



**Australian Government**

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**Australian Fisheries Management Authority**

# **Small Pelagic Fishery Resource Assessment Group**

## **Meeting number 01**

**Meeting Minutes**

**5 December 2019**

**Parkroyal, Melbourne Airport**

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## Attendees

Name	Membership
Mr Max Kitchell	Chair
Mr Gerry Geen	Industry member
Mr Andrew Penney	Scientific member
Associate Professor Tim Ward	Scientific member
Professor Caleb Gardner	Economic member
Ms Anissa Lawrence	Conservation member
Ms Fiona Hill	AFMA member
Associate Professor Jeremy Lyle	Invited participant - IMAS
Mr Tony Muollo	Invited participant - Industry
Dr Latif Siddique	Executive Officer
Mr Nic Marton	Observer - ABARES
Ms Louise Cathro	Observer - AFMA

## Agenda item 1.1 – Welcome and apologies

The Chair opened the meeting at 9.00 am and welcomed participants. Members were advised the meeting was being recorded to assist with the preparation of the minutes, to which there were no objections. Apologies were noted from Ms Sally Weekes and Mr Malcolm Poole, as both of them were unable to attend due to the threat of bushfires in their areas of residence. Fiona Hill, Senior Manager Demersal and Midwater Fisheries attended the meeting as the AFMA member in Ms Weekes' absence.

## Agenda item 1.2 – Declarations of Interest

The SPFRAG members reviewed the members' and invited participants' declarations of interest as required in *Fisheries Administration Paper 12*, and all confirmed the information provided to be accurate.

The Chair asked participants to declare any conflicts of interest with items on the agenda. The participants confirmed their potential conflicts with agenda items as below:

### SPFRAG Members

Max Kitchell, Chair -

- No interest, pecuniary or otherwise, in the SPF.
- Chair of the Southern Bluefin Tuna Management Advisory Committee and AFMA's Ecological Risk Management Technical Working Group.

Mr Gerry Geen, industry member -

- A partner in Seafish Tasmania Pty Ltd that holds approximately 60 per cent of the SPF Jack Mackerel SFRs, 70 per cent of the Redbait (east) SFRs, 30 per cent of Blue Mackerel (east) SFRs and significant quota holdings in the western zone.
- Seafish Tasmania Pty Ltd owns a Southern and Eastern Scalefish and Shark Trawl Boat SFR.
- Declared potential conflicts with agenda item 4, especially 4.2, 4.3 and 7.

Ms Anissa Lawrence, conservation member -

- Independent consultant. Director of TierraMar Consulting and member on the South East Management Advisory Committee (SEMAC) and Great Australian Bight Management Advisory Committee (GABMAC).
- Undertakes contracts for a number of Conservation NGOs, government departments, non-government agencies and the private sector on a range of fishery related matters.
- No pecuniary interest.
- President of the Ocean Future Fund.

Andrew Penney, scientific member -

- Director of Pisces Australis (Pty) Ltd which has a potential interest in research in relation to the SPF.
- No pecuniary or other involvement in the fishing industry.

Associate Prof Tim Ward, scientific member -

- Leader of the finfish fisheries group in SARDI which undertakes research in the relation to the SPF including Daily Egg Production Method surveys.
- Conducts research for State fisheries and other jurisdictions.
- Member of South Australia Sardine Fishery Industry research/management committee.
- Advisor to Northern Territory on small pelagic fish and squid.
- Declared conflicts with agenda item 7.

Prof Caleb Gardner, economic member -

- No interest, pecuniary or otherwise, in the SPF.
- Employee of Institute for Marine and Antarctic Studies (IMAS), which conducts research on a range of fisheries issues including at times the SPF.

Mr Malcolm Poole, recreational member-Absent

## Invited participants

Associate Prof Jeremy Lyle -

- Senior Research Scientist, Institute for Marine and Antarctic Studies which undertakes research in relation to the SPF from time to time.
- Has led several research projects relevant to the SPF and is involved in the assessment of Tasmania's scalefish fishery.

Mr Tony Muollo -

- SPF quota holder and actively fishing in the fishery. Also involved in other fisheries.
- Declared potential conflicts with agenda item 4, especially 4.2, 4.3 and 7.

## Observers

Nic Marton (ABARES) -

- No interest, pecuniary or otherwise, in the SPF.

## AFMA staff

Ms Fiona Hill, Senior Manager, Demersal and Midwater Trawl Fishery -

- Employee of AFMA, no interest, pecuniary or otherwise, in the SPF.

Dr Latif Siddique, Executive Officer -

- Employee of AFMA, no interest, pecuniary or otherwise, in the SPF.

Ms Louise Cathro, Graduate -

- Employee of AFMA, no interest, pecuniary or otherwise, in the SPF.

## Managing declared conflicts during meeting

The members who had declared potential conflicts with agenda items were requested to leave the meeting while other members discussed their involvement in discussions and decision making processes and agreed that it was important for them to participate in discussions due to their expertise, but they would be excluded from making recommendations for the items they had declared potential conflicts.

## Agenda item 1.3 – Adoption of agenda

The agenda was adopted with no further changes.

## Agenda item 1.4 – Actions arising

The SPFRAG noted that there were no outstanding actions from the last SPF Scientific Panel meeting.

## Agenda item 2 – Roles and responsibilities of members

Chair introduced the paper and stressed on the following three main points referring the contents in the page 8-12 of Fisheries Administration Paper 12:

### Individual capacity

The SPFRAG members should act in the best interests of the fishery as a whole, rather than as an advocate for any particular organisation, interest group or regional concern.

### AFMA Commission's requirement

To assist the Commission in making informed decisions, SPFRAG advice should detail how it related to the pursuit of AFMA's legislative objectives.

### Confidentiality and non-disclosure

SPFRAG members receive confidential information as agents of AFMA and are therefore also required to follow AFMA's instructions as to its use.

In addition to the points mentioned above, the Chair also reminded the SPFRAG members that they have to treat everyone with respect and courtesy, and without harassment, as he considers such issues with zero tolerance.

The rationale for transitioning from a scientific panel to a RAG was also discussed and acknowledged that it was the decision of the AFMA Commission to return to the RAG model while maintaining the opportunity to consult with the SPF stakeholder forum on an as needs basis.

## Agenda item 3.1 – General overview of fishery and annual catch and effort update

The SPFRAG was provided with an update from AFMA on the following:

- A general overview of the SPF fishery.
- Ms Fiona Hill has replaced George Day as Senior Manager for Demersal and Midwater Fisheries, which includes the SPF.
- AFMA finalised the review of the Dolphin Mitigation Strategy in 2018-19.

### Catch and effort data

The operational, catch, effort and protected species update for the fishery was presented, the SPFRAG noted that:

- The percentage of TAC caught for each of the target species for the 2018-19 season to date is:
  - Sardine ~0.35%
  - Blue Mackerel East ~31.8%
  - Jack Mackerel East ~26%
  - Redbait East ~17.1%
- There was no effort in the western sector of the fishery in the 2018-19 season.
- Jack Mackerel east, Blue Mackerel east and Redbait east have mainly been caught off southern NSW. Sardines have mainly been caught off northern NSW.
- In 2018-19, the protected species interactions included one dolphin, 5 Australian fur seals, 12 New Zealand fur seals, 3 Shortfin Mako and 2 Shy Albatross.

Key discussion points were:

- **Seal interactions:** Committee questioned the accuracy of the fur seal identification given it can be difficult to separate species.
- **Shy albatross:** SPFRAG suggested that all efforts be made to improve species identification due to the high conservation status of certain albatross species.

## Agenda item 4.1 – Jack Mackerel East DEPM results

A/Prof Ward presented the results of the *Spawning biomass survey for Jack Mackerel East*.

Key points from the presentation were that:

- The 2019 DEPM survey improved the coverage of the spawning area compared to the 2014 survey but likely missed peak spawning season.
- The egg survey collected 921 live eggs from 107 of 206 stations. The spawning area was 36,100km<sup>2</sup>.
- A total of 1,087 adult fish were collected from the adult survey, including 575 female Jack Mackerel.
- The estimate of spawning biomass from the survey was 156,292 tonnes, slightly lower than the estimate for 2014 biomass 157,805 tonnes.
- The 1 estimate of egg production in 2019 of 15.1 eggs/day/m<sup>2</sup> is less than the 2014 results of 28.9 eggs/day/m<sup>2</sup>.
- The per day egg production per m<sup>2</sup> ( $P_0$ ) and spawning fraction ( $S$ ; proportions of female fish spawn in a given night) were lower than that in 2014, suggesting that the survey was conducted outside the peak spawning season.
- The egg production model with the narrowest confidence intervals was the General Linear Mixed Model with a negative binomial error distribution (GLM NB). The GLM NB model produced an estimate of egg production that was lower (more conservative) estimate of egg production than the non-linear least squares and three General Linear Models and slightly higher than the estimate for the log-linear model.
- The most plausible estimate for spawning biomass in 2019 was 156,292 tonnes, slightly less than the 2014 biomass estimate of 157,805 tonnes

**The SPFRAG recommended the spawning biomass estimate of 156,292 tonnes be used as the basis for the recommended biological catch (RBC).**



## Agenda item 4.2 – Annual Fishery Assessment - all stocks

A/Prof Tim Ward provided a summary of the annual assessment of each SPF stock.

The SPFRAG noted the outcomes of the annual fishery assessment and a summary of its discussions on each SPF stock is provided at Table 1 in the appendix.

Other discussion points regarding the annual assessment were:

- The DEPM spawning biomass estimates for Blue Mackerel (West) and Redbait (East) are dated.
- Field work is now complete for the DEPM survey of Blue Mackerel (East).
- Victorian catches for all SPF species have not been available since 2015/16.
- Stock structure of mackerel - Management boundaries are acceptable given current knowledge of stock structure however information presented on egg distribution, especially through Bass Strait, suggest stock boundaries may not be the same for all SPF species.
- Climate change implications - Despite the specific impact of climate change on SPF stocks not being clearly understood, the harvest strategy (conservative exploitation rates in combination with DEPMs and the annual fishery assessment) buffers against recruitment variation including from climate change.
- Juveniles caught - SPFRAG discussed the large proportion of JMK and BMK juveniles that were being caught in the new fishing operation in the East sub-area and speculated on a number of factors that could contribute to this such as distance from shore, depth and other spatial considerations.
- Weekly CPUE graph - the weekly CPUE graph is monitored for evidence of localised depletion. If a general decrease in CPUE occurs after consistent effort within a given grid cell, this may be evidence of localised depletion occurring. However, there are a number of factors, not just fishing effort that can influence CPUE.

### Acceptance of estimate of spawning biomass

The RAG accepted the estimate of spawning biomass from the DEPM survey for Jack mackerel (East) and the subsequent RBC resulting from the application of the maximum exploitation rate of 12% of the biomass (Table 1). As there were no new DEPM surveys for the other target stocks and no evidence arising from the annual fishery assessment that was cause for concern, the Committee also accepted the biomass, exploitation rates and RBC for those stocks as unchanged for the 2020-21 season.

## **Agenda item 4.3 – Recommended Biological Catches for all stocks in the Small Pelagic Fishery for the 2020-21 fishing season**

### **Recommended biological catches (RBC)**

The recommended biological catches (RBCs) for the 2020-21 fishing season and additional SPFRAG advice is presented in Table 1.

## **Agenda item 5.1 – Methodology to calculate state catch for TAC setting**

The AFMA member introduced the item seeking advice from the SPFRAG on how to calculate the state catch to be deducted from Recommended Biological Catches (RBCs) as part of the Total Allowable Catch (TAC) setting process.

In the SESSF a four year weighted average of state catch is used with the most recent year given the most weight, reducing down to year four, which is given the least weight. Currently, the SPF use a five year, non-weighted average of state catch.

The SPFRAG noted:

- South East Management Advisory Committee (SEMAC) had requested SPFRAG consider whether a four year weighted average may be more appropriate than the current method of calculating state catch to be deducted from the RBC.
- the logic behind the weighted average is that the most recent year's catch is likely to provide the best indication of the following years catch, particularly when there is any trend (increasing or decreasing) in State catches..

**The SPFRAG recommended that in order to ensure consistency with other fisheries, a four year weighted average should be used to estimate state catch to be deducted from the RBC as part of the TAC setting process for each stock.**

## Agenda item 5.2 – Triggers for bycatch and Ecological Risk re-Assessment

AFMA introduced this item seeking advice from the RAG regarding the triggers that could be used to indicate a potentially significant change in the risk posed by the fishery that would warrant a re-assessment of the Ecological Risk Assessment (ERA) for the fishery. The 'Guide to AFMAs Ecological Risk Management Framework' (AFMA 2016) requires RAGs to develop triggers for evaluation between regular ERA updates to indicate whether the fishery has changed in any way that could mean that the results of the previous ERA are no longer valid, and that the ERA may need to be updated to evaluate the changed fishery circumstances.

AFMA commissioned work to provide advice on what triggers might be appropriate to detect significant change in the operational characteristics of a fishery. To assist the discussion, Mr Andrew Penney presented the key findings from his 2018 report, 'Guidelines for ERA reassessment triggers for Commonwealth Fisheries':

### Operational characteristics of the SPF relevant to ERAs

- **Catch and effort correlation:** overlap of fishing area and catch and effort correlation is usually common for many fisheries, meaning that change in effort is an indicator of change in fished area. The SPF does not have a strong catch and effort correlation as it is still a developing fishery, with effort and fished area changing independently.
- **Changes in fishing method:** Most other fisheries also have a long history of stable gear type and vessel use. In contrast, the vessels and nets used in the SPF have changed in recent years. Any changes in SPF fishing method, such as new gear types or introducing large fishing vessels, which can fish further offshore than existing small vessels may warrant a new ERA.
- **Electronic monitoring:** Industry queried whether having electronic monitoring and observer coverage removes the need to undertake another ERA. The RAG discussed whether it may be more beneficial spending money to increase the review of electronic monitoring footage rather than doing ERA, should the need arise. It was noted, however, that these monitoring methods provide good information for use in ERAs, but that the ERAs still need to be run to provide advice on specific risk levels for each species. These risk ratings are an integral component underpinning AFMA's management approach for each species.

There was discussion about whether setting specific triggers was justified for this fishery at this stage, given its current low-risk status through the conservative HS settings and the degree of TAC undercatch. The RAG reviewed the draft ERA triggers checklist provided in Penney (2018) and recommended a number of revisions to tailor this checklist for use in the SPF.

#### SPFRAG recommended that:

1. That AFMA prepare a SPF-specific checklist based on the pro-forma provided in the report 'Guidelines for ERA reassessment triggers for Commonwealth Fisheries' and provide to the RAG for comments. Once agreed, the checklist will be reviewed by AFMA and presented to the RAG annually.

2. Both effort and area fished should be used as indicators for the SPF, but without specific triggers, Instead, AFMA should provide an annual table of effort and fished blocks by Zone over the recent few years in the annual checklist.
3. The 'Other Factors' section of the checklist should be replaced with a table of key bycatch species weights and the number of protected species interactions over the past few years as an additional means of monitoring for changes in the fishery that may warrant further review.

**Action: AFMA to prepare a checklist that can be reviewed annually, specific to the SPF, based on the pro-forma detailed in Attachment A of the 'Guidelines for ERA reassessment triggers for Commonwealth Fisheries' and provide back to the RAG for comments out of session.**

**Action: AFMA to include the updated list of bycatch species weight and number of protected species interactions as part of the annual update on catch and effort in the fishery, and summarise these in the ERA checklist.**

## Agenda item 5.3 – Monitoring requirements for small bycatch

This item was seeking RAG advice regarding the on-board monitoring requirements for small bycatch in the midwater trawl sector of the SPF as this is currently one of the key drivers of the level of on-board observer coverage (as opposed to EM). To assist the discussion Mr Penney presented the key findings from his report *Effect of different level of observer coverage on estimates of catch composition and protected species interaction rates in the Commonwealth Small Pelagic Fishery*. The key findings and discussion points were:

- **Practicality of small bycatch monitoring:** factory freezer boats sort and process fish on board, providing a very unique opportunity to view every part of the catch. Smaller wet boats pump the fish directly into the hold unprocessed so it is impractical to sort and document small bycatch. Rapid pumped discharge in port also makes it difficult to sample the discharge onshore, unless separate samples are bagged and frozen at sea for onshore processing.
- **Low bycatch:** Bycatch in general in the SPF is low, consists primarily of species assessed by ERA to be at low risk, and therefore monitoring efforts should rather be focused on protected species.
- **Random analysis of EM footage:** Random analysis is required of EM data and regular feedback should be provided to fishers regarding any improvements needed to be made. EM footage should be retained for long enough to ensure that additional analysis can be conducted if an unexpected increase in bycatches or TEP interactions is detected in initial analysis, or detected in some other way.
- **Increase or decrease observer coverage:** The RAG discussed whether there was a need to adjust the observer coverage based on the outcomes of the report. The RAG considered that with a range of monitoring tools in use, there was not a strong justification to increase the observer coverage from 10 per cent to 15 per cent. nor was there a basis to reduce the observer coverage from 10 per cent to 5 per cent other than for potential cost implications for the fishing industry.
- **Episodic increased coverage:** The option of applying episodic increased coverage every 4-5 years to provide reliable species composition data for ERAs, with reduced coverage in other years, was also considered.

**SPFRAG recommended to maintain the observer coverage level of 10 per cent for small bycatch until there is evidence to suggest another approach may be required.**

**Action: AFMA will develop a paper on options for observer coverage for the RAG to consider to facilitate a discussion on a more holistic approach for observer coverage in the SPF, which may include episodic observer coverage.**

## **Agenda item 6.1 – Scoping for review SPF harvest strategy**

Ms Fiona Hill introduced the paper seeking RAG advice about aspects of the harvest strategy that may need to be considered as a part of the review of the SPF harvest strategy.

Key points from the discussion were:

- **Revised Commonwealth Fisheries Harvest Strategy Policy (CFHSP):** the RAG were of the view that no substantial changes had been made to the CFHSP and consequently no significant changes would be required to the SPF harvest strategy.
- **Marine Stewardship Council's (MSC) recommendations:** The MSC identified that if catch for all three target species in the SPF reached the Tier 1 TAC levels, there is no mechanism to determine where the stock is in relation to its limit reference point, resulting in potential sustainability issue. As such, MSC requires that within three years of the above scenario occurring, that such a mechanism be introduced. The RAG noted that A/Prof Tim Ward has done some work to address such issues in the South Australian Sardine fishery, which may be an option for the SPF in the future. Prof Ward undertook to provide information on the approach taken in SA.

**SPFRAG recommended that no change to the SPF Harvest Strategy be made in relation to the MSC recommendations.**

**Action: A/Prof Ward to present at the next RAG meeting regarding how the SA Sardine Fishery addresses the issue of assessing where the stock is in relation to its limit reference point.**

**Action: AFMA to undertake a desktop study comparing the requirements of the CFHSP and the SPF Harvest Strategy, identify any gaps and prepare a paper for the RAG to consider and provide advice.**

## Agenda item 7 – Research priorities

AFMA introduced the paper on research priorities. SPFRAG recommended that:

- The 'Annual monitoring, reporting and assessment of marine mammal interactions, including effectiveness of mitigation' needs to be kept in the priority list as 'Essential'
- The DEPM survey for Blue Mackerel West should be in the priority list as 'High' for 2021-22, and if fishing does not occur in the western region it can be removed at a later date.
- The DEPM for Redbait East should be a high priority for 2020-21 to prevent the stock dropping to Tier 3 and becoming a limiting species for the fishery.

## Agenda item 8 – Other business

No items were raised under other business.

## Agenda item 9 – Next meeting

The SPFRAG noted the next meeting is scheduled for similar time in 2020 with the exact date to be decided later.

The Chair thanked participants and closed the meeting at 3:15 pm.



**Signed (Chairperson):**

**Date:**

## Appendix

Species	Assessment results	SPFRAG Advice	Recommendation for 2020/21
Jack Mackerel East	<p>Annual Fishery Assessment.</p> <p>DEPM survey for jack mackerel conducted in 2019.</p> <p>Preliminary results are ready in December 2019 with a best estimate of biomass of 156 292 tonnes.</p>	<p>The SPFRAG was provided with an overview presentation for Jack Mackerel East. There was an increase in catches in 2015/16 to 6 321 t that decreased to 2 751 t in 2017/18 and where 4 942 t in 2018/19 (without Victorian catch), well below the historical peaks of ~40,000 t in the 1986/87. Trawl effort in 2016/17 to 2018/19 was located off NSW. The 2018/19 catches were 3.16 per cent of the DEPM biomass estimate and 26 per cent of the TAC. There is no discernible trend in CPUE.</p> <p><b>SPFRAG accepted the 2018 biomass estimate of 156 c292 tonnes for Jack Mackerel East and that it was appropriate to apply the Tier 1 exploitation rate for the 2020-21 season.</b></p> <p>The Tier 1 exploitation for this stock is 12%.</p>	<p>First season at Tier 1 with the 2019 DEPM biomass estimate.</p> <p>RBC</p> <p>= 156 292 x 12%</p> <p>= 18 755 tonnes</p>
Jack Mackerel West	<p>Annual Fishery Assessment.</p> <p>DEPM survey for jack mackerel conducted in 2017</p> <p>Results provide a best estimate of biomass of 34 978 tonnes.</p>	<p>The SPFRAG was provided with an overview presentation for Jack Mackerel West. The SPFRAG noted that fishing effort continues to remain low in the western area with 2017/18 catch &lt;1 t and no fishing effort / catch for Jack Mackerel West in the 2018-19 and 2019-20 season. The most recent catch in the area was 634 t in 2015/16 and 686 t in 2016/17 (the previous peak was 365 t), the majority which was around Kangaroo Island.</p> <p>For the years there was effort, the CPUE is low but is reflective of the very low to effort in the area. There is no discernible trend in CPUE.</p> <p>The SPFRAG agreed that due to no fishing effort in the 2018-19 and 2019-20 seasons, there is no reason for concern for the stock.</p> <p>The SPFRAG supported the previous advice from Scientific Panel that:</p> <p><b>A DEPM survey for jack mackerel conducted in 2017 provided a best</b></p>	<p>Third season at Tier 1</p> <p>RBC</p> <p>= 34 978 x 12%</p> <p>= 4 197 tonnes</p>

Species	Assessment results	SPFRAG Advice	Recommendation for 2020/21
		<p>estimate of biomass of 34 978 tonnes (which is the 31, 069 plus the Bass Strait estimate) which was considered to be conservative given that the stock extends west of Kangaroo Island and a large amount of spawning activity was detected in Bass Strait which was not extensively sampled (and therefore the biomass estimate is an underestimate).</p> <p>The Tier 1 exploitation for this stock is 12%.</p>	
Blue Mackerel East	<p>Annual Fishery Assessment.</p> <p>Previous DEPM survey conducted in 2014.</p> <p>Estimated biomass 83 300 tonnes</p>	<p>The SPFRAG was provided with an overview presentation for Blue Mackerel East. Catch increased in 2015/16 and reached their highest in 2018/19 at 3 811t. The 2018/19 catch was 4.6 per cent of the DEPM biomass estimate and 31.8 per cent of the TAC with effort concentrated off NSW.</p> <p>The SPFRAG noted that it is remains difficult to draw conclusions from the length frequency and ageing data due to the variability in effort and fleets which would result in different sizes of fish being caught each year. There is no discernible trend in CPUE.</p> <p>Samples collected by the fishing vessel operating between 2015 and 2016 have been analysed and did not provide any further clarity around adult parameters consequently uncertainty around the adult parameters used in the calculation of biomass estimate remain. Further, that the samples do not support an increase to the exploitation rate in the harvest strategy. The then SPF Scientific Panel noted that the more precautionary exploitation rate adopted in the harvest strategy than the original MSE work suggested could be applied, accounts for the uncertainties in the DEPM biomass estimate.</p> <p><b>The annual assessment provided no basis to change the previous Scientific Panel's advice for this stock. The SPFRAG confirmed that the uncertainty associated with the adult parameters used in the DEPM remain however the DEPM survey biomass estimate of 83 300</b></p>	<p>Fifth season at Tier 1</p> <p>RBC</p> <p>= 83 300 x 15%</p> <p>= 12 495 tonnes</p>



Species	Assessment results	SPFRAG Advice	Recommendation for 2020/21
		<p>tonnes is appropriate to be used as the basis for providing RBC advice.</p> <p>The current exploitation rate of 15 per cent is considered to be precautionary (as shown by the MSE testing by Smith et al 2015) and accounts for uncertainties in the assessment.</p>	
Blue Mackerel West	<p>Annual Fishery Assessment.</p> <p>Estimated biomass 86 500 tonnes</p>	<p>The SPFRAG was provided with an overview presentation for Blue Mackerel West. Recent catches of this species have been very low, with 2018/19 catch &lt;1 t (previous peaks were ~2,000 t in 2006 and 2008). The RAG noted the difference in size structure for this species with much larger fish in the west that don't appear in the east.</p> <p>There were no discernible trends in the CPUE data (given very low effort).</p> <p>The SPFRAG noted that the most recent DEPM survey for this stock had been undertaken in 2005 and 2006. The RAG confirmed its previous approach which adopted a biomass estimate for blue mackerel of 86 500 tonne based on the results of the two surveys that covered most of the central part of the western spawning sub area.</p>	<p>Fourth season at Tier 3</p> <p>RBC</p> <p>= 86 500 x 3.75%</p> <p>= 3 243 tonnes</p>
Australian Sardines East	<p>DEPM survey conducted in 2015.</p> <p>Estimated biomass 49 575 tonnes</p>	<p>The SPFRAG was provided with an overview presentation for Australian Sardines East. Catches of this species peaked at 7 392 tonnes in 2016-17 due to a significant increase in Victorian State catch (previous peak of 4 690 tonnes in 2007/08). For 2018/19 total catch was 132 t (excluding Victorian catch data). Excluding the increase in 2016/17, catches were relatively stable at around 1 300 t from 2012-13 and 2015-16. The 2018/19 catch was 0.27% of the DEPM biomass estimate and 0.35% of the TAC. There were no discernible trends in the CPUE data.</p> <p>The RAG noted that Victorian catches have not been provided due to confidentiality concerns and the issue of data sharing is</p>	<p>Fifth season at Tier 1</p> <p>RBC</p> <p>=49 575 x 20%</p> <p>= 9 915 tonnes</p>

Species	Assessment results	SPFRAG Advice	Recommendation for 2020/21
		<p>becoming a concern in multiple jurisdictions for a number of jointly managed stocks.</p> <p>However, this has not been relevant to the RBC / TAC setting process for this Commonwealth stock since 2017 given the research showing the stock boundary corresponds broadly with the NSW / Victorian border.</p> <p>The RAG also noted that two DEPM surveys have been undertaken for this species, a southern area survey (biomass estimate 10,962) was undertaken at the same time as the 2014 jack mackerel survey (Ward <i>et al.</i> 2015a) and a northern area survey (biomass estimate 49,575) was conducted at the same time as the 2014 Blue Mackerel East survey (Ward <i>et al.</i> 2015b). It was noted that the southern estimate is likely an underestimate.</p> <p><b>The annual assessment provided no basis to change the then Scientific Panel's previous advice for this stock. The RAG confirmed its previous recommendation to use the biomass estimate from the northern survey to determine a RBC for the northern area and that only the NSW State catches should be taken off the RBC when setting the TAC.</b></p> <p><b>This recommendation was based on the research (Izzo <i>et al.</i>, 2017, Ward <i>et al.</i> in prep, and Sexton <i>et al.</i>, 2019) that provides indications of stock structuring, with a north stock and south eastern stock (with the stock spilt occurring around the NSW/Victorian border).</b></p>	
Redbait East	<p>DEPMs conducted in 2005 and 2006</p> <p>Estimated biomass 68 886 tonnes</p>	<p>The SPFRAG was provided with an overview presentation for Redbait East. The catches in recent years continue to be low compared to the peak catches of ~7700 t in 2003/04, although catches increased from negligible levels to 217 tonnes in 2015/16, 101 tonnes in 2016/17 and 10 tonnes in 2017/18. The 2018/19 SPF catch was 539 tonnes; 0.78%</p>	<p>Ninth season at Tier 2</p> <p>RBC</p> <p>= 68 886 x 5%</p> <p>= 3 444 tonnes</p>

Species	Assessment results	SPFRAG Advice	Recommendation for 2020/21
		<p>of the DEPM biomass estimate and 17.1% of the TAC.</p> <p>There were no discernible trends in the CPUE data, with highly variable fishing effort and catches for this species and very low catches over the last 6 years. The length frequency data shows large fish however there are low sample numbers. With very low catches there is no basis to change the then Scientific Panel's previous advice.</p> <p><b>The RAG noted the most recent biomass estimates from DEPMs in October 2005 and October 2006 of 86 990 tonnes and 50 782 tonnes, respectively. The annual assessment provided no basis to change the then Scientific Panel's previous advice for this species. The RAG confirmed that the approach used by SPFRAG of adopting the average of these DEPM estimates (68 886 tonnes) should be continued, and the Harvest Strategy Tier 2 harvest rate for redbait of 5 per cent be used as the basis for RBC advice.</b></p>	
Redbait West	<p>Annual Fishery Assessment.</p> <p>DEPM survey conducted in 2017</p> <p>Estimated biomass of 66 787 tonnes</p>	<p>The SPFRAG was provided with an overview presentation for Redbait West. The RAG noted that limited fishing for this stock has occurred over the last few years with no catch in 2018/19 and 2017/18. In recent years, catches increased to 1 157 in 2015/16 and 1 140 t in 2016-17 (from previous peaks of ~3,000 t in 2005-2007).</p> <p>The CPUE is variable due to the intermittent fishing effort for this species making trends difficult to discern from the data. The RAG agreed that due to this variability in the data and extremely low fishing effort in the fishery over recent years that there is no reason for concern with the stock.</p> <p><b>A new DEPM survey for this stock was completed in 2017 with the then Scientific Panel recommending a spawning biomass estimate of 66,787 tonnes be used for the recommended biological catch (RBC) based on the</b></p>	<p>Second season at Tier 1</p> <p>RBC = 66 787 x 10% = 6 678 tonnes</p>

Species	Assessment results	SPFRAG Advice	Recommendation for 2020/21
		<p>weight of evidence provided by the survey.</p> <p>With the new survey results accepted by the then Scientific Panel, this stock moved into Tier 1 under the Harvest Strategy with an exploitation rate of 10%.</p> <p>SPFRAG agreed that the annual assessment provided no basis to change the then Scientific Panel's previous advice for this stock as outlined above.</p>	

**Table 1 Summary of SPFRAG recommendations for the 2020-21 Recommended Biological Catches (RBC) for each of the seven target stocks in the Small Pelagic Fishery (SPF). RBCs inform the Total Allowable Catch setting process for the SPF.**