



## Small Pelagic Fishery Scientific Panel

### Meeting No. 3

Minutes

**Date:** 5-6 April 2016

**Venue:** Park Royal Hotel, Melbourne Airport

#### Attendance

Name	Membership
Mr Max Kitchell	Chair
Dr Caleb Gardner	Invited expert
Dr Sean Pascoe	Economic Member (via teleconference, apology on 6 April 2016)
Mr Andrew Penney	Scientific Member
Associate Professor Tim Ward	Scientific Member
Dr Jeremy Lyle	Scientific Member
Ms Sally Weekes	AFMA Member
Ms Danait Ghebregabhier	Executive Officer
Dr Anthony Smith	Observer on 5 April 2016

#### 1. Preliminaries

The Chair welcomed all members to the meeting, noting that Dr Smith from the CSIRO would be joining the meeting for agenda items 4 and 5. The Executive Officer advised the Panel that the meeting would be recorded for the purposes of preparing the minutes but the recording would not be retained after the minutes had been agreed.

#### 1.2 Declarations of interest

Each Panel member confirmed their declared interests relevant to the Small Pelagic Fishery (SPF) in the table below. Interests in relation to an agenda item were noted before that agenda item.

Participant & Membership	Interest declared
Mr 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.

<b>Participant &amp; Membership</b>	<b>Interest declared</b>
Associate Professor Tim Ward, Scientific Member	Leader of the finfish fisheries group in SARDI which undertakes research in 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.
Mr Andrew Penney, Scientific Member	No interest, pecuniary or otherwise, in the SPF. Director of Pisces Australis (Pty) Ltd, with research and management interests in a wide range of fisheries and environmental matters. Member of the AFMA Southern and Eastern Scalefish and Shark Fishery Slope Resource Assessment Group, Tropical Rock Lobster Resource Assessment Group and 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.
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, 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.
Danait Ghebregabhier, Executive Officer	Employee of AFMA, no interest, pecuniary or otherwise, in the SPF.
<b>Observer</b>	<b>Interest declared</b>
Dr Anthony Smith	Undertakes research in 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.

### 1.3 Adoption of the draft agenda

The Panel adopted the draft agenda.

### 1.4 Actions arising from previous meetings

The Panel noted that the actions arising from the first and second Panel meetings have been completed and that the actions below were completed subsequent to the last meeting:

- The Panel Chair sent written responses to stakeholders that submitted written submissions and to those that attended the Stakeholder Forum on 28 January 2016.
- Ms Weekes and the Panel Chair addressed the South East Management Advisory Committee (SEMAC) at their meeting on 16-17 February 2016 on the outcome of the Panel's deliberations, which was well received.

## 1.5 Confirmation of the teleconference minutes

The Panel adopted the minutes of the teleconference meeting on 9 February 2016 as a final and accurate record subject to Ms Weekes' amendments being incorporated.

## 2. General updates

### 2.1 Manager's update (incl. catch and effort data to date)

Ms Weekes provided the following management updates.

#### *General*

Dr James Findlay has been re-appointed as the AFMA Chief Executive Officer for a period of three years.

The Senate Standing Committee on Environment and Communications is undertaking an enquiry into the environmental, social and economic impacts of large-capacity fishing vessels commonly known as 'Supertrawlers' operating in Australia's marine jurisdiction. The committee's final reporting date has been extended to 24 August 2016 (from 30 April 2016).

#### *Marine Mammal Working Group*

Members have been appointed to the new AFMA Marine Mammal Working Group (MMWG) and consist of a Chair, scientific, industry and conservation members, and representatives from the Department of Agriculture and Water Resources and the Department of the Environment. The MMWG may discuss marine mammal population estimates and sustainable mortalities as part of its work plan following the outcomes of the FRDC/SARDI project.

**Action:** AFMA to circulate the SARDI/FRDC report on marine mammals to the Panel for consideration and discussion once received.

The Panel stated that there should be a formal communication arrangement between it and the MMWG and requested to see the MMWG's terms of reference to ascertain how the two groups can best complement each other's work plans as relevant to the SPF. The Panel recommended that the respective Chairs should meet initially to discuss ways in which the two committees can assist each other to achieve the best results in mitigating marine mammal interactions in the SPF, including the possibility of attending each other's meetings as observers.

**Action:** AFMA to circulate the MMWG's terms of reference to the Panel.

**Action:** AFMA to investigate the Panel Chair discussing with the Chair of the MMWG ways in which the two committees can assist each other in relation to marine mammal interactions in the SPF.

#### *Seafish Tasmania voluntary exclusion areas*

Following negotiations with recreational fishers, Seafish Tasmania have made a voluntary offer to avoid fishing in certain areas important to recreational fishers as at 1 May 2016. The Australian Recreational Fishing Foundation is consulting its constituencies in relation to endorsing these offers as appropriate concessions. The voluntary offers may change

following further negotiations and AFMA will be monitoring adherence to the voluntary offers and report it quarterly on its website.

#### *Closure review*

Because of the requirement for mid-water trawl boats nominated to concessions in the SPF to also be nominated to Southern and Eastern Scalefish and Shark Fishery (SESSF) concessions in overlapping areas, a large number of spatial closures applicable to the SESSF also apply to mid-water trawling in the SPF. SEMAC is meeting on 7 April 2016 to review the application of these closures, following the review of the East Coast Deep Water Trawl closure in February. This review will also address issues that were raised at the SPF Stakeholder Forum on 28 January 2016 on the removal of redundant rules in the SPF.

#### *Update on catch and effort data, and protected species interactions*

The Panel noted the update provided on catch, effort and threatened, endangered and protected (TEP) interactions in the SPF for the 2014-15 and 2015-16 fishing seasons to date. Whilst the 2015-16 catches to date are significant compared to previous years, the total allowable catch (TAC) remains significantly undercaught. Given the current fishing season ends in less than one month, the Panel requested commentary from industry and AFMA for the basis of this undercatch for context purposes, acknowledging that it may be partly due to spatial and temporal constraints in the SPF, some of which may not apply in future years.

**Action:** AFMA, in consultation with industry, to provide commentary for the basis of the significant undercatch of the TAC for the 2015-16 fishing season.

**Recommendation:** going forward, the Panel recommended that catch, effort and protected species updates are structured to provide species-specific, monthly data summaries to add a temporal dimension to fleet activity in the SPF. The Panel also recommended the following in relation to the timing, content and structure for future updates:

- Reporting should be undertaken at each Panel meeting and an annual report. The Panel recommended that AFMA consider dedicating resources to support the development and delivery of these reports.
- A consistent template should be developed and used for the periodic updates.
- The Panel can review the reports and include them in its work program.
- Updates on protected species interactions should include explanatory information on the mitigation measures used and narrative relating to the interactions to allow the Panel to make recommendations for improvement. This may include:
  - details on the number and nature of interactions in relation to the level of effort
  - assessment of the interactions against the indicators currently used to assess the performance of SPF operations compared to other domestic and/or international fisheries.

**Action:** AFMA to revise the content and structure for future updates on catch, effort and protected species interactions for review by the Panel at a subsequent meeting.

**Recommendation:** to allow for this reporting, the Panel recommended that AFMA expedite the capture of observer data so it is available for collation, noting that e-log data may be used to update the Panel when there is a lag in observer data.

## 2.2 Commission meeting outcomes

Ms Weekes advised the Panel that the AFMA Commission at its meeting in March 2016 deferred its decision on the revised draft SPF Harvest Strategy and consequential TACs for the 2016-17 fishing season, pending the outcomes of outstanding Tier 3 Management Strategy Evaluation (MSE) testing. The AFMA Commission also requested that AFMA explore policy considerations for setting alternative target and limit reference points for the SPF as a different approach to accounting for uncertainty (rather than through harvest rates as it is currently done) given the international approach to managing similar species.

The outcomes of this additional work will not be available by 1 May 2016 to inform TACs for the 2016-17 fishing season. Therefore, AFMA's preferred option is to roll over the 2015-16 TACs for another 12 months, provided the risk in relation to the three western stocks was acceptable. The results of CSIRO's risk assessment on maintaining the TACs constant for another 12 months will be discussed under Agenda Item 4.

**Action:** AFMA to circulate the minutes of the SEMAC 24 meeting on 16-17 February 2016 to Panel members.

## 3. Review of the Geelong Star's Vessel Management Plan

AFMA is undertaking an annual review of the Vessel Management Plan (VMP) for the *Geelong Star*. The Panel's advice is being sought specifically on the 2000 tonne regional catch limit but AFMA will also consider comments on the VMP more broadly.

### *Regional catch limits*

Three types of regional catch limits apply to mid-water trawling in the SPF to distribute effort across the fishery and collect representative data on target species as follows:

- i. a maximum of 75 per cent of the concession holder's combined SPF quota holdings (for all species) for either the eastern or western sub-area can be taken in a single management zone within the respective sub-area for that fishing season; and
- ii. a 2000 tonne limit applies to the combined catch of quota species within each grid (there are 120 roughly 1 degree grids) over a 30 day period.

In terms of meeting the objectives of distributing effort across the SPF to collect representative data on target species, the 2000 tonne grid catch limit is the most influential and the Panel's discussion centred on this limit.

The Panel noted:

- Mid-water trawl effort had been spread over 23 grids, with less effort in the far west compared to the eastern sub-area of the fishery.
- ~96 per cent of the catch to date has been concentrated in three grids.
- Searching for fish by mid-water trawlers, whilst constituting effort, may not necessarily be captured in the data.
- A large proportion of the 120 grids cannot be fished due to significant spatial closures. However, the current review by AFMA and SEMAC on the relevance of some spatial closures to midwater trawling in the SPF is likely to result in more of these grids being available to be fished in the 2016-17 season.

- A large number of the grips are outside of the depth range currently being fished by mid-water trawling in the SPF (100-300 metres deep).
- The voluntary offer by Seafish Tasmania to avoid fishing in certain areas, but given it is voluntary the Panel did not take it into account in its advice regarding the regional catch limits.

The Panel agreed that a revised regional catch limit should aim to strike a balance between achieving the objectives of collecting representative data whilst not being operationally unworkable for industry. Members agreed that halving the original catch limit of 2000 tonnes is the most appropriate adaptive response and would, by definition, improve the probability of achieving a greater spread of fishing effort across the fishery.

**Recommendation:** the Panel recommended that the catch limit be reduced to 1000 tonnes over the 30 day period. In providing its advice, the Panel stated that the practical and economic implications of halving the catch limit are unclear and noted that AFMA will be consulting with industry on the revised VMP. Further, members recommended that AFMA continue to monitor catches with the expectation of reviewing the effectiveness of the arrangements again in 12 months.

#### *Localised depletion*

With regards to localised depletion, the Panel reiterated that the risk is already low. The Panel considered that assessing any risk of localised depletion would be more appropriately addressed through a study that overlays fishing effort with the estimated distribution of a stock that is determined based on known information on fish distribution and its drivers. This has been tested to a degree in the South Australian sardine fishery, where significant catches of fish are able to be harvested from a small area without harming the ecosystem or other fisheries in the region.

#### *General comments on the VMP*

With regards to the revised draft VMP more generally, the Panel noted that:

- AFMA is seeking advice from marine mammal and seabird experts regarding the relevant mitigation requirements in the VMP.
- The electronic monitoring camera positions will be reviewed to monitor the effectiveness of seabird mitigation measures.
- A full reporting and narrative of the effectiveness of the mitigation measures outlined in the VMP would be useful.
- The wording regarding the sardine bycatch trigger limits applicable to South and Western Australian waters should be consistent.
- In the absence of observers, the VMP should facilitate the collection by industry of data required to manage the fishery such as catch sampling and information on any gear modifications.

#### **4. Risk of holding TACs constant for the three western stocks**

Dr Smith from the CSIRO presented the results of the simulation tests undertaken by Dr Fulton on the risk of holding the 2015-16 TACs for the three western SPF stocks constant for another 12 months. The model took into account biomass values, productivity, environmental stochasticity and effort dynamics. The biomass values and environmental drivers were refined in response to new data that became available since the development of the model. Dr

Smith emphasised that given the Atlantis ecosystem model is not a formal stock assessment precaution should be applied.

The Panel noted the results of the analysis undertaken by Dr Fulton, including that associated with environmental drivers. However, the Panel also noted the level of undercatch to date for the current fishing season and this, in the Panel's view, further reduced the risk of rolling over the western stock TACs to very low levels. In addition, the Panel noted that the undercatch is not a reflection of the abundance of the stock but is due to operational issues within the fishery and follows a period of low to no fishing.

The results showed that the relative decrease in the biomass of western stocks as a result of holding the current TACs constant for another fishing year is very low, even with stock productivity at 70 per cent or less of the eastern stocks and under poor recruitment (i.e. the risk is low even under the worst case scenario). Environmental factors account for the majority of any risk that does exist.

**Recommendation:** on this basis, the Panel considered maintaining TACs for another 12 months to be of low risk.

<p><b>Action:</b> The Panel members requested clarification on whether the Atlantis model and the MSE analyses include data from the 2014 daily egg production method (DEPM).</p>
---

## 5. Simulation tests on the SPF Harvest Strategy – preliminary work regarding Tier 3 and use of alternative reference points

Dr Smith presented the preliminary results of the project *Further simulation tests of the SPF Harvest Strategy*, which illustrated key inputs/parameters into MSE testing and the selection of reference points that advice from the Panel is sought on. The example was based on jack mackerel east. Multiple simulations were run over a 117-year projection period and over the last 20 years of the projection period and at initial stock biomass scenarios of  $B_0$  and  $B_{50}$ . Dr Smith clarified that:

- $B_0$  (virgin biomass) refers to the average biomass of a stock if no fishing mortality was applied.
- The 117-year projection period is determined based on information relating to species longevity and generation time.

### *Alternative reference points*

The Panel noted the results presented by Dr Smith and commented that whilst alternative reference points of  $B_{70}$ :  $B_{30}$  may be assumed to be more precautionary, this is already built in the SPF Harvest Strategy and further confirmed by the preliminary analysis being considered. Historically, international work has shown that in systems that have a relatively high dependency on small pelagic species, target reference points should be set at around  $B_{70}$ .

However, there is a significant body of work showing that the Australian key predators are not overly dependent on small pelagic species and that, even high levels of depletion of these species, individually or in aggregate, are estimated not to have substantial effects on predator populations. This work has also shown that, in the Australian system, a target reference point of  $B_{50}$  not only meets the Harvest Strategy policy but is also adequate to provide for the needs of the predators. This therefore suggests that higher reference points may not be necessary in the Australian ecosystem to further reduce risk of impact on the ecosystem.

On this basis, AFMA may, as a matter of policy, choose to use alternative reference points of  $B_{70}$ :  $B_{30}$  noting this may result in significant catch trade-offs which would be more precautionary and leave more fish in the 'system' but from an ecological perspective, it is not necessary. However, from an economic viewpoint, higher reference points may be worth investigating.

Dr Pascoe advised the Panel that recent work on *Estimating Proxy Economic Target Reference Points in Data-Poor Single-Species Fisheries* suggests that  $B_{70}$  (or thereabouts) may be more appropriate as an economic target for fisheries such as the SPF which are high cost relative to revenue.

Prof Gardner noted that this conclusion only occurs where there is a strong stock externality or a decrease in cost of fishing at larger stock sizes because of higher catch rates. The paper discussed assumed an inverse relationship between stock size and cost. This does not tend to hold with schooling species where catch rates tend to be less influenced by total biomass.

Noting that there was uncertainty about the economic outcome from different targets, the Panel recommended that further work specific to the SPF should be conducted in relation to this, prior to such a target being adopted given potentially large trade offs in terms of catch. Dr Pascoe agreed that he could easily revisit the model used in the study to determine its applicability to the SPF.

**Action:** Dr Pascoe to revisit the model used in the study *Estimating Proxy Economic Target Reference Points in Data-Poor Single-Species Fisheries* to determine its applicability to the SPF.

#### *Starting biomass*

The starting biomass has a large influence on the exploitation rate applied, consequently, knowing the actual status of the stock going into a harvest strategy would be a high priority in terms of the science to support the SPF.

**Recommendation:** the Panel recommended that, as a starting point, this can be determined for jack mackerel east through a simple stock assessment given currently available information on the biomass, catches and life history of the species. This would assist in setting up the capability to undertake a fully integrated stock assessment in the SPF in the future and would ideally inform the settings for further MSE testing.

#### *Positive bias*

The current sensitivity test assumes that DEPM surveys are positively biased by 50 per cent. While there is the potential for bias from some of the DEPM survey parameters, 50 per cent is overly conservative and 20 per cent would more accurately reflect the level of bias associated with the biomass estimates. This assumption is not carried over in the base case model

**Recommendation:** the Panel recommended that the sensitivity test that DEPM surveys are positively biased be reduced to 20 per cent, given the significant influence of this test in constraining exploitation rates.

CVs

**Recommendation:** the Panel recommended that the CV of the DEPM biomass estimates should also be revised to 0.5 in the base case model (currently 0.3) to more accurately reflect the actual CV associated with the estimates.

*MSE testing*

The Tier 3 exploitation rates for the DEPM and Atlantis generated biomass estimates that need to be re-tested for the other SPF species given the preliminary jack mackerel east results and revised sensitivities as follows:

- i. Tier 3 DEPM – the approach of halving the relevant Tier 2 exploitation rate under the three alternative assumptions of survey frequencies needs to be tested.
- ii. Tier 3 Atlantis – the approach of quartering the relevant Tier 2 exploitation rate to be tested, noting that larger CVs will be applied due to the uncertainty associated with the Atlantis biomass estimates.

**Recommendation:** the Panel recommended that the initial work on a jack mackerel east stock assessment and Tier 3 MSE testing be completed in time for the next annual assessment cycle in November 2016. Once the results of the initial stock assessment are available, the Panel agreed to meet to discuss sensitivities relating to estimates of mortality and time varying parameters (e.g. stochasticity, recruitment and productivity).

## 6. Forward work program

### 6.1 Development of the SPF Scientific Panel's forward work program

*Dr Pascoe was an apology for this agenda item.*

The Panel discussed future work priorities that will form part of its work program based on preliminary suggestions compiled out-of-session, noting that each work priority will need to be within the Panel's terms of reference and be of management use to AFMA.

- i. *Research plan and priorities:* members agreed to discuss this under *Agenda Item 7 Research Priorities* using the current SPF research plans as a starting point.
- ii. *Bycatch interactions and mitigation strategies:* the Panel reiterated their previous comments in relation to working with the MMWG and the timing, content and structure for future catch, effort and protected species updates. Further, the Panel offered their services to AFMA if it seeks to consult with the Panel collectively or individuals within the group in the event of significant circumstances.
- iii. *Localised depletion:* given the concerns expressed at the SPF Stakeholder Forum in relation to this issue, the Panel agreed to include it in the work program. The Panel also agreed to formally adopt the definition of localised depletion formulated by the former Small Pelagic Fishery Resource Assessment Group, in response to stakeholder concerns that it had not agreed on a definition. The new catch and effort reporting framework that will be used to monitor the performance of the regional catch limits with regards to the spatial distribution of catches will also provide some of the temporal and spatial data to inform localised depletion considerations. In the medium term, the Panel reiterated their previous advice that this issue is more appropriately addressed through a study that overlays long-term fishing effort with the estimated

distribution of a stock that is determined based on known information on fish distribution and its drivers.

**Action:** AFMA to provide species-specific spatial and temporal catch and effort data as part of the new reporting framework recommended by the Panel.

- iv. *Vessel Management Plan:* the Panel agreed that this is an ongoing, annual work priority, noting that AFMA may seek the Panel's advice on specific issues on an ad hoc basis as the need arises. As more data becomes available in the SPF, the Panel will increasingly be in a position to critically review the spatial elements of the VMP against the indicators outlined.
- v. *Economic efficiency of the fishery:* the Panel acknowledged that there is a clear need for research in this area and requested further advice and guidance from AFMA in relation to the key economic considerations for the fishery. There are significant, unreconciled economic issues in the SPF and there is not enough information about the complex issues that affect the operation of the fishery to make economic analysis of the SPF relevant at this stage. However, given the potential economic impetus to use higher harvest strategy reference points a desktop study should be undertaken to quantify the marginal effect of cost on biomass to explore the maximum economic yield (MEY) and the drivers and constraints on MEY for the SPF. The study should draw on similar case studies in other multi-gear fisheries.

The Panel commented that collection of economic data would also be useful in being able to determine the value of the fishery, noting that AFMA is currently looking to implement the collection of price information from every quota transaction that occurs in Commonwealth fisheries. The Panel also recommended that AFMA ask ABARES whether SPF operators are included in their fisheries economic surveys and request economic data, if available, for consideration at a future meeting.

**Action:** AFMA ask ABARES whether SPF operators are included in their fisheries economic surveys and request economic data, if available, for consideration at a future meeting.

- vi. *Integrated stock assessment approaches:* the Panel agreed to identify data requirements and approaches for implementing integrated assessments for SPF species, including preliminary assessments for stocks for MSE testing. As catch at age data is a key input into the assessments, otoliths will need to be collected by observers and existing standard aging protocols refined. The use of acoustic indices as an alternative or supplement to DEPMs may be considered in the future.

The Panel agreed to proceed with the above work priorities and further reflect on them once the work program has been revised to reflect the discussions.

## 6.2 Process for SPF Panel meetings

Mr Penney requested that the Panel discuss the issue of time allocation to allow for the Panel's critical review of scientific reports in accordance with its terms of reference to 'conduct and facilitate peer review of stock assessments and other commissioned science'.

The Panel noted Mr Penney's request and agreed to allocate time at future meetings to consider, assess, and critically review the results of the any new DEPMs and annual assessment reports used in developing Panel advice. Assoc. Prof Ward advised that the

results of DEPM surveys and the annual assessment reports can be provided for the Panel's consideration at the November meeting. The presentations can also be circulated one week prior to the meeting to allow Panel members adequate time to seek clarification or additional analysis for key assessment reports as required prior to the meeting.

### 6.3 Stakeholder Forum

The Panel agreed to defer discussions regarding the second SPF Stakeholder Forum until their next meeting, when they expect to have matters of substance to take to the forum.

## 7. Research priorities

### 7.1 Review and update of the SPF annual and 5-year strategic research plans

Panel members Prof Gardner, Dr Lyle and Assoc. Prof Ward declared they had potential conflicts of interest relating to their and/or their respective organisations' participation in research or potential research in the SPF. Those members left the room while the remaining members discussed the potential conflicts and considered whether each of those members should re-join the meeting. They noted that calls for research are public and that the AFMA Research Committee (ARC) reviews applications before a decision to proceed with a research provider is made. On that basis and recognising the value of having members present for discussions, it was agreed that all Panel members would be able to participate in discussions on the agenda item, but those who had left the room should not participate in the prioritisation of the research.

The Panel undertook an initial review of the draft 2017-18 to 2021-22 five year strategic research plan (the plan) for the SPF as outlined in the table below and endorsed the three goals expressed in the plan.

No.	Title	Panel comments
1	Western jack mackerel DEPM survey	A survey is planned for 2016-17.
2	DEPM survey for: <ul style="list-style-type: none"> <li>• blue mackerel west</li> <li>• redbait west</li> <li>• redbait east</li> </ul>	There are currently provisions in the SPF Harvest Strategy to recommend reduced biological catches in the absence of annual DEPMS. It is difficult to commit to annual DEPMS in the SPF without developing a program of research and structured fishing over the next three years to improve information about western stocks, recognising that the DEPM for redbait east is a decade old and will need to be updated in the future. The Panel proposed that the stocks which either do not have DEPM or for which the DEPM is about to expire should be prioritised following the completion of the DEPM for jack mackerel west.
3	Annual Development of the Fishery Assessment Report	The Panel agreed to maintain this priority as an annual baseline research need for the SPF.
	Establishing improved methods for estimating egg production.	The Panel agreed to remove this research project as the project will be completed by 2017-18.

No.	Title	Panel comments
4	Develop comprehensive integrated stock assessments that incorporate multiple lines of evidence.	The aim of this project is to develop and test integrated stock assessment models for key SPF species when the fishery develops. The Panel agreed to maintain this priority given the initial work proposed to undertake a simple stock assessment for jack mackerel east to feed into the annual assessment cycle for the SPF in November 2016.
	Assess movement and distribution of small pelagic stocks, through the use of acoustic/sonar fishing equipment.	The Panel agreed to remove this priority as it is not feasible within the resources currently available and given the Panel's previous discussions in relation to localised depletion, agreed to replace it with the priority below.
5	Analysis of the spatial distribution of fishing catch and effort in relation to distribution of SPF stocks, key predators and other fishery sectors.	The Panel agreed that this is a reasonable way of investigating this issue and needs to be done after the fishery has been running for two years.
6	Effectiveness of seal exclusion devices (SEDs) in reducing marine mammal by-catch in mid-water trawls	This priority is relevant given the recommended annual protected species monitoring and reporting framework, however there is still uncertainty as to how the evolution of mitigation strategies in the SPF will be funded. The Panel recommended that it be reworded to <i>Annual monitoring, reporting and assessment of the effectiveness of current mitigation measures and impact of the fishery on protected species</i> .  This priority would be very relevant to the MMWG and should be brought to their attention.
7	The economic impact of reference point selection.	Given the potential economic impetus to use higher harvest strategy reference points a desktop study should be undertaken to quantify the marginal effect of cost on biomass to explore the MEY and the drivers and constraints on MEY for the SPF. The study should draw on similar case studies in other multi-gear fisheries.
8	Tracking economic performance of the SPF	The Panel agreed that collection of economic data would be useful in being able to determine the value of the fishery.

The Panel felt confident that the eight research priorities above address the key issues for the SPF over the next five years in terms of adequacy of stock assessments, mitigation of protected species interactions and localised depletion. Whilst they are all high priority research needs, some of them can be scheduled to start later over the five year period of the strategic research plan.

Further, the Panel agreed to include an additional table in the strategic research plan that outlines research areas that are not high priority but were raised through the Stakeholder

Forum such as the impact of climate change on future recruitment variation and economic surveys. The Panel requested that AFMA re-draft the strategic research plan based on its discussions and circulate for the Panel's consideration out of session. The finalised 2017-18 to 2021-22 five year strategic research plan will be used as the basis for the 2017-18 annual research plan.

**Action:** AFMA to re-draft the strategic research plan based on the Panel's discussions and circulate for the Panel's out of session consideration.

With regards to the project *Ichthyoplankton long term monitoring at National Reference Stations* in the 2016-17 annual research plan, the Panel recognised the importance of maintaining long-term data series. However, this project was not identified as an essential research priority for the management of the SPF through the RAG process, so it should be excluded from the annual research plan.

## **7.2 Spawning biomass of jack mackerel between western Tasmania and Kangaroo Island (DEPM) – Expression of interest (EOI)**

Assoc. Prof Ward informed the Panel that the ARC gave in principle approval for the EOI to be developed into a full application and recommended that industry provide acoustic data to the project. He explained that this presents an opportunity to investigate options to use the *Geelong Star's* acoustic equipment to start collecting information on the extent of adult stock distribution outside the survey areas as part of normal fishing operations. However, it is hard to allow for the collection of acoustic data within the current structure of the DEPM as it may result in higher survey costs due to additional expertise. As the Panel previously discussed, development of acoustic indices as a supplementary index will take time and cannot be done in tandem with a DEPM survey, but the DEPM survey report will include recommendations regarding the use of acoustic methods in the SPF.

In relation to the ARC's recommendation to provide for genetic sampling and testing in the DEPM project and the fishery's research plan, Assoc. Prof Ward confirmed that genetic samples will be collected and stored to potentially inform future analysis. The Panel commented that genetic assessment methods such as close kin may not be appropriate for SPF species.

## **8. Other business**

### **8.1 Meeting of the International Council for the Exploration of the Sea (ICES)**

Assoc. Prof Tim Ward advised the Panel that the ICES working group on Atlantic Larvae and Egg Surveys is holding a workshop in Greece in October 2016. The workshop will evaluate parameter estimation methodologies for and from egg and larvae surveys and its applicability for assessments. Given its relevance to the SPF, Assoc. Prof Ward noted that it would be valuable for a Panel member to attend the workshop.

Noting that it will cover daily egg production methodologies, which are integral to the management of the SPF, the Panel saw an advantage in a member attending the workshop. Further, the Panel noted that the workshop presents an opportunity to:

- present on the outcomes of recent Australian research in this area to broaden the working group's thinking in this field

- learn from and ensure consistency with international best practice in relation to daily egg production methodologies
- workshop specific issues relating to the methodologies such as potential sources of bias in estimating parameters.

The Panel supported Assoc. Prof Ward's attendance of the workshop given his extensive experience in this field and the Chair agreed to write a support letter if one is required to secure funding to attend the workshop.

## **8.2 Probability based reporting**

Mr Penney gave a presentation on his paper *Probability reporting of spawning biomass estimates derived from daily egg production surveys*. Mr Penney explained that the paper was prompted by the Panel's discussion at its December 2015 meeting as to how it might provide precautionary advice to SEMAC and AFMA when there is particular uncertainty in the estimates of one or more of the input parameters to DEPM-based biomass estimates (e.g. as a result of difficulties in obtaining the adult samples required to provide a number of the DEPM input parameters). This question arose as a result of difficulties in obtaining adequate samples of adult blue mackerel east during the recent DEPM survey, necessitating the use of values obtained from previous surveys.

Mr Penney presented analyses using Monte-Carlo re-sampling of published probability distributions for the DEPM input parameters for the most recent assessment of jack mackerel and blue mackerel, to re-generate probability distributions around DEPM biomass estimates from these assessments. These were then used to illustrate how advice could be provided based on precautionary alternative, e.g. the 75 per cent and 90 per cent probability estimates of biomass, in addition to the usual 50 per cent (median) biomass estimate.

The method shown was then used to provide illustrative examples of how specific uncertainty in one or more parameter estimates could be explored and reported, using three hypothetical alternate scenarios of extended spawning area, uncertain spawning fraction or increased spawning fraction. These examples were used to show how advice might be altered under these scenarios.

Mr Penney noted that such analyses would usually be conducted as an integral part of the initial DEPM analysis, rather than subsequently re-creating the biomass probability distribution using post-hoc re-sampling of the input parameter distributions. He advised that Bayesian assessment methods were specifically suited to exploring and reporting on the integration of multiple complex contributory probability distributions.

Panel members noted Mr Penney's work and agreed that the methods shown provide an option for future reporting of precautionary advice under situations of particular uncertainty in one or more of the contributory DEPM parameters (e.g. as a result of sampling difficulties).

## **8.3 Next meeting**

Given the overlap of membership, Panel members agreed to schedule the next meeting out of session once the SESSFRAG meeting dates are set.