Australian Government
Australian Fisheries Management Authority

Southern and Eastern Scalefish and Shark Fishery

South East Resource Assessment Group (SERAG)

2019 Meeting #1 – October 2019

22-23 October 2019

CSIRO - Hobart, Tasmania

Minutes

Chair: Dr Michael Steer

DAY 1: Tuesday 22 October 2019

The Chair opened the meeting at 9am

Agenda item 1 – Preliminaries

1.1. Welcome and Introductions

1. Dr Mike Steer (Chair) welcomed members, invited participants and observers to the meeting and made an Acknowledgement of Country statement recognising the Tasmanian Aboriginal people as the traditional custodians of the land on which we meet - Muwinina country, and paid our respects to their Elders both past and present.

   There was an apology from Mr James Woodhams who nominated Mr Tim Emery to attend in his place, on behalf of ABARES.

   Attendees introduced themselves, outlined their relevant background and/or experience. Each Attendee's Declaration of Interest was provided prior to meeting and noted by exception. Some attendees arrived later and at that point, they introduced themselves.

Members	**Role**
Dr Michael Steer	Chair
Dr Ian Knuckey	Scientific Member, Fishwell Consulting
Mr Ross Winstanley	Recreational Member
Dr Sarah Jennings	Scientific (Economics) Member
Mr John Jarvis	Industry Member - east
Mr Daniel Hogan	Industry Member - west
Mr Simon Boag	Industry Member, SETFIA,
Mr Tim Emery	Proxy for Mr James Woodhams, ABARES
Dr Geoff Tuck	Scientific Member, CSIRO
Mr Andrew Penney	Scientific Member, Pisces Australis
Mr Dan Corrie	AFMA Member
Ms Mardi Albert	Executive Officer, AFMA
Invited Participants	
Ms Heather Johnston	AFMA
Dr Miriana Sporcic	Assessment Scientist, CSIRO
Dr Robin Thomson	Assessment Scientist, CSIRO
Dr Jemery Day	Assessment Scientist, CSIRO
Dr Paul Burch	Assessment Scientist, CSIRO
Dr Geoff Liggins	Senior Fisheries Scientist, NSW DPI
Dr Rudy Kloser	CSIRO
Mr Anthony Moore	ABARES
Observers	
Mr Nicholas Marton	ABARES
Ms Sandra Curin	CSIRO
Ms Florence Briton	CSIRO

1.2. Declarations of interest

2. A list of all conflict of interest declarations has been updated from the previous meeting, and provided on GovTeams. The Chair noted that attendees could provide further updates by exception.
3. The Chair outlined that attendees with conflicts would be required to leave when decisions were being finalised.
4. A copy of the Declarations of Interest is provided (Attachment A).

1.3. Adoption of agenda

5. Mr Boag raised that industry are reporting a broad range of size classes for eastern gemfish, indicating the potential beginning of a rebuild phase and would like SERAG to consider what other data could be collected other than biologicals via the Integrated Scientific Monitoring Program (ISMP). Mr Corrie noted this was discussed at the Southern and Eastern Scalefish and Shark Resource Assessment Group (SESSFRAG) meeting recently and would be included in the research agenda at SERAG #2. A review of the rebuilding strategy for eastern Gemfish would also be covered at SERAG #2 in December 2019.
6. No major changes were identified to the agenda and it was adopted (Attachment B).

1.4. Action items review

7. Mr Corrie drew the RAG's attention to the list of action items noting that the items were colour-coded according to their status. The RAG noted that many items were completed and updates were noted in the status column, in bold. The following updates were discussed:

Action item 1 (2018.11 agenda item 5):
AFMA to investigate the quantity of Silver Warehou likely to be caught if catches of Blue Grenadier increase under the proposed increase to the RBC. Consider the different fishing and discard practices of wet boats and freezer trawlers and the current status and RBC for Silver Warehou.

The RAG noted there were very low catches of Silver Warehou and the TAC was largely undercaught. This item referred to concerns around increased catches of Silver Warehou if any freezer vessels were to fish for Blue Grenadier. There was also some uncertainty around the recording of retained Silver Warehou that had been processed through the meal plant on freezer vessels in the past. Industry advised that Silver Warehou are typically caught when demersal trawling, and wouldn't expect to see large catches when midwater trawling for Blue Grenadier. Freezer vessels have 100% AFMA observer coverage and the RAG was comfortable that all catches were accounted for. The item was closed.

Action item 3 (2018.11 agenda item 9):
AFMA to approach NZ Fisheries regarding the holding of a joint Australian/New Zealand workshop to address common issues with Orange Roughy assessments, including natural mortality and stock recruitment relationships.

It was noted that this issue would be addressed when Dr Tuck and Dr Haddon attend the CAPAM workshop (Center for the Advancement of Population Assessment Methodology) in Seattle USA in March 2020. A separate workshop with NZ is not necessary as it would be discussed at this workshop. The RAG requested that Dr Tuck provide an update to SERAG in 2020 (captured in action items) and this item be closed. Link to the CAPAM workshop: http://capamresearch.org/Natural-Mortality-Workshop

Action item 1: Geoff Tuck to provide feedback from the CAPAM workshop in Seattle (March 2020) to the SESSFRAG data meeting in August 2020, to inform discussions and the stock assessment for Orange Roughy, including issues around natural mortality and stock recruitment relationships.

Action item 4 (2018.11 agenda item 2)

Review industry recording of non-quota discard groups in logbooks to identify any reporting issues that require a management response. Consider whether reporting is sufficient to allow fishery wide estimates of total non-quota species discards.

Mr Corrie noted SESSFRAG advice at their August 2019 meeting for CSIRO to include a summary of non-quota species catch and effort information in the annual Data Summary Report. SESSFRAG will review the data each year. Over time it may become possible to provide estimates of fishery-wide non-quota discards. This item can be closed.

Action item 6 (2018.11 agenda item 10)

Ian Knuckey to provide Miriana Sporcic with information regarding use of habitat closures in the upper slope dogfish management strategy as a proxy for stock protection. Info to be used in residual risk assessment for greeneye spurdog, Harrisson's dogfish, southern dogfish and endeavour dogfish. Provide rationale/justification for reducing the ERA risk ratings of white warehou, whitefin swellshark, Gould's squid, gulper sharks and southern sleeper shark, to feed into the residual risk analysis.

Dr Sporcic advised that under the new spatially explicit ERA method, the number of high risk species has reduced from 45 to 12 – this was presented to SESSFRAG in Aug 2019. The RAG noted that closures are explicitly accounted for under the new methodology. The item can be closed, noting that results of the ERA will be reviewed later in this agenda.

Action item 7 (2018.11 agenda item 10)

Refer to the ERA Technical Working Group: consider providing better guidance to observers to address species identification issues for cephalopods in order to assist with future ERAs.

Mr Corrie outlined the issues with cephalopods only being identified to Family level in logbooks, which require any species under that Family to be assessed in the ERA. To address the identification issue, a previous suggestion was to have an octopus expert (Mark Nolan or Julian Finn) go to Lakes Entrance to identify species composition. The RAG agreed to reconsider this at the ERA agenda item.

Action item 8 (2018.11 agenda item 11)

Incorporate data collection for Blue-eye Trevalla (seamounts) into the Data Plan.

Mr Corrie noted that the Shark Industry Data Collection project (SIDaC) data plan was being updated to include the collection of total and partial lengths of school and gummy shark, particularly any school sharks larger than 160cm. Also tissue samples of Blue-eye trevalla for CSIRO close-kin work and for ageing. AFMA was seeking advice from SERAG on the number of samples to be collected. Mr Boag advised there are contractual issues - they are waiting for AFMA to advise on the Southern Shark Industry Association (SSIA) co-management agreement being updated so industry can collect more samples. Dr Thomson noted the Blue-eye Trevalla close-kin project had not been supported by FRDC, but would be resubmitted for the next round.

The RAG agreed that it's important to get the data collection started and then refine the targets later. Mr Jarvis noted that only 2-3 boats fish the seamounts so we need to consider how many samples are collected from each seamount, and avoid under-collecting.

Noting the fishing was episodic, the RAG agreed to start collecting 20 samples from approximately 20% of the shots – as a starting point. This item will be closed, and respecified under a new action item.

Action item 2: AFMA to ensure that SiDAC data collection includes total and partial lengths of School and Gummy shark including School sharks larger than 160cm, and tissue samples of Blue-eye Trevalla for CSIRO's close-kin work and otoliths for ageing: (a) start collecting 20 samples from approximately 20% of the shots, and (b) the SSIA co-management contract needs to be finalised and this action item incorporated into the SiDAC Data Plan.

Action item 7 (2017.11 agenda item 6.2)

AFMA to quantify the area of suitable Deepwater Shark habitat inside and outside closures as a proxy for stock protection.

The RAG noted that this issue has been outstanding for some time and that deepwater shark had been reclassified as a Tier 5 species because of issues with the tier 4 assessment. However, the impact of closures on catches represents similar issues for Tier 5 assessments.

On a separate issue, the RAG discussed the application of discount factors (applied to lower Tier assessments) where there are significant closures in place. Mr Boag added that in line with the risk-cost-catch mantra if risk is reduced in the fishery by closing grounds then there should be a benefit, or at least no reduction to TACs.

Mr Jarvis raised concerns about the impacts of continuing to lower TACs for some species because of low CPUE caused by loss of grounds to closures which in turn causes issues with assessments., He raised concerns about the difference in TAC between east and west deepwater shark, which is driven by different trajectories in CPUE. This issue is discussed repeatedly, and Mr Jarvis thinks there is an issue with CPUE that is not being addressed. This will be considered as part of the 2020 assessment.

Mr Jarvis and Mr Boag commented that sharks will continue to be discarded, and potentially not reported, due to not having the TAC to cover it. If orange roughy grounds are opened in the west, the TAC may be too low to cover increased deepwater shark catches

Dr Knuckey and Dr Jennings suggested Rich Little's Multi-Species Harvest Strategy Project, which will consider species technical interactions and incorporate objectives of the revised Commonwealth Harvest Strategy Policy (HSP) for byproduct species, may provide some solutions to these issues.

The next deepwater shark assessment is scheduled as a Tier 5 assessment in 2021 and will be undertaken using all available information. The RAG agreed to continue with established practice – to not apply the discount factor when large closures are in place and agreed to defer further discussion on how to assess the stock and how to set a TAC for deepwater sharks to SERAG in 2020, in preparation for the next assessment in 2021.

Post meeting note:
Mr Penney provided reference:
Williams, A., Althaus, F., Smith, T., Daley, R., Barker, B. and Fuller, M. (2012a). Developing and applying a spatially based seascape analysis (the "habitat proxy" method) to inform management of gulper sharks: A compendium of discussion papers. Report to AFMA. CSIRO, Australia.

Action item 3: AFMA to schedule further discussion about stock assessments of Deepwater Sharks and how to set an RBC, at SERAG in 2020 in preparation for the 2021 assessment.

Action item 9 (2017.11 agenda item 6.3)

SESSFRAG to consider a standard approach to limiting the multiplier value (D/C+1) in Tier 4 assessments where estimated discard rates are high.

The RAG agreed to close this item noting that Tier 4 species with species with high discard rates are now being assessed using Tier 5 or ERA assessments.

Action item 20 (2018.09 agenda item 2)

CSIRO to consider which factors (e.g. season, depth, zone) influence length frequencies for all species, to update data plans and targets for observer program and port sampling.

Dr Thomson advised that she provided an update on preliminary work to SESSFRAG. There appears to be a length/depth relationship for some species, however further work is required to determine whether this is the case for all species, and if some samples can be collected in port. The work is being

scoped out with Dr Burch and a proposal will be presented to AFMA and an update will be provided at SERAG #2 (2019) as part of the SESSF annual research statement item. This item was closed.

8. The list of action items was updated after the meeting (Attachment C). Items that were noted as completed (highlighted green) at the meeting will be removed and an updated list will be provided to SERAG #2 in December 2019.

9. The list of action items arising from this meeting is included (Attachment D).

Agenda item 2 – Economic conditions in the SESSF

2.1. Advice on proposed economic conditions template

10. Mr Corrie advised that AFMA was increasing the use of economic information to help inform decision making for Commonwealth fisheries, and that key economic information will be included in AFMA's Fisheries Management Strategies and reporting frameworks. AFMA is seeking advice from the RAG on the type of economic information that should be collected and reported in future RAG meetings. The information compiled would be sourced from existing information in the first instance to minimise costs, and is intended to help contextualise recent economic conditions in the fishery and to help inform RAGs, MACs and the Commission when providing advice and/or making management decisions.

11. Dr Jennings advised that the Economic Working Group (EWG) had two aims (1) to provide a template of indicators to support AFMA's monitoring and reporting of economic performance of all fisheries to the AFMA Commission, and (2) to support RAGs and MACs and AFMA with better economic information. The economic conditions template to be provided to members refers to point (2). Dr Jennings noted the EWG's focus on pulling together the available economic information, making it easily accessible and to minimise costs. The information would be updated annually and the result would be an economic snapshot of each fishery. The purpose is to support discussions at RAGs, MACs and then put up to the Commission.

12. The RAG discussed or noted:

    - AFMA uses Maximum Economic Yield (MEY) (more usually proxy) targets in its fishery harvest strategies to help pursue maximising the net economics returns to the Australian community.
    - The proxy target is a static value that does not change with changing economic conditions. The use of static proxies may be appropriate and consistent with the risk-cost-catch principles.
    - Incorporating fisher's observations would be useful.
    - Mr Boag suggested focussing on the key commercial species in each sector (not separating by quota and non-quota) and including levies as a percentage of fishery Gross Value Production (GVP). Mr Boag also offered assistance with industry contacts to obtain information and feedback.
    - Dr Knuckey and Mr Penney emphasised that we need to understand exactly what various economic data mean, and limitations in these data, , before they could support decision making.
    - Explaining the meaning of economic data and having interpretation around the indicators is important. Suggest starting with a mock-up of the template so members can review and provide feedback.
    - Mr Penney emphasised the importance of having a clear hierarchy of evidence, with evidence relating to stock status (against biological reference points) taking priority over economic indicators. Ensuring high stock biomass (above MSY) is generally a pre-requisite to achieving good economic performance.

- Dr Knuckey said we need to understand the complexities of how fishing industry businesses are structured including how quota holdings are managed.
- Dr Jennings was happy for SERAG members to provide feedback on the proposed economic data template Members can also provide their input via Mr Corrie or the Executive Officer.

13. The RAG noted that the EWG, once membership is established, would progress this initiative and a further update would likely be made in 2020.

Agenda Item 3: ISMP Discards, Catch Reports and Data Summary

3.1 Proposed changes and interim update

14. Dr Burch provided an update on proposed changes to the reports provided under the Data Services contract in 2019 and 2020. The following changes were noted:

    Data Summary report

    A revised version will be provided to SERAG #2 (2019) with minor corrections to the data. Catches will be identified where CDR records differ markedly from logbook records, and CAAB codes for each species or species group will be included.

    There are some very large recorded shots of Blue Warehou and Dr Thomson is investigating this with Tamre Sarhan (AFMA). The RAG discussed issues with Blue Warehou being recorded as Black Trevally in logbooks, and requested that AFMA investigate the discrepancy between CDRs and logbooks. It appears to be an e-Log issue with choosing the correct species or family name.

    Mr Jarvis suggested that the Blue Warehou stock seems to be recovering.

    The RAG also discussed discrepancies between logbooks and CDRs for Bight Redfish and requested CSIRO to investigate the discrepancy and to report to GABRAG (by 21 November 2019).

    ISMP Discards report

    A revised version will be provided to SERAG #2 meeting in 2019 that includes changes requested at SESSFRAG in August 2019. Further changes to be implemented for the 2020 report include:

    - Discards for frostfishes and King Dory, squid, Latchet and Ocean Jacket.
    - Re-estimation of the time-series of discarded catch estimates using the method approved at the February 2020 SESSFRAG meeting.
    - A revision of the ISMP strata for Deepwater Shark off southern Tasmania, to align these strata with current management boundaries and to investigate whether depth zonation is needed.

    Catch and Discard report

    A revised version will be provided to SERAG #2 meeting in 2019 that includes changes requested at SESSFRAG in August 2019. Further changes will be implemented for the 2020 report that includes:

    - Catches and discards for frostfishes and King Dory, squid, Latchet and Ocean Jacket.
    - Additional data on recreational catches where reported catches in numbers are converted to catches in weights using mean weight from other studies. This information will be made available to the RAG for relevant species to decide if/how to incorporate into the assessment.

15. Dr Burch provided an update on work for the evaluation of discard estimation and observer coverage, which will be finalised and presented at the SESSFRAG Chairs meeting in February 2020. Key points include:

    - Use of a geometric mean to calculate discards, the uncertainty in the total catch (retained + discarded), and sensitivities to the minimum number of observed shots (e.g. 3, 5, 10) for a stratum to be included in the discard estimate.

- An evaluation of the rules used to determine whether a discard estimate is representative of the fishery, and should therefore be used in TAC calculations.
- Evaluation of the allocation of observers to vessels and the resulting coverage of observer days across the fishery to determine whether observers are being appropriately allocated.

16. Dr Burch also advised that CSIRO provided funding to undertake work on using a generalised linear mixed modelling approach to estimate discarded catches for selected species that represent common discarding patterns in the SESSF. Results from this work and a report entitled "A model-based approach to estimating discarded catches in a multi-species, multi-sector fishery" will be presented to the SESSFRAG Chairs meeting in February 2020.

Action item 4: AFMA to investigate logbook records of catches of 'Black Trevally' (also called Black Snotty) from the last 2 years and verify with skippers whether species recorded on CDRs is Blue Warehou. If so, AFMA will correct data records and correct recording practices.

Action item 5: CSIRO to investigate the Bight Redfish discrepancy (page 5 of Data Summary), between logbooks and CDR catches in 2017, to understand where the discrepancy is coming from.

Agenda Item 4 – Tier 1 Tiger Flathead stock assessment

4.1 Update from industry

17. Industry members noted that catch rates around Lakes Entrance are low, perhaps because of localised depletion or due to fishery interactions. There's an increased number of Danish seiners working and the Victorian octopus fishery is having an impact with approximately 20% of seine shots compromised by octopus pots – this complicates access to grounds. Other points discussed:
    - Seiners usually fish in good weather, and recent poor weather conditions may be affecting catch rates. There's been an influx of cold water up the east coast. Catch rates may be low because the Lakes Entrance seine fleet have been fishing in adverse weather over the last 18 months. Dr Burch said he's included weather factors into other assessments but too late to include in this assessment Mr Boag noted that Flathead don't spawn until water temperature reaches 19°C and stock may be moving elsewhere to spawn.
    - Catch rates in north-east Tasmania are better. This is likely linked to environmental change (water temperature) and the species range may be shifting into this area.
    - Danish seine mesh size was increased by 5mm in 2019 but won't affect this year's assessment. It was increased to 75mm mesh based on Dr Knuckey's work (2008).
    - Tiger Flathead are generally not seen in the west around Portland.
    - There are underlying economic factors that influence targeting – lease price vs. market price where the Flathead lease price is currently low.
18. Mr Boag raised the issue that the assessment is called 'Tiger Flathead' yet includes other flathead species – Sand, Dusky, Toothy and Blue Spot. Dr Day noted that six CAAB codes are included but it consists of approximately 97% Tiger Flathead. Dr Thomson advised that when another flathead species like sand or toothy is caught in the Commonwealth, it is often recorded as 'Flathead' in logbooks and CDRs.

Dr Knuckey suggested writing a one-page summary of the discussion, context, catch composition from ISMP to explain the reasoning for future reference, and avoid confusion. Dr Day will incorporate an update that was presented to SESSFRAG in August 2019 into this stock assessment which will be presented at SERAG #2 (2019).

19. The RAG agreed that the assessment report should include an overview of the species included in the assessment.

4.2 Overview of recent data

20. Dr Day summarised the 2019 preliminary assessment, with the following overview of the assessment:

    - Last assessment in 2016 estimated a 2017 spawning stock biomass of 43% of virgin stock biomass
    - Previous assessment in 2013 estimated a 2014 spawning stock biomass of 50% of virgin stock biomass
    - Two sex model assumes single stock across zones 10, 20, 30 and 60
    - Four fleets: three still active (Danish seine, eastern trawl, Tasmanian trawl) and one historical fleet (steam trawl)
    - Selectivity is estimated by the model but allowed to vary between fleets, and to change for Danish seine in 1978 and for eastern trawl in 1985.
    - Discards are assumed to be 17% prior to 1960 (for Danish Seine and steam trawl (agreed by the RAG) and estimated post 1960
    - Natural mortality fixed at 0.27 (agreed by RAG)
    - Recruitment estimated 1915 to 2015, and the 2019 assessment shows that for the last 10 years:
        - 3 years good (2008, 2010, 2011)
        - 2 years poor (2014, 2013)
        - 5 years average (2006, 2007, 2009, 2012, 2015)
    - This is the first time that FIS age-at-length data (from 2008) has been included.
    - The three extra years of recruitment shows that recruitment in 2013 was poor, just slightly above the worst ever seen. It was noted that there was a structural adjustment in 2005 and there was seismic testing in 2012/13.
    - Mr Jarvis noted that 2014-16 lease prices started to increase after low catches in 2013.
    - Mr Boag noted a major 3D seismic survey (5 months and biggest seen in the fishery) is planned for January 2020, covering 40% of all flathead fishing area, and all of the Danish seine grounds and also covers some of the trawl/gummy shark grounds.
    - The RAG requested Dr Day to check the divergence between the CPUE series and the model fit (report, page 26, the '1990s hump') and clarify at SERAG #2 (2019).
    - Members discussed whether flathead off the coast of Tasmania should be treated as a separate stock. Dr Day said that he'd noted this previously in his 2016 report.
    - Members noted that the two-phased bridging approach works well and provides a good comparison to inform the RAG's discussion.
    - Mr Penney noted that two issues need further attention: (1)what future recruitment scenario to use for projections, given the recent low recruitments in 2013 and 2014 and (2) the possibility that eastern Tasmania represents a separate stock.
    - There were some concerns about estimating recruitment deviations from 100 years ago (1920s), particularly the higher 'sigma r' used in this time period to improve the fits to the CPUE. Dr Day to investigate how valid this is and include a sensitivity using a lower 'sigma R' to see how it affects the time-series.

4.3 Preliminary base case

21. Dr Day noted that the last assessment (2016) estimated a spawning stock biomass of 43% of virgin stock biomass. The 2019 proposed base case estimates a spawning stock biomass of 34% of virgin stock biomass.
22. Same assumptions as 2016 assessment except:
    - Both on-board and port length frequencies included
    - Length frequencies weighted by shot/trip
    - Updated tuning procedure (Francis weighting)
    - Recruitment now estimated 1915 to 2015 (was to 2012)
    - Revised recruitment estimates for 2010-2012 are above average, with new recruitment estimates below average for 2013 - 2014 and average for 2015
    - Inclusion of Fishery Independent Survey split in fleet + FIS lengths + FIS ages
23. The likelihood profile for natural mortality (M) is uninformative, noting the following:
    - The likelihood profile suggests that increasing M allows better fits to data
    - However, the maximum age observed and biology should be considered when choosing M
    - M should not be chosen based on results from a likelihood profile alone
    - Biology and maximum age suggest that $M = 0.27\ yr^{-1}$ is reasonable
    - Conflict between likelihood profile and biological considerations
24. Spawning stock biomass (SSB_0) is estimated with considerable uncertainty, noting the following:
    - The likelihood profile suggests that a broad range of plausible SSB_0 values (15,000-29,000 t), but most likely around 22,000 t
    - This is in general agreement with the asymptotics
    - Index data (especially steam trawl data) and recruitment is the most informative data
    - SSB_0 needs to be sufficiently high to enable the historical catches to be sustained
    - Recruitment component of likelihood provides lower bound on SSB_0
    - Fits to the index data deteriorate with larger values of SSB_0
    - Dr Tuck noted that B_0 is not well estimated (but depletion level is) and while B_0 is uncertain, the model is not weakened by this uncertainty.
    - Suggestion to add a likelihood profile around depletion and to emphasise the uncertainty bounds.
25. The retrospective summary shows no pathological patterns and no apparent biases in the estimates at the end of the time series with the addition of new data.

4.4 Discussion

26. The RAG considered and resolved the following:
    - Incorporate FIS3 abundance indices in the model – the RAG agreed it is a better option instead of FIS1.
    - Include summer FIS length frequencies (2008, 2010, 2012) – agreed.
    - Exclude Tiger Flathead catches in the west (zones 40 and 50) – agreed. Dr Day clarified that these catches are included in the CDR total but are not modelled as coming from the west. Alternative discard estimate series, reverting to a previously used method to calculate yearly discard rates – after discussion, the RAG agreed to maintain the new approach and flag this for further discussion in future.
27. The RAG requested that the issue about the Tasmanian stock being a separate stock be added to SERAG #2 agenda under the annual research statement item.

28. The RAG requested Dr Day focus on the following tasks in preparation for SERAG #2 (2019):

- Provide a statement in the assessment report identifying all the species covered by the assessment. Resolve the method of dealing with multi-species in the assessment.
- Reference: slide 17 (report page 26) about increase in catch rate standardisation

  Reconcile the discrepancy (a relative increase in the standardised values in recent years) for Danish seine on page 26, catch rate standardisation over previous 20 years. Noting that Dr Sporcic indicated that depth is a contributing factor in standardisation for Danish Seine. This requires clarification by SERAG #2.
- Reconcile the divergence and fit between the modelled abundance and various CPUE indices in the 1990s.
- Ref slide 27/28 and Figure 11

  Recruitment deviations data from 100 years ago (1920s) may result in decrease across whole series and makes a fundamental difference to results. RAG to consider whether to include these. Dr Day to investigate how valid this is – has the whole series been operating lower? Include a sensitivity of reduced 'sigma R' to see how it affects the series.
- Explain the shifting trajectory in reference to the management target and how this relates to revised estimate of B_0(completed on day 2).
- Use the FIS3 series rather than FIS1 and include summer FIS length frequencies.
- In the base-case, include the western catches of Tiger Flathead.
- Continue using the revised discard estimate series (introduced in all other SESSF assessments, but different to the method used in the last tiger flathead assessment).

Agreed sensitivities:

- Constrain the historic recruitment around the 1920s and 1935 (refer to point 4 above)
- Add a likelihood profile for depletion (addressing uncertainty in B_0)
- Remove the western catches of Tiger Flathead
- Use new/current discard estimate method

SERAG requested for next meeting:

(1) Fixed catch scenarios at long term average recruitment, 4 levels over 3 years between current RBCs of 2016 and 2019
(2) Cross-catch scenarios at recruitment above and below (e.g. 75th percentile) average projected forward 3 years. Under same catch scenarios from point 1 but with crossed-catch analysis.

Agenda Item 5 – Gemfish stock structure

5.1: Overview of latest genetics research

29. Mr Andy Moore (ABARES) presented an overview the FRDC project (2013/014)[1] 'Research to underpin a better understanding of Western Gemfish stocks in the Great Australian Bight' :

- The project commenced when the stock was being assessed at GABRAG as a Tier 1 assessment in 2011, and stark differences were noted between east and west Gemfish catches over time.
- Eastern Gemfish stocks are known to migrate north and spawn in winter.

[1] Link to FRDC project summary: https://www.frdc.com.au/project?id=501

- Noted previous research from Paxton & Colgan (1993) 'Biochemical genetics and stock assessment of common Gemfish and Ocean Perch' (FRDC 1991/35).
- New research included modern molecular markers (mitochondrial DNA, microsatellites, single nucleotide polymorphisms (SNPs). Add-on work included gonad staging and length frequency sampling.
- The research included assistance from industry and Fishwell Pty Ltd for collecting samples.
- The research revealed evidence of genetically different populations between the east and west (no gene flow), with a mixing (overlap) of the two stocks in western Bass Strait through to Portland.
- The eastern stock is the same as those in New Zealand.
- Although no gene flow was found between east and west, individuals from each were found in the other population. So questions arose about whether the stocks were hybrids or migrants. Subsequent analysis revealed no hybridisation and these individuals are not sharing genes between either population.
- This research found that Western Gemfish migrate west and spawn in the GAB during summer. Both eastern and western Gemfish migrate towards opposite ends of their distributions and spawn six months apart, which is likely to be the major contributor to the genetic differentiation seen.
- The genetic differentiation between east and west is likely large enough to warrant separate species designation, though some work needs to be done to describe this difference.
- Initial tests to determine the effective population size (*Ne*) (the number of individuals contributing to the next generation – effective genetic contributors) of Gemfish revealed substantially smaller (*Ne*) in the east than expected for a population of this kind (i.e. a population in the thousands or tens of thousands). The effective population size calculations revealed an (*Ne*) that is an order of magnitude smaller in the east than the west (6406 contributors in west and 613 in east). The expectation is that the eastern population is demographically larger than the western population. Further work has revealed additional evidence to support these findings. There is clear evidence for a small Ne and the effects of genetic drift in the east.

30. Summary of key research findings:

- No gene flow between east and west stocks - but an overlap zone
- There are no hybrids and migrants are not breeding
- Spawning is separated in space and time
- There is compelling evidence for low effective population size in the east.

31. The RAG discussed:

- Mr Jarvis suggested the differences in spawning in east and west were related to water temperature, where the GAB water is colder than the east coast.
- What affects 'effective population' size? Ideas include lack of recruits coming through, impacts of dominant larger females spawning perhaps overwhelming the smaller females.
- Issues include: rebuilding strategy not effective and not collecting data on recruitment, need to investigate what's affecting east coast populations. Abundance and length data needed.
- Where to draw the line between stocks for management purposes, noting overlap zones. The RAG suggested that the boundary is the line separating zone 50 and 40.
- Further genetic and recruitment work could answer why eastern Gemfish are not recovering.

Agenda Item 6 – Tier 4 Assessments

6.1 Gemfish west

32. The RAG noted that information from the previous presentation (agenda item 5) would feed into Dr Sporcic's assessment for Gemfish west, to be presented at SERAG #2 (2019).
33. The RAG discussed how to assess the stock noting that it is a quota species in the CTS but not in the GAB. Mr Corrie said the Tier 4 would be conducted for western Gemfish caught in the CTS and clarified that Gemfish caught below zone 50 (northern part of zone 40) would come off western Gemfish quota.
34. Mr Corrie pointed out that the opportunity to change where the management plan draws boundary between eastern and western stocks, would be through a regionalisation process.
35. Currently eastern and western Gemfish are assessed as separate stocks – Gemfish is not assessed in the GAB because it's not a quota species, nor is it caught in any great quantity. If catches were to increase then an assessment could be run for western Gemfish caught in the GAB, and that would be discussed at GABRAG.
36. There are two distinct biological stocks. The RAG agreed to a Tier 4 assessment for Gemfish caught in zone 50 including discards from zone 50 to produce the RBC. This does not include western Gemfish caught in the GAB.

6.2 Mirror Dory Tier 4 Assessment

East:

37. Dr Sporcic noted that eastern Mirror Dory catches and CPUE have decreased considerably in 2018 which will have an impact on the Tier 4 assessment.
38. Mr Jarvis noted that there were about six fewer boats from the 2017/18 season onwards and one of those was the biggest catcher of Mirror Dory. There are now three vessels left that catch or target Mirror Dory.
39. The RAG noted the following:
    - The CPUE decrease in 2018 has dropped below the long-term average, and the 'lost vessels' are accounted for in the CPUE standardisations using a 'vessel correction' factor.
    - Discards are included in the east but not in the west (this was a previous RAG decision).
    - The target and limit have changed slightly due to an error in the CDR data during the reference period (1998 – 2006) which has since been corrected.
    - The 2019 RBC is 92.7 t (decrease of 48 t from 2018: 140.4 t) noting the 2018 catch was 79.8 t.

In the West:

40. Dr Sporcic noted that catches in the west have also dropped dramatically.
41. Mr Hogan added that the water is warmer and seasons are changing, the catches are coming later each year.

42. The RAG noted the following:
    - Discards are not included in the west.
    - The 2019 RBC is 76.7 t (decrease of 18 t from 2018: 94.8 t) noting the 2018 catch was 37.4 t.

Combined RBC

43. The 2019 combined RBC (east and west) is 169.4 t.

44. The RAG discussed the following points:

- The 'draft CPUE standardisation SESSF species August 2019' page 44, figure 38 shows the 'year effect' is driving the CPUE and suggests there are now less efficient vessels, noting that the vessel effect is more important than the depth effect.
- Dr Knuckey requested the terminology "in any case" be removed from the report as it affects people personally.
- There are more catches at shallower depths (less than 200 m) in 2018 compared with the previous year.
- The species summaries will be updated at SERAG #2 meeting.

45. The RAG recommended:

- a combined RBC (east and west) of 169.4 t with a 15% discount factor to apply.
- maintaining a single-year TAC due to the cyclical nature of catch rates.
- weighted discards from the east (6.48 t) to come off the RBC.
- 10% overcatch and undercatch provisions apply.

Agenda Item 7 – Orange Roughy acoustic survey

7.1 Voyage report and preliminary findings

46. Dr Rudy Kloser provided an update on the Orange Roughy (OR) acoustic optical survey (AOS) that was conducted in the eastern zone (St Helens seamount and St Patrick's Head) in 2019 on board the *FV Saxon Onwards*.

47. The eastern zone OR fishery was reopened in 2014 based on a sustained monitoring program since 2006 that combined with an updated stock assessment model, showed the stock was recovering and was above the 20% pre fishery equilibrium level (Upston et al., 2014; Kloser et al., 2015).

48. Key points included:

- The acoustic surveys have been a major index for the eastern zone spawning stock that due to multi-frequency species identification and optically verified target strengths provide an estimate of stock biomass at two frequencies.
- Scientific objectives were to determine acoustic biomass of spawning Orange Roughy in the Eastern Zone in 2019 and to collect biological data to support target strength, age, length, weight and environmental analyses.
- This voyage was very successful with no down time in doing surveys due to unexpected gear problems despite the high winds and high seas experienced for most of the voyage.
- They trialled new equipment – a net attached acoustic optical system deployed at the net's headline for biomass estimation, conducted 100 biomass estimates across Australia and New Zealand between 2010-2014.
- The targeted catches ensured they sampled the main body of the spawning aggregation for representative samples. They trawled at 4-500m above the seamounts, if they went closer than 200m then the OR would dive.
- They used multiple lines of evidence – trawling, optical observations, fish target strength, depth and location.
- The bad weather conditions made it difficult to work and other gas bladder fish made it hard to distinguish Orange Roughy. However, they encountered good schools at St. Helens (more females here than at St. Patricks).
- They observed lots of sex segregation in the trawls.
- Preliminary results show the provisional mean at St. Helens was 25000 t (in 2016 it was 15000-21000 t) and the provisional mean at St. Patricks was 9900 t (in 2016 it was 4000-6000 t). So initial numbers suggest an increase since 2016.

- The final research report is due to CSIRO by March 2020 for inclusion in the assessment and Dr Kloser thanked Mr Boag, Mr Corrie, Mr Tony Muollo, the skipper Mr Jamie Dunkley-Price and his crew.
- Mr Boag thanked Dr Kloser and his team for their work noting the bad weather conditions.

49. Dr Kloser also provided a brief update on another survey he conducted on the *RV Investigator* of the southern seamounts, Pedra Branca in December 2018. He noted it is a known summer feeding ground for Orange Roughy. Video-tows shows schools of Orange Roughy at Pedra Branca and small oreos. Stereo photos can estimate lengths and numbers but with low precision.
50. The RAG supported the AOS survey being completed before the assessment is undertaken to contribute to the index of abundance for OR.

DAY 2: Wednesday 23 October 2019

The Chair reconvened the meeting at 9am

Agenda Item 8 – Ecological Risk Assessments

51. Dr Sporcic provided a residual risk update for the ERAs for Danish seine and Otter trawl, noting:
    - ERAs were updated in August 2019 at SESSFRAG to incorporate a new approach to quantifying effort. Rather than assuming the same impact on any fished 1 km grid, actual effort levels within each block (swept area) were used to account for different intensity between fished blocks. This approach is considered to be more appropriate for the SESSF where effort tends to be concentrated in certain areas .
    - SESSFRAG (at the August 2019 data meeting) agreed this was an appropriate way forward, however, noted potential issues with how swept area is calculated because only the width of the net is considered, which does not include the bridles, sweeps or trawl doors. SESSFRAG suggested deferring a review of the swept area factor to the next assessment, and recommended SERAG finalise the results of the most recent ERA assessments, subject to a residual risk assessment being undertaken for the CTS Otter Board Trawl method.
    - The revised results are available in the ERA supplementary report[2] (Supplement 1: Table S1.1, and Supplement 2: Table S2.1) – also copied below:
        - Otter trawl: 45 high-risk species revised down to 12 (6 PSA and 6 bSAFE-i[3])
        - Danish seine: remains at 5 high-risk species
    - Mr Corrie advised that an action from SESSFRAG was for SERAG to review the downgrading of Whitefin Swellshark from high risk under bSAFE to medium risk under bSAFE2 because it was recently added to the IUCN red list as a critically endangered species. SERAG considered this and was comfortable with the downgraded risk since they reflect the risk in Australia. The RAG was comfortable there are sufficient management measures in place, such that closures and low effort represent little risk to the species. The SESSFRAG Executive Officer will be notified.
    - Mr Boag suggested the terminology of 'extreme' was problematic and would prefer 'high risk' but accepted that the classifications are standard and based on peer-reviewed work by Dr Shiji Zhou

[2] Sporcic et al. (2019). Draft Supplementary Results (bSAFE-i) for the Southern and Eastern Scalefish and Shark Fishery: four sub-fisheries 2012-2016

[3] bSAFE-i (accounting for intensity); bSAFE2(effort in a 1 km grid)

Table S1.1. SESSF Otter trawl sub-fishery: Extreme or high risk PSA or bSAFE-i species following a residual risk (RR) analysis. x: risk score following RR analysis. CH: chondrichthyan; INV: invertebrate. No. Missing: Number of missing attributes in PSA analysis. Grey shading: expanded species from group code. ^: at risk from Zhou et al. (2012). C1: Key commercial; BC: bycatch; BP: byproduct. *: Upper-slope dogfish closures exist. T4: Tier 4 species. bSAFE-i: fishing effort including intensity.

LEVEL 2 ANALYSIS	ERA CLASSIFICATION	TAXA	NO. MISSING	SCIENTIFIC NAME	COMMON NAME	EXTREME RISK	HIGH RISK
PSA	C1	INV	1	*Nototodarus gouldi*	Gould's squid		x
	BP#	CH	6	*Chimaera ogilbyi*	Ogilby's ghostshark^		x
		CH	6	*Pavoraja arenaria*	Sandy skate		x
	BP	INV	10	*Melo miltonis*	Southern bailer shell		x
		INV	10	*Sepia braggi*	Cuttlefish		x
		INV	5	*Pinnoctopus cordiformis*	Maori octopus		x
	BP	CH	-	*Dipturus gudgeri*	Bight skate^		x
bSAFE-i		CH[T4]		*Deania quadrispinosa*	Longsnout dogfish		x
	BC	CH	-	*Centrophorus squamosus*	Leafscale gulper shark^	x	
		CH*	-	*Centrophorus zeehaani*	Southern dogfish	x	
		CH	-	*Centrophorus granulosus*	Gulper shark	x	
		CH*	-	*Centrophorus moluccensis*	Endeavour dogfish	x	

Table S2.1. SESSF Danish seine sub-fishery: High risk PSA or bSAFE-i species following a residual risk (RR) analysis. x: risk score following RR analysis. INV: invertebrate. No. Missing: Number of missing attributes in PSA analysis. Grey shading: expanded species from group code. BP: byproduct.

LEVEL 2 ANALYSIS	ERA CLASSIFICATION	TAXA	No. MISSING	SCIENTIFIC NAME	COMMON NAME	HIGH RISK
PSA	BP	INV	10	*Sepia braggi*	Cuttlefish	x
		INV	5	*Sepia grahami*	Cuttlefish	x
		INV	5	*Sepia rozella*	Rosecone cuttlefish	x
		INV	5	*Octopus pallidus*	Pale octopus	x
		INV	1	*Nototodarus gouldi*	Gould's squid; Arrow squid	x

- The RAG agreed to review the results by exception, if any listed species raised concerns or were questionable. Mr Corrie noted that risk scores should only be reviewed where there is a structured and justifiable approach, rather than 'cherry-picking' certain results to change/justify their score. For scores that remain 'questionable' the appropriate management response may be to collect more data to reduce uncertainty.
- Mr Emery asked if the PSA results incorporated the way susceptibility is calculated (this was changed in 2019) noting the work that ABARES and CSIRO have recently collaborated on with deepwater sharks. Dr Sporcic will investigate this.

Action item 6: Dr Sporcic to check whether the latest PSA methodology have incorporated the new way susceptibility is calculated.

- It was noted that Gould's squid has identification issues and exhibit considerable inter-annual variation in population abundance. Dr Sporcic also noted that Cuttlefish (*Sepia braggi*) has 10 missing attributes, and Maori octopus (*Pinnoctopus cordiformis*) has five missing attributes.
- Dr Sporcic noted that in the absence of information, risks increase- in a PSA analysis (e.g. identification issues).

52. In summary, the RAG noted the following:

- The results were adopted for both Danish seine and Otter trawl.
- Dr Sporcic will link the reports noting the results are accepted in the full final reports. The reports will be made publically available.
- The RAG recognised and appreciated the efforts by Dr Sporcic in the ERA process.

Agenda Item 9 – Smooth Oreo RBC advice

9.1 Smooth Oreo (other)

53. Mr Corrie advised that Smooth Oreo (other) was one of several species identified as 'difficult to assess' by SESSFRAG in August 2018. These species were then considered separately by a technical

working group (TWG) in terms of how to assess them in future and to provide advice to the relevant RAGs. The reasons varied, but were generally related to high discards for Tier 4 species, conflicting and/or inadequate data, or suspected regime shifts.

54. Previously, Smooth Oreo (other) was assessed using a Tier 5 depletion based stock reduction analysis (DBRSA) for the first time in 2015. This generated an RBC of 90 t of which 50-80% has been caught over the last few years.

55. At its November 2018 meeting, SERAG was asked to provide 2019-20 RBC advice for Smooth Oreo (other) which was in the third year of a 3-year multi-year TAC (MYTAC). SERAG deferred updating the Tier 5 assessment until the SESSFRAG TWG had provided advice. The RAG noted there was no basis for changing the RBC advice from the 2015 assessment and there was little risk in rolling over the TAC of 90 t.

56. The TWG was established in February 2019 to provide advice on how to set TACs for species identified as 'difficult to assess'. For problematic species being assessed using Tier 4 or Tier 5 assessments, the TWG recommended an interim approach, pending the outcomes of the multi-species harvest strategy:

    - setting a TAC based on the existing TAC, subject to sustainability concerns and consideration of whether the TAC is restricting catches of that species or any other species
    - annual monitoring of available fishery indicators on a weight-of-evidence basis, including SAFE assessments, where available
    - if fishing mortality needs to be constrained, management measures other than output controls should be considered by SEMAC and AFMA.

57. SESSFRAG (Data meeting August 2019) recommended assessing Smooth Oreo (other) as an 'ERA species' recognising issues with the Tier 5 assessment, specifically that a key underlying assumption of the methodology – that catch is an indicator of abundance – is undermined because catch has been affected by closure and then reopening of OR grounds.

58. The RAG discussed the following points:

    - Industry noted that catches are starting to increase in line with Orange Roughy catches in the south. If OR catches increase, there is a need to recognise that catches of oreos will rise as well, and set the TAC accordingly, otherwise discards will increase.
    - How to assess oreos noting issues with previous Tier 4, Tier 5 and DBSRA assessments (run by Dr Haddon) which produced RBCs ranging from 72-195 t.
    - Treat it as a developing fishery, and set triggers that require collecting extra data, such as biologicals, to start building up the fishery or simply start collecting data with the intent of using it in some form of assessment in the future. The current ISMP data plan only includes lengths but no otoliths.
    - There is a need to invest in developing a plan for data collection to consider options and consult experts and industry e.g. Dr Kloser's acoustic work – could estimates of oreo abundance be extracted post-hoc?
    - Other ideas raised include:
        - AFMA to consult the skipper of the Saxon Onwards who is the industry expert on the fishing areas to gauge seasonal information, stock sizes, and catches to inform sampling plan.
        - Draft the western Orange Roughy research plan to include sampling for other species like oreos.
        - Consider an acoustic survey now before rolling out to the western region.
        - Including a research quota allocation for smooth oreos as part of the Western Orange Roughy Research Plan.
    - A SERAG sub-working group could develop a proposal considering:
        - Including age and length in the ISMP data plan
        - Acoustic surveys for oreos as part of the Orange Roughy surveys
        - Consult industry experts for background information and expertise

- Meet out of session and report back to SERAG #2 (2019)

Action item 7: Update the ISMP data plan to collect otolith and length data for Smooth Oreos

Action item 8: SERAG sub-working group (Dan Corrie, Geoff Tuck, Jamie Dunkley-Price, Rudy Kloser and Paul Burch) to develop proposal for Oreo fishery to present to SERAG #2

59. The RAG recommended continuing the 90 t RBC for the 2020-21 SESSF season Smooth Oreo (other).

9.2 Smooth Oreo (Cascade)

60. Mr Corrie advised that Smooth Oreo (Cascade) was last assessed by SlopeRAG in 2010 using a Tier 4 assessment which concluded that the CPUE-based biomass proxy was above the target reference point. CPUE has been historically variable but this is not considered to be indicative of changes in stock status.
61. Low catch and effort levels since 2009 have precluded any updates to the Tier 4 assessment.
62. Smooth Oreo (Cascade) is managed under a single-year TAC of 150 t, which is subject to a 10 t review trigger. The trigger has not been reached and there has been no catch since 2012 (0.5 t).

RBC Decision for Smooth Oreo (other) and (Cascade)

63. The RAG recommended to rollover the RBC for Smooth Oreo (other) as a single year TAC at 90 t with 10 per cent overcatch and undercatch provisions. Catches should be reviewed in 2020, and if additional data is available, SERAG should consider increasing the RBC.
64. The RAG recommended to rollover the RBC for Smooth Oreo (Cascade) at 150 t with 10 per cent undercatch and overcatch provisions, with a review trigger of 10 t.

Agenda Item 10 – Rebuilding strategy reviews

10.1 Blue Warehou: 5-year strategy review and annual review

65. Ms Heather Johnston outlined the review of the Blue Warehou rebuilding strategy (the Strategy) review, noting that the 5-year Strategy review was due this year as well as the annual review. The original Strategy implemented a rebuilding timeframe of 2024.
66. The RAG noted/discussed the following:

- When comparing catch against TAC as part of the review, AFMA should ensure that discards are considered separately to the TAC in the graphs.
- The bycatch TAC, which is based on landed catch, has never been exceeded.
- The AFMA Commission had concerns around the high discard rate estimate in 2017, however there has been a decrease in 2018. These estimates are highly uncertain, and error bars should be included on the chart for the Commission.
- The CV for Blue Warehou east discard estimates is 62% (from 33 observed shots) and no estimate of discards in the west because only one shot was observed.
- Some data is being collected, including otoliths, but these have not been aged and have not been used for a Tier 1 assessment.
- A move-on provision was introduced for the 2019/20 season which required operators to move three nautical miles away for at least 24 hours when they caught more than 200 kg in a single shot. This was driven by high discard rates. There have been five shots reported in excess of 200 kg for the season and the rule has been adhered to. Mr Boag suggested that this rule is not widely known.

- A targeting analysis showed that, of the 187 shots that contained Blue Warehou in 2019/20 (as at 11 November 2019), only 14 shots contained more than 100kg of retained blue warehou. Of those 14 shots, blue warehou constituted more than 50% of the retained catch for 3 shots. More than 50% in the catch *can* be taken to be targeting if the shots are repeated (based on methodology of Neil Klaer).
- Although catches are low, ISMP sampling has improved in the last 12 months and the RAG emphasises the importance of the ISMP program.
- Avoidance by industry, unknown discards and low catches mean there is very little data to assess the effectiveness of the strategy, and measuring the status of the stock. Sufficient observer coverage is critical for obtaining estimates of discards.
- While we do get some survey data from Tasmania DPIPWE on recreational catches, social media could also be a source of information.
- The RAG discussed the designated rebuilding timeframe of 2024 and how members would then assess where the stock is in relation to the limit. It was noted that retained catch is monitored but avoidance and discarding may be missed. Observer coverage is important to capture industry discarding.
- Dr Thomson noted that age structure for Blue Warehou has never been useful, they are caught episodically and age classes are difficult to track. Close-kin assessments are an option (costs approx. $300K) though it only provides an estimate of absolute abundance, and doesn't provide a status in relation to B_0.
- A 10 year old Blue Warehou fish is considered 'old', and we can establish a time series of abundance for 10 years, and a fishing mortality rate to help indicate whether overfishing is occurring or not. Mr Corrie noted the 2020/21 SESSF research plan includes a COMRAC proposal for a close-kin scoping study that includes Blue Warehou.
- A Tier 1 assessment in 2024 is unlikely due to a lack of data. We don't know the current level of depletion or what the virgin biomass was. Results from a close-kin assessment, if supported, would not be expected until after 2024.
- While it is difficult to determine whether rebuilding is occurring, appropriate management strategies are in place and everything that can be done to reduce targeting is being done.
- The current data may be able to show if there is a recruitment-driven recovery or an availability-driven recovery. There is no indication of range contraction and there appears to be a small increase in frequency of larger shots.
- Dr Tuck emphasised the broader context – concerns about the ecosystem shifting that may lead to non-recovery of some stocks. Dr Knuckey added that there is a declining trend in commercial CPUE for 27 out of 34 SESSF quota stocks despite a decrease in effort over time.
- Dr Tuck advised there is an FRDC-funded project to investigate changes in species biological parameters that may be associated with climate change[4]. Also Drs Ian Knuckey and Rich Little are in the process of drafting an application to utilise the CSIRO Research Vessel *Investigator* for ongoing surveys to collect periodic snapshots of environmental data and species distributions.

67. In response to the Commission's request for advice, SERAG noted:

- While it may compromise any future companion species analyses, the move-on provision seems to have been effective. The RAG recommends reinforcing the message via educative campaigns, including Mr Boag to SMS fishers again.
- The 118 t bycatch TAC was based on historical incidental catches and the RAG needs more information to determine if it is still appropriate. Dr Haddon's method may be a better tool to update the analysis.
- The targeting analyses can be updated to update estimates of unavoidable bycatch and should include market prices over time. SERAG requested AFMA to obtain Sydney Fish Market data on price to check trends in value – this could be done for all rebuilding strategies.

[4] FRDC project: Revisiting biological parameters and information used in the assessment of Commonwealth fisheries: a reality check and work plan for future proofing.

- Recent discards are concerning but the RAG noted the uncertainty around the high 2017 estimate and discards are lower in 2018.
- Updating the stock assessment will be problematic due to lack of data but an option would be to support a close-kin study, however this is costly.

Action item 9: AFMA to get Sydney Fish Market price data for the rebuilding species (eastern redfish, blue warehou and eastern gemfish) to present at SERAG #2.

68. The RAG requested AFMA to return to SERAG #2 with an overview of changes to be made to the Strategy, including the points above for Commission consideration.
69. The RAG asked to confirm that the COMRAC close-kin proposal includes Blue Warehou.
70. SERAG recommends undertaking a targeting analysis to inform the TAC for the 2020/21 season. This advice should be included in the advice to the Commission in March 2020. It was noted that there were potential conflicts of interest in the room regarding the targeting analysis and that it would form part of the research agenda item at SERAG #2.

OUTCOME: SERAG recommends a targeting analysis for Blue Warehou is completed as part of the March 2020 package to the Commission, to inform the TAC for the 2020/21 season.

10.2 Eastern Redfish: annual review

71. Ms Johnston outlined the review of the Eastern Redfish Rebuilding Strategy (the Strategy) noting that this is an annual review only. The Commission reduced the 2019-20 Eastern Redfish bycatch TAC to 50 tonnes from 100 tonnes in 2018-19, to address concerns regarding current stock status and rebuilding timeframes.
72. The Tier 1 assessment is due in 2020.
73. The RAG discussed/noted the following:

- There has been an incredible turnaround in ISMP data collection with credit due to Mr Tamre Sarhan (AFMA) as part of the ISMP program.
- Dr Liggins advised that annual NSW catches from 2013 onwards are 17 t, 16 t, 11 t, 10 t, 8.8 t and 4.5 t – i.e. a declining trend.
- SERAG have an accepted Tier 1 assessment which is driven by commercial CPUE (showing a steady downward trend in abundance).
- Data indicates that fishing occurs across the distribution of redfish, however targeting is not occurring.
- Dr Liggins said in the past redfish was in high numbers off Ulladulla and it would be useful to now see the spatial distribution of effort along the southern NSW coast to understand the decline.
- There is some skewed data or a reporting error with redfish reported in the GABT which AFMA will investigate.

Action item 10: AFMA to investigate CDR data for redfish catches in the west - how it is reported as either Bight Redfish or redfish and correct errors.

- There is no indication of range contraction or a change in distribution. Dr Tuck suggested generating heat maps (catch, effort or kernel density) may be informative of the current distribution of redfish catches. The RAG discussed whether to do this as part of the stock assessment and whether to consider range change due to environmental climate factors – not suggesting it is climate driven but there may be range change. CSIRO will incorporate gridded distribution maps into the annual data summary.

- Dr Knuckey noted that industry have become very good at avoiding redfish, and there is little concern that catches would increase with increases in a Tiger Flathead TAC.

74. In response to the Commission's request for advice, SERAG noted:

- The assessment cannot provide a definitive answer about recruitment due to a lack of data and poor sampling from previous years. The RAG emphasises that improved sampling is critical. There has been a pulse of fish – i.e. some evidence of recruitment in the fishery, but unclear if it will translate into an index of abundance.
- There is some evidence of recruitment (from 2017) but sampling has not been of sufficient quality to indicate whether it's occurring across the range of fish. Port sampling was primarily from NSW but on-board sampling seemed to be representative of the spatial distribution of the fishery.
- The collection of age and length information is improving, however, at these low catch levels, CPUE may be becoming less informative as an index of abundance. Recreational and commercial catch data will be available to update the assessment.
- Dr Liggins noted that the estimate of recreational catch in NSW in 2014/15 was around 10 t and results from a recent recreational survey will be available in the next few months. The recreational catch may be becoming a non-trivial proportion of the catch.
- SERAG provides the same advice as for Blue Warehou: the targeting analyses can be updated to include estimates of unavoidable bycatch and should include market prices over time.
  SERAG requested AFMA to obtain Sydney Fish Market data on price to check trends – this could be done for all rebuilding strategies. Dr Haddon's method may be a better tool to update the analysis.
- The RAG notes that there is a potential reduction in the flathead TAC coming and that commercial fishers are avoiding targeting of redfish. The RAG notes that redfish catches have been declining over the past two decades but flathead catches haven't been declining in line with that trend.

Agenda Item 11 – Western Orange Roughy research plan

75. Mr Corrie provided background about the proposed Western Orange Roughy (OR) Research Plan:

- In November 2006, Orange Roughy was listed as conservation dependent under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The listing required additional measures to address specific objectives and requirements of the then Orange Roughy Conservation Program 2006. The Conservation Program was reviewed by AFMA in 2014 and Orange Roughy stocks are currently managed under the Orange Roughy Stock Rebuilding Strategy 2014.
- The last updated stock assessment for Western zone Orange Roughy was in 2002. The assessment estimated the biomass had a 50 per cent chance of being less than 30 per cent of the 1985 biomass.
- The ABARES Fisheries Status Report 2019 classified the stock as overfished but not subject to overfishing. There is currently a 60 t bycatch trigger in place; of which 21.2 t has been landed on average over the last three SESSF seasons.
- SERAG previously noted that the observed recovery of the eastern OR stock may suggest that similar rebuilding has occurred in the west. Thus, a western OR workshop was held in March 2017 to develop a data collection and research work plan that would allow for an updated assessment. A five-stage plan of action was developed for consideration by SERAG, however, industry was reluctant to pursue this given the perceived cost of undertaking a 'mock' Tier 1 assessment (using the eastern model with updated parameters) to determine data requirements and then the cost of data collection.
- At the SERAG Nov 2018 meeting, members supported the development of a western Orange Roughy research plan similar to the Great Australian Bight Trawl (GABT) Orange Roughy Research Plan, that would be approved at the SESSFRAG Chairs' meeting in March 2020. A copy of the GABT plan and the draft western Orange Roughy research plan are available in the collection of meeting papers.

76. The group discussed potential sampling designs, including allocating zones to the hills in the western zone or creating 4 zones based on geographical structure and to capture the 'flats' as well. Mr Boag suggested looking at heat maps of where catch was taken, previously developed by Danait at AFMA.

77. The RAG discussed the following points:

    - Catch maps suggest 4 zones: corner area, Portland area, coral coast and the west coast.
    - Orange Roughy are 'flighty' – there is one chance to catch them or they disperse. Western Orange Roughy sit deeper than eastern stock, around 480-500 fathoms (advised by Mr Hogan).
    - There are some concerns about potential bycatch implications for other deepwater species such as oreos and deepwater shark basket, noting two gulper shark species (Harrisson's dogfish and Southern dogfish) are conservation dependent. Trigger limits should be considered for species of concern, including sensitive benthos.
    - Potential allocations of research allowance should be based on the logistics of fishing the area and obtaining the biological parameters.
    - Observer coverage should be considered on first few trips, potentially integrated with the existing ISMP program, as is done in the GAB, to ensure sampling is done correctly.
    - The RAG agreed there's enough information for Mr Corrie and Mr Boag to further develop the proposal and include proposed targets.

78. The RAG supported the proposal and requested to see a developed plan at SERAG #2 (2019).

Action item 11: Ian Knuckey to provide GAB survey design to Dan/Simon for consideration when developing the Western Orange Roughy research plan.

Action item 12: AFMA and SETFIA to present an updated draft Western Orange Roughy proposal to SERAG #2 in 2019.

Agenda Item 12 – Other business

79. Mr Corrie provided an update developing a sampling and research program for Hagfish in the Gillnet, Hook and Trap Sector (GHAT):

    - There is a current operator using a GHAT trap permit who has been fishing for a couple of years and now there is interest from other operators to develop a fishery.
    - An exploratory fishery policy is currently in development by the Department which will allow the issuing of exploratory permits to all parties.
    - Until then, AFMA is proposing to issue scientific permits (similar to OR permits in the GAB) under a research program which will specify sampling requirements.
    - AFMA will return to SERAG #2 with a more detailed proposal and structured plan.
    - Dr Knuckey declared a conflict of interest – a friend is interested in the Hagfish fishery.
    - It was noted that the fishery is prone to localised depletion and there is no advice about available catch limits, so CPUE should be monitored.
    - Suggestions include splitting into zones to get representative data via scientific permits and to consult previous work and scientific literature from the USA.
    - SERAG members noted this development and that further information will be presented at SERAG #2 (2019).

80. Mr Corrie advised the RAG about recent issues with eastern school whiting catches:

    - Under the SESSF Harvest Strategy, recent increases in NSW catches of school whiting would have significant impacts on the Commonwealth TAC for the 2020/21 season. Industry have indicated significant impacts to the Danish seine fishery, particularly at Lakes Entrance and

flow-on effects to fishing dependent communities if the Commonwealth TAC were to be decreased as predicted.

- AFMA Executives met with local industry in Lakes Entrance due to the significance of this issue and developed an interim proposal. The Commission supported AFMA's proposal to maintain the current TAC at current levels for the next two SESSF seasons, subject to SERAG advice on the risk to sustainability.
- The Commission requested SERAG consider catch projections at fixed catches and provide advice on the risk to the stock in the short term if catches are maintained at current levels.
- The stock assessment is scheduled for 2020, but given the Commission have supported maintaining the TAC for two seasons, AFMA are seeking advice on the risk to delaying the assessment until 2021.
- While there was some concern about delaying the assessment, the Chair noted the RAG's role is to provide advice to the Commission as requested.
- Dr Liggins (DPI NSW) said the NSW trawl whiting TAC (1189 t) is already 43 per cent caught, and that the NSW Total Allowable Fishing (TAF) committee is scheduled to meet to set NSW TACS on (1) 11 December 19 for Blue-spotted Flathead, and (2) 22-23 January 2020 for Silver Trevally, Tiger Flathead, Trawl whiting (School and Stout).
- The RAG requested a sub-group meet out-of-session to determine the details of catch projections to be considered at SERAG #2. The group includes: Dan Corrie, Geoff Tuck, Jemery Day, Mike Steer, Karina Hall (DPI NSW) and Mardi Albert.

Action item 13: SERAG sub group (Mike Steer, Dan Corrie, Geoff Tuck, Jemery Day, Karina Hall (DPI NSW) and Mardi Albert) to meet out-of-session to agree on catch projections for eastern school whiting for consideration at SERAG #2 2019. Jemery Day will aim to complete the work by SERAG #2 (2019)

81. **Note** *(added after meeting)*: refer to Appendix 1 for minutes of this sub-group meeting.

Agenda Item 13 – Action items and close

82. The Chair noted that the next meeting SERAG #2 is scheduled for 3-5 December 2019.
83. The Chair thanked all attendees for their input and for welcoming him in the role of new SERAG Chair. The meeting was closed at 4.45pm.

Appendix 1

SERAG sub group meeting Date: Wed 30 October 2019

Attendees: Mike Steer, Mardi Albert, Dan Corrie, Heather Johnston, Jemery Day, Geoff Tuck and Karina Hall

1. Mardi noted that she accidentally left Simon Boag off the invite list. Simon was not available at short notice and instead Dan spoke with him and briefed him after the meeting.
2. Dan recapped on the recent history for Eastern school whiting:
    - NSW catches have increased and the anticipated impact is a significant reduction to the Commonwealth TAC next season.
    - State catches and discards are taken off the Commonwealth RBC.
    - Industry have voiced concerns about the impact of a large TAC reduction and also the impact to the value of their quota assets.
    - Significant impacts for the Danish seine fleet in Lakes Entrance and flow-on impacts.
    - AFMA proposed to the Commission to maintain the current TAC for the next two seasons, subject to AFMA and NSW negotiating an equitable catch/cost sharing arrangement and subject to SERAG advice of the risk to stock of over-catching the RBC - noting that RBC has already been exceeded for the past two seasons based on the increased NSW catches.
3. SERAG therefore needs to provide advice to the Commission and needs catch projections from CSIRO preferably at SERAG #2, to inform its advice.
4. Karina noted that NSW catches in 2019 are expected to be high and we can expect similar catches – estimating to be around 1200 t.
5. NSW Total Allowable Fishing (TAF) committee is scheduled to meet in Jan 2020 to set the NSW TAC for the season commencing 1 May 2020.
6. The group agreed that it's important to paint the whole picture for the Commission based on balance and scientific integrity, thus include high and low recruitment scenarios.
7. The group agreed to the following:
    - Karina to provide NSW catch data by fleet to Jemery as soon as possible,
    - Heather to provide AFMA data by fleet to Jemery (and liaise with CSIRO Data Services) as soon as possible,
    - Using discard rate by fleet from the last assessment,
    - Projections:
        - Scenario 1 – current RBC (1615 t)
        - Scenario 2 – worst case 1900 t
        - Scenario 3 – 1700 t
        - Scenario 4 – 1800 t
    - Agreed to Jemery's point 5: project predicted stock status for the start of the following years: 2020, 2021, 2022, 2023 under the range of catch scenarios defined and projecting beyond 2023 (under average catch) to see how long it is projected to take to approach the target biomass,
    - Agreed to Jemery's point 6: undertake cross-catch risk assessment incorporating each scenario.
8. Jemery will aim to complete the work and present to SERAG #2, the agenda will allow for 1.5hrs slot.
9. NSW DPI will send Geoff Liggins and Veronica Silberschneider to next SERAG meeting, and Karina Hall will attend if possible.

**After the meeting Jemery suggested including the following (agreed by the group):

- Revising the CPUE series by adding in 2017 and 2018 CPUE data for each fleet and revising the whole CPUE series.
- Noting the CPUE standardisation has already been done (part of Miriana Sporcic's report presented at SESSFRAG Data Meeting in August 2019).

ATTACHMENT A – Declarations of Interest

Member	Declaration
Dr Michael Steer (Chairperson)	Principal Scientist at SARDI Aquatic Sciences (Finfish Fisheries) Chair of SERAG Member of SEMAC Member of Commercial Marine Scalefish Fishery Reform Advisory Committee (SA) Member of Marine Scalefish Fishery Management Advisory Group (SA) Member of Charter Boat Management Plan Advisory Group (SA) Scientific member of Snapper Management Advisory Committee (SA) No pecuniary interest in the SESSF.
Mr Daniel Corrie	Employed by AFMA. Manager of Southern Trawl, Scallop and Squid Fisheries. No pecuniary or other interest in the SESSF.
Dr Sarah Jennings	**Economics member** on SESSFRAG. Invited **economics participant** on SEMAC. Economics coordinator, FRDC Human Dimensions Research Subprogram. **Member** of AFMA Economics Working Group. Adjunct Senior Researcher, TSBE, University of Tasmania. Independent economics consultant. No pecuniary or other interest.
Dr Ian Knuckey	**Current positions:** Director – Fishwell Consulting Pty Ltd Director – Olrac Australia (Electronic logbooks) Deputy Chair – Victorian Marine and Coastal Council Chair / Director – Australian Seafood Co-products & ASCo Fertilisers (seafood waste) Chair – Northern Prawn Fishery Resource Assessment Group Chair – Tropical Rock Lobster Resource Assessment Group Chair – Victorian Rock Lobster and Giant Crab Assessment Group Chair – Victorian Central Zone Abalone Fisheries Resource Advisory Group Chair – Gulf of St Vincent's Prawn Fishery MAC Research Scientific Committee Scientific Member – Northern Prawn Management Advisory Committee Scientific Member – SESSF Shark Resource Assessment Group Scientific Member – Great Australian Bight Resource Assessment Group Scientific Member – Gulf of St Vincent's Prawn Fishery Management Advisory Committee Scientific Member – Tropical Tuna Resource Assessment Group Scientific participant – SEMAC, SESSF Resource Assessment Group **Current projects:** AFMA 2018/08 – Bass Strait Scallop Fishery Survey – 2020-22 FRDC 2017/069 – Indigenous Capacity Building FRDC 2016/116 – 5-year RD&E Plan for NT fisheries and aquaculture Traffic Project – Shark Product Traceability FRDC 2018/021 – Development and evaluation of SESSF multi-species harvest strategies FRDC 2017/014 – Informing structural reform of South Australia's Marine Scalefish Fishery NT Fisheries – Design and implementation of a tropical snapper trawl survey Sea Cucumber Ass. Design and implementation of sea cucumber dive survey FRDC 2019-072 - A survey to detect change in Danish Seine catch rates of Flathead and School Whiting resulting from CGG seismic exploration.

Dr Geoff Tuck	CSIRO. Involved in stock assessments. Interest in obtaining funding for future research. **Principle investigator** on the SESSF stock assessment project.
Mr Tim Emery	ABARES, proxy for James Woodhams. No interest in SESSF, pecuniary or otherwise.
Mr Andrew Penney	**Sole Director** of Pisces Australis Pty Ltd, an Australian registered marine/coastal research and management consultancy based in Canberra - interests in any opportunities in this regard. **Principal Investigator** on FRDC Project No 2014-009: Development of guidelines for quality assurance of Australian fisheries research and science information, and co-investigator on FRDC Project No 2014-203: SESSF Monitoring and Assessment – Strategic Review. **Member** of the AFMA ERA Technical Working Group. No shareholding and hold no positions relating to any other companies, including any fishing companies or industry associations.
Mr Ross Winstanley	No pecuniary interest in SESSF however declares he has a brother-in-law that holds a Victorian Inshore Trawl Licence.
Mr Daniel Hogan	Owner operator of trawler Zeehaan out of Portland, Vic. Commonwealth Trawl Sector boat and quota SFR holder.
Mr John Jarvis	Commonwealth Trawl Sector boat and quota SFR holder. **Member** of SETFIA. Worked with NSW Primary Industry Minister for Comfish.
Mr Simon Boag	Runs a fisheries consulting firm Atlantis Fisheries Consulting Group. Clients include associations such as SETFIA, SSIA, SPFIA but also other private clients. Has recently been engaged by AFMA to collect biological data in the shark fishery. Non-beneficiary **Director** of two fishing companies in the SESSF one of which is a significant quota owner. **Industry member** on SERAG and SEMAC.
Ms Mardi Albert	Employed by AFMA. Executive Officer of SERAG. No interest in SESSF, pecuniary or otherwise.

Invited Participant	**Declaration**
Dr Robin Thomson	CSIRO, assessment scientist. Acquiring funding for research purposes. **Principal Investigator** for close kin project for school shark.
Dr Miriana Sporcic	CSIRO, Assessment scientist. Acquiring funding for research purposes.
Dr Jemery Day	CSIRO, Assessment scientist. Acquiring funding for research purposes. Interests in promoting good science.
Dr Paul Burch	CSIRO, assessment scientist. **Principal Investigator** for data services project. Acquiring funding for research purposes.
Dr Geoff Liggins	DPI NSW. Research scientist. No interest in SESSF, pecuniary or otherwise.
Ms Heather Johnston	Employed by AFMA. A/g Manager Southern Trawl, Scallop and Squid. No interest in SESSF, pecuniary or otherwise.

Observer	Declaration
Ms Florence Briton	CSIRO, PhD student.
Ms Sandra Curin-Osorio	CSIRO, PhD student.
Mr Nic Marton	ABARES. No interest in SESSF, pecuniary or otherwise.

Attachment B – Adopted agenda

AGENDA

Day 1: Tuesday 22 October 2019 Time: 09:00 to 17:15

Time	Item	Lead presenter
09:00	**1. Preliminaries** 1.1 Acknowledgement of country, introductions and apologies 1.2 Declarations of interest 1.3 Adoption of agenda 1.4 Action items review	Chair
09:45	**2. Economic conditions in the SESSF** • Feedback on template – economic and data information needs	Dan Corrie
10:00	*Morning Tea*	
10:15	**3. ISMP Discards and Catch Reports, and Data Summary** 3.1 Discard report, interim update 3.2 Data Summary, update	Paul Burch and Robin Thomson
11:00	**4. Tier 1 Flathead stock assessment** • Update from industry • Overview of recent data and effect of including winter/summer FIS length data • Preliminary 2019 assessment – base case presentation • Discussion	Jemery Day
13:00	*Lunch*	
13:30	**5. Gemfish stock structure** • Overview of latest genetic research	Andy Moore ABARES
14:30	**6. Tier 4 stock assessments** 6.1 Gemfish west • Overview of recent data • Approach to Tier 4 for SERAG #2 (note stock structure)	Miriana Sporcic
15:15	*Afternoon Tea*	
15:30	6.2 Mirror dory • Update from industry • Overview of recent data & Tier 4 results • Discussion & RBC advice	Miriana Sporcic
16:15	**7. Orange roughy acoustic survey** • Voyage report and preliminary findings	Rudy Kloser
17:15	*Adjourn*	

Day 2: Wednesday 23 October 2019 Time: 09:00 to 16:30

Time	Item	Presenter
09:00	**8. Ecological Risk Assessments – Final Advice** 8.1 CTS Danish seine 8.2 CTS Otter trawl	Miriana Sporcic and Dan Corrie
10:30	*Morning Tea*	
10:45	**9. Smooth Oreo – RBC advice** 9.1 Smooth oreo (other) • Update from industry • Overview of recent data • RBC advice 9.2 Smooth oreo (Cascade) • Update from industry • Overview of recent data • RBC advice	Dan Corrie
12:00	*Lunch*	
12:45	**10. Rebuilding strategy reviews** 10.1 Blue warehou • Annual review • 5-year strategy review 10.2 Eastern Redfish (annual review) • Annual review	Heather Johnston
14:30	**11. Western Orange roughy research plan** • Survey design and data needs	Dan Corrie and Simon Boag
15:30	*Afternoon Tea*	
15:45	**12. Other business** • Hagfish – sampling/research program • Eastern school whiting – rolling over the TAC and catch projections for the Commission	Chair
16:30	*Adjourn*	

Attachment C – List of all SERAG action items (updated)

List of action items – updated after SERAG #1 (2019)

Complete/Redundant	Underway	Yet to start	SERAG advice required / for noting

Table 1 Action items from SERAG #2 (Nov 2018)

	Meeting & agenda item ref	No.	Description	Responsibility	Timeframe	Status update after SERAG #1 (2019)
	2018.11 Agenda Item 5	1	Investigate the quantity of Silver Warehou likely to be caught if catches of Blue Grenadier increase under the proposed RBC increase. Consider the different fishing and discard practices of wet boats and freezer trawlers and the current status and RBC for Silver Warehou.	AFMA	As part of advice to SEMAC, Jan 2019	Review of catch and discards at Appendix A. Increase to BG TAC does not seem to be significantly impacting SW catches/ discards. **Item closed.**
	2018.11 Agenda item 7	2	Request SESSFRAG consider the issues associated with regime shifts in stock assessments including: • use of dynamic reference points (including triggers) • how this analysis may then feed into the longer term multi-species harvest strategy/project • issues with the Jackass Morwong productivity shift.	AFMA	SESSFRAG Chairs meeting 2019	FRDC project looking at DRPs has been supported. Also to be considered in FRDC multi-species HS project. **Item closed.**
	2018.11 Agenda Item 9	3	AFMA to approach NZ Fisheries regarding the holding of a joint Australian/New Zealand workshop to address common issues with Orange Roughy assessments, including natural mortality and stock recruitment relationships.	AFMA	As soon as practical. Outcome preferred for 2020 assessment.	International workshop (CAPAM) being held in March 2020. Geoff Tuck will update 2020 SESSFRAG meeting to inform 2020 Orange Roughy stock assessment. **Item closed.**
	2018.11 Agenda item 2	4	Review industry recording of non-quota discard groups in logbooks to identify any reporting issues that require a management response. Consider whether reporting is sufficient to allow fishery wide estimates of total non-quota species discards.	AFMA, Paul Burch and Ian Knuckey	As soon as practical	With the new Harvest Strategy, we now use the ERA weight-of-evidence approach for Tier 4 species that fall into this category of being difficult to assess. **The RAG agreed that the item could be closed.**

	2018.11 Agenda item 10	5	Refer question to ERA technical WG – should tier 4 species be included in Ecological Risk Assessments, noting there are some issues around assessing particular Tier 4 species (i.e. those in the 'not assessable' basket).	AFMA	Next ERA technical working group meeting?	SESSFRAG agreed that a number of T4 and T5 species to be included in ERA framework. How to set an RBC for ERA species is being considered at agenda item 9. **Item closed.**
	2018.11 Agenda item 10	6	Ian Knuckey to provide Miriana Sporcic with information regarding use of habitat closures in the upper slope dogfish management strategy as a proxy for stock protection. Info to be used in residual risk assessment for greeneye spurdog, Harrisson's dogfish, southern dogfish and endeavour dogfish. Provide rationale/justification for reducing the ERA risk ratings of white warehou, whitefin swellshark, Gould's squid, gulper sharks and southern sleeper shark, to feed into the residual risk analysis.	Ian Knuckey and Dan Corrie	As soon as possible	Miriana advised no. of high risk species has reduced (45 reduced to 12) – this presented to SESSFRAG Aug 2019. The species amended to: Gould's squid, Southern dogfish, Leafscale gulper shark and Endeavour shark. Results from residual risk update supersede old results. **Item closed.**
	2018.11 Agenda item 10	7	Refer to the ERA Technical Working Group: consider providing better guidance to observers to address species identification issues for cephalopods in order to assist with future ERAs.	AFMA	Next ERA technical working group meeting?	**SERAG agreed to consider and provide advice pending outcomes of ERA (Danish seine) results at agenda item 8 (SERAG #1).**
	2018.11 Agenda item 11	8	Incorporate data collection for Blue-eye Trevalla (seamounts) into the Data Plan.	AFMA (Brodie)	Prior to SESSFRAG Data meeting. Ensure ISMP program is aware.	Brodie advised that the SiDAC data collection plan to be updated to include the collection of total and partial lengths of school and gummy shark particularly any school sharks larger than 160cm. Also tissue samples of BET for CSIRO close-kin work and for ageing. Request SERAG advice on number of samples to collect? **This items was closed a new item to replace it (Action item 2) was recorded.**
	2018.11 Agenda item 11	9	Dan Corrie and Simon Boag to develop a western Orange Roughy research plan and present to SERAG in September 2019. Consult Rudy Kloser.	Dan Corrie and Simon Boag	Present to SERAG 1 2019	This was discussed under agenda item 11. **Item closed.**

	2018.11 Agenda item 12.3	10	CSIRO and AFMA to investigate the apparent high discards of Blue Warehou as indicated in the Blue Warehou rebuilding strategy report.	Dan Corrie and Paul Burch	As soon as practical	Discard estimates were based on a single trip and a number of shots with high discards. 2018 estimates are lower at 54.8t. **Item closed.**

Action items still outstanding from all previous SERAG meetings

Complete/Redundant	Underway	Yet to start	SERAG advice required / for noting

	Meeting & agenda item ref	No.	Description	Responsibility	Timeframe	Status update after SERAG #1 (2019)
	2017.09 1.4	1	Dr Day to prepare a discussion paper regarding the inclusion of winter/ summer FIS surveys in future tiger flathead assessments.	AFMA and CSIRO	SESSFRAG Data Meeting 2018. To be raised at SESSFRAG Chairs meeting 2018	SESSFRAG agreed that this should be looked at as a sensitivity in the stock assessment update in 2019. The RAG corrected the wording for this item to reflect the action required and requested this item remain open until the assessment is completed. This can be closed after Flathead assessment at this meeting. **Item closed.**
	2017.11 Agenda item 4	2	CSIRO to provide advice on whether data as an input to stock assessments could be reviewed at SESSFRAG data meeting in July/August each year.	CSIRO Dr Thomson Dr Tuck	SESSFRAG Chairs meeting 2018.	This was discussed at SERAG 1, 2018 and is covered by action item 16 (2018.09, 1.5). **Agreed to close.**
	2017.11 Agenda item 4	3	CSIRO to provide advice on whether the most recent year's data needs to be included in stock assessments to give the assessment scientists more time to identify issues.		SESSFRAG Chairs meeting 2018.	This was discussed at SERAG 1, 2018 and is covered by action item 16 (2018.09, 1.5). **Agreed to close.**

	2017.11 Agenda item 4	4	AFMA to investigate the occurrence of 22cm+ school whiting recorded as discarded in 2016 ISMP records.		Prior to next stock assessment.	AFMA records indicate eleven 22cm+ fish (8*22cm, 1*24cm and 1*25cm) were discarded in 2016. Observer trip reports confirm this was the case. Stock assessment scheduled for 2020. **Item closed.**
	2017.11 Agenda item 5	5	Dr Thomson to include NSW recreational catch data in the SESSF catch and discard summary for redfish.		2018 Data Summary.	So far only included where estimates of recreational catch weight are available. This will eventually be extended to include numbers of fish, or using numbers to estimate weights. Not an issue for redfish alone. **CSIRO are working on these figures and they will be ready for the August 2020 Catch report.**
	2017.11 Agenda item 6.2	7	AFMA to quantify the area of suitable deepwater shark habitat inside and outside closures as a proxy for stock protection.		2018 Assessment period.	Item will remain until resolved, or advice is received. Dr Tuck presented the paper "*Incorporating the effects of marine spatial closures in risk assessments and fisheries stock assessments´* at SESSFRAG in March 2019. Project showed that protection is dependent on mixing rates which are unknown for deepwater sharks. **Deepwater shark scheduled for T5 in 2021. This item to be closed and new action item (Action item 3) to schedule discussion for SERAG 2020. Item closed.**
	2017.11 Agenda item 6.3	9	SESSFRAG to consider a standard approach to limiting the multiplier value (D/C+1) in Tier 4 assessments where estimated discard rates are high.		2018 SESSFRAG data meeting.	SESSFRAG agreed that this was not a suitable approach and a working group has been established to propose a way forward for 'non-assessable' species, including Tier 4 species with high discard proportions. Refer to Appendix A for overview of what this group is doing. Discussed at Feb 2019 SESSF data meeting. Tier 4 species with high discards now to be assessed as T5 or ERA. **Item closed.**
	2017.11 Agenda item 6.4	10	AFMA to investigate records of oxeye oreo dory in logbooks and CDRs.		Prior to 2020 assessment.	**To start in 2020**.

	2017.11 Agenda item 8.2	12	AFMA to investigate the top redfish catching vessels to ensure targeting is not occurring.		As soon as possible.	This will be completed as part of the rebuilding strategy review for SERAG 2, Nov 2018. Addressed as part of agenda item 12.2. **Agreed to close.**
	2018.09 Agenda item: 3.2	1	CSIRO to add species specific discard proportion to the bottom row of the species-specific tables in the discards report.	Robin Thomson	By SERAG 2 (Nov 2018)	This is completed – changes will be reflected in the revised report provided to 2019 data meeting. **Completed.**
	2018.09 Agenda item: 5.2	2	Malcolm Haddon to scan the relevant pages of historical Blue-eye Trevalla reports (e.g. Tilzey, 1997) and circulate to SERAG.	Malcolm Haddon	ASAP	Links to access the reports have been included in the minutes from SERAG 1. **Completed.**
	2018.09 Agenda item: 5.2	3	AFMA/CSIRO to discuss whether ASPM age-structured production model for Blue-eye Trevalla (seamount) can be completed prior to SERAG 2 (Nov 2018). NB. This may be considered for application to other species in future.	Geoff Tuck, Dan Corrie & George Day	By SERAG 2 (Nov 2018)	This is completed - to be addressed at agenda item 6.2. **Completed.**
	2018.09 Agenda item: 4.2	4	AFMA/CSIRO to check whether observations of deepwater shark catch and/or discards are occurring in Orange Roughy zones (there are no records in the ISMP discards report). Also CSIRO (Paul Burch) to check ISMP strata definitions.	Paul Burch & Dan Corrie	By SERAG 2 (Nov 2018)	Over the 2016-2018 fishing seasons during the period June - August, for days where vessels recorded Orange Roughy catch >250 kg, there were 1.2t of platypus shark and 400kg of brier shark landed, and no records of any discarded deepwater sharks. Observer records appear to be accurate. **Completed.**
	2018.09 Agenda item: 4.2	5	AFMA to check pre 2017 observer reported discards of deepwater shark to confirm estimates in the ISMP discard report. Status: done for 2017 and large discard of deepwater shark confirmed as data punching error.	Dan Corrie	By SERAG 2 (Nov 2018)	Large discard record of deepwater shark in 2017 confirmed as data punching error. All other records appear to be accurate. **Completed.**

	2018.09 Agenda item: 8	6	AFMA/Industry to clarify how observers have recorded discards of Silver Warehou on the factory boats (suggesting it was discarded but covered by quota, so should be in CDR records).	Dan Corrie	ASAP	Logbook discard record books show 1t discarded by a factory trawler - AFMA will follow up with the observer section. **This is underway, to update at SERAG #2**
	2018.09 Agenda item: 8	7	AFMA to rectify the issues with use of vessel call-signs in the AFMA database as boat identifiers, as it affects the assessments.	Dan Corrie & John Garvey	Check and rectify by 2019 (prior to AFMA sending data to CSIRO)	John Garvey advised: 'vessel ID' is also available and should be used as a unique identifier instead of 'call-sign'. **Completed.**
	2018.09 Agenda item: 11	8	Simon Boag to present paper regarding industry proposal to limit Orange Roughy TACs for 2nd and 3rd year of MYTAC, to SERAG 2.	Simon Boag	By SERAG 2 (Nov 2018)	This is complete. It was addressed as part of agenda item 9.1. **Completed.**
	2018.09 Agenda item: 10	9	AFMA to consult Ian Knuckey for a paper to SERAG 2, re: recommendation of prioritised species for inclusion in the scoping paper for 'Updating knowledge of key species biology' project.	Mardi Albert & Ian Knuckey	By SERAG 2 (Nov 2018)	This is complete. It was addressed as part of agenda item 11.1. **Completed.**
	2018.09 Agenda item: 12	10	AFMA and CSIRO to follow up on all queries raised in SERAG 1, 2018 regarding ERA high-risk species. Refer to agenda item 12 minutes for details.	Dan Corrie & Miriana Sporcic	By SERAG 2 (Nov 2018)	This was addressed as part of agenda item 10. **Completed.**
	2018.09 Agenda item: 12	11	AFMA to prepare a document comparing results of 2018 ERA assessments with previous assessments and report back to SERAG 2, 2018.	Dan Corrie	By SERAG 2 (Nov 2018)	This was addressed as part of agenda item 10. **Completed.**
	2018.09 Agenda item: 12.2	12	AMFA to confirm species identification for southern octopus and giant cuttlefish in the Danish Seine ERA, and provide info to CSIRO.	Mardi Albert	By SERAG 2 (Nov 2018)	Species ID could not be confirmed. This was addressed as part of agenda item 10. **Item closed.**

	2018.09 Agenda item: 12	13	AFMA to confirm the protocol for recording unknown species by observers.	Mardi Albert	By SERAG 2 (Nov 2018)	This is complete. The protocol is to record to family name only. **Item closed.**
	2018.09 Agenda item: 12	14	AFMA to investigate missing ERA productivity attributes for southern octopus and giant cuttlefish, as well as distribution overlap of Danish Seine effort and green-eye spurdog.	Dan Corrie	By SERAG 2 (Nov 2018)	ERAs have been updated and none of the species noted here are high risk. **Item closed.**
	2018.09 Agenda item: 12	15	Ensure agenda item for ERA triggers is added to SESSFRAG Chair's meeting, 2019.	Mardi Albert	ASAP	This is complete. Can be removed. **Item closed.**
	2018.09 Agenda item: 1.5	16	AFMA and CSIRO to review the TAC setting guidelines paper and due dates for data preparation and report back to SESSFRAG Chair's meeting in 2019.	Dan Corrie & Geoff Tuck	By SESSFRAG Chair's meeting, 2019	This will be actioned in early 2019. **Completed.**
	2018.09 Agenda item: 2	17	AFMA to correct units of Royal Red Prawn in database (sometimes in mm not cm).	Dan Corrie & John Garvey	Before 2019 data provision to CSIRO	This is being addressed in SESSFRAG Data meeting's action items. **Completed.**
	2018.09 Agenda item: 2	18	AFMA to incorporate traffic-light system in the ISMP coverage report for year-to-date tables.	AFMA (Observer team)	ASAP	This will be incorporated into future reports. AFMA will follow up with Observer team. **Completed.**
	2018.09	19	Malcolm Haddon to clarify which length plus age frequencies time-series were	CSIRO, Malcolm Haddon	By SERAG 2 (14/11/18)	**Dr Haddon advised:**

	Agenda item: 11		used in the HOENIG method for Orange Roughy mortality estimation (generally relies on age frequency at start of exploitation). Report back to SERAG 2, 2018 as part of Orange Roughy agenda item.			*For the Hoenig calculations and the proportional distribution of ages I simply used most of the ageing data available to the assessment. Given the high degree of depletion this stock has undergone this ageing data is likely to be biased towards the younger fish, meaning any proportional distribution of older fish may well be under-represented relative to an unfished population.* *What this implies is that any estimate of maximum age (defined as at what age do we expect 1% of recruits to survive) is likely to be biased low. The effect of this would be to suggest lower M values than those indicated by the analysis.* *This discussion can be pursued in the RAG should you wish. I have attached an amended natural mortality document and am grateful for the opportunity to correct the algebra.* **Attachment uploaded to GovDex. Completed.**
	2018.09 Agenda item: 2	20	CSIRO to consider which factors (season depth zone) influence length frequencies for all species, to update data plans and targets for observer program and port sampling.	Robin Thomson	By SESSFRAG Chairs meeting, 2019	This will be addressed as part of the data services contract between AFMA and CSIRO. SERAG #1 update: Dr Thomson presented outcomes and the final report at 2019 SESSF Data meeting. Dr Thomson proposed additional work that is not yet funded – this will determine whether port sampling is changed or abandoned. **Dr Thomson to present proposal for further work at SERAG #2 (2019) under annual research statement agenda item. Item closed.**

Note: All items marked green (complete) will be removed from the list of action items that is prepared for the next meeting (SERAG #2, 2019).

Attachment D

ACTION ITEM	Agenda Item Ref	Description	Responsibility	Timeframe
1	action items review	Geoff Tuck to provide feedback from the CAPAM workshop in Seattle (March 2020) to the SESSFRAG data meeting in August 2020, to inform discussions and the stock assessment for Orange Roughy, including issues around natural mortality and stock recruitment relationships.	Geoff Tuck, CSIRO	By Aug 2020 (SESSFRAG data meeting)
2	action items review	AFMA to ensure that SiDAC data collection includes total and partial lengths of School and Gummy shark including School sharks larger than 160cm, and tissue samples of Blue-eye Trevalla for CSIRO's close-kin work and otoliths for ageing: (a) start collecting 20 samples from approximately 20% of the shots, (b) the SSIA co-management contract needs to be finalised and this action item incorporated into the SiDAC Data Plan.	AFMA (Brodie)	As soon as possible
3	action items review	AFMA to schedule in-depth discussion about stock assessments of Deepwater Sharks and how to set an RBC, at SERAG in 2020 in preparation for the 2021 assessment.	AFMA (EO)	By SERAG #1, 2020
4	3	AFMA to investigate logbook records of catches of 'Black Trevally' (also called Black Snotty) from the last 2 years and verify with skippers whether species recorded on CDRs is Blue Warehou. If so, AFMA will correct data records and correct recording practices.	AFMA	By SERAG #2, Dec 2019
5	3	CSIRO to investigate the Bight Redfish discrepancy (page 5 of Data Summary), between logbooks and CDR catches in 2017, to understand where the discrepancy is coming from.	Robin Thomson, CSIRO	By GABRAG, 21 Nov 2019
6	8	Dr Sporcic to check whether the latest PSA methodology have incorporated the new way susceptibility is calculated.	Miriana Sporcic, CSIRO	By SERAG #2, Dec 2019
7	9	Update the ISMP data plan to collect otolith and length data for Smooth Oreos.	AFMA (Mardi to Tamre)	By SERAG #2, Dec 2019

ACTION ITEM	Agenda Item Ref	Description	Responsibility	Timeframe
8	9	SERAG sub-working group (Dan Corrie, Geoff Tuck, Jamie Dunkley-Price, Rudy Kloser and Paul Burch) to develop proposal for Oreo fishery to present to SERAG #2.	AFMA	By SERAG #2, Dec 2019
9	10.1	AFMA to get Sydney Fish Market price data for the rebuilding species (eastern redfish, blue warehou and eastern gemfish) to present at SERAG #2.	AFMA (Nigel Abery)	By SERAG #2, Dec 2019
10	10.2	AFMA to investigate CDR data for redfish catches in the west - how it is reported as either Bight Redfish or redfish, and correct errors.	AFMA	By SERAG #2, Dec 2019
11	11	Ian Knuckey to provide GAB survey design to Dan/Simon for consideration when developing the Western Orange Roughy research plan.	Ian Knuckey	ASAP
12	11	AFMA and SETFIA to present an updated draft Western Orange Roughy proposal to SERAG #2 in 2019.	AFMA and SETFIA	By SERAG #2, Dec 2019
13	12	SERAG sub group (Mike Steer, Dan Corrie, Geoff Tuck, Jemery Day, Karina Hall (DPI NSW) and Mardi Albert) to meet out-of-session to agree on catch projections for eastern school whiting for consideration at SERAG #2 2019. Jemery Day will aim to complete the work by SERAG #2 (2019)	Jemery Day and others	By SERAG #2, Dec 2019

OUTCOME (agenda item 10.1): SERAG recommends a targeting analysis for Blue Warehou is completed as part of the March 2020 package to the Commission, to inform the TAC for the 2020/21 season.