Third Meeting of the Scientific Committee

La Réunion, 20-24 March 2018

Including outcomes from the First Meeting of the Stock Assessment Working Group

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SIOFA | APSOI

Southern Indian Ocean Fisheries Agreement

Accord relatif aux Pêches dans le Sud de l'Océan Indien

Outline

1. Overview of SIOFA fisheries
2. Scientific data standards
    - SIOFA Scientific database
    - Observer coverage
    - Voluntary observer data
3. Vulnerable marine ecosystems
    - Mapping where VMEs are known to, or likely to occur
    - Bottom fishing impact assessment standard
4. Standard protocols future protected area designation
5. Proposed protected areas
6. Stock assessments
    - Tiered assessment framework
    - Orange roughy
    - Alfonsino, Patagonian toothfish and other species
7. Ecologically related species working group
8. Draft CMM on fishing research
9. Cooperation
10. SC work plan, including research activity budget

Terminology in SC reports

- SC2 **adopted** the guide **(Annex E of SC2 report)**

Recommended, recommendation: Any conclusion or request for an action to be undertaken from the SC to the MoP which is to be formally provided to the MoP for its consideration/endorsement

Requested: to a Party, Secretariat or other body, not the MoP, where the SC does not wish to formalise the request beyond the mandate of the SC.

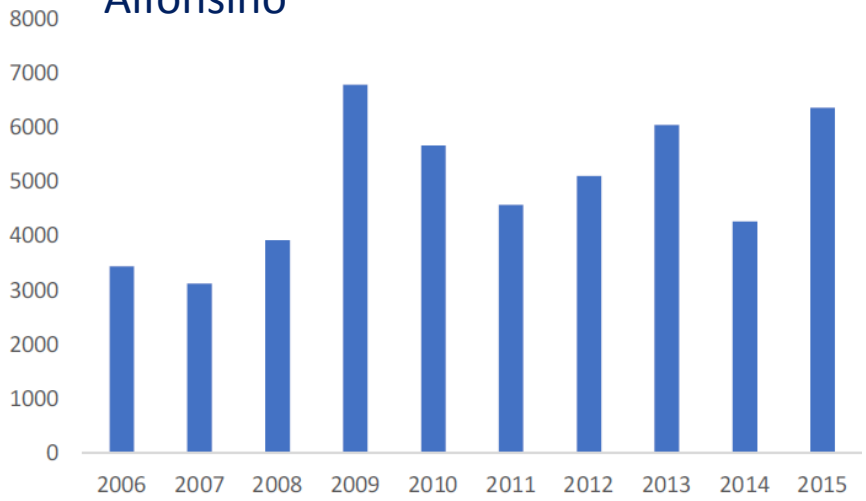
1. Overview of SIOFA fisheries

	Number of vessels 2011-2017	Fishing effort 2011-2015	Change from 2017 report
All vessels (reported)	7-79		Thailand 13-60 vessels, 2015-17 China 3-20 vessels, 2011-17
Trawl	4-65	712-912 days 813-2,274 hrs Australia, Japan, Korea	Thailand 13-60 vessels, 2015-17
Demersal longline	2-25	Peak 13 million hooks 2016 3.5 million hooks	China 2-20 longline vessels, 2011-13
Gillnet	0-1	Peak 5,422 km 2017 0 km	
Light purse seine	0-8		China 5-8 purse seine vessels, 2014-17

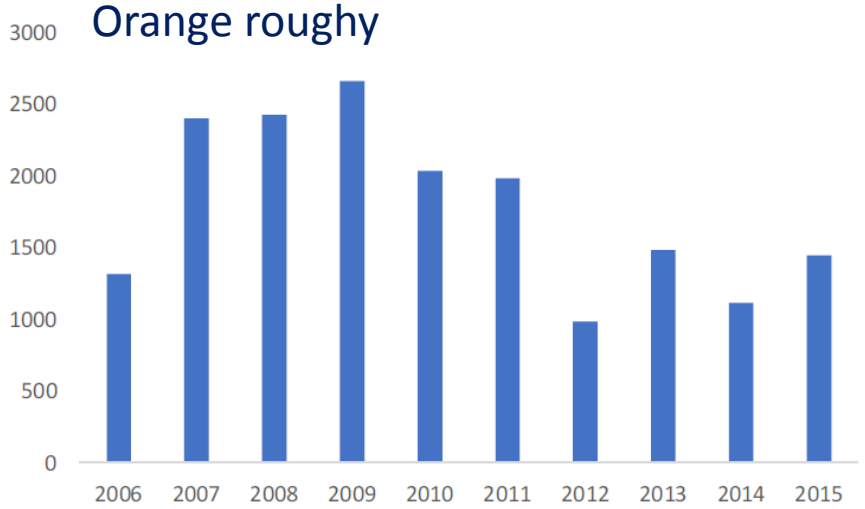
Mauritius and Seychelles are not included

1. Overview of SIOFA fisheries – provisional annual catch

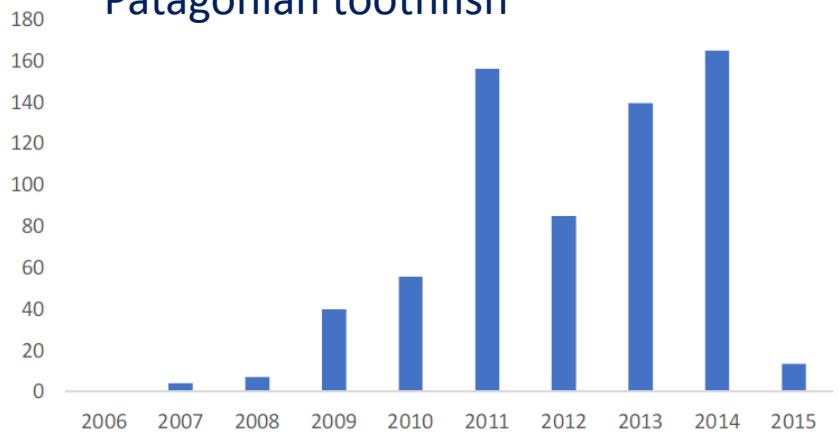
Alfonsino



Orange roughy



Patagonian toothfish

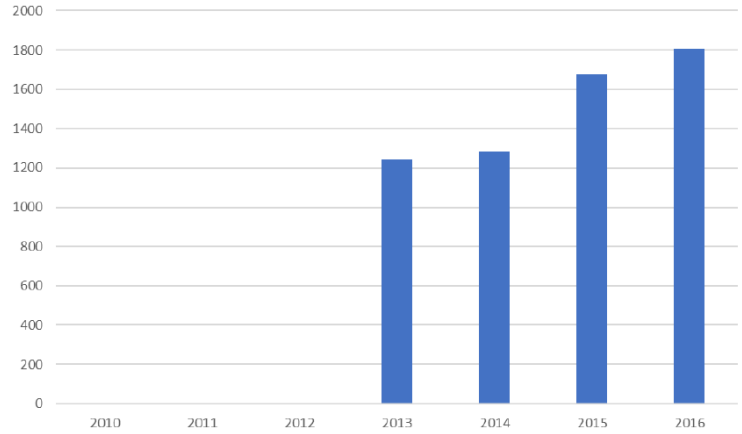


Note: catches **not updated** from last year due to differences between national reports and database – **undesirable to be in this position in 2019 as compromises ability of SC**.

Catches **do not include** non-contracting parties

1. Overview of SIOFA fisheries – provisional annual catch

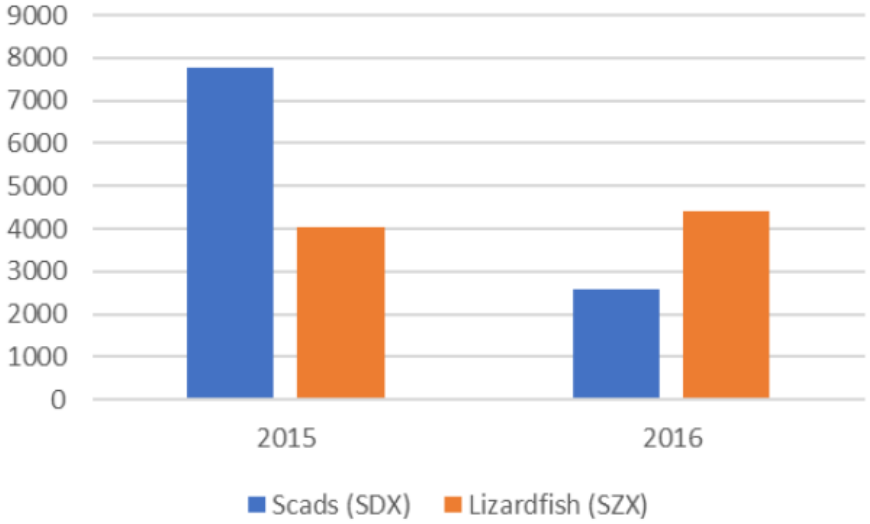
Deepwater sharks



Note: Catches updated
Catches **do not include** non-contracting parties

SC discussed expansion in this fishery and data collection should be a priority.

Reported catch by Thai trawl fishery



Note: Catches **do not include** Mauritius and Seychelles

China
Light seining targeting mackerel and *Brama* spp

1. Overview of SIOFA fisheries

Fishery	Gear	Participants
Toothfish	Demersal longline, traps	France (Territoires); EU-Spain; Japan; Korea
Demersal trawl - Orange roughy	Demersal trawl	Australia; Cook Islands; China (2000-02)
Midwater trawl - Alfonsino	Midwater trawl	Australia; Cook Islands; Japan; Korea
Saya de Malha Bank - demersal species	Demersal trawl, traps, demersal longline, hook and line	Thailand (trawl, traps - lizardfish, scads and others; 2015-); EU-France (longline - snappers, emperors); Mauritius and Seychelles
Demersal longline - mixed species	Demersal longline	Chinese longline (ruby snapper and lutjanids; 2011-13); Australia (Hapuku); EU (mixed)
Deepwater sharks	Demersal gillnets, demersal longline	EU-Spain
Light seine (mackerel and *Brama* spp)	Purse seine with lights	China (2015-)
Squid jig	Jigs	China (authorised since 2003 but no fishing)

1. Overview of SIOFA fisheries

Thresholds of VME indicators

- Threshold weight for coral and sponge vary across parties even where the same gear is used
- Some not described

Management responses

- Variable

Summary of observer programs

- Since 2017, all trawl fleets report implementation of 100% onboard observers
- Non-trawl fleets report 5-20%
- Thailand reports 100% for at sea transhipment
- Data submitted to SIOFA - Australia
- Uncertainty on what observer data are collected

1. Overview of SIOFA fisheries

Chair noted constraints around the availability of data, in particular catch and effort.

SC requests Secretariat produce draft overview report 30 days before SC and check consistency of national reports with data holdings

SC **noted** concern over resourcing for database manager given the large amount of work in the initial implementation of the SIOFA database, including data validation, quality controls and other related issues

Questions?

2. Scientific data standards – SIOFA database

Database Manager presented SIOFA database including physical security. SC discussed species coding, facilitating collaboration and data that are not able to be stored currently

- **Requested** Database Manager implement protocols for secure transfer of confidential data (eg FTP or encryption methods) to end-users
- **Requested** Secretariat prepare annual data holdings report, including; challenges, quality control process, issues with data submissions, for each SC
- **Recommends** additional work is required on harmonisation of sampling protocols for collection of biological and species identification data, particularly for bycatch
  - Sharks ERA report highlighted better identification and harmonisation of methods for collecting data.
- **Recommends** intersessional work on data collection and sampling protocols for stock assessment inputs, including for acoustic and catch history data.

Questions?

2. Scientific data standards – Observer coverage

Electronic monitoring

Thailand introduced its e-reporting and e-monitoring that complement human observers. Sought advice on proportion of coverage by e-monitoring compared to human observers needed to meet requirements.

- **Annex G of SC2** *Guidelines for evaluation and approval of electronic observer programs for scientific data collection*

Describes information needed for SC to review how e-monitoring equipment satisfies each data field in the data standards (CMM 2017/02).

2. Scientific data standards – Observer coverage

CMM 2017/01, para. 32, SC to review observer coverage prescribed (para 31): 100% for bottom trawl and 20% for all other bottom fishing methods

- **Noted** additional information required to consider types and levels of coverage for specific research, SC work and/or other needs. Consideration of CC needs beyond SC remit.
- **Agreed** inventory of observer data holdings of CPS (by fishery, species) be compiled intersessionally using consistent template. CPs **requested** to provide summary of relevant data holdings and SC **noted** resourcing would be required.
- **Agreed** investigation of observer coverage type and levels (%) included in SC workplan. Includes data collection plans in place and whether meet requirements of SC workplan. **Requests** the ERAWG and SAWG provide guidance on observer data required
- **Advises** MoP that SC cannot review appropriateness of current coverage levels, as little data have been provided and appropriateness depends on scientific needs and uses.
    - **SC4 should be able to review, if data inventory and other steps are completed before SC4.**

2. Scientific data standards – Voluntary observer data

CMM 2017/02, para. 13, SC to review Annex B Voluntary Observer data

- **Indicated** collection of observer data would ideally be mandatory, and not voluntary, to assist the SC meet its objectives. However, consensus could not be reached as there was still work to be done on aspects, in particular, consistent protocols for the collection of observer data.
- **Advises** SC cannot currently review Annex B as there is little observer data being provided to the Secretariat.
    - **SC should be able to review Annex B, if data inventory and other steps are completed before SC4.**

Questions?

3. Vulnerable marine ecosystems - Mapping

CMM 2017/01, para 5b tasked the SC to develop maps of where VMEs are known to occur, or likely to occur, by SC 2017

- At SC2, SC **requested**; **Secretariat create maps** using the georeferenced data, **Parties provide or facilitate provision of other data** available from surveys, **Secretariat work with FAO ABNJ Deep Seas Project** on planned mapping of data on VMEs in the SIOFA area
- Executive Secretary noted progress on ABNJ project limited
- SC discussed potential data inputs including; VME data to be collated in the observer database (once finished), FAO VME database, proposed benthic taxa sampling protocol.
- SC **requests** Secretariat consider how additional VME data could be included in the SIOFA database.

3. Vulnerable marine ecosystems - Mapping

CMM 2017/01, para 5b tasked the SC to develop maps of where VMEs are known to occur, or likely to occur, by SC 2017

- Mapping VMEs requires a common definition of VMEs. Other RFMOs and CCAMLR have developed definitions
- In absence of SIOFA definition of VME concept:
  - **Agreed** a common definition of VMEs is required
  - **Agreed** a common data collection protocol should be adopted by CPs. Benthos data collection framework presented by France (Territories) could be a source to build this
  - **Noted** data sharing could be done through the Protected Areas and Ecosystems WG (PAEWG) and a common database

Questions?

3. Vulnerable marine ecosystems – Bottom Fishing Impact Assessments (BFIA)

CMM 2017/01 para 14 any CPs, CNCP or PFE that authorise or seek to authorise vessels to bottom fish, shall, at least 30 days prior to SC 2018, submit a Bottom Fishing Impact Assessment (BFIA)

BFIA were submitted by

- Japan
- Thailand
- EU (EU-Spain and EU-France)
- Cook Islands
- Australia
- France (Territories)

SC is required to review submitted BFIA in accordance with CMM 2017/01
The SC shall provide advice:

(a) likely cumulative impacts of bottom fishing impact activity in the Agreement Area; and
(b) whether each BFIA meets an appropriate standard in light of international standards and the SIOFA BFIA Standard

3. Vulnerable marine ecosystems – BFIA

- For each BFIA the SC had a presentation and discussion
- A small working group was formed to consider alignment between the BFIAs and the BFIA Standard
- SC, through the small working group, produced two documents
  - Gap Analysis of BFIAs against BFIA Standard (Annex F) – to aid with developing SC guidance on the next steps for estimating cumulative impacts
  - Summary of BFIAs presented, completed by the individual CPs (Annex G)
- SC discussions highlighted:
  - Different interpretations of the BFIA Standard
  - Different calculations and interpretations of risk
  - Further work was required to progress the SC work on cumulative impacts

3. Vulnerable marine ecosystems – BFIA

Cumulative impact of SIOFA fisheries, the SC:

- **Recommends** that it was not possible to provide an assessment of the cumulative impact of all SIOFA fisheries at this time in accordance with CMM 2017/01. Due to the differences in data and approaches in the BFIAs provided.
- As the Secretariat holds the available fine scale fishing effort data, they are **requested** to assist CPs in undertaking GIS work on the spatial extent of fishing to aid CP work to assess cumulative impacts. This will depend on the availability of the Database manager
- Progress could be made for particular gears/fisheries, where similar data and the impact assessment approach are available (bottom trawl, static gears and for the trawl fisheries on the Saya de Malha bank).
  - SC **requested** CPs who share particular fishing/gear characteristics work together to develop cumulative impact assessments for each fishery type. **These cumulative assessments will be considered by SC4**

3. Vulnerable marine ecosystems – BFIA

In relation to the individual BFIA, the SC:

- **Noted** efforts made by Australia, Cook Islands, EU, France (Territories), Japan and Thailand to comply with CMM 2017/01 and the SIOFA BFIA Standard.
- **Noted** large differences in the submitted BFIA in interpretation of, and methods used to determine, 'impact' and 'risk'
- **Noted** varying levels of alignment between the submitted BFIA and SIOFA BFIA Standard 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 SIOFA Area
- **Reiterated** the need to review the SIOFA BFIA Standard (as per the SC's Workplan and CMM 2017/01) to ensure SIOFA's objectives are met.

Questions?

4. Standard protocol for future protected area designation

2017 SC2 developed and adopted the protocol (Annex H of SC2 report)

MoP4 (June 2017) adopted the protocol and requested the SC consider that there are various management measures possible.

Implementation

Protocol included creation of a dedicated working group within the SC.

Not formally established in 2017, although a meeting of an informal steering committee (Australia's initiative, November 2017) to provide guidance on formulation of proposals and review of the protocol.

- Proposed date did not enable all members to participate. Progress and conclusion were transmitted to the Secretariat before the SC and uploaded on the website for consideration

SC **agreed** that while this element had not been implemented yet, this did not prevent the SC testing the protocol and discussing the submitted proposals against the protocol.

4. Standard protocol for future protected area designation

SC discussed points in relation to the proposed protected areas, paragraph 162.

A small working group considered revisions to the protocol and test the revised protocol against some proposals. They reported that the revised protocol worked well in considering the protected areas.

SC **recommends** MoP adopts the revised *SIOFA Standard protocol for future protected areas designation* (Annexes H and I):

- Process for proposal and review described in ToR for **Protected Areas and Ecosystems working group (PAEWG, Annex I)**
- Objective/s clearly stated

The SC **requests** MoP define the objectives to be included in the protocol

4. Standard protocol for future protected area designation

SC **recommends** MoP adopts the revised SIOFA protocol (Annexes H and I):

State which **criteria** meet the objectives:

2. VME are known to occur and/or triggering of VME indicator thresholds
    a) Closure may be warranted if there are known or consistent triggering of VME indicator thresholds of CPs, indicating potential VMEs
3. Bioregional representation
    a) Known to contain unique, rare or distinct habitats or ecosystems that fishing operations will disturb
    b) Area with comparatively higher degree of naturalness due to zero or low level of human-induced disturbance or degradation
4. Geographic and/or geomorphological representation
    a) Provides for important or desirable geographic representation within the SIOFA area
    b) Known to contain unique or unusual geomorphological features that fishing may damage

4. Standard protocol for future protected area designation

State which **criteria** meet the objectives:

5. Biodiversity representation
   a) Known to contain unique or rare species, populations or communities
   b) Known to contain a high diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity
   c) Known to contain relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery
6. Scientific interest
   a) Scientific research interest associated with understanding ecosystem, biological, geological and biodiversity processes
7. Areas of special significance for threatened or important species or ecosystem properties
   a) Evidence of special importance for life history stages of species and/or threatened species
   b) Evidence contains habitat for survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.

4. Standard protocol for future protected area designation

SC **recommends** MoP adopts the revised SIOFA protocol (Annexes H and I):

Other principles to be considered

- Best available information used, sufficiently substantiated and/or verified.
- Adverse impacts on existing users evaluated
- Rational used to recommend spatial management measures is consistent and transparent
- Evaluation of existing closures and explanation of how new management measure will assist in achieving MoP objectives

Considerations for determining boundaries

4. Standard protocol for future protected area designation

SC **recommends** MoP adopts the revised SIOFA protocol (Annexes H and I):

Guidance for SC recommendations

- SC should make a recommendation based on how the proposal satisfies one or more criteria
- If scientific evidence is uncertain or insufficient, more data may be required
- If proposal documents the necessary data and scientific information to support a protected area, different measures could be applied, such as management measures, technical measures, closures
- In case of an area becoming protected, **management and research plan** shall be associated to it on the year to come: Including
  - Measures in place
  - Time of review
  - If needed, the research that should be undertaken

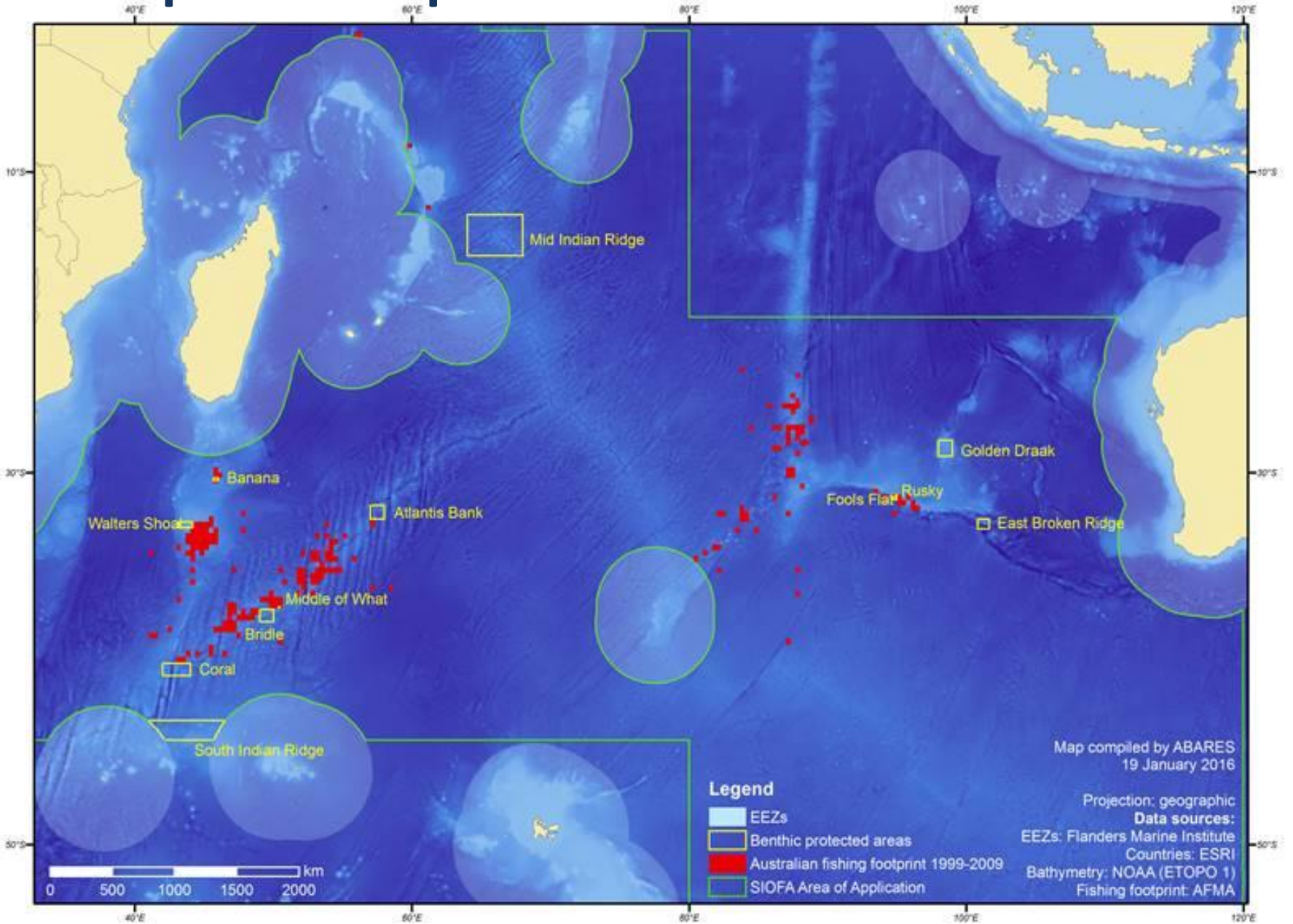
Questions?

5. Proposals for protected areas

Proposed protected areas evaluated against the Standard protocol

1. East Broken Ridge (SC-03-06.3.2(01))
2. Atlantis Bank (SC-03-06.3.2(02))
3. Banana (SC-03-06.3.2(03))
4. Bridle (SC-03-06.3.2(04))
5. Coral (SC-03-06.3.2(05))
6. Del Cano Rise (SC-03-06.3.2(06))
7. Fool's Flat (SC-03-06.3.2(07))
8. Gulden Draak (SC-03-06.3.2(08))
9. Mid Indian Ridge (SC-03-06.3.2(09))
10. Middle of What (MoW) (SC-03-06.3.2(10))
11. Rusky Knoll (SC-03-06.3.2(11))
12. Walter's Shoal (SC-03-06.3.2(12))

5. Proposals for protected areas



5. Proposals for protected areas

SC discussion was grouped based on Australian advice that it considered six proposed areas information rich, with compelling evidence of VMEs and where likely all forms of fishing could damage and degrade the attributes

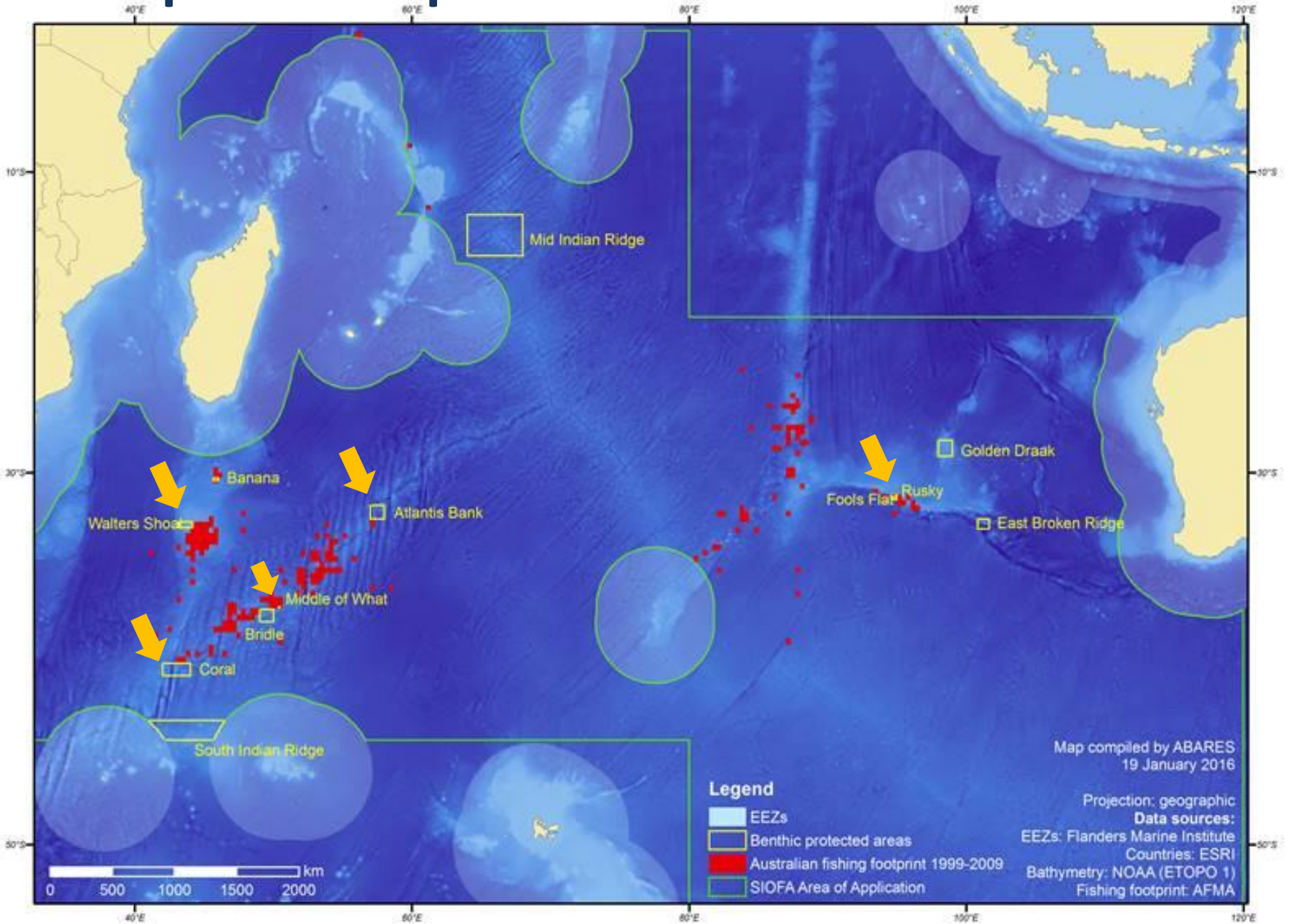
Atlantis bank
Coral
Fool's flat
Middle of What
Walter's Shoal
Del Carno Rise

Australia regarded the other six areas more uncertain in terms of the evidence available and generally satisfied fewer criteria. All had some evidence of VMEs except for Gulden Draak.

5. Proposals for protected areas

Feature	SC noted evidence that satisfied criteria
Atlantis bank	5b Biodiversity representation 6a Scientific interest
Coral	3b Bioregional representation 5b Biodiversity representation 6a Scientific interest
Fool's flat	3b Biodiversity representation 4a Geographic and/or unique representation 5b Biodiversity representation
Walter's Shoal	3b Bioregional representation 5b Biodiversity representation 6a Scientific interest
Middle of What	3b Bioregional representation

5. Proposals for protected areas



5. Proposals for protected areas

For the features Atlantis bank, Coral, Fool's flat, Middle of What, Walter's Shoal SC **recommends** to the MoP that:

- these sites could be designated as protected areas; and
- the MoP consider that fishing with all gears were identified as activities that may degrade the scientific and biodiversity value of the area [except Middle of What feature]

Research and management plans be prepared within 12 months

SC **requested** Secretariat provide relevant fishing and effort data to assist the MoP's discussions (MoP5-INFO-03)

5. Proposals for protected areas

Del Cano Rise feature

SC could not reach consensus that the evidence presented satisfied criteria:

- 3b Bioregional representation
- 4a Geographic representation
- 5b Biodiversity representation

One CP noted that the justification for the proposal for this area had a greater focus on mesopelagic and pelagic processes, and that more information was required on the benthic ecosystem in the area.

As this area that shares boundaries with CCAMLR and national jurisdictions, the SC **agreed** that a collaborative approach to its consideration as a protected area was necessary.

5. Proposals for protected areas

Questions?

Remaining six proposed features

- **SC could not reach consensus**. SC discussed challenge was related to a trade-off between the requirement for a robust scientific approach and the need to be precautionary.

  e.g. where move-on thresholds may have been triggered or VMEs reported but there was no peer-reviewed or other robust evidence. It was discussed in these situations, if fishing is allowed to continue the assets may be further degraded.

- **Some CPs noted that for the sites had been reviewed by CBD and listed as EBSA**, which involves numerous scientists in review, SIOFA's decisions need to be defensible. For these it was discussed that additional intersessional work would be required.
- Banana, Bridle, East Broken Ridge, Gulden Drake, Mid Indian Ridge and Rusky Knoll features are scientific data limited.
- For some CPs, records that VME thresholds have been triggered and other evidence (eg acoustic surveys) indicate potential for VME presence and the need to consider precautionary management arrangements until improved information in obtained.

6. Stock assessments

CMM 2016/01, para 6a SC will provide advice and recommendations on the status 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 by SC 2019

First meeting of the Stock Assessment Working Group (SAWG)

Chaired by Dr Nishida

- A tiered assessment framework for SIOFA fisheries
- Stock assessment for 7 orange roughy sub-regions – intersessional preparation and discussion on approach
- Future work, alfonsino, Patagonian toothfish and other species

6. Stock assessments – tiered assessment framework

To prioritise stocks for status assessment:

Tier 1 Benchmark assessments using catch data from fishery monitoring, ideally in combination with stock abundance from independent surveys, catch rates and biological data with the purpose of estimating depletion levels and fishing mortality rates.

Tier 2 Data limited assessments that may use catch-only or simple indicators to track status (e.g. CPUE, size composition, Productivity-Susceptibility Analysis).

Tier 3 No assessment necessary.

Not equivalent to frameworks applied in some management approaches, where tiers guide the application of harvest control rules and generate effort or quota outputs.

Classification into Tier 1 and 2 is based on the data available. Scoping Analyses should be undertaken to assist.

6. Stock assessments – tiered assessment framework

In relation to the tiered assessment framework the SC:

- **Adopts** the tiered assessment framework to provide direction for future assessment work and speed the SAWGs processes in developing analyses for the SC (Annex J).

★ **Requests** CPs cooperate in the development of Scoping Analyses for the species caught by their SIOFA fisheries.

- **Amended** the SC operational research plan to include the activities described above.

★ **Requests** the SIOFA data manager to support these activities.

Questions?

6. Stock assessments – Orange roughy

Walter's Shoal region

Inputs:

- biological data, including age composition data (para 230)
- stock structure hypothesis; preliminary including consideration of geomorphological features, presence and timing of spawning aggregations and length frequency of the catches (Annex F, para 231).
- catch history; well defined from 2002 onwards but very uncertain 2000 and 2001, large number on non-CP vessels. Little catch prior to this. Best educated guess was used to increase reported catches of 2000 and 2001 and sensitivities were run on half and double the assumed catch
- acoustic estimates; industry-based collection and considered in the acoustic data review commissioned by SIOFA (para 233)

Bayesian stock assessment using NIWA's stock assessment package CASAL

Assessment for the region as a whole and 5 individual features and 'others'

6. Stock assessments – Orange roughy

Walter's Shoal region – Sensitivities examined

Model Name	Description
Base	Middle value for early catch history; middle value for acoustic data, effective sample size for the age frequency was 40, informed priors on *M* (0.045, cv=15%), acoustic q (0.8, cv=25%), proportion migrating to 'Other' (mean 20%), and the maturation parameters (means of 37 years and 12 years)
Low	Low treatment of the acoustic biomass estimates and 10% of mature fish to migrate to 'Other'
High	High treatment of the acoustic biomass estimates and 30% of mature fish to migrate to 'Other'
Uniform	Uniform prior on both maturation parameters
AF80	Increase the effective sample size on the age frequency to 80
Low catch	Amount of catch added on to reported catch for 2000 and 2001 is half that assumed in the base model
High catch	Amount of catch added on to reported catch for 2000 and 2001 is double that assumed in the base model.
Low & low M	Low treatment of the acoustic data and a fixed *M* = 0.036 (20% less than the mean of the prior in the base model).
More acoustics	Includes the additional acoustic biomass estimates (that have not been revised/refined)

6. Stock assessments – Orange roughy

Walter's Shoal region

Results estimated spawning stock biomass in 2017 compared to virgin spawning stock biomass ($ss_{17} = SSB_{17}/SSB_0$) **above 50% for base model and all sensitivities** examined.

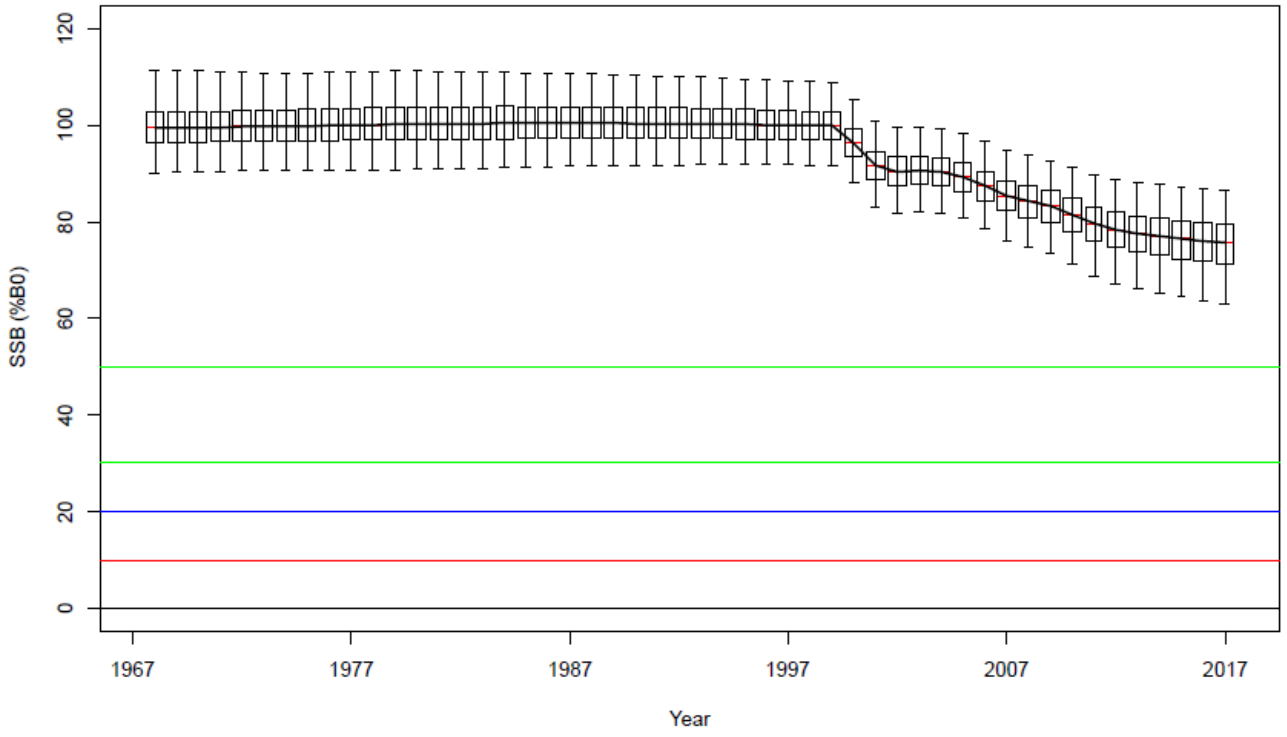


Figure 1: Base model MCMC: box and whiskers plot of the spawning biomass trajectory for the whole stock (% *B0*). Each box covers the middle 50% of the distribution and the whiskers extend to a 95% CI.

6. Stock assessments – Orange roughy

Walter's Shoal region

Some potential for depletion of individual features was estimated

- Two features (1 and 4) had lower ss17
- Local depletion within the 'other' group was plausible for the 'low' and 'low and low M' model runs.

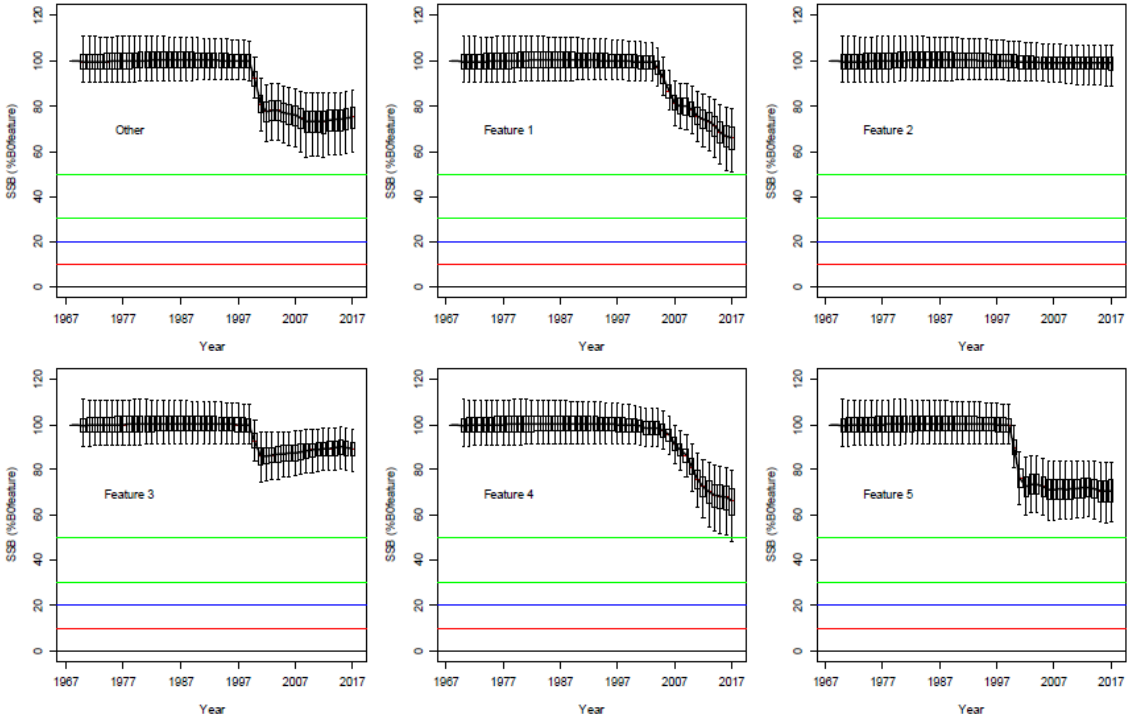


Figure 2: Base model MCMC: box and whiskers plot of the spawning biomass trajectory for Other and each numbered feature (% of virgin biomass at the feature). Each box covers the middle 50% of the distribution and the whiskers extend to a 95% CI.

6. Stock assessments – Orange roughy

Walter's Shoal region

- For the whole stock, projections of constant catch for the next 5 years using catch as reported in 2017 were run for the base and low models
- Results did not indicate that the median ss17 would reduce below 50% under either model scenario. ~5% reduction of base and ~9% for low model

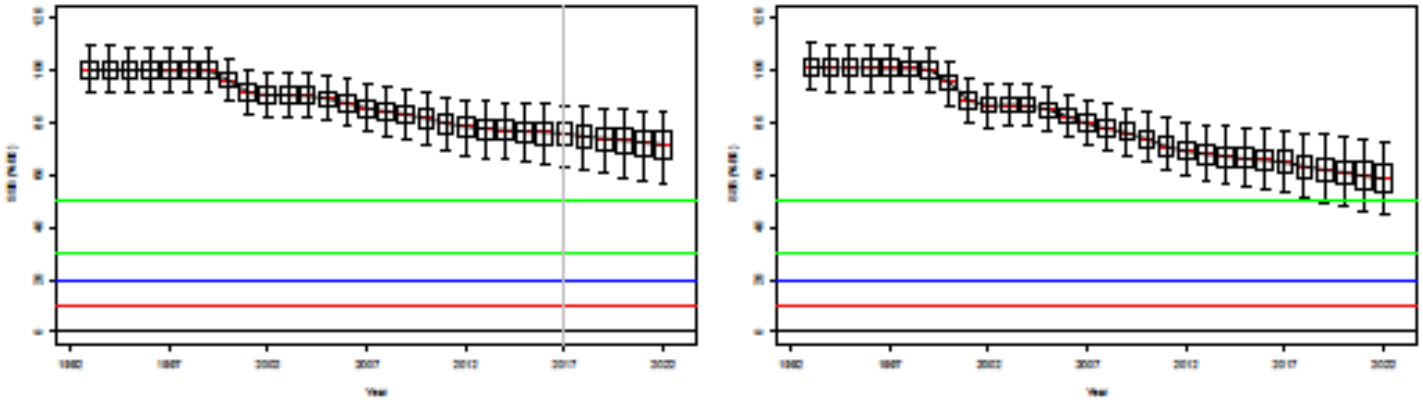


Figure I: Base model MCMC (left) and Low model MCMC (right): constant catch projection at current levels: box and whiskers plot of the spawning biomass trajectory for the whole stock. Each box covers the middle 50% of the distribution and the whiskers extend to a 95% CI.

6. Stock assessments – Orange roughy

Seven other stocks

- Western Walters: little catch and no acoustic estimates so no assessment undertaken
- Six stocks; catch-history based assessment, using maximum exploitation rates (U_{max}) of 5% and 40% to estimate plausible range of SS_{17}.
- For three stocks; simple Bayesian assessment with acoustic biomass estimates (not revised/refined) from features within stocks.
    - Assumes stock biology and dynamics are equivalent to the Walters Shoal Region (and assumptions from NZ assessments)
- Early catch histories are uncertain and revised using information from non-CPs and sectors of industry

6. Stock assessments – Orange roughy

Six other stocks

Catch-history based assessments, using maximum exploitation rates (U_{max}) of 5% and 40% to estimate plausible range of SS_{17}

When U_{max} 5% all ss_{17} > 50% SSB_0

When U_{max} 40%, four stocks were $ss_{17} \geq$ 50% SSB_0, two SS_{17} < 50% SSB_0

Table III: The calculated values of ss_{17} for each assessed stock and the two levels of historical maximum exploitation rate.

		ss_{17} (%B_0)	
Meeting	$U_{max} = 40\%$	77	
	$U_{max} = 5\%$	97	
N. Walters	$U_{max} = 40\%$	57	
	$U_{max} = 5\%$	94	
Seamounts	$U_{max} = 40\%$	22	←
	$U_{max} = 5\%$	84	
N. Ridge	$U_{max} = 40\%$	50	
	$U_{max} = 5\%$	93	
M. Ridge	$U_{max} = 40\%$	59	
	$U_{max} = 5\%$	94	
S. Ridge	$U_{max} = 40\%$	43	←
	$U_{max} = 5\%$	92	

6. Stock assessments – Orange roughy

Thee stocks

Simple Bayesian assessment with acoustic biomass estimates

All three stocks ss_{17} > 50% SSB_0

Seamounts results suggest the catch history only method is unlikely to be correct

Table IV: The MPD estimates of virgin biomass (SSB_0), current biomass (SSB_{17}), and current stock status (ss_{17}) for each assessed stock and each of the three different treatments of the acoustic biomass estimates.

		B_0 (000 t)	B_{17} (000 t)	ss_{17} (%B_0)
N. Walters	Low	9.7	8.5	88
	Middle	13	12	91
	High	19	17	94
Seamounts	Low	24	17	70
	Middle	31	24	77
	High	45	38	84
M. Ridge	Low	55	46	84
	Middle	75	66	88
	High	108	99	92

6. Stock assessments – Orange roughy

Key data issue

- Secretariat does not hold all orange roughy data to the specifications of CMM 217/02 for the early part of the catch history. This does not allow the SC to be assure by the Secretariat that the catch information included in the assessment is verified.

SC **agreed** that the outputs of the stock assessment could be used to provide advice

SC **noted** that since the MoP had not provided advice on preferred reference points, advice on status would not be made but instead the SS_{17} estimates and ranges presented

Overfished = ?

Overfishing = ?

SC **noted** that the **three assessment approaches are considered suitable for providing advice on the current stock depletion for the seven sub-regions assessed**

6. Stock assessments – Orange roughy

In relation to the assessment outputs, the SC notes the following advice to MoP:

- All three assessment approaches indicated for 7 sub-regions **ss_{17} was likely to be above 50% SSB_0**

- Median estimates ss_{17} for Walter's Shoal Region from the base model and eight sensitivities varied between **63% SSB_0 and 85% SSB_0**. Median estimate of the Base model was 76% SSB_0
- Projections for Walters' Shoal Region (assuming the Base model ss_{17} of 67–87%) 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 absolute scale of the Walter's Shoal Region stock is very uncertain because the true scale of the acoustic biomass estimates is poorly known. Virgin biomass (B_0) is very likely to be in the range of 25,000–90,000 t.

6. Stock assessments – Orange roughy

In relation to the assessment outputs, the SC notes the following advice to MoP:

- Assessments of North Walters, Seamounts and Middle Ridge using the data moderate method (simple Bayesian assessment with acoustic biomass estimates) estimated **ss_{17} to be at or above 70% SSB_0**
- Assessments of Meeting, South Ridge and North Ridge stocks using the catch-history-only method estimated **ss_{17} for all stocks to be at or above 43% SSB_0 assuming 40% U_{max} and above 92% SSB_0 assuming 5% U_{max}**
- SC **requires further direction from the Meeting of the Parties on the establishment of reference points**, as it is not possible to develop advice on status or specific catch limits without reference points
- 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 (i.e. an earlier assessment may be required)

Questions?

6. Stock assessments – Alfonsino

SAWG Chairperson provided an update on work, noting work plan and indicative timeline for stock assessment.

Discussion on acoustic data availability and review

The SC:

- **Notes** the indicative work plan (Annex K) and efforts are being made to progress the assessment of alfonsino stock/s in SIOFA
- **Notes** that due to the unresolved complexities relating to alfonsino catch histories, biological data, stock structure and acoustic data, an integrated assessment may be overambitious to achieve prior to SC4
- **Notes** that data-poor assessment approaches (e.g. SRA or catch-only methods) will be considered as part of the indicative work plan if an acoustics-based assessment is not possible within this timeframe.

Questions?

6. Stock assessments – Patagonian toothfish

SAWG Chairperson summarised consideration of other species

Saya de Malha Bank was an area where additional work may be required as recent catch volumes are high and those species have not yet been considered

Information from China's report about at least one fishery not yet considered – light seine fishing for Pomfret (*Brama* spp)

The SC:

- **Agreed** on the importance of progressing work on species taken on the Saya de Malha bank
- **Requested** the ERAWG to consider progressing this work
- **Noted** priorities in relation to activities that may require additional resources
- **Recommended** SIOFA Chairperson write to FAO regarding orange roughy coding issues

Questions?

7. Ecological Risk Assessment Working Group

First meeting of ERAWG held October 2017

Chaired by Dr Simon Nicol

Focused on the ERA for deepwater chondrithyans

- Update on the ERA assessment, relatively data-poor and bycatch records scarce
- Two approaches: PSA and SAFE assessments
- SC discussed uncertainties in additional analysis that could assist in identifying and correcting potential erroneous categorisations and the value of the work commissioned by SIOFA and online tool developed by CSIRO

7. Ecological Risk Assessment Working Group

For the deepwater chondrichtyan risk assessment, the SC:

- **Noted** the results presented
- **Noted** it is likely that these results include a number of yet to be identified false positives and false negatives.
- **Noted** the ERA has prioritised species for which better information is needed and those for which explicit management actions may be required.

Requested CPs continue collaboration, including the provision of data that has not yet been included in this assessment.

Recommends to MoP that FAO identification guides for deepwater chondrichthyans in the Indian Ocean are implemented on fishing vessels to improve the collection of sharks catch information, and that CPs consider the use of the Smartforms when available

SC **recommends** the MoP adopt the proposal to amalgamate the SAWG and ERAWG and revised ToR (Annex K), with Co-chairs (Japan and Australia)

Questions?

8. Draft CMM on fishing research

Questions?

MoP Report, paras 39-41, SC to provide advice and recommendations on proposal for CMM to regulate fisheries research

SC **recommends** a revised draft is provided for SC review, in producing that draft, the SC **recommends**:

- Provides objectives/purpose of the draft CMM
- CMM focus on encouraging research and collaboration and facilitating flow of information from research to the SC to enhance SC activities
- Explicitly take into account the range of approaches to conducting research, including through commercial vessels (such as collection of length frequency data, otoliths for aging; ad hoc acoustic surveys)
- Explicitly includes the process for the SC to review and comment on research plans and receive the outcomes of the research
- Consider mechanisms to engage with research activities conducted by non-CPs
- Define what would be included in a fishing research plan
- Consider that the exemption of research activities from CMMs may be a case by case issue. There may be some provisions of CMMs from which some research activities could be exempted, e.g. in some cases it may be appropriate to be outside the defined footprint. However, this is dependent on the type of research and needs further consideration.
- Consider FAO deep-sea guidelines and other guidelines on fisheries research.

9. Cooperation

FAO ABNJ Deep Seas Project

- **Requested** the Executive Secretary continue to engage with a focus on the areas of work identified by SC2 and flag interest in engagement with the Common Oceans Project Phase 2
  - EAF-Nansen program has relevant work in the Southern Indian Ocean and on Saya de Malha bank
  - Requested the Executive Secretary maintain contact with FAO ABNJ Deep Seas Project, EAF-Nansen program and Seychelles and Mauritius

SWIOFC

  - SC received an update but linkages unclear

CCAMLR

  - Patagonian toothfish assessment and Del Cano Rise proposal – see previous requests

Agreement on the Conservation of Albatrosses and Petrels (ACAP)

  - SC noted desire for ongoing cooperation with ACAP

Questions?

10. SC Work plan and budget

- Overarching work plan - SC noted it did not need review
- Long term research plan – SC noted it did not need review
- 2016-19 Operational work plan and budget
  - **Annex L** review of 2016-19 work plan – opportunity to see the work that has been progressed
    - Some tasks are being progressed more slowly than CMM direction:

      Maps of VMEs (2017)

      Cumulative impacts of bottom fishing impact (2018)

      Consideration of all BFIA (2018)

      Review of observer coverage (2018)

  - **Annex M** updated 2018-22 work plan was adopted – activities and timelines against the themes from the overarching work plan

Questions?

10. SC Work plan and budget

SC flagged the need to consider consultants may be required and research activities should be considered in the SIOFA budget, and **recommended** the following priorities (some costs estimated after SC):

- Establishment of Target Strength and length relationship for alfonsino (data collection has already been done) (5000 EUR)
- Analysis and review of alfonsino acoustic surveys (10,000 EUR)
- Otolith preparation and reading for ageing for alfonsino, orange roughy or other species (estimated for 1 age composition of 400 otoliths, 8,000 EUR)
- Genetics to provide equipment for SNP analyses to postgraduate students (5,000 EUR)
- Stock assessment consultant for alfonsino work (23,000 EUR)
- Consultants to compile the biological data to support the risk assessments of teleosts, particularly species caught on the Saya de Malha bank (supporting the SAERWG work plan, if CP require assistance) (17,000 EUR)
- To inform the review of observer coverage and data standards, a consultant to intersessionally review observer data holdings (i.e. an inventory) of CPs (by fishery, species). This will require a consistent template, that also captures information on the sampling protocols/regimes. (17,000 EUR)
- Scoping analyses for alfonsino and Patagonian toothfish (14,000 EUR)

10. SC Work plan and budget

Election of Chairperson and Vice Chairperson

- **Dr Ilona Stobutzki**, Chairperson for an additional 12 months
- **Dr Tsutomu Nishida**, Vice Chairperson for an additional 12 months

Recommended SC Working Groups

Protected Areas and Ecosystems Working Group (PAEWG, Annex I)

Stock and Ecological Risk Assessment Working Group (SERAWG; Annex K) – c0-chairs Australia and Japan

Thank you

- Chairs of SAWG and ERAWG
- Researchers commissioned to undertake research elements
- CPs that progressed research and papers
- Fishers, scientists, data managers, fishery managers and teams who provided data, analyses and inputs
- Delegates from all Parties
- Executive Secretary and Database Manager
- Observers
- Rapporteur