



**Australian Government**

**Australian Fisheries Management Authority**

**Small Pelagic Fishery  
Scientific Panel (the Panel)  
Meeting 5**

**Meeting Minutes**

**Date: 15/16 December 2016**

**Venue: CSIRO Castray Esplanade, Hobart**

**Time: 9:00am – 5:00pm (Day 1 – AEST)**

**08:30 - 12:00pm (Day 2 – AEST)**

## Attendees

Name	Membership
Max Kitchell	Chair
Dr Jeremy Lyle	Scientific member
Andrew Penney	Scientific member
Associate Professor Tim Ward	Scientific member
Dr Sean Pascoe	Economic member
Sally Weekes	AFMA member
Darci Wallis	Executive Officer
Professor Caleb Gardner	Invited expert
Andy Moore	Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)
Dr Simon Nicol	Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)
George Day	AFMA
Melissa Maly	AFMA
Paul Ryan	AFMA
Dr Cathy Bulman	Commonwealth Scientific and Industrial Research Organisation (CSIRO)
Dr Rich Hillary	Commonwealth Scientific and Industrial Research Organisation (CSIRO)
Dr Rich Little	Commonwealth Scientific and Industrial Research Organisation (CSIRO)
Dr John Stewart	New South Wales Department of Primary Industries

### Agenda Item 1.1 Welcome and apologies

The Chair opened the meeting at 9:05 am and welcomed participants. Members were advised the meeting was being recorded to assist with the preparation of the minutes, there were no objections.

### Agenda Item 1.2 Declaration of interests

The Panel reviewed the table of members' and invited participants' standing declarations as required in *Fisheries Administration Paper 12*. The Chair asked participants to declare any conflicts of interest with items on the agenda or to declare conflicts of interest that were not recorded in the provided table. The research interests of members and observers were noted. Given the interests declared by Tim Ward, Caleb Gardner and Jeremy Lyle regarding the research agenda item in that they participate in DEPM surveys, it was agreed that they should be present for the discussion on DEPM surveys but not participate in ranking the priority of them. Given the interests declared by Andrew Moore and Andrew Penney regarding the research agenda item in that they may submit a research application for the spatial impact of fishing or development of fisheries indicators projects, it was agreed that they should participate for the discussion and not participate in the ranking of research priorities.

#### Declarations of Interest

Participant & Membership	Interest declared
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.

Dr Jeremy Lyle, scientific member	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.
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 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.
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.
Sally Weekes, AFMA member	Employee of AFMA, no interest, pecuniary or otherwise, in the SPF.
Darci Wallis, Executive Officer	Employee of AFMA, no interest, pecuniary or otherwise, in the SPF.
<b>Invited observer</b>	<b>Interest declared</b>
Andy Moore	Scientist, ABARES.
Dr Simon Nicol	Scientist, ABARES.
George Day	Employee of AFMA, no interest, pecuniary or otherwise, in the SPF.
Melissa Malay	Employee of AFMA, no interest, pecuniary or otherwise, in the SPF.
Paul Ryan	Employee of AFMA, no interest, pecuniary or otherwise, in the SPF.
Dr Rich Hillary	Undertakes research in the relation to the SPF including the review of the SPF Harvest Strategy and management strategy evaluation. Employee of CSIRO which undertakes research in relation to the SPF from time to time.
Dr Rich Little	Undertakes research in the relation to the SPF including the review of the SPF Harvest Strategy and management strategy evaluation. Employee of CSIRO which undertakes research in relation to the SPF from time to time.
Dr John Stewart	Senior Research Scientist, NSW Department of Industry.
Andy Moore	Scientist, ABARES.
Dr Simon Nicol	Scientist, ABARES.
George Day	Employee of AFMA, no interest, pecuniary or otherwise, in the SPF.
Melissa Maly	Employee of AFMA, no interest, pecuniary or otherwise, in the SPF.

Paul Ryan	Employee of AFMA, no interest, pecuniary or otherwise, in the SPF.
Dr Cathy Bulman	Undertakes research in the relation to the SPF including the review of the Ecological Risk Assessment of the SPF. Employee of CSIRO which undertakes research in relation to the SPF from time to time.
Dr Miriana Sporcic	Undertakes research in the relation to the SPF including the review of the Ecological Risk Assessment of the SPF. Employee of CSIRO which undertakes research in relation to the SPF from time to time.

### **Agenda Item 1.3 Adoption of agenda**

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The agenda was adopted with the addition of the pair trawling application received, to be considered on day two of the meeting.

### **Agenda Item 1.4 Actions arising from previous meetings**

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The Panel noted the two action items from the previous meeting had been completed.

- Sean Pascoe provided the words for inclusion in economic section of the data needs plan to AFMA.
- John Stewart to present available recreational data and catches from NSW under other business on day 2.

### **Agenda Item 1.5 Confirmation of meeting no. 4 minutes**

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The Panel formally adopted the meeting minutes from the fourth meeting of the Panel held on 5 October 2016 with no changes.

### **Agenda Item 2 ERA for the SPF**

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An overview of the Ecological Risk Assessment (ERA) process was provided along with a brief update on the next steps:

- The previous ERA process had been developed 10 years ago, with all fisheries assessed in 2006 and 2007. The methodology has been revised, with the updated methodology initially being applied in the Eastern Tuna and Billfish Fishery and the SPF as test cases.
- Once the trial of the ETBF and SPF is completed for each fishery, a comprehensive fishery management strategy (FMS) will be developed by AFMA for each fishery. This will incorporate all the fishery requirements and strategies including:
  - Ecological Risk Management;
  - Harvest strategies;
  - Bycatch and discarding action plans; and
  - Research plans.
- The revised ERA methodology is due to be signed off by AFMA Commission in the first half of 2017. Key changes to the methodology include:
  - Revised and updated input databases and species lists;

- Revised Level 2 - now integrates Productivity-Susceptibility Analysis (PSA), Sustainability Analysis of Fishing Effects (SAFE) and the residual risk assessment (RRA) process;
- SAFE is the preferred Level 3 assessment where data and species biology allow;
- No dual assessments. Where a Level 3 equivalent assessment already exists for a species (for example, via harvest strategies), Level 2 assessments will not be conducted;
- Species assessed as high risk under base SAFE (bSAFE) method may be further assessed using the enhanced SAFE (eSAFE) method; and
- An online delivery system to allow for units of analysis (e.g. species) to be easily reassessed by AFMA staff if new information becomes available.

CSIRO presented the draft results for the SPF based on the revised methodology. The key points discussed by the Panel related to protected species:

- Reduction in the number of species assessed in the first ERA compared to the revised draft, as a result of excluding species with which interactions have never been recorded;
- How additional species may be included for assessment due to either a new species being interacted with, or where there is a high level of uncertainty (e.g. due to low levels of monitoring).
- How the cumulative impact on a species can be assessed.

The Panel broadly supported the revised ERA methodology as applied to the SPF and recommended:

- Text be included in the ERA document to explain reasons for the difference between the list of protected species assessed in the first ERA compared to the revised ERA;
- A process for adding species to the list for assessment should be established (and documented) to account for the following circumstances:
  - (a) where there is high level confidence in the data for a species generated from logbooks and observer data (i.e. a fishery with a high level of monitoring such as midwater trawling in the SPF) and an observed interaction occurs with a new species.
  - (b) where there is a low level of confidence in the comprehensiveness of the list of species interactions based on logbook and observer data, species of high conservation status that may be at risk should be included for assessment.
- Noting the ERA level 2 PSA methodology cannot deal with the cumulative impact of fisheries on a species (unless the species makes it through to level 3 SAFE assessment), the Panel recommended that further consideration should be given to how cumulative impacts may be evaluated.

<b>Action Item 1</b>	<b>AFMA</b>
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<p>AFMA to provide the Panel's recommendations immediately to CSIRO for their consideration in developing the next draft of the ERA in time to be considered by the next ERA Technical Working Group meeting on 16 February 2017.</p>
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- It was noted that broader stakeholder review of the revised methodology and results will be conducted but that the above recommended additions and/or revisions should be made before this is completed.

## Agenda Item 3 Managers Update

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A brief update on the following topics was provided:

- AFMA is on the final stage of market testing AFMA's Scientific Observer Program to confirm that industry and the government are receiving value for money.
- The final report for the super-trawler Senate Inquiry was published on 23 November 2016 and is available Parliament of Australia website.
- The *Geelong Star* is no longer under Australian jurisdiction and has left Australian waters due to a mechanical issue that cannot be rectified locally. The vessel is not subject to any investigation by AFMA for breaches of Commonwealth fishing regulations. Any further enquiries about the decision to leave Australian waters or future fishing operations of the *Geelong Star*, should be directed to the operator.
- A summary of the recent catch and effort information, noting that this is confidential due to only one vessel operating in the fishery.
- The Panel reiterated its support for improved reporting from observer and log book data of protected species interactions, especially relating the number and nature of interactions and any mitigation measures that were in place. This would allow for some assessment of the success of otherwise of such measures.
  - AFMA advised that the development of improved reporting templates will be considered as part of the FMS development.
- The first part of the Jack Mackerel survey in the west has been completed, with the second part commencing in January 2017 and will be collecting both egg and adult samples. This may also coincide with redbait spawning so will potentially have data available for this species (there is limited biological data currently available).

## Agenda Item 4 SPF Harvest Strategy

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The Panel recalled that the work to be considered under this item was prompted by its advice in December 2015 regarding MSE testing of Tier 3 in the proposed SPF Harvest Strategy (HS) and the Commission's request to review the appropriateness of the existing target and limit reference points used in MSE testing of the HS. The work conducted to support the Tier 3 review and appropriateness of reference points was:

- Stock assessments for jack mackerel east and blue mackerel east to provide updated operating models for use in further MSE testing for these stocks;
- An updated MSE, particularly to test the proposed Tier 3; and
- Bioeconomic work to investigate whether for economic reasons, alternative reference points may be more appropriate for SPF stocks (noting the Panel's previous advice that the target reference point of  $B_{50}$  and limit reference point of  $B_{20}$  are appropriate from a biological and ecosystem perspective).

### Bioeconomic work

Dr Pascoe (CSIRO) presented the results of the eastern Jack Mackerel bioeconomic project '*Impact of hyperstability on bioeconomic reference points*'.

The Panel noted:

- The concept that the biomass which achieves MEY is larger than the biomass which achieves MSY, is based on the assumption that CPUE is directly proportional to biomass.
- For fisheries where there is a strong relationship between biomass and CPUE,  $B_{MEY}$  requires a higher biomass in the water compared with  $B_{MSY}$ . However,  $B_{MEY}$  moves progressively towards  $B_{MSY}$  as this relationship weakens.
- Given that hyperstability in CPUE is a characteristic of these stocks, one of the outputs of the jack mackerel east stock assessment was used to estimate the relationship between CPUE and biomass for this stock.
- The result of the assessment indicates that there is no relationship between biomass and CPUE, at the aggregated level considered in the assessment (i.e. annual and across the spatial domain of the fishery as a whole). The economic analysis shows that, under these circumstances, costs do not increase substantially above some  $B_{MEY}$  until near stock collapse. The biological sustainability level of  $B_{MSY}$  then becomes the appropriate target to use.
- The finding that there is no relationship between CPUE and biomass for eastern Jack Mackerel is supported by empirical evidence from another small pelagic fishery, the SA Sardine fishery, which has also found through many years of research and monitoring that, at the harvest rates typical of that fishery, there is no relationship between CPUE and biomass. However, it was noted that searching times can be an indicator of reduced stock levels if vessels have to travel further and search for longer to find stocks.
- The proposed target reference point of  $B_{50}$  is above  $B_{MSY}$  for these species and so provides an additional sustainability buffer, similar to setting a  $B_{MEY} < B_{MSY}$  target (the Smith et al. 2015 MSE work estimated  $B_{MSY}$  for these species was between  $B_{30}$  and  $B_{36}$ ).

**Recommendation: that there is no basis to change the reference points in the SPF Harvest Strategy as the current target reference point of  $B_{50}$  and limit reference point of  $B_{20}$  meet the biological, ecological and economic requirements of the fishery.**

## Jack Mackerel east stock assessment

Dr Hilary (CSIRO) presented the results for the updated eastern jack mackerel stock assessment '*Assessment for Eastern Jack Mackerel*', addressing questions posed by the Panel at the Panel's October meeting.

Both models were updated:

- 1) Stochastic Stock Reduction Model (SSRM), which involves projecting a stock from its unexploited equilibrium level, given biological and catch information.
- 2) Statistical Catch-At-Age model (SCAA) which additionally includes catch-at-age composition and estimates both the recruitment process (unfished recruitment level, year-class strength and the distributional parameters thereof) and selectivity.

Key points discussed:

- Eastern Jack Mackerel is a 'data-moderate' stock with available data including a catch time-series, 2014 estimate of spawning stock biomass and limited data on the age and length composition of historical catches.
- Given the availability of catch-at-age data, the SCAA model is the preferred method of assessment as this can better analyse the potential trade-off between time varying

selectivity (TVS) and recruitment, in terms of explaining the available catch-at-age data. Assuming constant selectivity over time permitted the detailed estimation of the recruitment process, but with a clear interpretation that the catch-at-age represented the population age structure. Future model configurations that explore time-varying selectivity will likely result in different and less variable historical recruitment trends. Given the current and likely future data available for this species with respect to stock assessment we cannot expect to be able to sensibly estimate both time-varying selectivity *and* a detailed recruitment model (i.e. deviations, variance and autocorrelation) at the same time.

- Both models indicated that the stock is likely to be fairly close to unfished levels, with the SCAA model estimating the current biomass to be greater than 0.85 of  $B_0$ .

**The Panel supported the use of the assessment to inform an update of the MSE and noted the development of the assessment is progress towards the development of an integrated stock assessment in the future but that until more data is available, there is not much use in developing them further.**

## Blue Mackerel east stock assessment

Dr Hilary (CSIRO) presented the draft results for the eastern blue mackerel stock assessment using the Stochastic Stock Reduction Model (SSRM). The panel noted:

- The SSRM model was used for Blue Mackerel as this is a 'data-poor' species with little catch-at age data, and available data being limited to a catch time-series, 2014 estimate of spawning stock biomass and estimates of biological parameters.
- The model indicate that the stock is likely to be fairly close to unfished levels, noting that the depletion estimate is significantly affected impacted by the assumptions regarding stock-recruit steepness, stock recruitment relationship and autocorrelation in recruitment.

**The Panel supported the use of the assessment to inform an update of the MSE and noted the development of the assessment is progress towards the development of an integrated stock assessment in the future but that until more data is available, there is not much use in developing them further.**

## Jack Mackerel and Blue Mackerel Management Strategy Evaluation

Dr Hilary (CSIRO) presented the '*Updated Management Strategy Evaluation (MSE) Eastern Jack and Blue Mackerel*'. Given the conclusions from the economic work that the existing reference points are appropriate, the Panel considered the results of the MSE using  $B_{50}$  as the target reference point and  $B_{20}$  as the limit reference point.

The Panel noted:

- Three key pieces of data were updated in this MSE compared to the Smith et al. 2015 MSE:
  - Current depletion estimates for eastern jack mackerel and eastern blue mackerel (derived from the assessments above);
  - Higher recruitment variability than used in the original MSE; and
  - Effects of incorporating autocorrelation in recruitment.
- Increased recruitment variability can have a substantial effect on trends in biomass in relation to static reference points determined from equilibrium estimates of  $B_0$ .



- The model assumes the fluctuations in catches reflects fluctuations in recruitment when in reality, catches in the SPF have been driven by other factors such as economics so the recruitment pattern generated from the model is unlikely to reflect the true population dynamics.
- There are also possible limitations to the catch-at-age data and the Panel expressed some reservations about recruitment and recruitment variability estimates derived using this data.
- Using static reference points and including increased recruitment variability, even in the absence of fishing, the risk criterion in the Commonwealth Fisheries Harvest Strategy Policy (HSP) may not be met if autocorrelation in recruitment is included – *(to ensure that the stock stays above the limit reference point at least 90 % of the time (i.e. a 1 in 10 year risk that stocks will fall below  $B_{LM}$ )*. This result is not unusual for species that have the high degree of natural variability that SPF stocks do. In other fisheries where this occurs, a dynamic  $B_0$  is used.
- Future assessment and MSE modelling should explore the incorporation of a more dynamic interpretation of  $B_0$ . Given the various issues with the current risk criteria and operating model structure, the most recent results should not be used as a basis for setting explicit exploitation rates. This issue would also benefit from being placed in a wider context in relation to the current HSP and the potential outcomes from the HSP review process. The model would also benefit from appropriate levels of future catch-at-age data collection (in terms of both sample sizes and spatiotemporal coverage).
- Nonetheless, the results of the MSE do indicate that the halving approach recommended by the Panel with respect to Tier 3 (i.e. exploitation rates should be half those of Tier 2, or quarter if Atlantis biomass estimates are used), will maintain similarly low risk across all HS tiers (as per its advice from December 2015).

**The Panel recommended:**

- **that Tier 3 as recommended by the Panel in December 2015 be adopted;**
- **that there be no change to the existing Tier 1 and Tier 2 exploitation rates in the harvest strategy; and**
- **if the MSE is updated in the future, a dynamic  $B_0$  should be investigated for the SPF stocks, noting that there is currently no urgent need for additional MSE testing but that this may change if activity in the fishery increases significantly beyond current levels.**

## **Agenda Item 7      Pair Trawling Application**

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AFMA advised that an application to pair trawl in the SPF had been received and the Panel's advice is sought regarding the data collection and monitoring requirements that should apply to the operation, should it be approved by the AFMA Commission.

Consultation on the application is occurring, starting with the Panel, stakeholder forum, other experts on marine mammals and seabirds and SEMAC prior to the Commission's consideration. The application and a summary of the Panel's advice will be made public on the AFMA website as soon as possible.

In considering the application, the Panel agreed that it would be useful to clarify the following aspects of the application *not* within the remit of the Panel:

- Ownership of the beneficiary companies and whether net benefit to the Australian community is maximised (this is a broader issue for management of Australian fisheries)
- Profitability of operations (this is a risk for the commercial operators not resource management)
- Product forms and markets, including whether product was used for human consumption vs. animal feeds, domestic vs. export markets (this is a broader issue for Australian resources and not managed on a fishery-by-fishery basis).
- Recreational impacts - broader ecosystem effects have been assessed previously (and found to be low at recommended exploitation rate) and are a function of the TAC, not the fishing method.

The Panel noted that key questions regarding the proposed fishing method probably relate to interactions with protected species, and that specific advice in this regard should be sought from marine mammal and seabird experts. The Panel provided advice with a focus on commercial species.

In general, the Panel supported similar data collection and monitoring conditions applying to pair trawling as had applied to the *Geelong Star*.

#### *Commercial species*

- The Panel considered there should be no sustainability issues given the fishery is managed on an output basis with TACs and quota.

**Recommendation: The Panel recommended that the following data collection be undertaken:**

- **50 randomly selected fish of each species from each shot to monitor age composition of the catch and changes in growth patterns.**
- **Samples of the catch, with clear protocols in place, could be collected by an observer or operator.**
- **The current level of ongoing monitoring required for other midwater trawl operations, 20 per cent, would be sufficient for sample collection.**
- Regional catch limits:
  - In terms of spreading effort to support the collection of representative data on target species, the benefit of regional catch limits is minimal as this type of data collection is best achieved through research surveys given the characteristics of the fishery (stocks occur across a significant spatial area and there is only a limited number or the potential for a limited number of boats to fish at any one time).
  - The Panel reiterated that the risk of localised depletion in this fishery remains low due to the highly migratory/mobile nature of the target species and that any risk to the stocks is best managed through setting appropriate catch limits (i.e. through TACs as is currently done) that have been tested to have a very low risk of overall depletion.

**Recommendation: The Panel recommended reviewing the requirement for the 2000 tonne grid regional catch limits once the research project previously identified by the Panel ‘*Analysis of spatial impacts of fishing in the SPF*’ has been completed.**

## *Protected species*

Given interactions with protected species are statistically rare events, the Panel agreed a high level of monitoring would be required to detect interactions.

**Recommendation: The Panel recommended that an electronic monitoring (EM) system be placed on each boat and that for the first ten trips an onboard observer be present (this is consistent with the current requirement for new midwater trawl boats), alternating between vessels each trip if hauling is switched between vessels. This is to ensure that the EM systems can adequately monitor protected species interactions. After the first 10 trips, the level and mix of coverage required should be reviewed.**

## **Agenda Item 8 AFMA Bycatch Strategy**

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The Panel noted that AFMA is progressing the development of AFMA's Bycatch Strategy and two sub strategies: the dolphin strategy and seabird strategy. A meeting of the Marine Mammal Working Group and seabird workshop were held recently and provided advice to inform the development of those strategies.

## **Agenda Item 9 Research Priorities**

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The Panel noted the existing research priorities and agreed that the project on data standards and performance indicators (e.g. catch against TAC), is still necessary but not as high a priority given the low level of fishing effort now the *Geelong Star* has left.

## **Agenda Item 10 Other Business**

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### **Recreational catch data (NSW)**

NSW Department of Primary Industries provided a summary of the available recreational data. The panel noted:

- Recent recreational fishing surveys found that Blue Mackerel is caught widely across the state, with a bulk of the recreational catches in the south east (total estimate of catch 42 tonnes).
- Blue Mackerel commercial catch is primarily taken inshore using purse seine with a majority of the catches in the Wollongong/Ulladulla region.
- Recent recreational fishing surveys found that Yellowtail Scad is caught throughout the state with a bulk of the catch in the Sydney region.
- A majority of the Yellowtail Scad commercial catches are from the Wollongong region.
- Work is being undertaken to identify and map the major bait grounds along the coast. However, this work has not yet been completed.

### **Stakeholder forum agenda**

The stakeholder forum will be held in 24 January 2017, items for discussion are:

- Harvest Strategy (including the results of the stock assessment and economic work)
- Annual Research Statement
- Pair Trawling Application
- Update from AFMA regarding activity in the fishery since the last forum

## **Next meeting**

The next meeting will be held on 8 February 2017 in Melbourne at Park Royal. Items for discussion: finalise Harvest Strategy advice following the stakeholder consultation; and development of RBC advice for the 2017-18. With no other items of business raised, the Chair thanked participants and closed the meeting at 12:00 pm.

**Signed (Chairperson):**

**Date:**