

**Small Pelagic Fishery
Scientific Panel (the Panel)
Meeting 10**

Meeting Minutes

Date: 26 November 2018

Venue: Holiday Inn, Melbourne Airport

8:30am – 5:30pm

Attendees

Name	Membership
Max Kitchell	Chair
Dr Jeremy Lyle	Scientific member
Associate Professor Tim Ward	Scientific member
Andrew Penney	Scientific member
Sally Weekes	AFMA member
Natalie Rivero	Executive Officer
Dr Sean Pascoe	Economic member
Professor Caleb Gardner	Invited expert
Rowan Chick	Observer NSW Fisheries
Nic Marton	Observer ABARES
Eddy Freeman	Observer AFMA observer program

Agenda Item 1.1 Welcome and apologies

The Chair opened the meeting at 8:30 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. No apologies were noted.

Agenda Item 1.2 Declaration of interests

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

The Chair asked participants to declare any conflicts of interest with items on the agenda. Caleb Gardener, Jeremy Lyle, Tim Ward and Andrew Penney confirmed potential conflicts with item 5 on research priorities. As per the approach from recent meetings, the Panel agreed that the input of all members to the prioritisation of research was necessary and agreed that all members and observers were able to participate in both the discussion and prioritisation of research under this item. Tim Ward excused himself from the discussion on the cost and frequency of the annual fishery assessments under the research priority agenda item.

Declarations of Interest

Participant & Membership	Interest declared
Max Kitchell, Chair	No interest, pecuniary or otherwise, in the Small Pelagic Fishery (SPF). Chair of the Southern Bluefin Tuna Management Advisory Committee and AFMA's Ecological Risk Management Technical Working Group.
Dr Jeremy Lyle, scientific member	Senior Research Scientist, Institute for Marine and Antarctic Studies (IMAS) 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 Andrew Penney, scientific member	Director of Pisces Australis (Pty) Ltd which has a potential interest in research in relation to the SPF.

Associate Professor Tim Ward, scientific member	Leader of the finfish fisheries group in South Australian Research and Development Institute (SARDI) which undertakes research in the relation to the SPF including Daily Egg Production Method (DEPM) 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.
Dr Sean Pascoe, economic member	No interest, pecuniary or otherwise, in the SPF. Employee of CSIRO which undertakes research in relation to the SPF from time to time.
Professor Caleb Gardner, invited expert	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.
Ms Sally Weekes, AFMA member	Employee of AFMA, no interest, pecuniary or otherwise, in the SPF.
Ms Natalie Rivero, Executive Officer	Employee of AFMA, no interest, pecuniary or otherwise, in the SPF.
Invited Observers	Interest declared
Mr Nic Marton	Scientist, ABARES which undertakes research work in relation to the SPF from time to time. No interest, pecuniary or otherwise, in the SPF.
Mr Rowan Chick	NSW fisheries, no interest, pecuniary or otherwise, in the SPF.
Mr Eddy Freeman	AFMA Observer, no interest, pecuniary or otherwise, in the SPF.

Agenda Item 1.3 Adoption of agenda

The agenda was adopted with no further changes and the Panel noted that an upcoming FRDC project proposal by A/Prof Tim Ward would be discussed under agenda item 5.

Agenda Item 1.4 Actions arising from previous meetings

The Panel noted that the last outstanding action item is near completion with new sample labels distributed to AFMA Observers to support biological sampling. The Panel noted that ongoing collection of biological samples in the fishery would be discussed under agenda item 4.2.

Agenda Item 2 Managers update

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

- The revised *Commonwealth Fisheries Harvest Strategy Policy and Guidelines* and *Commonwealth Fisheries Bycatch Policy* were released 21 November 2018 and links to the documents have been circulated to the Panel.
- The SPF Scientific Panel and Stakeholder Forum model review is now complete. The AFMA Commission decided to return to a Resource Assessment Group (RAG) model with a revision of Fisheries Administration Paper 12 (FAP12) to maintain the focus of all RAGs on the scientific, economic and other expert advice required, as well as to

retain the benefits from a broader forum to engage interested stakeholders as required. Based on this, there will be a transition from a Scientific Panel to a RAG by June 2019 with the revision of FAP 12 to be completed in that timeframe. The Panel noted that AFMA will put out a call for membership for the SPF RAG soon.

- The *Commonwealth Marine Mammal Working Group* (CMMWG) met in October with the main topics of discussion being the review of the SPF and Gillnet Dolphin strategies as well as the current Seal Excluder Device (SED) design used by the midwater trawler operating in the fishery. AMFA will be seeking public comment on the review of the Dolphin strategies and advice received from the CMMWG was that the current SED design used in the SPF is consistent with best practice.
- AFMA is in discussion with NSW regarding catch sharing arrangements for a range of species including Blue Mackerel and Sardines. A Fisheries Research Development Corporation (FRDC) project has been funded that aims to work through two case studies (Blue-eye Trevalla and Striped Marlin) to develop a framework for catch sharing between jurisdictions.
- Dr James Findlay has resigned as CEO of AFMA and will be taking up a position at Parks Australia. Ms Anna Wilock will be Acting CEO until the position is filled. Anna previously worked at AFMA and more recently has been working at the senior executive level in DAWR in various policy and program roles.
- Dr Nick Rayns, Executive Manager Fisheries has announced his retirement and will be finishing at AFMA on 30 November. George Day, Manager of Demersal and Midwater Fisheries will be acting in his position until it is filled.
- Senator Anne Ruston is no longer the appointed Assistant Minister for the Agriculture and Water Resources portfolio with Senator Richard Colbeck appointed to the role.

Agenda Item 2.1 Catch and effort in the SPF

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

- Up until December 2017 there was 100 per cent observer coverage of the midwater trawl sector at which point it was reduced to 20 per cent as per the ongoing level of coverage in the fishery. Review of electronic monitoring footage for protected species interactions remains at 100 per cent.
- A new purse seine boat has entered the fishery in Northern NSW. The operation is relatively small and intends to primarily target Sardines.
- Observer coverage targets in the purse seine sector are being pursued as a matter of priority with seven observer trips completed recently, five of which were on the new purse seine vessel as per the monitoring requirements of the fishery.
- The percentage of TAC caught for each of the target species for the 2018-19 season to date is:
 - Sardine ~1%
 - Blue Mackerel East ~6%
 - Jack Mackerel East ~10%
 - Redbait East ~<1%

- There has been no effort in the western sector of the fishery in the 2018-19 season.
- The key months in which target species are predominately caught. For Jack Mackerel east it is October to January and for Blue Mackerel east is February to April.
- Jack Mackerel east and Blue Mackerel east have mainly being caught off southern NSW (3 grids, mainly grid 105). Sardines have mainly being caught off northern NSW (2 grids).
- In 2017-18, the protected species interactions included seven dolphins caught over two sets as well as ten seals.
- The bycatch and by-product caught in the fishery from 2015-2018 overall is quiet low with good species breakdown observed.

Agenda Item 3.1 Accounting for discards in the TACs

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

AFMA highlighted an issue with the method previously recommended by the Panel which related to the different discard profiles between midwater trawl and purse seine methods and the intermittent midwater trawl effort.

The Panel noted that:

- Discards in the SPF are currently very low (generally less than 5 per cent of total catch). Only when discards become larger than the uncaught TAC do they become of concern.
- Generally discards are related to total catch so if discards are to be accounted for, a rate based approach, rather than an absolute tonnage deduction, is more appropriate. This is also consistent with the approach adopted in other fisheries.
- In light of its previous advice regarding how to estimate discards (by calculating a rate based on retained and discarded catch from the previous three seasons and applying that to the RBC), the Panel acknowledged the issue that arose when trying to apply this approach without accounting for the differences between the different methods in the fishery and the abrupt changes in the fleet.
- Consequently, the **Panel recommended that the discard rate should be calculated by vessel type to account for the differences in mid-water trawl and purse seine operations. In applying the discard rate, if there is to be no fishing expected by a sector in the upcoming season, the discard rate for the respective sector not be applied.**

Agenda Item 3.2 Redbait west DEPM results

A/Prof Tim Ward presented the results of the *Spawning of redbait west between Kangaroo Island and Southern Tasmanian* survey.

Key points from the presentation were that:

- The survey collected 3,280 live eggs from 113 sites and provided a preliminary DEPM spawning biomass estimate for Redbait West.
- There were no obvious breaks in distribution observed in the survey and no eggs collected in Bass Strait. These results differ from the recent Jack Mackerel survey where a stock separation was observed. From the survey, Redbait West appear to have a more continuous spawning distribution over a larger area.
- The resulting spawning biomass estimates were largely driven by model selection and overall they provided conservative estimates of biomass.
- The most plausible model biomass estimate ranged between 51,765 tonnes and 102,867 tonnes. With no solid reason to reject either estimate and for consistency with the approach taken with other stocks, the median biomass estimate of 66,787 tonnes was used as the basis for the Panel's recommended biological catch level.

The Panel recommended the spawning biomass estimate of 66 787 tonnes be used as the basis for the recommended biological catch (RBC). This tonnage is based on the weight of evidence provided by the DEPM survey.

Agenda Item 3.3 Annual fishery assessment- all stocks

A/Prof Tim Ward provided a summary of the annual assessment of each SPF stock. The Panel noted the outcomes of the annual fishery assessment and a summary of its discussions on each SPF stock is provided at Table 1. Essentially there was nothing identified in the annual assessment that resulted in a change to the Panel's previous advice for each stock.

Agenda Item 3.4 Blue Mackerel East harvest rate

The Panel noted the background for this item in which SEMAC recommended the Panel consider if the samples of Blue Mackerel East collected by the Geelong Star provide adequate information to reduce the uncertainty associated with the biology of this stock. This uncertainty was the reason a more precautionary Tier 1 exploitation rate of 15 per cent was adopted in the harvest strategy rather than 23 per cent as suggested by the initial Management Strategy Evaluation testing of the harvest strategy. If the uncertainty can be reduced then a less conservative harvest rate could potentially be adopted.

A summary of the Panel's discussion on the Blue Mackerel east harvest rate is provided with the RBC recommendation for the species in Table 1.

Agenda Item 3.5 RBC Recommendations 2019-20

The recommended biological catches (RBCs) for the 2019-20 fishing season and additional Panel advice is presented in Table 1.

Agenda Item 4.1 SPF Data and monitoring strategy

AFMA presented this item and the Panel noted that:

- As part of the development of a Fisheries Management Strategy (FMS) for each fishery, a data and monitoring strategy will be required for each fishery.

- AFMA is intending to incorporate all the work that has been completed on various aspects of data collection in the SPF into a draft strategy for consideration by the Panel in 2019.
- A number of items relevant to the data and monitoring strategy are to be discussed at this meeting and AFMA will use the meeting's outcomes as a basis to form the draft strategy.

Agenda Item 4.2 Biological sampling of commercial species to support annual fishery assessments

The Panel considered the current biological sampling regime in the fishery with A/Prof Tim Ward presenting a cost benefit analysis to determine the number of samples required for biological sampling in the fishery to support the annual fishery assessment.

The key points from the discussion were that:

- The sampling regime has varied in the fishery over time adjusting for the practicality of AFMA Observers collecting a large number of samples (for both biological sampling but also for catch composition sampling which is discussed further under item 4.3).
- The current level of sampling in the fishery was considered to be manageable from a practical operational perspective.
- The analysis was able to determine the corresponding mean standard error in varying the number of samples used to estimate age and length for each species. The number of samples to reduce the coefficient of variation (CV) varied by species and when estimating either length or age.
- It was found that for Jack Mackerel and Blue Mackerel, collecting 30 samples of 20 fish per sample per fishing location provided a narrow CV when estimating length. For age, the analysis showed that 5 samples of fish across species was adequate to provide an estimate of age with a narrow CV.
- The cost of preparing, analysing and reporting on 30 samples of 20 fish for length estimates and 5 aged fish across all species is ~\$12, 900.
- Sampling should be spread evenly over the year to reduce seasonal variability.
- If the fishery expands significantly, there may be changes to the age structure within species over time. Collecting age samples now, even if they are not analysed at this point, will allow for any changes to be identified and modelled.

The Panel considered each of the key questions presented by AFMA with respect to biological sampling and the Panel's advice and recommendations are provided in Table 2, Attachment A.

Agenda Item 4.3 Catch composition sampling to support logbook reporting

The Panel noted the outcomes of work completed in April 2018 by Andrew Penney in which AFMA sought advice on the design of an ongoing sampling program to obtain reliable

estimates of species composition of catches of quota species in the Small Pelagic Fishery for the purpose of quota decrementation.

The Panel noted the outcomes of the work that recommended:

- Sampling must be designed to take a number of reasonably evenly spaced samples across the duration of the pumping process. The number of samples to be taken across each shot increases if you want to capture the more rare species caught.
- It is recommended that a coefficient of variation (CV) of <10% in the main species proportions should be the target in designing the sampling protocol. It was demonstrated that the higher the species contribution to a shot, the less samples you need to achieve a CV of 10%. For example when Jack Mackerel contributed ~70% of the total sample, a CV of 10% was achieved with two samples.
- Analyses further indicate that a CV < 10% should be obtainable for all species contributing 10% or more to the overall shot by collecting eight samples per shot.
- If eight samples totalling 150kg cumulative weight are to be taken, individual sample weights should be around 20kg. If sample weights are limited to 15kg, then 10 samples should be taken.
- Sampling must be designed to minimise the risk of bias in selection of fish when each sample is taken.

In discussing the results the Panel noted that:

- Previously AFMA Observers were collecting 30kg samples that were too heavy and also taking 15 samples which was too many samples to practically continue.
- If a species makes up more than one third of the catch then 4 or 5 samples will achieve an acceptable CV and that most of the time, the two target species make up more than one third of the catch.

The Panel's recommendations with respect to catch composition sampling for quota decrementation purposes is provided in Table 2.

Agenda Item 4.4 Coverage levels (EM and Observers)

The Panel considered the data collected through the current electronic monitoring (EM) program and on-board observers in the fishery.

Key points of discussion were:

- The EM footage reviewed to date provided a high level of consistency with logbook reported protected species interactions in the fishery.
- There is evidence from international work that 10 per cent review of EM footage increases the accuracy of reporting in logbooks (note that the cameras are on all the time but only 10 per cent of the footage is reviewed and fishers do not know which 10 per cent is reviewed).
- For small bycatch and by-product species, catch composition information should continue to come from observer collected samples rather than from EM footage review as the presence of smaller species would be difficult to capture and identify with EM.

- Observers are not required to collect biological samples as no on-board processing of samples is required (just whole fish put into bags and frozen) and industry have indicated they would be willing to provide the samples going forward.
- If industry collected the samples required to support the annual fishery assessment, observer coverage for this purpose would not be required with no risk posed to the assessment.

The Panel considered each of the key questions presented by AFMA with respect to coverage levels and the Panel's advice and recommendations are provided in Table 2

Agenda Item 4.5 Monitoring triggers (Jack Mackerel West and ERA)

Jack Mackerel West monitoring trigger

AFMA introduced this item seeking Panel advice on potential indicators that can be used to make more informed judgements on the potential stock structure and depletion (and consequently devise an appropriate management response) of Jack Mackerel West off Kangaroo Island. This is following the DEPM survey results which showed a gap in egg distribution between Kangaroo Island and Bass Strait which lead the Panel to hypothesize that the east / west stock boundary for this species may be further west than the current boundary through central Tasmania. Consequently, the Panel previously recommended that the catch of Jack Mackerel West be restricted to 20 per cent of the RBC in the two grids south of Kangaroo Island until more is known about the biomass and / or stock structure in this area.

Key points from the discussion were:

- The catch limit (20 per cent of the RBC) was based on the spawning biomass in the area, with 20 per cent of the RBC being equivalent to the proportion of the total spawning area found during the DEPM survey represented by this area.
- Regarding triggers for detecting depletion, an individual Panel members' out of session advice in July regarding this matter was that if the catch limit is reached, temporal trends in catch and CPUE by species in this area should be examined for evidence of stock depletion. The Panel considered this approach appropriate, noting that the annual fishery assessment monitors catch, CPUE, age and length frequencies and spatially and temporally for evidence of depletion and increased fishing effort in the western zone of the fishery and specifically off Kangaroo Island would be examined as a part of the normal monitoring in the fishery.
- Regarding stock structure, the Panel considered that there are no suitable triggers that would clarify stock structure but rather it would require a dedicated project including such things as a genetic comparison of fish taken from different geographical locations. It was noted that this type of work would be costly to undertake and in the absence of any serious fishing in the area would not currently be justified.
- The fishing operators should be made aware of the 20 per cent cap off Kangaroo Island.

The Panel recommended:

- That the previous advice to restrict Jack Mackerel West catch to 20 percent of the RBC in the two grids south of Kangaroo Island until more is known about the biomass and / or stock structure in this area be retained.
- There is not a suitable trigger for determining stock structure but rather, a dedicated project would be required. However, until such time as there is an increase in fishing effort off Kangaroo Island or the western part of the fishery more broadly it would not be justified to pursue such work.
- That monitoring for evidence of depletion spatially and temporally continue to be undertaken as part of the annual fishery assessment and that an increase in fishing effort off Kangaroo Island would be the trigger for the Panel to examine this area explicitly for evidence of depletion.

Potential triggers for re-doing an Ecological Risk Assessment (ERA) in the SPF

The Panel noted that triggers for reassessments of fisheries under the revised ERA framework will be an item for discussion at the upcoming ERA Steering Committee meeting on 28 November 2018. As advice from the Steering Committee will inform discussions by the Panel this item was deferred until advice from the Committee was forthcoming.

Agenda Item 5.1 2020-21 Research priorities

Under this item the Panel provided preliminary advice on the 2020-21 research priorities for the SPF noting that there will be the opportunity for further Panel comment on these priorities at the January meeting or out of session if required. In discussing the priorities, the Panel considered the current schedule for DEPM surveys in the fishery as well as the request from SEMAC that the Panel provide advice on the cost and necessity of conducting annual fisheries assessments.

Key points raised in relation to DEPM surveys:

- Industry has expressed a keen interest in undertaking a DEPM for Jack Mackerel East in early 2019 to ensure that the TAC will not halve in 2020-21 as is currently scheduled and that they will pay directly for the field component of the project given that the timing means it is not in AFMA's 2018-19 budget. However, they would be looking to get the analysis and report component funded by AFMA in 2019-20.
- A decision as to whether the AFMA will commit to funding the analysis and write up for the project in the 2019/20 financial year will not be made until the AFMA Research Committee (ARC) meeting in March 2019.
- The survey for Blue Mackerel East was identified as a priority for funding in 2019-20 with a decision on funding also to be made at the March 2019 ARC meeting.
- Blue Mackerel West is scheduled for 2020-21 and will be subject to industry interest in completing the DEPM and effort in the western sector of the fishery.
- With the Redbait West survey now completed, all stocks have an updated DEPM survey. The order of the DEPM surveys, as per the Harvest Strategy framework, allow the level of investment in research and assessment to be varied to match commercial interest, unless otherwise identified by the Panel.

In relation to SEMAC's question on the cost and necessity of conducting annual fisheries assessments, the Panel noted:

- DEPM surveys for one stock occur at least five years apart and the annual fishery assessment provides an important means of monitoring key indicators in between times to ensure that there has been no change to stock status.
- Presently, the Panel formulate its advice based on information in a presentation at the face-to-face meeting. The final report that follows some months later is not used as the basis for the Panel's advice and also contains more detail than necessary. An abbreviated report based primarily on the presentation with a summary of key findings is a suitable option for the future.
- The reduction in samples for age and length frequencies recommended under Agenda item 4.2 is expected to decrease the cost of the annual assessment.

Other key points discussed by the Panel regarding research priorities were:

- The use of acoustic surveys to estimate biomass of small pelagics in Australian conditions is of limited use given the vast geographic area over which stocks occur, the tendency to aggregate less densely than small pelagics elsewhere in the world and the mixed nature of schools. Any potential cost savings by using acoustics would be traded off for more uncertain results than are achieved through DEPM surveys. In light of this, the Panel did not support a potential pilot study using a sail drone to examine the feasibility of using acoustics to assess biomass in this fishery.
- A/Prof Tim Ward noted that he would be submitting a project proposal through to FRDC that would be using DNA barcoding to identify all species present in a large number of samples collected through previous DEPM surveys in the SPF and other fisheries. The aim of the project would be to provide a snap shot of species composition over time and could be used to inform future surveys in the SPF and also provide a valuable information for a range of other species relevant to both state and Commonwealth fisheries.

The Panel recommended:

- **Maintain the current order of DEPM surveys but noting that it may change given the Harvest Strategy allows the level of investment in research and assessment to be varied to match commercial interest in exploiting the resource while generating the information required to manage each stock. The current schedule is:**
 - **Jack Mackerel East 2018-19**
 - **Blue Mackerel East 2019-20**
 - **Blue Mackerel West 2020-21**
- **Retain the annual monitoring and assessment of the fishery as an ongoing priority noting that the project could be simplified in light of the revised sampling requirements and abbreviated report.**
- **Add an additional research priority to improve the level of information regarding the distribution of small pelagic species to the west of Kangaroo Island, in the western quota zone. This project would use a method such as DNA barcoding to identify all species present in a large number of samples collected through other research projects. This project will provide valuable information on species distribution in a cost effective manner which can then be used to design more targeted DEPM surveys of stocks in this area. This project replaced the previous priority which had a similar objective of improving the level of**

understanding about stocks west of Kangaroo Island but with more conventional methods of sorting and identifying eggs.

Agenda Item 5.2 Annual Fishery Assessment schedule

The annual fishery assessment schedule was noted in the discussion of research priorities under Agenda item 5.1.

Agenda Item 6 Agenda and presentation for stakeholder forum

The Panel considered the draft agenda for the upcoming Stakeholder Forum meeting scheduled for 10 December 2018 to be held in Sydney.

The Panel agreed the following items for discussion and identified who would present as follows:

- Tim Ward- Redbait west DEPM survey results and Annual assessment of SPF stocks.
- Max Kitchell- Introduction of SPF Scientific Panel members and outcomes from last Forum meeting and RBC advice.
- Andrew Penney- Future research priorities and DEPM schedule as well as data and monitoring in the SPF including biological and catch composition sampling.
- Sally Weekes- AFMA manager update that includes a protected species update and overview of how discards are accounted for in the TAC setting process.

Agenda Item 7 Other Business

No items were raised under other business.

Agenda Item 8 Next meeting

The Panel noted the next meeting is scheduled for 17 January 2019 and will likely be a teleconference.

The Chair thanked participants and closed the meeting at 3:20 pm.

Signed (Chairperson):

Date:

Table 1: Summary of Scientific Panel's recommendations for the 2019-20 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.

Species	Assessment results	Panel Advice	Recommendation for 2019/20
Jack Mackerel East	<p>Annual Fishery Assessment.</p> <p>DEPM survey for jack mackerel conducted in 2014.</p> <p>Results published in March 2015 with a best estimate of biomass of 157 805 tonnes.</p>	<p>The Panel was provided with an overview presentation for Jack Mackerel East. There was an increase in catches in 2015/16 to 6,321 t, which has since been decreasing with a total catch of 2,751 t in 2017/18, well below the historical peaks of ~40,000 t in the 1986/87. Trawl effort in 2016/17 and 2017/18 was located off NSW. The 2017/18 catches were 1.74 of the DEPM biomass estimate and 14.5% of the TAC. There is no discernible trend in CPUE.</p> <p>The species is now at the fifth season and Tier 1 and the Panel noted that industry have expressed they would like a new survey to be conducted in January 2019 to keep the species at the Tier 1 level.</p> <p>The Panel's advice for Jack Mackerel East was:</p> <p>The DEPM and associated adult sampling provided robust estimates of key parameters. Results published in March 2015 with a best estimate of biomass of 157 805 tonnes.</p> <p>The annual assessment provided no basis to change the Panel's previous advice for this species. The Panel agreed that the DEPM survey results were appropriate for setting jack mackerel RBCs under the Harvest Strategy for the 2019-20 season.</p>	<p>Fifth season at Tier 1</p> <p>RBC</p> <p>= 157 805 x 12%</p> <p>= 18 937 tonnes</p>
Jack Mackerel West	<p>Annual Fishery Assessment.</p>	<p>The Panel was provided with an overview presentation for Jack Mackerel West. The Panel noted that, there is continued low effort in the western area with 2017/18 catch <1 t despite the increase in catches to 634 t in 2015/16 and 686 t in 2016/17 (the previous peak was 365 t). A majority of the recent fishing effort was around Kangaroo Island.</p>	<p>Second season at Tier 1</p> <p>RBC</p>

Species	Assessment results	Panel Advice	Recommendation for 2019/20
	<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 CPUE is low but is reflective of the very low effort in the area. There is no discernible trend in CPUE.</p> <p>The Panel agreed that due to this variability in the data and sporadic fishing effort in the fishery over recent years that there is no reason for concern with the stock. The Jack mackerel west trigger was further discussed under Agenda item 4.5.</p> <p>The Panel reiterated their previous advice that:</p> <p>A DEPM survey for jack mackerel conducted in 2017 provided a best 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>On the basis of the information provided, the Panel agreed that the DEPM survey results were appropriate for setting jack mackerel RBCs under the Harvest Strategy for the 2019/20 season.</p> <p>The Tier 1 exploitation for this stock is 12%.</p> <p>Considering the limited information on jack mackerel to the west of Kangaroo Island and the spatial separation of the two key spawning areas (Kangaroo Island and western Bass Strait) which may be evidence of a stock structuring, the Panel recommended that, until more is known about the biomass and / or stock structure of jack mackerel west, the catch taken to the west of the Bonney coast should be restricted to 20 per cent of the RBC. This is equivalent to the proportion of the total spawning area found during the DEPM survey that was represented by this area.</p>	<p>= 34 978 x 12%</p> <p>= 4 197 tonnes</p>

Species	Assessment results	Panel Advice	Recommendation for 2019/20
Blue Mackerel East	<p>Annual Fishery Assessment.</p> <p>DEPM survey conducted for blue mackerel in 2014.</p> <p>Estimated biomass 83 300 tonnes</p>	<p>The Panel was provided with an overview presentation for Blue Mackerel East. The catches peaked in 2017/18 at 3,119 t (previous peak of 2,368 t in 2015/16). The 2017/18 catches were 3.74% of the DEPM biomass estimate and 24.9% of the TAC with effort in 2016/17 and 2017/18 concentrated off NSW.</p> <p>The Panel noted that it 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 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>The annual assessment provided no basis to change the Panel's previous advice for this species. The Panel confirmed that the uncertainty associated with the adult parameters used in the DEPM remain however the DEPM survey biomass estimate of 83 300 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>	<p>Fourth season at Tier 1</p> <p>RBC</p> <p>= 83 300 x 15%</p> <p>= 12 495 tonnes</p>
Blue Mackerel West	Annual Fishery Assessment.	The Panel was provided with an overview presentation for Blue Mackerel West. Recent catches of this species have been very low, with 2017/18 catch <1 t (previous	Third season at Tier 3

Species	Assessment results	Panel Advice	Recommendation for 2019/20
	Estimated biomass 86 500 tonnes	<p>peaks were ~2,000 t in 2006 and 2008). The Panel noted that the size structures 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 Panel noted that the most recent DEPM survey for this stock had been undertaken in 2005 and 2006. The Panel confirmed its previous support of the SPFRAG 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 western spawning area.</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 Panel 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 catches (previous peak of 4,690 tonnes in 2007-08). For 2017/18, total catch is 429 t (excludes 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 2017-18 SPF catches were 0.86% of the DEPM biomass estimate and 4.33% of the TAC, with the total catches of Australian sardines 14.9% of the DEPM biomass. There were no discernible trends in the CPUE data.</p> <p>The Panel noted that Victorian catches have not been provided due to confidentiality concerns and the issue of data sharing is becoming a concern in multiple jurisdictions for a number of jointly managed stocks. However, this is not relevant to the RBC / TAC setting process for the Commonwealth given the stock boundary corresponding broadly with the NSW / Victorian border.</p> <p>The Panel 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 recent 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 Blue Mackerel East survey (Ward <i>et al.</i> 2015b). It was noted that the southern estimate is likely an underestimate.</p>	<p>Fourth season at Tier 1</p> <p>RBC</p> <p>=49 575 x 20%</p> <p>= 9 915 tonnes</p>

Species	Assessment results	Panel Advice	Recommendation for 2019/20
		<p>The annual assessment provided no basis to change the Panel's previous advice for this species. The Panel 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.</p> <p>This recommendation was based on recent research (Izzo et al. 2017, Ward et al. in prep, and Sexton et al. submitted to Fisheries Oceanography) that provides indications of stock structuring, with a north stock and south eastern stock (with the stock spilt occurring around the NSW/Victorian border).</p>	
Redbait East	<p>DEPMs conducted in 2005 and 2006</p> <p>Estimated biomass 68 886 tonnes</p>	<p>The Panel 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 and 101 tonnes in 2016/17, however 2017/18 catches are again low at 10 tonnes. The 2017/18 SPF catches were 0.02% of the agreed DEPM biomass estimate and 0.3% 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 5 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 Panel's previous advice.</p> <p>The Panel 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 Panel's previous advice for this species. The Panel 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.</p>	<p>Eighth season at Tier 2</p> <p>RBC</p> <p>= 68 886 x 5%</p> <p>= 3 444 tonnes</p>

Species	Assessment results	Panel Advice	Recommendation for 2019/20
Redbait West	<p>Annual Fishery Assessment.</p> <p>DEPM survey conducted in 2017</p> <p>Estimated biomass of 66 787 tonnes</p>	<p>The Panel was provided with an overview presentation for Redbait West. The Panel noted that limited fishing for this stock has occurred over the last few years with no catch in 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 Panel 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>A new DEPM survey for this stock was completed in 2017 with the Panel recommending a spawning biomass estimate of 66,787 tonnes be used for the recommended biological catch (RBC) based on the weight of evidence provided by the survey.</p> <p>With the new survey results accepted by the Panel, this species moves into Tier 1 under the Harvest Strategy with an exploitation rate of 10%</p>	<p>First season at Tier 1</p> <p>RBC</p> <p>= 66 787 x 10%</p> <p>= 6, 678 tonnes</p>

Table 2: Scientific Panel recommendations regarding the data collection and monitoring requirements for the Small Pelagic Fishery.

Group	Data type	Data need	Current regime	Questions to be considered	Panel recommendation
Commercial species	Biological Samples	Collection of samples of quota species to support	- Length frequency sampling of 60 individual Jack	(1) How many biological samples are required for ongoing collection?	(1) Based on the outcomes of the work completed by A/Prof Tim Ward, the Panel

Group	Data type	Data need	Current regime	Questions to be considered	Panel recommendation
		annual assessment of quota species	Mackerel, Redbait and Blue Mackerel per shot - 50 samples of Mackerels and Redbait from each shot	<p>(2) What spatial and temporal coverage do we need to provide confidence in the data collected?</p> <p>(3) Will crew collected samples be adequate for the annual assessment of quota species?</p> <p>(4) In light of the frequency (and costs) of DEPM, should we adjust the level of data collection and analyses in annual assessments? (this question was raised by SEMAC at their most recent meeting)</p>	<p>recommended 30 samples of 20 fish for length estimates and five samples for ageing.</p> <p>(2) Sample collection should be spaced evenly over time to reduce the seasonal variability in the results. Samples will also need to be taken at each new fishing location (spatial grid) where practical to do so.</p> <p>(3) Yes, crew based sampling would be adequate as no on-board processing of samples is required. It would be particularly useful to have the crew collect samples if observer coverage were to vary in the future.</p> <p>(4) Length and age samples should continue to be collected and analysed on an annual basis (see Panel's discussion under Agenda item 5.1) but the number of samples should be adjusted as described above (Recommendation 1).</p>

Group	Data type	Data need	Current regime	Questions to be considered	Panel recommendation
	Catch composition sampling	Provide an estimate of catch composition for the purposes of logbook reporting and quota decrementation	<p>Observer sampling comprised of:</p> <ul style="list-style-type: none"> - 3 x 30kg samples taken at five points (evenly spread) during pumping of each shot. - Species composition and weight of each 30kg sample recorded. - Observers extrapolate the total retained catch from the sub samples taken. - Crew based samples record total weight samples and proportion of each species. 	<p>(5) How many samples (weight and number) are adequate to obtain a reliable estimate of species composition?</p> <p>(6) Can we verify species composition sampling using EM (If crew were to undertake the sampling)?</p>	<p>(5) The outcomes of the catch composition sampling project showed that eight samples of 15kg each would provide confidence that the composition of the main target species are being captured. For bycatch species, the Panel recommended the use of observer collected samples to maintain confidence in catch composition sampling.</p> <p>(6) For the main target species, yes. Smaller bycatch species will be difficult to verify using EM only and for this reason observers should continue to collect this information.</p>
Bycatch/ Byproduct species	Catch composition	Provide accurate data on the catch of non-quota species	- Large bycatch recorded during 100% review of EM footage and reported in logbooks and by observers.	(7) Can EM verify the bycatch/byproduct species reported in logbooks?	(7) Larger bycatch items reported in logbooks are able to be verified through EM however to verify smaller bycatch/by-product species caught, observer coverage would be required. The Panel

Group	Data type	Data need	Current regime	Questions to be considered	Panel recommendation
Protected species	Interactions	Verify logbook reported interactions	<ul style="list-style-type: none"> - Interactions recorded in logbooks (additional interaction evaluation report for Dolphins) -20% Observer coverage verifies interactions, seabird mitigation procedures, pre-shot/pre-haul marine mammal observation, determine effectiveness of mitigation devices (SED, Pingers) -100% EM review of protected species verifies interactions. 	<p>(8) Can EM provide the same confidence in detecting interactions as on-board observer coverage?</p> <p>AFMA is proposing that EM coverage is reduced to 10% based on a preliminary assessment of the reviewed footage to date and evidence from international work that has explored the review level of footage required for accurate reporting in logbooks.</p>	<p>recommended 10 per cent ongoing on-board observer coverage for this purpose.</p> <p>(8) The EM footage reviewed to date in the fishery has shown a high level of consistency with logbook reported interactions. The Panel agreed with AFMA's recommendation to reduce the review of EM footage for TEP interactions to 10 per cent.</p>