIOFA area is 0.22% (Table 8). However, the French theoretical fishing footprint can reach up to 56% when considering the bathomes separately (for example the bathome 701-1000 m, Table 8). Real footprint in the 2013-2017 period The real footprint of the French fleet is calculated for the 2013-2017 period. The data available for the bottom longline operations is used. All the operations are plotted using a GIS software. The whole area covered by the longlines represents a surface of 2679 km² and 0.0099 % of the SIOFA area, which corresponds to the French cumulative impact in recent years (Table 8).	
Japan	Y	Intensity and spatial extent assumed to be small – 3 years of exploratory fishing only. Map of footprint provided.	2012 : density of corals was roughly estimated as less than 1.0 kg / km2 except for 2 hauls (5.8 kg / km2 and 2.8 kg / km2) by calculating from by-catch amount of corals including VME indicators and trawling areas. Assumed very low probability of interactions with VME due to limited operations over only 3 years. No surveys undertaken. No stock assessments. Location of vessels verified through VMS. Catch and effort data collection system also in place. (Doesn't say these applied in 1970s, nor does it say it doesn't). No scientific observer coverage	Japanese bottom trawl exploratory fishing was conducted only three cruises in 1977, 1978, and 2012, thus cumulative impacts is considered as minimal.
Thailand	Y	Analysis of impact of 62 active fishing vessels 2015-2017, primarily otter board trawl, 14 vessels active in June 2016-2017; 7.5%of trawlable area on continental shelf (0.12% of total SIOFA area) – 33,336 sq km, continental shelf and shallow upper continental slope. BFIA is prepared in accordance with the FAO deep-sea fisheries Guidelines	Utlises mandatory levels of observer coverge, move-on requirement (>60k accidental catch of corals and <700 kg sponges), restrictions on some gear, restrictions within footprint defined 2016-2017. Thailand controls their fishing activities in the SIOFA Area of competent and taken all necessary precautionary approach to prevent the adverse impact to the ecosystem. (Section 4.5). Some of those measures include: - limits on total capacity of Thai fleet; - constraints on the spatial distribution of bottom fishing effort; - legal provisions to ensure that bottom fishing will not have significant adverse impacts on VMEs; and - legal provisions ensuring	• Thai fishing ground cover 7.15% of trawlable area mainly on continental shelf or 0.12% of total SIOFA area. This fishing ground was not close to the Benthic Protected Areas (BPAs) that defined by Southern Indian Ocean Deepwater Fisheries Association (SIODFA) even the nearest, Mid-Indian Ridge. So, the fishing activities of

		and the SIOFA BFIA Standard. The assessment uses the data and information from fishing logbook and observer report of the trawl and trap fisheries during the year 2016-2017. Thailand has adopted the SIODFA BPA restrictions.	that any vessel flying Thai flag is not authorized to fish in any areas that the Meeting of the Parties has decided to close to fishing. Used logbook data, 5% scientific observer reports from June 2016-February 2017, 1 paired trawler, 11 otter board trawlers and 1 fish trap vessel, Saya de Malha bank – from a total of 61 vessels. Adopted a protocol for detection of VMEs evidence drawn from NAFO and SEAFO – 60kg corals and 600 kg of sponges. Move on at least 2 nm for trawler; for longliner, move on 1 nm when 10 kg / 1000 hooks/1200 m longline. Move on 1 nm for fish trap if coral or sponge catch is more than 10 kg. Committed to refresh training for observers and fishermen, EM tools for inspectors reviewing data collection. Requested capacity building	Thai fleet did not impact to any current BPAs. • Although the trawlers targeted demersal fish, the fishing ground was in the area of 0-200 and 200-700 meters that allowed the possibility of catching of pelagic species which move between the water columns e.g. round scad, Indian mackerel. • For this assessment, the two major species, lizardfish (*Saurida undosquamis*) and round scad (*Decapterus russelli*) are analyzed as representatives of demersal fish and pelagic fish species. The average length of lizardfish and round scad is mostly larger than the length at first maturity. • There is no record in logbook and observer report that these fishing activities encounter with Endangered, Threatened or Protected (ETP) species neither marine mammals, corals or sponges and it was suggested that this may be indicative of a lack of VMEs in the Saya de Malha bank area.
Korea	N	N/A		N/A
Comoros	Y	The BFIA focused on two mother vessels and 19 motorized embarkations from 2016 to 2018. VME assessment is less significant in relation to fishing effort and fishing gear used. For this purpose, the constraints on the spatial distribution of its fishing effort are	The competent Comorian authorities authorized these both vessels. The homeport of both vessels is in Mauritius. The information was collected from fishing logs, inspection reports, but also information from the competent authorities of Mauritius. We were also inspired by the Thailand report (2015/2017). Data analyses were carried out in collaboration with many departments in the Directorate- General for Fisheries.	Fishing for both vessels was conducted for 2 years with 4,100 hours on hand line fishing. The impacts are minimal The vessel has carried out 3 fishing campaigns since 2019 so far. The impacts are minimal since it uses the hand line.

		not taken into account in accordance with the provisions of paragraph 9 (a) (iii) of CMM 2018/01. Although there is a national plan of observation, the fishing practiced does not require (at least for the moment) the presence of the observers.		

ANNEX L - REVISION ON ACTIVITY BUDGETS

2020 Activities	2020 Remaining budget	Revised at SC5	Status at SC5		Comment (SC5)
T/S & length relationship for alfonsino (Univ. Students) (MoP5 approved)	5,000	Completed			Work post SC by SEARWG suggests this work will not be required for planned assessment
Analysis of alfonsino acoustic data (MoP5 approved)	10,000	Completed			Work post SC by SEARWG suggests this work will not be required for planned assessment
Otolith reading, alfonsino and orange roughy (MoP5 approved)	16,000	Completed			
Genetics work to provide equipment for SNP analyses to postgrad student (MoP5 approved)	5,000	Completed			
Stock Assessment consultant alfonsino work (MoP5 approved)	23,000	Completed			
Risk assessment teleost species caught on Saya del Malha bank (MoP5 approved)	9,000	Completed			
Review of observer coverage and data standards & template (MoP5 approved)	17,000	Completed			
Development of T + L Reference points and Harvest strategies Year 1 (2 years total 30,000) (MoP 6 approved)	15,000	Consultancy not yet commenced	High		
BFIA Trawl and Longline consultancy - [3 months trawl, 2 months longline]	66,900	Consultancy not yet commenced	High		Voluntary contribution from Australia to cumulative BFIA trawl (33 567 €)
VME Habitat Mapping	12000	In progress	High	Total Cost 96000 €	Payment assured by EU Grant Agreement : EU 78380€ +SIOFA 17620€

2021-2020 Activities	2021 budget	Activities planned in 2022	Priority (SC5)	Decision from MoP 7	
1.VME Habitat Mapping (12 month)	5620		**High (6)** Medium (1 Low (1)		Sold to reach SIOFA participation (17620 - 12000) = 5620 €
2.Orange roughy acoustic data process (2018-2020) [Consultant	20000		**High (5)** Medium (3		
3.Orange roughy stosk assessement	25000		**High (6)** Medium (1) Medium/ Low (1)		
4. Alfonsino Investigation of the acoustic data	5000*		**High (7)** Medium (1)		If the accoustic data is found to be useful dor the stock assessment (SA) in 2021, then the data will be processed and applied for the SA in 2022
5. EU Voluntary fund (60k limit) - match funding for additional work contributing to SC work plan	*12000*			*Commited to match EU Grant Agreement*	*Secretariat request*
6. Alfonsino Accoustic data process		15000			
7. Additional ageing by otolith for more accurate growth equation for all ages especialy female (>50cm)		15000			
8. Age validation using bomb calorimetry		15000			
9. Stock Assessment with more size, other biological data and accoustic data if useful		25000			
Balance suggested for 2021	67620	70,000			