



Australian Government

Australian Fisheries Management Authority



**Sub-
Antarctic
Resource
Assessment Group
(SARAG)**

**FINAL MINUTES
SARAG 56**

6 SEPTEMBER 2017

SUB- ANTARCTIC RESOURCE ASSESSMENT GROUP (SARAG)

CHAIR: Prof John Buckeridge

Date: 6 September 2017

Venue: Australian Antarctic Division, Channel Highway, Kingston

Attendance

Members

Prof John Buckeridge, Chair
Dr Rich Hillary, CSIRO
Dr Philippe Ziegler, AAD
Dr Dirk Welsford, AAD
Mr Martin Exel, Industry Member
Mr Malcolm McNeil, Industry Member
Ms Jo Fisher, AFMA
Ms Sarah Kirkcaldie, Executive Officer, AFMA

Observers

Dr Heather Patterson, ABARES
Dr Jemery Day, CSIRO
Mr Ian Cartwright, AFMA Commission*
Mr Trent Timmiss, AFMA
Ms Katie Murphy, AFMA
Mr Simon Boag, Industry consultant
Dr Tony Smith^

* agenda item 11-19 only

^agenda item 11-13 only

Introduction

Agenda item 1 - Preliminaries

The fifty-sixth meeting of the Sub-Antarctic Resource Assessment Group (SARAG 56) was opened at 9:00 am on 6 September 2017 by the Chair, Professor John Buckeridge.

1.1 Declaration of interests

Professor Buckeridge asked members and observers to state their name and profession and declare any conflict of interest that they may have on specific agenda items.

Professor Buckeridge declared he has no pecuniary interest in the sub-Antarctic fisheries.

Dr Hillary advised that he is employed by CSIRO and is the Principal Investigator of the MITF stock assessment. He also advised that he is a member of AFMA's Southern Bluefin Tuna Management Advisory Committee (SBTMAC) and Tropical Tuna RAG. Dr Hillary advised that he has no pecuniary interests in the sub-Antarctic fisheries.

Mr McNeill advised he is the Managing Director of Australian Longline P/L which holds various fishing rights in, and operates vessels in the sub-Antarctic fisheries and New and Exploratory fisheries under the jurisdiction of CCAMLR. Mr McNeill further advised he is a member on SouthMAC, Board member of the Coalition of Legal Toothfish Operators (COLTO) and member of the Executive Committee of Tasmanian Polar Network. Mr McNeill was not aware of any



investigation or prosecution action by AFMA against his Company or of any legal action taken by his Company against AFMA.

Mr Exel advised that he is the General Manager, Environment and Policy, Austral Fisheries Pty Ltd. Austral Fisheries P/L owns Statutory Fishing Rights (SFRs) in the Australian sub-Antarctic fisheries and waters under the jurisdiction of Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). Mr Exel also declared that he is a Director of the Institute of Marine and Antarctic Studies (IMAS), Member and public officer of the Commonwealth Fisheries Association (CFA), member of the South East Trawl Fishing Industry Association (SETFIA), Deputy Chair of the Great Australian Bight Industry Association, Member of Coral Sea Fishers Association and Board member of COLTO. Mr Exel further advised that he is a member of the "National Benefit Assessment Panel" for the Marine National Facility (the RV Investigator). He was not aware of any investigation or prosecution action by AFMA against his Company or of any legal action taken by his Company against AFMA.

Dr Welsford advised that he is employed by the Australian Antarctic Division (AAD) and no research grants contribute towards his salary. Dr Welsford advised that AAD get core funding but also seek grants from Fisheries Research and Development Corporation (FRDC) and AFMA. However, members noted that Dr Welsford salary was not connected to the FRDC grants. Dr Welsford further advised he is the Scientific Committee representative to CCAMLR, Chair of the Working Group for Fish Stock Assessments (WG-FSA) and a member on the Torres Strait Scientific Advisory Committee.

Dr Ziegler advised that he is employed by AAD and is the Fishery scientist responsible for HIMIF work including the HIMI stock assessments. Dr Ziegler has no pecuniary interest in the sub-Antarctic and his salary is not connected to any research grants noting that he is a co-investigator on a FRDC project and future FRDC projects.

Ms Fisher advised she is employed by the Australian Fisheries Management Authority (AFMA) as the Manager for sub-Antarctic fisheries at AFMA. Ms Fisher advised she has no pecuniary interests in the sub-Antarctic fisheries.

Ms Kirkcaldie advised she is employed by AFMA as a Senior Management Officer and advised that she is also the Executive Officer for Sub-Antarctic Management Advisory Committee (SouthMAC) and the Southern Bluefin Tuna MAC (SBTMAC). Ms Kirkcaldie advised that she has no pecuniary interests in the sub-Antarctic fisheries.

Mr Timmiss advised he is employed by AFMA as the Senior Manager of the Tuna and Antarctic fisheries and advised that he is a member on SBTMAC and Tropical Tuna MAC. Mr Timmiss advised that he has no pecuniary interests in the sub-Antarctic fisheries.

Dr Patterson advised she is an employee of the Department of Agriculture and Water Resources and is the Editor of the Australian Bureau of Agricultural Resource Economics and Sciences (ABARES) Fishery Status Reports. Dr Patterson noted that she had no pecuniary interest in the sub-Antarctic fisheries.

Dr Day advised he is an observer to SARAG and a CSIRO employee and was undertaking work on the MITF stock assessment. Dr Day advised that he has no pecuniary interests in the sub-Antarctic fisheries.

Mr Boag advised that he is an observer to SARAG and had been contracted by industry to work on broader research work. Mr Boag advised that he has no pecuniary interests in the sub-Antarctic fisheries.



Ms Katie Murphy advised she is an employee of the Department of Agriculture and Water Resources and is working at AFMA on a graduate rotation. Ms Murphy stated that she has no pecuniary interests.

1.2 Apologies and observers

Apologies were received from CSIRO member Dr Malcolm Haddon and industry observer Mr Rhys Arangio.

1.3 Agenda

Members noted that a draft agenda was circulated to members on 15 August 2017 and agenda item 14 - Mackerel Icefish stock assessment was added to the agenda. Industry members also requested that skates be discussed under agenda item 16.

SARAG adopted the agenda with amendments (Attachment A)

Agenda item 2 – Adoption of minutes from SARAG 55

SARAG noted that the draft minutes from SARAG 55 were circulated for comment on 6 June 2017. Comments were received from Mr Exel, Mr Arangio, Dr Patterson and Dr Ziegler. Members noted that the minutes from SARAG 55 meeting are now finalised.

Members noted that the draft minutes from the 14 June 2017 teleconference were circulated on 17 August 2017 and comments were due by 31 August 2017. Members noted that Mr Exel and Dr Ziegler provided comments. Members discussed these comments and it was agreed that the table under Agenda Item 2 would remain in the minutes, and that the minutes could now be finalised.

Agenda item 3 – Actions arising from SARAG 55

SARAG discussed the status of action arising items from SARAG 55.

Item	Action arising	Status
1	Toothfish model - CSIRO and AAD to discuss and develop a scoping paper of the cost/benefits of developing a new Toothfish stock assessment model.	SARAG 55 agreed that CSIRO and AAD would prepare a discussion paper for consideration at SARAG's early 2018 meeting.
2	Macquarie Island Toothfish Fishery (MITF) stock assessment - CSIRO and AFMA to discuss the implications of delaying the stock assessment	SARAG noted that the MITF stock assessment was originally due on 1 June



		2017 but there was a delay and CSIRO were concerned that the project would not be delivered by 30 June 2017 which could be an issue for milestone payments. AFMA and CSIRO discussed out-of-session and this action was completed.
3	Analysis of 2016/17 Toothfish catch rates - AAD to update graphs at the end of the season	Members noted that the 2016/17 season ends on 30 November 2017 and AAD will do the analysis then. SARAG 55 agreed that AAD's analysis will be used to inform the decision on whether to conduct a stock assessment in 2018.
4	Research task group - AAD and Industry to convene a task group to discuss any further research.	Members noted that this will be discussed at Agenda Item 15.
5	Independent review of Heard Island and McDonald islands (HIMI) toothfish stock assessment - Members agreed to hold a SARAG teleconference on 14 June 2017.	SARAG noted that a teleconference was held on 14 June 2017.
6	Tags - AAD agreed to investigate if tags from the trawl fishery could be used in the stock assessment.	AAD advised that the investigation into whether tags from the trawl fishery could be used in the stock assessment has been delayed due to other priorities for the stock assessment (see agenda item 13).
7	Tagging program - industry requested that an enhanced tagging program be designed to ensure all future tagging data can be maximised in the assessment process	AAD advised that an enhanced tagging program has not yet been devised.
8	Skates/rays - AAD agreed to examine skate/ray life status from observer data against vessels to determine if there are any patterns.	AAD noted that AFMA and AAD had been discussing skate/ray status with the observers and discussing best practice. Members noted that one observer sent photographs showing skates hooked in both their mouth and wing. SARAG noted that the 2017 CCAMLR Scheme of International Scientific Observation (SISO)



		workshop discussed best practice handling of skates and rays. AAD explained that previously the skates and rays were cut off the hook and line and this was considered best practice but now it has become evident that this is dependent on a variety of factors including the vessel. AAD reported that the workshop agreed that skates should be handled in a way that maximises survival, recognising the variation in survivability between vessels and crew. Members noted that this issue will now be discussed at the CCAMLR Scientific Committee. SARAG noted that more work still needs to be done on post release survivability. Members agreed that the outcomes need to be clearly articulated to the on-board observers so they know rules. AAD and AFMA to communicate best handling practices for skates and rays with observers by start of next season (Action arising 1). This issue will also be discussed at observer workshop in December 2017. Industry requested consistency with new and exploratory fisheries to minimise confusion.
9	Southern elephant seals paper - AAD agreed to provide the executive officer with the paper titled "Southern elephant seals (<i>Mirounga leonine</i> Linn.) depredate toothfish longlines in the midnight zone' for circulation to members.	Members noted that the Southern Elephant Seal paper was circulated on 28 August 2017.
10	ERA/ERM reports - AFMA to circulate final reports for information.	Members noted that final and minor edits are still to be made to the ERA/ERM reports and then they will be



		circulated to SARAG (Action arising 2).
11	FRDC genetics project - AAD agreed to provide (when completed) the full proposal for the project "Stock Connectivity of Antarctic Toothfish (<i>Dissostichus mawsoni</i>).	SARAG noted that this item was discussed under agenda Item 10.
12	Research papers for AFMA website - Members to provide any research papers that can be made publicly available to place up on the AFMA website.	SARAG noted that this agenda item is ongoing and members agreed to provide any research papers when they become available
13	Joint Australia-France research action plan - AAD agreed to circulate the ToR for the action plan.	AAD agreed to circulate ToR as soon as possible.
14	Kerguelen Plateau Symposium - include a paper on IUU activity including a history of compliance and lessons learnt.	SARAG noted that this item was discussed under agenda Item 22.
15	Environmental interactions and gear loss - AFMA agreed to present the gear loss and recovery in the same table with an overall net result report	SARAG noted that this item was discussed under agenda Item 23.
16	Tag based mortality – AAD agreed to run a sensitivity test by removing 2007 and 2008 data and test 15% tag based mortality for one year.	AAD noted that there was no pattern when the two years of data was removed.

Agenda item 4 – Correspondence

SARAG noted the following correspondence which had been received out-of-session since the last meeting in May 2017:

- An email dated 15 May 2017 from Sarah Kirkcaldie attaching a letter addressed to the Chair advising the RAG of the public consultation period for the Commonwealth Fisheries Harvest Strategy Policy, Bycatch Policy and National Plan of Action for Seabirds;
- An email dated 17 May 2017 from Sarah Kirkcaldie attaching an advertisement for the position of Chief Executive Officer, Seafood Industry Australia;
- An email dated 30 May 2017 from Jo Fisher seeking comments on AAD's review of the Australian Antarctic Science Strategic Plan 2011-12 to 2020-21;
- An email dated 1 June 2017 from Sarah Kirkcaldie regarding an extension to the comment period for the Commonwealth Fisheries Harvest Strategy Policy, Bycatch Policy and National Plan of Action for Seabirds;
- An email dated 13 June 2017 from Sarah Kirkcaldie attaching the details for the teleconference held on 14 June 2017;



- An email dated 14 June 2017 from Sarah Kirkcaldie attaching the declarations of interest for the teleconference;
- An email dated 6 June 2017 from Sarah Kirkcaldie seeking comments on the draft minutes from SARAG 55 held on 16-17 May 2017;
- An email dated 4 July 2017 from Sarah Kirkcaldie seeking comments on the draft Strategic Research Plan 2017-2022;
- An email dated 15 August 2017 from Sarah Kirkcaldie seeking comments on the draft agenda for SARAG 56; and
- An email dated 17 August 2017 from Sarah Kirkcaldie seeking comments on the draft minutes for the SARAG teleconference held on 14 June 2017.

Agenda item 5 - Fishing operations update

Mr Exel and Mr McNeill provided SARAG with verbal updates on fishing operations in the HIMIF, MITF and CCAMLR New and Exploratory fisheries.

Mr Exel advised that all of the Mackerel Icefish total allowable catch (TAC) was taken in a trip and a half which included the random stratified trawl survey (RSTS). Members noted that the RSTS included additional shots using small mesh cod end but no little toothfish were found. Mr Exel reported that the longline season started at low catch rates 0.15 kg/hook which was 30% down on the long-term average. Industry indicated that early in the season they were concerned about the Fishery and whether they would catch the TAC. However, Mr Exel advised that on 1 June 2017 catch rates increased and have been continuing at a higher level ever since. Mr Exel noted that they caught a bird on the cusp of the end of the April season extension which was very disappointing and more so, given the Austral Fisheries Pty Ltd vessels are now using additional mitigation. Mr Exel expects that Austral Fisheries vessels will be fishing until the end of season (November) but this depends on catch rates. It is expected that Austral Fisheries will catch all of their TAC at this stage.

Mr Exel acknowledged that there has been a fair amount of gear lost but noted that the vessels had not had an opportunity to recover any gear this season, but they would be starting to concentrate on recovery between now and the end of season.

Mr McNeill reiterated Mr Exel's comments, noting that the Fishery changed on 1 June when catch rates improved. Mr McNeill further noted that the Australian Longline Pty Ltd vessel had some whale interactions early in the season. Members noted that the whale left when the vessel went to dump offal outside the fishing grounds. Mr McNeill advised that Australian Longline Pty Ltd caught their second bird ever, a White Chinned Petrel, in April 2017.

Mr McNeill advised that the MITF longline season had now ended and the vessel is currently returning to Nelson, NZ. Members noted that during the season 360t green weight was caught out of the 460 t TAC. Mr McNeill advised that the 2017/18 MITF season had been very unpredictable with good and bad fishing. Mr McNeill stated that a lot of gear had been lost at MITF especially on the first trip. The Company had deployed underwater cameras which showed bad ground where the most gear was lost so the vessel avoided those areas on the second trip. Members acknowledged that a lot more gear had been recovered at MITF this season. Mr McNeill noted that the vessel tried to grapple for more lost gear at end of season for two days but did not have a lot of luck only grappling back one 11km line lost earlier in the



season. SARAG noted that no birds were caught in the 2017/18 MITF season and the average catch per unit effort had been good.

SARAG noted that some Illegal, Unreported and Unregulated (IUU) gear had been recovered in MITF. The gear was approximately 18,000m of Spanish longline, and very likely from the vessel *Taruman*. The *Taruman* was a Cambodian boat that was boarded and prosecuted in 2005 for fishing offences within the area of the MITF. The vessel had been on its way to the Ross Sea but stopped at MITF. The vessel had 143 tonnes of toothfish on board which was subsequently sold by tender, and purchased by Austral Fisheries Pty Ltd.

Macquarie Island Toothfish Fishery

Mr Exel, Mr McNeill and Mr Boag declared their interest under agenda items 6-7 and left the room. SARAG then discussed whether the Industry members and observer needed to leave the room for any agenda items; it was agreed that as their input was essential to the agenda items that they should remain in the meeting room for all discussions but not any recommendations.

Agenda item 6 – Toothfish stock assessment

SARAG discussed the CSIRO prepared 2017 'Stock Assessment of the Macquarie Island fishery for Patagonian Toothfish (*Dissostichus eleginoides*) using data up to and including August 2016'. The assessment uses a spatial model that fits to data from the entire Macquarie Island toothfish Fishery, and assumes a single reproductive stock, but takes into account spatial structuring of the population within the region. Two areas – northern and southern – are incorporated into the model, with movement of fish between areas, and recruitment to both areas.

Members noted that the status of the Fishery was similar to last year with the stock at 69% of B_0 (67% in 2016). The trend in spawning biomass from 1990–2016 is almost identical to that estimated last year, but the estimated magnitude of spawning biomass is about 20% higher in each year, and about 8% higher than the spawning biomass series from the 2015 assessment.

SARAG noted that a bridging analysis was conducted that showed the combined addition of 2016 catch, length composition, age-at-length data and tag data made little overall difference to the spawning biomass trajectory and recruitment estimates. The addition of the age-at-length data saw some changes, especially to the end of the recruitment time series. However, these changes were largely reversed in the next step with the addition of the 2016 tag data, resulting in very similar time series to the 2016 base case. Estimating one more year of recruitment made little difference, as the additional recruitment event was estimated to be only slightly below average.

Members noted that the estimated growth curve for males has changed in this assessment with L_{∞} fixed at 165cm, the same value used for females. In earlier assessments, L_{∞} was estimated for males, but the estimates were unreasonably large in the 2016 assessment, with little data available to inform the estimate of L_{∞} for older males.

Members further noted that estimation of movement rates remain uncertain. In the base case, the movement rate from south-to-north is higher than the movement north-to-south. Industry



noted that fish are clearly different in Aurora Trough compared to South Macquarie Ridge and North Macquarie Ridge.

Members noted that the preliminary results had some issues with MCMC but the problem is now fixed.

Industry members then left the room, and the remainder of SARAG members agreed that it is important to maintain fishing across the entire fishery and recommended a TAC of 450 tonnes for the 2018/19 season and 450 tonnes for the 2019/20 season, to be taken in approximately the following proportions: 250 tonnes from the Aurora Trough, 80 tonnes in the Southern Macquarie Ridge and 120 tonnes in the Northern Macquarie Ridge. Members noted that there may be some minor adjustments to the percentage from each area depending on the season.

Industry then rejoined discussions, and SARAG noted that receiving the stock assessment earlier is beneficial for industry in planning their operations for the following season. Members agreed that the only issue with the stock assessment being conducted earlier is getting data from AAD (both boat data and ageing). Members noted that it is difficult for AAD when there is both a HIMIF and MITF stock assessment conducted in the same year. SARAG agreed to continue with the arrangement where the HIMIF stock assessment will be presented at a May SARAG meeting and MITF assessment at a September meeting. Members agreed that the next MITF stock assessment will include ageing data from 2017 but not 2018 and that this would avoid a bottle neck of aging work at AAD. AAD noted that the ageing work will be kept up-to-date or they will do alternative years of ageing. AAD noted that the priority is to age Australian fisheries. SARAG noted that there are around 250 otoliths (from the 2017 season) needing to be aged and included in the next MITF stock assessment.

SARAG agreed there would be benefit in a Macquarie Island Industry Consultation meeting, with MITF skippers and CSIRO scientists, similar to the meeting that HIMIF industry, including skippers, has with AAD each year.

Dr Day further agreed to investigate whether the catch from the illegal fishing vessel *Taruman* is included in the stock assessment.

SARAG thanked CSIRO for completing the 2017 Macquarie Island Toothfish Fishery stock assessment.

Agenda item 7 – Tagging study

Dr Hillary presented a paper on the impact of spatial tagging rates for key estimates coming from the Macquarie Island toothfish assessment. The paper looked at how factors that can potentially be controlled (spatial tagging rates per tonne and overall spatial catch splits, effective length sample sizes) interact with things that cannot be controlled (spatial recruitment and migration rates) when estimating abundance, migration and selectivity in the MITF model.

SARAG noted that the current spatial configuration of the assessment has two regions (northern and southern) with movement between them and variable fishing pressure over time. The paper explored how a range of area specific tagging rates (per tonne caught), conditional on the overall rate being fixed at 2 tags per tonne, interacted with a range of plausible true spatial mean recruitment and migration rates, in terms of the uncertainty in resultant estimates of spawning abundance and the key spatial parameters.



SARAG noted that having higher rates of tag release in the northern regions, relative to the south, resulted in more accurate estimates of SSB. Dr Hillary noted that there are trade-offs between the accuracy of north to south/south to north movement if the spatial tagging rate is shifted. SARAG noted that in conclusion there is no clear optimal spatial tagging strategy and/or spatial catch distribution. The paper noted if the primary focus is SSB then a higher release rate in the North and enforcing a 50/50 spatial catch split results in more accurate estimates and avoids overly large CVs. The 50/50 catch ratio does seem to have negative effects on some movement parameters (north to south).

Dr Hillary noted that future work could include using the “Brownie likelihood” to explore M estimation and using overall tagging to be able to estimate M. Members noted industry would continue with the current tagging rate.

SARAG thanks Dr Hillary for presenting the paper noting that this work would be transferrable to HIMIF if the assessment becomes a spatial assessment.

CCAMLR & Exploratory Fisheries

Mr Exel, Mr McNeill and Mr Boag declared their interest under agenda items 8-10 and left the room. The group then discussed whether the Industry members and observer needed to leave the room for any agenda items; SARAG members agreed that as their input was essential to the agenda items, that they should remain in the meeting room for all discussions noting that no recommendations/decisions being made.

Agenda item 8 – CCAMLR Exploratory Fisheries update

SARAG noted that Australia has submitted proposals for Australian flagged vessels to participate in the following CCAMLR Exploratory Fisheries during the 2017/18 CCAMLR fishing season:

- Statistical Divisions 58.4.1 and 58.4.2 (East Antarctica); and
- Statistical Divisions 88.1 and 88.2 (Ross and Amundsen Seas).

These proposals will be considered by the Working Group on Fish Stock Assessment (WG-FSA), Scientific Committee and Commission in October.

Agenda item 9 – Papers to WG-FSA, SC & CCAMLR 2017

AAD provided a verbal update on the papers that Australia is planning on submitting to the 2017 CCAMLR meetings including:

Working Group on Fish Stock Assessment (WG-FSA-17):

- Report on Random Stratified Trawl Survey (RSTS)
- HIMI Toothfish tag loss estimation – may be an appendix to stock assessment.
2008,09,10 – higher tag loss.
- HIMI Toothfish maturity re-estimation



- HIMI Toothfish stock assessment
- HIMI Mackerel icefish stock assessment
- Seabird interactions in season extension
- Reports on fishing in Divisions 58.4.1 & 58.4.2: (1) Summary of fishing activities, (2) Stock structure and habitat model, (3) Toothfish ageing, (4) Macrourid bycatch
- Proposal to continue research fishing in Divisions 58.4.1 & 58.4.2
- Preliminary results of request to observers to take images as they ID a species

SARAG noted the papers that Australia is submitting to the 2017 CCAMLR meetings.

Agenda item 10 - Update on East Antarctic genetics project proposal

SARAG observed that the project titled 'Stock Connectivity of Antarctic Toothfish (*Dissostichus mawsoni*)' had been submitted to FRDC as a full project proposal for funding consideration. At SARAG 55, members were informed that the project:

- is part of Australia's research commitments in the exploratory toothfish fishery in East Antarctica;
- is a 1-year pilot project that aims to evaluate the genetic structure of Antarctic toothfish in Antarctic waters; and
- has the potential to estimate biomass in East Antarctica using a close kin mark-recapture method.

At SARAG 55, in response to concerns about how FRDC would fund the project, noting that FRDC does not collect a research levy on CCAMLR New and Exploratory Fisheries, members had suggested that the project be presented as a 'for public good' project.

AAD noted that the proposal had been submitted to FRDC but the Principal Investigator have not been informed of the funding consideration.

AAD explained that if the project is funded Mr Dale Maschette, AAD, will go down on the vessel to the East Antarctica and collect the samples and results would be expected this time next year. AAD stated that the knowledge from the project will be transferrable to the HIMIF and MITF. It was agreed that AAD and Industry would discuss with FRDC if the project could seek public good funding. SARAG noted that public good funding is generally given to projects that benefit the Australian community not the international community, and this was a gap that industry was discussing with FRDC.

Heard Island and McDonalds Islands Toothfish Fishery

SARAG welcomed Dr Tony Smith and Mr Ian Cartwright to the meeting for agenda items 10-12.



Mr Exel, Mr McNeill and Mr Boag declared their interest under agenda items 11-16 and left the room. The group then discussed whether the Industry members and observer needed to leave the room for any agenda items; it was agreed that as their input was essential to the agenda items that they should remain in the meeting room for all discussions but not any recommendations.

Agenda item 11 –Update from WG-EMM and WG-SAM

SARAG noted that CCAMLR's Working Group on Statistics, Assessments and Modelling (WG-SAM-17) was held in Buenos Aires, Argentina, from 26-30 June 2017 and CCAMLR's Working Group on Ecosystem Monitoring and Management (WG-EMM-17) was also held in Buenos Aires from 10-14 July 2017.

AAD provided a verbal update on WG-SAM and advised that there was not a lot of stock assessment discussion but that Australia had presented a paper on bias from emigration of fish which was well accepted and received. Members noted that the UK also led a discussion on Mackerel Icefish and boot strapping for the assessment but that it didn't apply to Australia's assessment.

SARAG noted that there was a krill discussion at WG-EMM and the research plans for the exploratory fisheries were discussed and also the impact of the Ross Sea Marine Protected Area.

SARAG noted that the 2017 SISO Workshop had discussed observer logbooks (e-logs) cell by cell to ensure all data collected is relevant. Members noted that this was a useful process to reduce work load for observers. Members also noted the Workshop recommendations on amendments to e-logs would be considered by CCAMLR this year.

SARAG noted the verbal update from AAD on the outcomes from WG-EMM and WG-SAM.

Agenda item 12 – Actions arising from Independent review of HIMI toothfish stock assessment

At SARAG's June teleconference Members agreed how recommendations from AFMA's independent review of the HIMI Fishery stock would be addressed. AAD provided SARAG 56 with a summary table of AAD's response to the recommendations and Members noted progress. Members discussed progress on the recommendations in more detail under Agenda Item 13.

Dr Smith, who was contracted by AFMA to undertake the independent review, stated that he was satisfied with how recommendations from the review had been addressed. Members again thanked Dr Smith for his work on the review.

Agenda item 13 – Final draft assessment for presentation to WG-FSA

AAD presented an updated assessment for the Patagonian Toothfish Fishery at HIMI with data until the end of the 2015/16 season. Compared to the 2015 assessment this assessment takes into account:

- new fishery observations up to the end of 2016 including new ageing data from the RSTS and commercial fishery from 2015-2016;
- updated growth parameters;
- updated maturity parameters;



- update tag loss estimates;
- a bias correction for fish emigrating out of Division 58.5.2;
- survey biomass index and catch proportions instead of survey numbers-at-age; and
- iterative data weighting using the ‘Francis’ method.

The updated assessment model leads to a smaller estimate of the virgin spawning stock biomass B_0 to that obtained in 2015, with an MCMC estimate of 77 286 tonnes (95% CI: 71 492-84 tonnes). Estimated SSB status was 0.61 (95% CI: 0.58-0.64).

Similar to previous assessments, AAD had prepared a bridging analysis. The analysis started with the 2015 assessment model that was used to provide management advice in 2015 and led step-wise to the proposed 2017 assessment model. Members noted that models 6 and 7 had changed. In Model 6, the survey numbers-at age and length were replaced with an index of survey biomass across all survey years from 2001-2016 and proportions-at-age from 2006-2016 to facilitate the distinction between potential biomass signals and year class strength. In Model 7, iterative data re-weighting following the method described by Francis was introduced allowing for correlations within the observed composition data.

Members noted that there is a weak declining trend in year class strength (YCS) over time and AAD agreed to discuss the year class strength issue with New Zealand and the UK before the meeting and provide a summary on the feedback received (**Action arising 3**). It was agreed that looking at year class strength (YCS) would be on the agenda for the next SARAG meeting. (**Action arising 4**)

Members noted that a lower TAC would result if spawning biomass does not drop below 50% of B_0 at any point in the 35 year projection period, and that this may provide benefits to economic stability in the fishery. Industry noted that their reasons for considering the approach of maintaining spawning stock biomass above the 50% line in any projection is to recognise the recent events leading to low catch rates, which increased concern that the stock assessment needs added resilience, and also the industry desire to evaluate ways to maintain catch rates at above certain levels for maximum economic yield. Members discussed the possibility of setting a TAC lower than would be discussed at CCAMLR, but agreed that this should not be discussed in the CCAMLR forum. AAD advised that there is no requirement to present CCAMLR with a domestic decision to adopt a lower catch limit. Members noted that the UK adopts a similar approach to the fishery in South Georgia. CSIRO agreed to circulate a related paper from South Georgia (**Action arising 5**).

Industry members left the room and the remaining SARAG members agreed that model 7 was considered to be the most appropriate for management advice and model fits were generally acceptable. Under model 7 the catch limit that satisfies the CCAMLR decision rules is 3,525 tonnes.

Industry members then rejoined the meeting. SARAG noted that AFMA may set a lower TAC if industry made such a request on economic efficiency grounds. It was agreed that a SARAG teleconference would be held after CCAMLR if needed, and that the regular SouthMAC teleconference would be held after CCAMLR. AFMA management would then make recommendations to the AFMA Commission regarding the HIMIF Patagonian Toothfish TAC (**Action arising 6**).

SARAG noted that the revised stock assessment paper will be circulated for comment to SARAG before it is submitted to CCAMLR on 18 September 2017 (**Action arising 7**).



Members noted that SARAG had previously agreed that revised stock assessments would include data up to the end of fishing in the previous season. Members noted that this provided extra time for AAD to prepare assessment, and that this was beneficial. Members also agreed it was beneficial to have the extra SARAG meeting to consider the draft stock assessment (ie the May meeting). The additional meeting allowed AAD more time to respond to changes from SARAG. Members acknowledged that there was a lot more confidence in the stock assessment process as a result of the changes made by AAD, and the outcomes of Dr Smith's independent review.

Members thanked Dr Ziegler for completing the assessment and also responding to the independent review of the HIMI stock assessment.

Agenda item 14 – Mackerel icefish stock assessment

Dr Ziegler presented the preliminary 2017 HIMIF Mackerel Icefish assessment. The paper provided a preliminary assessment of Mackerel Icefish population structure, abundance and yield for the area of Division 58.5.2 to the west of 79° 20' E using standard CCAMLR methods.

SARAG noted that the RSTS has been conducted each year on the shallow plateau (<1000m) to collect data on the distribution, abundance and population structure of Patagonian Toothfish, Mackerel icefish and other species. The year classes present in that Mackerel Icefish standing stock are then projected forward two years to estimate the TAC. The CCAMLR decision rule requires a TAC that allows 75% escapement of biomass that would have been there in the absence of fishing. Uncertainty is incorporated by using the lower 95 percentile of the biomass estimate in the projection, which leads to a conservative approach.

SARAG noted that the 2017 survey of Mackerel Icefish in Division 58.5.2 shows that a large 3+ cohort is dominating the population. Members noted that there was a 4+ and 5+ cohort that was not present in the previous growth estimate and that overall, growth rates appear to have been faster in recent years compared to the period prior to 2010. Dr Ziegler indicated that the scientists were not sure why this was occurring but it was suggested that it could be environmental.

Members noted that it has been observed in previous years, cohorts younger than age 3+ may not be well selected by the survey gear. Members also noted that the stock assessment recommend catches of 526 tonnes in the 2017/18 season and 395t in the 2018/19 season and that these catch limits satisfy the CCAMLR decision rules.

Industry members left the room and the remaining SARAG members recommended that the paper that had been presented to SARAG should be presented to CCAMLR's WG-FSA. Members noted that the TAC recommended for the 2018/19 season is likely to be updated after the RSTS is completed next year. SARAG noted that a Mackerel Icefish assessment is done every year whilst a Patagonian Toothfish assessment is only done every second year. Industry members then re-joined the meeting.

Agenda item 15 – Oceanographic & fisheries data conceptual model

At SARAG 55 it was agreed that AAD and Industry would convene a task group to discuss any further research that might be available as well as what work needs to be done to determine what may be causing the decline in toothfish catch rates in the HIMI Fishery.



Members noted that on 25 July 2017, the first Southern Ocean Oceanography and Data meeting was convened to progress this agenda item. The group reconvened on Monday 4 September 2017, to further discuss research around HIMI on the Kerguelen Plateau. A verbal update was provided on the outcomes of Monday's discussion which focussed on what drives Patagonian toothfish catch rates. Industry, including Austral Fisheries Pty Ltd skippers, talked about influences and came up with diagram of what may be influencing toothfish catch rates at HIMI.

Members noted that at the meeting on 4 September, four broad research priorities groups were identified:

- 1 Routine assessment;
- 2 bioeconomic MSC, RSTS, RSLs;
- 3 leading indicators for catch rate; and
- 4 bycatch – rats, skates.

Factors identified as possible causes for catch rate decline included environment, sealice, bycatch, benthic predators and habitat. SARAG noted that sealice were identified as a major issue with two different types present.

SARAG noted that it was recommended that a qualitative analysis be done to highlight main drivers and look at existing data analysis, data gaps and that a research program would be developed. Members noted that many of the identified issues are poorly understood.

Agenda item 16 – Research requirements for revised grenadier and skate assessments

SARAG noted that a higher than normal prevalence of grenadier was being observed in the HIMI Fishery this year. Industry had requested via email that SARAG consider what further information needs to be collected in order to undertake another stock assessment of the grenadier species. Industry also raised a similar issue for skates and rays, requesting a review of data and research needed for a revised skate and ray assessments.

Industry noted that grenadier, skate and ray bycatch has the potential to be 'limiters' to Fishery operations, in that it is not inconceivable that bycatch limits for these species may be reached, therefore requiring that fishing for the target species cease.

Members noted that AAD undertook a grenadier assessment in 2015, and grenadier bycatch limits were significantly increased for the 2015/16 and 2016/17 fishing seasons.

Members noted that for a revised grenadier assessment in 2018, RSTS data is necessary. Industry also suggested that the different fishing strategies of the two companies are looked at as Austral Fisheries Pty Ltd catch a lot more grenadier bycatch than Australian Longline Pty Ltd. SARAG agreed that a revised grenadier assessment should be included in the 5-year Strategic Research Plan (**Action arising 8**).

SARAG noted that grenadier, skate and ray bycatch were also discussed at the Industry consultation meeting on Tuesday 5 September 2017 and it was agreed that clarification from management was needed regarding reporting of skates. Industry noted that they catch a lot of skates in the Icefish Fishery but they may become a limiter in the Patagonian Toothfish longline



Fishery if there is a bigger TACs of icefish in future. Industry noted that part of the issue may relate to reporting of skates and rays bycatch, as live ones released appeared to be included in the catch limits. It was agreed that AFMA and AAD would discuss how skates and ray catch should be recorded on the CCAMLR forms and provide advice to industry, as well as observers at the observer workshop that will be held later in the year. SARAG will then discuss and determine if more research is needed (**Action arising 9**).

Research

Dr Hillary and Dr Day declared their interest under agenda items 17-22 and left the room. The group then discussed whether the research member and observer needed to leave the room for any agenda items; it was agreed that as their input was essential to the agenda items that they should remain in the meeting room for all discussions but not any recommendations. Dr Hillary and Dr Day returned to the meeting.

Mr Exel and Mr McNeill noted that they had recently established a FRDC Industry Partnership Agreement (IPA) and declared an interest under all Research agenda items. As per requirements as RAG members who have declared interests under an agenda item, Mr Exel and Mr McNeill left the room. The remaining members of SARAG agreed that Mr Exel and Mr McNeill should be allowed to return for all discussions made under Agenda Items 17-22 noting that no recommendations were being made. Mr Exel and Mr McNeill returned to the meeting.

Agenda item 17 – Recent research

Members noted that this agenda item is an opportunity to discuss any planned research, any research currently happening and any recently completed research. SARAG noted the update on sub-Antarctic fisheries research projects that are not included in the AAD Science Workplan.

Industry members advised that a stock assessment for Southern Hemisphere porbeagle shark was currently being done under the auspices of the Western and Central Pacific Fisheries Commission (WCPFC) and the Commission for the Conservation of Southern Bluefin Tuna. This study is attempting to assess the status of the Southern Hemisphere population of porbeagle shark. A draft paper is being considered by the WCPFC and concludes that based on the available data there is a very low risk that the Southern Hemisphere porbeagle shark is subject to overfishing anywhere within its range. SARAG noted that the porbeagle shark was listed on the Convention on International Trade in Endangered Species (CITES) Appendix II in 2014 on the basis of evidence available for the Northern Hemisphere population in the Atlantic, and that the CITES process doesn't allow for listing of individual populations. The Executive Officer agreed to circulate the link to the study to SARAG (**Action arising 10**).

Agenda item 18 – Antarctic Fisheries 5 year strategic research plan

The AFMA member informed SARAG that the Antarctic fisheries 5 year strategic research plan is due to be updated by mid 2019. Members noted that future research needs were identified and discussed at the AAD/AFMA/Industry meeting on 5 September 2017.

SARAG agreed that AFMA should draft a 5 year strategic research plan for consideration at the next SARAG meeting (**Action arising 11**) and should include the following research:



- Development of a random stratified longline survey;
- Methodology to incorporate communities as identified in the Benthic impacts research program as part of the Ecological Risk Assessment process;
- Refined spatial assessment of HIMI tagging program;
- Review of M in HIMI stock assessment model;
- Skate research;
- Grenadier research;
- Research identified through the oceanographic and fisheries data meeting (refer to Agenda Item 15);

In discussing the 5 year Strategic Research Plan SARAG should also consider:

- Use of satellite smart tags on longlines to record environmental data
- Decadal modelling of the HIMI and Macquarie Island fisheries – climate change effects, projections based on ecosystem modelling (Atlantis);

It was agreed that the next 5 year strategic research plan should include estimates of costs and also possible funding sources. It was also agreed that the AAD workplan should be incorporated in to the strategic research plan and that New and Exploratory fisheries research should be added under its own heading. SARAG agreed that a new 5 year strategic research plan should be reviewed every year as soon as possible after the CCAMLR meeting to guide research in the upcoming year.

Agenda item 19 – Annual Research Statement

SARAG noted that individual RAGs and MACs are required to identify their research needs and prepare an Annual Research Statement for:

- a. AFMA funding in the 2018/19 financial year (essential stock assessment related research); and
- b. FRDC funding in the 2018/19 financial year (more innovative type projects).

SARAG noted that the AAD Science Work Plan addresses research for HIMI and CCAMLR Exploratory Fisheries for the 2017 period. SARAG also noted that Australian Longline Pty Ltd and Austral Fisheries Pty Ltd have established a FRDC Industry Partnership Agreement (IPA) and it is expected that research will be funded through the IPA. Industry noted that AFMA's Research Section has asked to be kept informed of research undertaken as part of the IPA.

SARAG discussed research that would be required to be funded in the 2018/16 financial year. The following projects were discussed for possible inclusion in the Research Statement:

1. Macquarie Island Toothfish stock assessment project for 2018/19 and 2019/20 financial years, that will include TAC recommendations for the 2020/21 and 2021/22 fishing season;

East Antarctic genetics project (noting that funding from FRDC had already been requested but members requested that the public good component of FRDC funding be explored); and



2. HIMI, MITF and East Antarctic ageing project (1 year).

Members agreed that AFMA, AAD and Industry would discuss these projects out-of-session and finalise the Annual Research Statement (**Actions arising 12**).

Agenda item 20 – Whale depredation project

Members noted that at SARAG 55, Industry informed members that a workshop was held in Hobart in February 2017 to discuss the Australian Research Council (ARC) project on whale depredation being led by Dr Paul Tixier. The aim of the project is to develop a model that looks at whale depredation patterns and to quantify impact on catch rates.

Industry provided SARAG with an update of the research undertaken as part of the ARC project on whale depredation on Patagonian toothfish in the longline fisheries in the Southern Ocean. Members noted that fishing data and whale observation data has been received from Chile (dataset spanning from 2007 to 2016), the Falklands (2012-2016), Crozet and Kerguelen (2003-2016) and HIMI (2011-2016). No data from South Georgia or Prince Edward and Marion Islands has been received yet. SARAG noted that depredation is occurring but that the HIMIF had the lowest depredation of all the fisheries looked at. Members noted that longline fishing has not been occurring in the HIMIF for as long as the other fisheries. Members noted that whales also have a tendency to go north to Kerguelen as it is more natural ground and habitat. For the HIMIF, members noted that:

- Hydrophone. Members noted that hydrophones are now on board the vessels and an analysis will be done on the acoustics of each vessel. Industry is hoping it will explain why the fishing vessel Atlas Cove and Isla Eden typically attract whales and vessels such as the Corinthian Bay don't appear to;
- Acoustic mooring. AAD has loaned a permanent acoustic mooring that will be based in HIMIF to listen to whales within a 20km radius. The mooring will be dropped off in the HIMIF shortly, noting that it will be dropped in the Fishery where there are no risks of tangles and at 1000m depth. The mooring will stay in the HIMIF for 12 months before it is collected;
- Accelerometer. The development of accelerometers on hooks will be able to detect when fish bites the hook and then determine if the fish has been taken off the hook by a whale. The accelerometers will need to distinguish between fish moving, whale depredation and fish falling off. Members noted that it is believed that there is a depredation of 1-5% when whales are present, which would require a very large sample size of accelerometers on snoods, possibly making this project non-viable.

SARAG noted that further work was still required including looking at bycatch versus catch to see if there is a link with whale depredation and certain bycatch. Members noted that this is being undertaken as part of the ARC project.

Agenda item 21 – Joint Australia-France research action plan



SARAG noted that in April 2015 Australian and French officials gave in-principle agreement to form a group to develop an Australia-France research plan. It was agreed that the group would contain scientists and officials from both countries. At SARAG 55, AAD informed members that the Terms of reference (ToR) had been agreed between AAD and the French *Muséum National d'Histoire Naturelle*.

AAD agreed to circulate the ToR to members (**Actions arising 13**).

SARAG noted the verbal update from AAD on the joint Australia-France industry research action plan.

Agenda item 22 – Kerguelen Plateau Symposium

SARAG noted that Australia and France have signed a bilateral agreement to form a Scientific Advisory Group to provide formal advice to Australian and French governments on the Kerguelen Plateau fisheries and ecosystem. As part of the agreement, a Kerguelen Plateau symposium will be held in Hobart from 13-15 November 2017 (<http://heardisland.antarctica.gov.au/research/kerguelen-plateau-symposium>) at the CCAMLR Secretariat building. AAD noted that they had received around 50 abstracts for presentations and 10 poster submissions.

SARAG noted that at the Kerguelen Symposium AAD and AFMA will present on the following management/policy topics:

1. Australia's Ecological Risk Assessment and Ecological Risk Management framework for fisheries (AFMA);
2. The bilateral cooperation between France and Australia on the Kerguelen Plateau (AAD); and
3. Expansion of the Heard Island and McDonald Islands Marine Reserve (AAD).

AAD's Science team will also be presenting additional science papers.

SARAG noted that at the last meeting it was suggested that a paper on illegal, unregulated and unreported (IUU) activity, including a history of compliance and lessons learnt, would be informative for the Symposium. In discussions between AFMA and AAD on this issue, it was agreed that IUU fishing in the French and Australian EEZs would be addressed through paper 2 listed above. Industry members noted that it was important that this information is included as it provides a history of the Fishery and will explain how IUU catch is incorporated into Australia's stock assessments.

Members noted that AFMA and AAD had provided funding for the Symposium and that there may be a registration fee. Industry asked AAD for a summary of funding providers so that any additional funding requirements could be discussed with FRDC next week.

AAD advised that a brochure would be produced that would be emailed to interested parties and that external activities such as tours would be organised.



Environment

Agenda item 23 – Environmental interactions and gear loss

SARAG noted that there has been three wildlife interactions resulting in deaths in the HIMI Fishery since the report to the last SARAG meeting in May 2017.

- 4/05/2017– A female elephant Seal was tangled in the line and brought to the surface dead on the vessel *Isla Eden*;
- 17/7/2017 - A Southern Elephant Seal was hooked by the mouth and brought to the surface dead on board the vessel *Antarctic Chieftain*; and
- 15/08/2017 – An unidentified seal was caught on the mouth by a single hook on the vessel *Isla Eden*.

SARAG noted that while there has been a decrease in the amount of gear lost in the HIMI Fishery in 2017 compared to 2016, the amount of gear recovered to date this season has been low. Industry stated that there had been limited gear recovery attempts made to date in 2016/17 but expected there to be a significant increase towards the end of the season. Members noted that AFMA had amended HIMI statutory fishing rights (SFRs) conditions so that lost gear can be recovered at any time during the year. In the MIT Fishery there has been a significant increase in the amount of integrated weight line and hooks lost so far in the season compared to last season.

Gear	HIMI Fishery		
	Loss	Recovery	NET (Loss)
	2016/17	2016/17	2016/17
Integrated weight line (metres)	119,784	11,650*	108,134
Downline (metres)	3,050	0	3,050
Hooks	85,274	8,200*	77,074
Floats/buoys	19	0	19
Gaff	3	0	3

Gear			MIT Fishery
	Loss	Recovery	NET (Loss)
	2017/18	2017/18	2017/18
Integrated weight line (metres)	145,466	26,863*	118,603
Downline (metres)	9,987	2000 (15,600 IUU)	7,987
Hooks	103,906	18,686*	85,220
Floats/buoys	4	0	4
Gaff/grapple	8	0	8



SARAG agreed that for future SARAG meetings gear loss and recovery (as well as net loss and recovery) would be presented for every year from 2010.

*Gear recovered in 2017/18 was included gear that had been lost in multiple seasons not just the current season

Other

Agenda item 24 – Other business

No other business

Agenda item 25 – Next meeting

It is proposed to hold the next face-to-face SARAG meeting on Wednesday 28 February 2018. The key items for discussion will be:

- the Fishery Assessment Plans for the Macquarie Island Toothfish Fishery and Heard Island and McDonald Islands Fishery and
- the Antarctic Fisheries Five Year Strategic Research Plan.

The meeting closed at 4.30 pm on Wednesday 6 September 2017.

Members are thanked for their input and support during 2017, and are wished all the best for the Festive Season and 2018.



Sub-Antarctic Resource Assessment Group (SARAG) Meeting 56

Final Agenda

Wednesday 6 September 2017

9:00am – 5:00pm

Mawson Conference Room 3

Australian Antarctic Division – Channel Highway, Kingston

Introduction

- | | | | |
|----|--|-------|------------------|
| 1. | Preliminaries | | |
| | 1.1 Declaration of interests | Chair | For Discussion |
| | 1.2 Apologies | AFMA | For Information |
| | 1.3 Adoption of Agenda | Chair | For Decision |
| 2. | Minutes from SARAG 55 and June teleconference | AFMA | For Information |
| 3. | Action Arising | AFMA | For Discussion |
| 4. | Correspondence | AFMA | For Discussion |
| 5. | Update on fishing operations, incl CTD recorders (HIMI & MITF) | | |
| | | All | For Information* |

Macquarie Island Toothfish Fishery

- | | | | |
|----|----------------------------|-------|----------------|
| 6. | Toothfish stock assessment | CSIRO | For Discussion |
| 7. | Tagging study | CSIRO | For Discussion |

CCAMLR & Exploratory Fisheries

- | | | | |
|-----|--|------|-----------------|
| 8. | CCAMLR Exploratory Fisheries update | AFMA | For Information |
| 9. | Papers to WG-FSA, SC & CCAMLR 2017 | AAD | For Discussion |
| 10. | Update on East Antarctic genetics project proposal | AAD | For Information |

Heard Island and McDonald Islands Fishery

- | | | | |
|-----|---|-----|----------------|
| 11. | Update from WG-EMM & WG-SAM | AAD | For Discussion |
| 12. | Actions arising from HIMI stock assessment review | AAD | For Discussion |



- | | | | |
|-----|--|----------------|----------------|
| 13. | Final draft stock assessment for presentation to WG-FSA | AAD | For Discussion |
| 14. | Mackerel Icefish stock assessment | AAD | For Decision |
| 15. | Oceanographic & fisheries data conceptual model | Industry & AAD | For Discussion |
| 16. | Research requirements for revised grenadier
and skate assessments | All | For Discussion |

Research

- | | | | |
|-----|--|----------|-----------------|
| 17. | Recent research | All | For Discussion |
| 18. | Antarctic Fisheries 5 year strategic research plan | All | For Discussion |
| 19. | Annual Research Statement | All | For Discussion |
| 20. | Whale depredation project update | Industry | For Information |
| 21. | Joint Australia-France industry research action plan | AAD | For Information |
| 22. | Kerguelen Plateau Symposium update | AAD | For Information |

Environment

- | | | | |
|-----|--|------|-----------------|
| 23. | Environmental interactions and gear loss | AFMA | For Information |
|-----|--|------|-----------------|

Other

- | | | | |
|-----|----------------|-------|----------------|
| 24. | Other Business | Chair | For Discussion |
| 25. | Next Meeting | Chair | For Discussion |

* Verbal update, no agenda paper provided

