Australian Government
Australian Fisheries Management Authority

South East Resource Assessment Group (SERAG) Meeting 1 2022

Meeting minutes

5–6 October 2022

In person and virtual

Contents

Meeting 1 – 5–6 October 2022

Agenda

Day 1: Wednesday 5 October 2022
Time (AEDT): 8:30–17:00
Location: Melbourne and Microsoft Teams
Chair: Dr Paul McShane

Time	Item	Purpose	Lead presenter
8:30 30 mins	**1. Preliminaries**		
	1.1 Welcome and apologies	For noting	Chair
	1.2 Declarations of interest	For action	Chair
	1.3 Adoption of agenda	For action	Chair
	1.4 Minutes from previous meeting	For noting	Chair
	1.5 Actions arising from previous meetings	For noting	Aaron Puckeridge (AFMA)
9:00 1.5 hours	**2. Data updates**	For noting	Paul Burch (CSIRO)
10:30	Break – 15 mins		
10:45 1 hour	**3. Climate change and ecosystem update**	For noting	Alice McDonald (AFMA)
11:45 1 hour	**4. Silver trevally Tier 4 assessment**	For advice	Miriana Sporcic (CSIRO)
12:45	Lunch – 30 mins		
13:15 1 hour	**5. Blue grenadier Tier 1 preliminary base case**	For advice	Geoff Tuck (CSIRO)
14:15	Break – 15 mins		
14:30 1.5 hours	**6. Flathead Tier 1 preliminary base case**	For advice	Pia Bessell-Browne (CSIRO)

Time	Item	Purpose	Lead presenter
16:00 1 hour	**7. Non-quota species TAC advice (ECDWT)**		
	7.1 Orange roughy	For advice	Mark Grubert (AFMA)
	7.2 Boarfish	For advice	Mark Grubert (AFMA)
	7.3 Alfonsino	For advice	Mark Grubert (AFMA)
17:00 30 mins	**8. Smooth Oreo (other) TAC advice**	For advice	Mark Grubert (AFMA)
17:30	End of day 1		

Day 2: Thursday 6 October 2022
Time (AEDT): 8:30–15:15
Location: Melbourne and Microsoft Teams

Time	Item	Purpose	Lead presenter
8:30 1.5 hours	**9. Blue-eye trevalla Tier 4 assessment (slope)**	For advice	Miriana Sporcic (CSIRO)
10:00	Break – 15 mins		
10:15 1.5 hours	**10. Deepwater shark assessment approach**	For noting	Robin Thomson (CSIRO) Ross Daley (Horizon Consultancy)
12:15	Lunch – 30 mins		
12:45 1.5 hours	**11. Research and extension updates**		
	11.1 Trawl selectivity	For noting	Matt Broadhurst (NSW DPI)
	11.2 Eastern school whiting stock structure	For noting	Karina Hall (NSW DPI)

Time	Item	Purpose	Lead presenter
	11.3 FRDC extension officers	For noting	FRDC
14:15	Break – 15 mins		
15:00 15 mins	**12. Other business and action items review**	For advice	Chair
15:15	End of day 2		

The Chair opened the meeting at 8:37 Australian Eastern Daylight Time (AEDT).

Agenda item 1 – Preliminaries

1.1 Welcome and apologies

1. Dr Paul McShane (the Chair) welcomed attendees to the meeting and made an Acknowledgement of Country paying our respects to this country's First People and Traditional Custodians of the land throughout Australia. Acknowledging Australia's Traditional Custodians of Country and recognising their continued connection to land, waters and community. Paying our respects to them and their cultures and to Elders past present and emerging.

2. The SERAG (the RAG) members noted the Acknowledgement of Country, that the meeting was being recorded and commenced proceedings.

3. The RAG noted that some attendees were absent for some of the meeting days as described in Table 1.

Table 1. SERAG members and other attendees.

Members	Position
Dr Paul McShane	Chair
Dr Ian Knuckey	Scientific member
Dr Geoff Tuck	Scientific member
Mr Andrew Penney	Scientific member
Mr James Woodhams	Scientific member
Dr Sarah Jennings	Scientific (Economics) member
Mr Simon Boag	Industry member
Mr Will Mure	Industry member
Mr Daniel Hogan	Industry member
Mr Ross Winstanley	Recreational member
Dr Mark Grubert	AFMA member
Executive Officer	**Organisation**
Mr Aaron Puckeridge	AFMA
Invited Participants	**Organisation**
Dr Paul Burch	Commonwealth Scientific and Industrial Research Organisation (CSIRO)
Dr Miriana Sporcic	CSIRO
Dr Pia Bessell-Browne	CSIRO
Dr Robin Thomson	CSIRO
Mr Chad Lunow	Queensland Department of Agriculture and Fisheries (DAF)
Dr Geoff Liggins	New South Wales Department of Primary Industries (NSW DPI)
Ms Frances Seaborn	Department of Natural Resources and Environment Tasmania (DNRET)

Dr Ashley Fowler[1]	NSW DPI
Dr Ross Daley[2]	Horizon Consulting
Dr Karina Hall[3]	NSW DPI
Dr Matt Broadhurst[3]	NSW DPI
Mr Jamie Allnutt[3]	Fisheries Research and Development Corporation (FRDC)
Dr Matthew Jones[3]	FRDC
Observers	**Organisation**
Mr Les Scott[4]	Peter and Una Fishing Co
Dr Daniel Wright	Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)
Dr Krystle Keller	ABARES
Dr Sandra Curin Osorio	CSIRO
Mr David Maynard[3]	FRDC
Mr Nathan Bicknell[3]	FRDC
Mr Kris Cooling[3]	FRDC
AFMA Attendees	**Role**
Mr Daniel Corrie	Senior Manager, Demersal and Midwater Fisheries
Dr Lara Ainley	Manager, Gillnet Hook and Trap (GHAT) sector
Dr Nastaran Mazloumi	Senior Fisheries Management Officer, GHAT sector
Mr Roshan Hanamseth	Senior Fisheries Management Officer, GHAT sector
Ms Rebecca Jol	Senior Fisheries Management Officer, Commonwealth Trawl Sector (CTS)
Mr Nathan Jackson	Graduate, Tuna and International Fisheries
Ms Alice McDonald[5]	Senior Program Manager, Climate Adaptation

1.2 Declarations of interest

4. The RAG members followed the conflict-of-interest declarations as outlined in *Fisheries Administration Paper 12*. Members and participants reviewed and updated the Declarations of Interest included at Attachment A.

5. The RAG decided that when management advice was being determined, any member with declared conflicts of interest (Table 2) would leave the meeting but remain present during the discussions.

[1] Only present for agenda item 4
[2] Only present for agenda item 10
[3] Only present for agenda item 11
[4] Only present for agenda items 5 and 9
[5] Only present for agenda item 3

Table 2. Participation in items where there are declared conflicts of interest

Agenda Item	Potential conflicts of interest	Discussion Participation	Recommendation Participation
4. Silver trevally Tier 4 assessment	Mr Simon Boag Mr Will Mure Mr Daniel Hogan	Present	Absent
5. Blue grenadier Tier 1 preliminary base case			
6. Flathead Tier 1 preliminary base case			
7. Non-quota species TAC advice (ECDWT)			
8. Smooth oreo (other) TAC advice			
9. Blue-eye trevalla Tier 4 assessment (slope)			

1.3 Adoption of agenda

6. The RAG adopted the agenda as final.

1.4 Minutes of previous meeting

7. The RAG noted the final minutes of the 2022 SERAG meetings are published on the AFMA website.

1.5 Actions arising from previous meetings

8. The RAG noted the action items from previous meetings and the updates provided by the Executive Officer at Attachment B. The RAG noted that several action items had been complete and had no specific questions for the ongoing items.

Agenda item 2 – Data updates

9. Dr Paul Burch (CSIRO) introduced the agenda item and updated the RAG with data processing and projects relevant to the Southern and Eastern Scalefish and Shark Fishery (SESSF).

10. The RAG noted various updates to SESSF data and the SESSF data report:
    - Hagfish (*Eptatretus cirrhatus*) have been added to the Catch Report.
    - CSIRO have amended the misreporting of catches of blue warehou (*Seriolella brama*) as black trevally (*Caranx lugubris*).
    - CSIRO encountered issues receiving some port collected and pre-1998 data from AFMA's data team. CSIRO and AFMA will continue to work together to resolve this.
    - In the Catch Report, blue-eye trevalla (*Hyperoglyphe antarctica* and *Schedophilus labyrinthica*) have been split into shelf and slope stocks for consistency with the blue-eye assessments. Previously, all blue-eye trevalla catch was presented together.

11. The RAG commented on the lack of port-length data collected in the northern part of the fishery, particularly Sydney. This needs to be addressed to ensure important commercial stocks like flathead have representative sampling across the stock. AFMA attendees noted that a Sydney based observer has recently been employed. They will regularly work in Sydney Fish Markets collecting samples.

12. The RAG noted that the SESSF Resource Assessment Group (SESSFRAG) (August 2022) discussed and approved changes to the method for categorising whether blue-eye trevalla belong to the slope or seamount stocks:
    - Previously, the slope stock was defined as being west of 153° E, this boundary has been moved eastwards. Catches west of 154.67° E are now categorised as slope catches.

- Catches from the Cascade Plateau and South Tasman rise are currently categorised as slope stock catches. A previous FRDC project (Williams *et al.* 2017) which categorised the 2 stocks of blue-eye trevalla did not have samples from the Cascade Plateau, so there has been no information to assess whether the Cascade fish represent a separate stock.
- Industry members noted that blue-eye trevalla from the Cascade Plateau are generally much larger fish and may be a separate stock to the slope blue-eye trevalla. While these fish may be a separate stock, there is no evidence to confirm this so a separate assessment should not be undertaken. Despite this, sporadic catches could influence the Catch Per Unit Effort (CPUE) indices used in the Tier 4 assessment.
- CSIRO attendees noted that Cascade Plateau catches could be separated and highlighted in the data report.
- The RAG recommended that the issues of catches on the Cascade Plateau should be discussed in agenda item 9 when the Tier 4 assessment is being discussed.

13. Dr Miriana Sporcic provided the RAG with updates to CPUE indices relevant to SESSF stock assessments.
    - Some vessels report constant depth values through different fishing events. These are corrected by comparing the vessel's location to bathymetry data. This is completed each year.
    - Fishing events that occurred in the location of the 2021 Gippsland seismic survey have been excluded from CPUE standardisation analyses for the flathead basket (*Platycephalus aurimaculatus*, *P. richardsoni*, *P. bassensis*, *P. caeruleopunctatus* and *P. speculator*) and eastern school whiting (*Sillago flindersi*).
    - A new automatic longline gear code 'LLA' appeared in logbook data for the first time in 2021. Calculations have included this gear code.

14. The RAG made the following comments:
    - Ideally e-logs should automatically record depth values based on sonar or bathymetry information on the vessel. Errors arising from e-logs should be communicated to the e-log providers.
    - The new automatic longline gear codes appeared in AFMA's Agency Data Capture (ADC) tables, which were created as a part of AFMA's data capture project, although, it is possible that these codes have existed for a long time, and CSIRO were not aware of them. The RAG agreed that multiple codes for single gear types are frustrating, increase data processing costs and increase the chance of errors in assessments. CSIRO are planning work with the AFMA data team to streamline this process.
    - Changes to data processing need to be communicated to end users such as CSIRO.
    - The Strategic Monitoring and Review Project (SMARP) is now 5 years old and many of the recommendations have not been implemented.
    - The RAG recommended drafting a letter to the AFMA Commission to communicate the data issues that are being discussed by the RAG.
    - There is ongoing recruitment in AFMA's data team and that the team is currently operating with a staff shortage.
    - There have been discussions of embedding a CSIRO staff member in AFMA's data team, to help communicate issues and areas for improvement. CSIRO will continue to progress this.

15. CSIRO updated the RAG on their method for validating and estimating discards and noted that following the SESSFRAG data meeting (August 2022) the discard validation rules had been modified.
    - If a processing code is 'headed' or 'gutted', the catch is assumed to be retained. If the processing code is 'trashed', the catch is assumed to be discarded.
    - Discards are identified as outliers if they are more than 2 standard deviations above the 4-year average catch per shot, or greater than 1000 kg, whichever is larger.

- Discards continue to be estimated using the Bergh *et al.* 2009 method A.
- Low observer coverage in the Great Australian Bight Trawl Sector (GABTS) causes high uncertainty in discard estimates.
- CSIRO are considering exploring a model-based approach for estimating discards.

16. CSIRO updated the RAG on revisions to discard estimates and ISMP strata:
    - The strata definition for the orange roughy (*Hoplostethus atlanticus*) and blue grenadier (*Macruronus novaezelandiae*) spawning stock fisheries has not been applied to non-target species such as oreo dories (Oreosomatidae) and frostfish (*Lepidopus caudatus*) which are common discards.
    - SESSFRAG approved incorporating the catch of the non-target species into the spawning stock strata. These revised discards estimates will be presented at SERAG 2 in November 2022.

17. CSIRO updated the RAG on updates to Commonwealth catch data:
    - Catches of western pink ling in the GABTS are now included in the Catch Report. This is a consistency measure to match the 2021 stock assessment.
    - In 2019, 105 t of orange roughy was landed under research catch allowance during an acoustic survey. This catch had not been included in previous versions of the Catch Report but has been added in 2022.

18. CSIRO updated the RAG on updates to state catches:
    - NSW catches of squid have decreased because estuarine catches have been excluded. These are not likely to be Gould's squid (*Nototodarus gouldi*) so are less relevant to the Commonwealth.
    - Catches of NSW eastern school whiting have changed because of revisions to how the catch split of school and stout whiting (*Sillago robusta*) are calculated, as NSW whiting trawl catches are a mixture of the 2 species.
    - Catches from Western Australia have changed because of how their data summaries are produced within their internal confidentiality policy.

19. Dr Paul Burch provided the RAG with a summary of the Catch History Project.
    - The project is reviewing historical catches for SESSF quota species. While Tier 1 stocks generally have a well-documented catch history, some other stocks received less attention when assessments and catch histories were first being developed.
    - Species in the CTS, such as silver trevally (*Pseudocaranx georgianus*) were identified as needing the most attention through this project. A catch history report will be provided at the SESSFRAG Chairs Meeting in 2023.

Recommendations:

20. The RAG recommended AFMA and CSIRO establish stronger communication between the 2 data teams to ensure that database changes are correctly communicated.

Action item 1: Dr Miriana Sporcic (CSIRO) is to present two CPUE series to SESSFRAG data meeting in 2023, one including and one excluding catches from the Cascade Plateau so that SESSFRAG can advise which should be used for the 2023 Tier 4 for the blue-eye trevalla slope stock. Furthermore, CSIRO should create a third zone, 'Cascade Plateau', when presenting blue-eye trevalla catches in future data reports.

Action item 2: SERAG are to write a letter the AFMA Commission, outlining data issues in the SESSF and methods to address some of these issues.

Agenda item 3 – Climate change and ecosystem update

21. The chair noted that this is now a standing agenda item that will be discussed at SERAG and other Management Advisory Committees (MACs) and RAGs annually.

22. Ms Alice McDonald (AFMA) introduced the agenda item and provided some context to AFMA's work incorporating climate change into its decision-making processes.
    - The SESSF is one of the top priority fisheries to have climate change adaptation work implemented as South East Australia is a climate change hotspot. Warmer waters and changing dynamics of the East Australian Current are expected to be having impacts on stock status.
    - Three key factors for fisheries management are distribution change, productivity change and species composition change.

23. Dr Beth Fulton (CSIRO) has used the Atlantis model to simulate the effects of climate change on 13 species in the SESSF.
    - Climate effects vary depending on the species.
    - Some species such as blue grenadier and tiger flathead (*P. richardsoni*) are not expected to be significantly affected by climate change, with stock status expected to rise and fall depending on recruitment pulses and food web interactions remaining relatively stable.
    - Species such as jackass morwong (*Nemadactylus macropterus*) are expected to be significantly impacted by climate change.
    - Model projections should be viewed with caution, but the direction of biomass shift can be looked at for some management guidance.

24. AFMA's climate adaptation program will allow for AFMA to start acting on climate effects, with climate change work being integrated into business-as-usual activities. The climate adaptation work will be addressed through 2 main elements.
    - The first element is feeding information and research into decision making processes on a more structured basis. Creating this standing agenda item at MACs and RAGs partially addresses this goal by providing context to management to affect decisions such as Total Allowable Catch (TAC) and Total Allowable Effort (TAE) setting.
    - The second element is ensuring that fisheries management changes are adapting to climate change. This could include incorporating climate change work into harvest strategies and working with states and territories.
    - The standing agenda item also provides an opportunity for qualitative insights into climate change and ecosystem shifts to be sought on the water from industry members.

25. The RAG noted that a useful output from this work could be a climate and ecosystem status report, which describes current and predicted climatic regimes, and how this may affect fisheries management. AFMA has begun to explore some data and indicators which could be useful for the SESSF. Currently this includes measurements of sea surface temperature, kinetic energy, chlorophyll, and the southern annular mode.
    - Industry concurred that water temperatures are increasing, and colder water is appearing later each year. The bottom temperature is often the biggest indicator of fish dynamics in deeper trawl grounds. For example, historically in September the bottom temperature in 400 m of water off Portland would be 11–12°C and blue grenadier would be appearing in the coastal waters. In September 2022, the bottom temperature is still 16–17°C and the fish assemblages reflect this. Scientific members noted that this could be caused by the current La Niña event which is caused by warm water pooling off northern Australia.
    - The RAG agreed that sea surface temperature is likely only to be an important indicator of shallower species, and efforts need to be put in to collect deepwater temperatures. Argo floats and fixed mooring arrays may provide some of this data.

- Species like blue warehou were thought to only be caught in a specific water temperature and depth. A disruption to certain water temperatures at depths could have huge impacts for a range of species.
- Projects which use fishing gear to collect oceanographic variables have great potential. Dr Ian Knuckey (Fishwell Consulting) noted that Fishwell Consulting are currently involved in a project with the Integrated Marine Observing System (IMOS) and universities which are working to achieve this. It is expected the project will start in 2023.
- Industry members noted that many of these projects can have large costs and that the impact on fishing levies should be considered.

26. The RAG continued to discuss how climate change information could be incorporated into its decision-making process.
    - There are diverging opinions on how to incorporate concepts like dynamic reference points.
    - The RAG questioned what the fishing industry could do to mitigate climate change and reduce its greenhouse gas emissions. Industry attendees noted that the fishing industry puts in extensive work to maintain its social license and liaise with offshore windfarm initiatives which will create clean energy. AFMA attendees further noted that Seafood Industry Australia is investigating alternative fuels for the fishing industry with the FRDC also interested in the fishing industry's carbon footprint. AFMA will continue to facilitate this work.
    - Most of AFMA's RAGs provide stock by stock advice. For the information to be considered in TAC setting process, the RAG could be provided with an in-depth view of a single stock. The Atlantis model contains a richness of chemical, physical and food web information which feeds the climate induced increases or decreases to stock status. The RAG has not seen this level of detail yet.

Agenda item 4 – Silver trevally Tier 4 assessment

27. Dr Miriana Sporcic (CSIRO) introduced the updated Tier 4 stock assessment for silver trevally, noting that the RAG was not being asked to provide Recommended Biological Catch (RBC) advice until the second SERAG meeting in November 2022, where the RAG will consider updates to the joint assessment between NSW DPI and CSIRO.

28. The RAG noted the following background on silver trevally catches and how it relates to the Tier 4 assessment:
    - The assessment uses Commonwealth catches from zones 10 and 20. This includes catches between Barrenjoey Point (NSW) and Cape Portland (Tas).
    - CPUE has been below the long-term average since 2011. The slight increase in CPUE for 2021 may be due to availability and should be viewed with caution.
    - In 2021, 84.6 t of silver trevally was landed, with 45.5 t of this catch coming from NSW waters.
    - Silver trevally catches greater than 30 kg are uncommon, suggesting that targeting is not occurring.
    - Discard estimates were taken from Althaus *et al.* 2022, and the mean discard estimates from 1998–2001 were used to backfill estimates from 1986–1997. Where discard data entries were missing from 2016–21, data was forward filled for missing years. Discards are used in the Tier 4 but are quite low.
    - The average CPUE from the last 4 years is used to recommend an RBC from the Tier 4 assessment. Standardised CPUE dropped below the limit reference point in 2019, although the 4-year average remained above the limit reference point. CPUE has since increased to be just above the limit reference point.

29. The RAG noted the updated Tier 4 assessment and queried the progress of the joint assessment between NSW and the Commonwealth.

- The joint assessment is likely 12 months away, and cannot be used to provide RBC advice until the RAG meets in 2023.

30. Dr Geoff Liggins (NSW DPI) explained some of the differences between NSW and the Commonwealth's approach to modelling the stock status of silver trevally, these include:
    - The abundance indices that NSW use show a steeper decline in the stock.
    - The NSW spawning potential ratio (SPR) and production model suggests that the stock was depleted below 40% B_0 during the reference period used in the Commonwealth Tier 4 criterion period.
    - NSW also estimates a higher discard rate than the Commonwealth at 30%. This is caused by the 30 cm minimum length for silver trevally in NSW which was introduced in 2007.
    - The joint assessment will incorporate these differences and additional data sources into a single assessment.

31. The RAG noted Dr Geoff Liggins' points and questioned whether the Tier 4 assessment should incorporate some of this updated information, including altered discard estimates, before RBC advice is provided.
    - The Tier 4 assessment assumes the stock was already fished and at the target reference point during the reference period. The joint assessment will likely be a Tier 1 type approach which will have a model-based estimate of virgin biomass.
    - The RAG noted that if the discard estimates in the Tier 4 assessment were higher, CPUE and the resulting RBC would be higher. This may be counterintuitive given the concerns regarding the stock's status.
    - Given the numerous concerns regarding the Tier 4 assessment, and that an improved joint assessment will be delivered within 12 months, the Tier 4 assessment may be best used as a line of evidence to recommend a TAC.

32. The RAG noted that SERAG's industry members had previously stated that the availability of silver trevally on trawl grounds is thought to be closely linked with rainfall.

33. The RAG further discussed whether it should provide RBC advice for silver trevally now or wait until the November 2022 meeting.
    - Waiting until November would allow the RAG to consider a partially completed joint assessment. Specifically, the RAG could consider the difference between the Commonwealth and NSW CPUE series and the historical profile of depletion during the criteria years of the Commonwealth Tier 4 assessment.
    - The RAG discussed whether a targeting analysis may assist in providing RBC advice. CSIRO attendees noted that the metier (targeting) analysis will not be useful for the trawl sector in the future because of the fishing effort changes which will be caused by the closures.
    - AFMA attendees noted that silver trevally catches are low within the areas of the proposed closures and they are unlikely to have an impact on future catches. However, the proposed buyout of CTS Statutory Fishing Rights may reduce silver trevally catches.

Recommendations:

34. The RAG recommended deferring RBC advice until SERAG 2. Furthermore, the RAG requested that AFMA provide heatmaps of Commonwealth silver trevally catches to inform the discussion at SERAG 2.

Action item 3: AFMA to generate heatmaps of Commonwealth silver trevally catch to help inform the discussion at SERAG 2 (November 2022).

Agenda item 5 – Blue grenadier Tier 1 preliminary base case

35. Dr Geoff Tuck (CSIRO) introduced the blue grenadier Tier 1 preliminary base case and noted that the RAG was being asked to provide advice on a final Tier 1 stock assessment to be presented at SERAG 2 in November 2022.

36. The RAG noted the following background to the assessment:
    - The last two blue grenadier Tier 1 assessments were considered by SERAG in November 2021 and November 2018.
    - The 2021 assessment estimated the RBC at 23,773 t with a high degree of uncertainty. Noting this uncertainty, the RAG recommended that the assessment be updated in 2022 with the acoustic data collected in 2019, 2020 and 2021 to increase certainty in the RBC estimate.
    - The stock has historically been driven by strong cohorts with episodic recruitment. Recently, estimates of annual recruitment have been consistently above average.
    - There are 2 trawl fleets which target blue grenadier: the non-spawning fleet and the spawning fleet, which captures the spawning fish off western Tasmania in winter.
    - The model is an age structured, 2 sex model which estimates mortality (M) and growth parameters separately for males and females. Separate selectivity values are used for males and females as females tend to enter the spawning grounds when they are larger and older than males.
    - Steepness (h) is fixed at 0.75.
    - The model estimates recruitment between 1974 and 2018.
    - Growth parameters are estimated by sex.
    - The model includes cohort specific growth, when recruitment is high, fish have slower growth and when recruitment is poor, fish have faster growth.
    - The assessment is data rich, with catches from both fleets, acoustic and egg surveys, CPUE data from the non-spawning fish catches, length data, conditional age at length data and discard data.
    - Length and age data is collected by port and onboard sampling. A plus group is used for fish over 20 years old.
    - The model generally has good fits to conditional age at length data.
    - Catches correspond to recruitment influxes in the stock. Currently catches in the spawning fleet are very high and discards from the vessels non-spawning fleet are very high, signalling ongoing recruitment.
    - Historically, there was strong recruitment in the 1990s which led to a period of high catches.
    - There has been a decrease to CPUE since the 2021 assessment.
    - Age compositions as an indicator of future recruitment to the fishery is promising, with large cohorts of young fish continuing to be observed in the age data. Other age classes are also prevalent, with an overall diverse group of cohorts. In the past the fishery has been supported by one or 2 large age classes.

37. The RAG noted the bridging process showing the impact of the additional data included in the assessment. Adding the new data did not affect the assessment history and reduced uncertainty, however, recent recruitment deviations have been revised downwards.
38. The RAG discussed the variability in the stock status biomass of blue grenadier through time, and how it may be accounted for to better predict future blue grenadier biomass.
    - Westerly winds were thought to affect blue grenadier recruitment in Australia, but this did not explain recruitment trends every year and is unlikely to be the only factor.
    - Industry members noted that there was a 5-year lag between assessments from 2013–18 because the stock was not being fished. In this time, the stock rose from below the target reference at 44% to 109% in 2018. The RAG could prioritise more frequent blue grenadier assessments because of this variability.
    - Industry attendees noted that this fishery is well suited to cope with fluctuating recruitment due to fleet dynamics, including the possibility of freezer boats fishing when the TAC is high.
    - Blue grenadier recruitment is likely being affected by an environmental variable and the unknown effects of climate change on blue grenadier are concerning. In the future, it will be important to understand the mechanism behind recruitment pulses.
39. The RAG requested that CSIRO demonstrate the value of the acoustic surveys and their contribution to the assessment. Dr Geoff Tuck agreed to run the final model with and without the acoustic data, to examine the effect this data has on stock status.

Action item 4: Dr Geoff Tuck (CSIRO) to run the final blue grenadier assessment with and without the acoustic survey data from 2019, 2020 and 2021 so that SERAG can examine the value of the survey data.

Agenda item 6 – Tiger flathead Tier 1 preliminary base case

40. Dr Pia Bessell-Browne (CSIRO) introduced the tiger flathead Tier 1 preliminary base case and provided the RAG with background on the updated assessment.
    - The RAG last considered a full update to the tiger flathead Tier 1 assessment in December 2019.
    - The assessment was partially updated in 2021 with catch and CPUE data from 2019 and 2020. This update was completed after the AFMA Commission expressed concern about decreasing CPUE for the Danish seine and otter board trawl fleets.
41. The RAG noted the data inputs for the 2022 assessment and that overall, the model fit well to the data.
    - The assessment includes data to the end of 2021 (calendar year).
    - GHAT sector catches have been included. These catches were not included in previous assessments.
    - There are onboard and port collected length frequencies used in the assessment. The RAG commented on the consistently low number of shots contributing to the onboard observer collected flathead length frequency datapoints. Given that observers spent around 30 days onboard Danish seine vessels and Danish seiners complete approximately 6 shots per day, it is expected that there would be more shots with flathead measured.
    - The maximum length bin was extended from 59 to 65 cm. There has been a large accumulation of data points with fish at this size in the Tasmanian trawl and eastern trawl fleets.
    - Bridging was completed with the updated stock synthesis software and tuning protocols. Adding the new data did not have significant effects on historical biomass estimates although discards, age and length data were the most influential.

- Recruitment deviations were randomly distributed and show no concerning trends.
- The RAG discussed the CPUE fits, and whether the Tasmanian trawl CPUE series fit well with the rest of the data.
    - The effect of the Tasmanian trawl CPUE series could be tested by excluding it and examining the effect on the biomass estimate.
    - Tasmania has larger fish than the rest of the fleets and the single stock assumption may not be correct.
- The final year which recruitment was estimated was due to increase by 3 years from 2015 to 2018, however, there was insufficient data to estimate the recruitment deviations for 2018. Recruitment deviation estimates have only been extended to 2017, an additional 2 years of estimates.

42. The RAG noted that steepness (*h*) is traditionally estimated in this assessment but at the October 2021 meeting, the RAG agreed to fix *h* at 0.75 in the 2022 flathead assessment – the RAG was unaware of the flow on effects of this decision at the time.
43. In each flathead assessment, the biomass at maximum sustainable yield (B_{MSY}) is estimated and a 1.2 multiplier is then applied to get B_{MEY}. This has previously been calculated in each assessment so the target can change from year to year. Historically this B_{MEY} estimate has always been below 0.4, but when this rule was created in 2010 a minimum value of 0.4 was implemented and the estimate has not been above this level since. With steepness fixed at 0.75, B_{MSY} and, therefore, B_{MEY} can no longer be estimated. As this scenario is now similar to all other Tier 1 species in the SESSF the harvest strategy policy suggests a return to the default B_{MEY} proxy of 0.48 would be most appropriate. This has implications for the management target and 2023–24 RBC advice. The RAG discussed whether *h* should be estimated, on the pre-determined fixed value of mortality (*M*) and the target reference point to use with the harvest control rule.
    - The RAG was presented with 3 scenarios for *h*:
        - Fixing *h* at 0.75, the default value for many SESSF species and reverting to the target reference point of 0.48.
        - Fixing *h* at the 2019 estimate of 0.72 and maintaining the current target reference point of 0.40.
        - Maintaining the model specifications of the preliminary base case, with *h* estimated at 0.85 and a target reference point of 0.4.
    - The RAG discussed the following regarding the value of *h*:
        - In 2019 a likelihood profile was run on *h*, identifying that there was not much information to inform estimation of *h*.
        - The fixed value of *M*= 0.27, was decided upon more than 10 years ago. A revised *M* value of 0.3 was suggested, as this would be the lower end of a plausible range indicated by the likelihood profile. The RAG noted that *M* was recently changed for eastern orange roughy in the 2021 assessment, but this occurred after 2.5 years of orange roughy working group meetings.
        - In the future, a prior may be used to better estimate *h*.
        - Industry members noted the pending trawl closures and structural adjustment are likely to have a significant economic impact on the fleet. Changing components of the stock assessment, and the resulting change in outputs (i.e. RBC), potentially adds even more pressure. Industry's preference is for stability in TACs, and as such, recommend that the model structure, including the target reference point, are not changed unless there is a compelling reason to do so.
        - The flathead stock assessment is one of the better and more trusted stock assessments in the SESSF. The current target reference point is considered well understood and conservative.

Recommendations:

44. SERAG requested that CSIRO examine the implications of a target reference point of 0.40 vs 0.48. The CSIRO stock assessment team will convene prior to the November 2022 SERAG meeting so that the RAG can be provided with more background on the parameters used in the final assessment.

Action item 5: CSIRO are to further examine the interaction between the steepness (*h*), mortality (*M*) and maximum sustainable yield (B_{MSY}) and summarise this for consideration at SERAG 2.

Action item 6: Dr Pia Bessell-Browne is to add an additional sensitivity to the standard model runs which excludes the Tasmanian trawl CPUE series so that SERAG can examine its effect on the flathead RBC.

Agenda item 7 – Non-quota species TAC advice (ECDWT)

45. Dr Mark Grubert (AFMA) introduced the agenda item and noted that the RAG was being asked to provide advice on a catch trigger for boarfish (Pentacerotidae), an incidental catch trigger for orange roughy and a TAC for alfonsino (*Beryx splendens*).

7.1 – Orange roughy

46. The RAG noted that orange roughy is a bycatch species in the ECDWT sector and are managed under the Orange Roughy (*Hoplostethus atlanticus*) Stock Rebuilding Strategy 2022 and targeted fishing is not allowed. An incidental catch trigger of 50 t exists in the ECDWT sector and no catch has been reported since 150 kg was landed in the 2003–04 season.

Recommendations:

47. The RAG recommended maintaining the incidental TAC for orange roughy in the ECDWT sector at 50 t.

7.2 – Boarfish

48. The RAG noted that boarfish are a target species in the ECDWT sector and currently have a catch trigger of 200 t. No catch has been reported since the 2018–19 and 2019–20 seasons when 39 kg and 77 kg were landed.

49. The RAG discussed the following regarding the 200 t catch trigger:
    - In 2021, the RAG tasked AFMA with reviewing where the 200 t catch trigger for boarfish originated. AFMA could not find a record of where this trigger originated.
    - The RAG discussed what the spatial spread of 200 t of boarfish catch would look like, where the productive spots are and whether boarfish stocks could sustain 200 t of catch.
    - AFMA could look at the Commonwealth catches of boarfish and their distribution and compare this to the New Zealand catches of boarfish which have a longer history of exploitation.
    - There is no evidence base for the RAG to consider, therefore recommending an alternative TAC is difficult. A 50 t data collection trigger could be introduced to complement the 200 t stop fishing trigger for boarfish. In the future if boarfish became more heavily targeted, there would be some data to support management decisions. If boarfish catches reach 50 t, the RAG can discuss data collection protocols.
    - Similar data collection arrangements successfully exist in the GABTS.

Recommendations:

50. The RAG recommended keeping the boarfish catch trigger of 200 t and introducing a 50 t data collection trigger, noting that they had insufficient information to recommend a new catch trigger.

7.3 – Alfonsino

51. AFMA attendees provided a background on alfonsino, and the RAG noted that it is a quota species last assessed with a Tier 3 assessment in 2013, with a current TAC of 1017 t.

52. The RAG discussed the following:
    - There are catches of alfonsino in other parts of the SESSF, but catches have been low and sporadic in the ECDWT sector.
    - The last catches occurred in the 2018–19 and 2019–20 seasons with 11.8 t and 6.2 t caught.
    - The RAG discussed whether alfonsino catch on the high seas may be of the same stock as alfonsino in the SESSF, but the RAG agreed that they had insufficient information to address this question.

Recommendations:

53. In the absence of any new information the RAG recommended maintaining the alfonsino TAC of 1017 t.

Agenda item 8 – Smooth oreo (other) TAC advice

54. Dr Mark Grubert introduced the agenda item and noted that the RAG was being asked to provide TAC advice for smooth oreo (*Pseudocyttus maculatus*) (other), the smooth oreo stock which occurs outside the Cascade Plateau. Assessment strategies have varied from a Depletion-Based Stock Reduction Analysis (DBSRA) in 2015, to its current weight of evidence approach which views all evidence including catch data and Ecological Risk Assessments (ERAs) to infer the likely state of the stock in relation to the reference points. Catches have generally been low in the last 4 years, with most of the catch coming from the southern zone alongside orange roughy catches in the Pedra Branca area.

55. The RAG noted the history of smooth oreo (other) management and assessment approaches and made the following points:
    - The most recent ERA was published in 2021 - Otter Trawl Sub-Fishery 2012–2016 ERA. ERAs will continue to be updated into the future. Since this ERA was completed, fishing effort has expanded in the Pedra Branca and western Tasmania areas.
    - There is high quality data for smooth oreo (other) and the RAG may wish to consider another assessment method. Despite this, smooth oreodory are not a highly valuable species and research funds may be better spent elsewhere.
    - The RAG noted the range of factors which contributed to the sustainability of the smooth oreo (other) stock:
        - Smooth oreodory are a companion species to orange roughy. The eastern orange roughy TAC dropped in the 2022–23 fishing season so smooth oreodory catches are expected to reduce too.
        - The Huon Marine Park and extensive deepwater closures protect many seamounts and much of the smooth oreodory habitat.
    - SERAG noted there was not enough evidence to deviate from previous advice.

Recommendations:

56. The RAG recommended maintaining the TAC of smooth oreo (other) at 90 t.

Agenda item 9 – Blue-eye trevalla Tier 4 assessment (slope)

57. Dr Miriana Sporcic (CSIRO) introduced the agenda item and noted that the RAG last considered a blue-eye trevalla (slope) Tier 4 assessment at its 2021 meetings, that they were being asked to consider the updated Tier 4 assessment and provide RBC advice for the 2023–24 season.

58. The RAG noted the following points regarding the assessment:
    - Hook catch in the Great Australian Bight (GAB) were included for the first time in the 2021 assessment, they have also been included in the 2022 update.
    - In previous assessments, some gear codes associated with automatic longline fishing were not included in Day/Night calculations but were included in the 2022 assessment. The DayNight factor has been updated to account for additional automatic longline records (i.e., to include records identified as 'ALL' and 'LLA' in addition to 'AL') that have both start and end times to estimate an average time fished for specific gear types and fishery. This information was used in the CPUE standardisation analyses.
    - Including these data have revised the CPUE series downwards.
    - The 2022 assessment incorporates the updated slope and seamount division line as presented in agenda item 2.
    - NSW catch data have been added in the 2022 assessment.
    - The assessment produces an RBC of 249.08 t, a 28.7% drop from the 2021 RBC of 349.32 t.

59. The RAG noted the following points regarding the assessment:
    - AFMA should ensure that logbooks do not allow for fishing events to be submitted without end shot information.
    - Dr Geoff Liggins (NSW DPI) noted that during the reference period the blue-eye trevalla Tier 4, abundance is decreasing and stability in the catch rates seem to arrive from the period following the original removals. If you went back to pre-1997 there could be large removals that are not displayed in the CPUE series. This raises the question whether the equilibrium in the catch rates is before the reference period used.
    - The RAG noted that original default reference period was 1986–94.
    - Industry attendees noted that prior to 2002, there was only one automatic longliner fishing for blue-eye trevalla. The dropping catch rates after 2006 corresponds with a shift from droplining to longlining, where droplining tends to capture more fish per hooks set.
    - Industry attendees noted that there have been major cuts to catches in the previous 2 years and the decreasing TAC has constrained fishing effort for blue-eye trevalla. Industry generally do not view Australian blue-eye trevalla as having the same depletion issues as New Zealand. There may be some regional depletion in the east but catches in the west remain strong. The TAC is also undercaught.

60. The RAG discussed concerns with the CPUE series:
    - The RAG noted that depredation by orcas remains a large concern for the validity of the CPUE series and is a major reason why the discount factor is used.
        - CSIRO attendees noted that the RAG has made recommendations to improve data collection practices to account for issues with the CPUE index, and AFMA have been tasked with adding fields in e-logs to record orca sightings and depredation events.
        - Observer data in the Eastern Tuna and Billfish Fishery (ETBF) showed that there was up to a 40% reduction of catch rates from orca depredation.
        - Orca depredation of blue-eye trevalla is thought to have started in the 1970s. If it has been constant throughout this time, it may not have a major effect on the utility of the CPUE series to model relative abundance over time.

    - If orca depredation data (specifically the presence of orcas during the hauling of shots) were collected, CSIRO could fit a model to the data to examine its effect on catch rates.
- In New Zealand it has been concluded that blue-eye trevalla catch rates are hyper stable because of the fish's life history.
    - Blue-eye trevalla life-history includes a lengthy period of free swimming then settling to bottom habitat. The bottom habitat is limited and when you remove a settled fish, it is likely replaced by recruiting sub-adults.
    - New Zealand fish are believed to move amongst a networks of seamounts, further stabilising CPUE.
    - This life history makes blue-eye trevalla a poor candidate for a Tier 4 assessment.
    - Despite these patterns, if recruitment is strictly size associated, and less habitat associated, hyperstability may be counteracted slightly as recruitment would not be accelerated by removing fish.
- Bait type likely contributes to catch rates and should be recorded in the logbooks. It is a significant factor in the ETBF. Industry attendees confirmed that they vary between fish and squid as bait. Squid availability is variable but is more durable on a hook.
- The RAG broadly agreed that the blue-eye trevalla CPUE trend is not necessarily wrong, but it may not index the stock status.
    - Eventually the reliance on CPUE may lead to over-estimation bias in the stock status.
    - Close-Kin Mark Recapture (CKMR) may be the future of the blue-eye trevalla assessment but there are years of work ahead before it can be used to recommend an RBC.
    - In the future, the RAG needs to discuss a workplan to address blue-eye trevalla tissue sample collection for CKMR.

Recommendations:

61. The RAG accepted the RBC advice from the Tier 4 assessment and recommended an RBC of 249.08 t with the discount factor to be applied, noting concerns with CPUE hyperstability and orca depredation.

62. The RAG recommended that a blue-eye trevalla workplan be developed which will address data collection and CKMR sampling protocols.

Action item 7: AFMA to examine the possibility of adding 'bait type' as a field in e-logs so that it can be included as a factor in the blue-eye trevalla CPUE series.

Agenda item 10 – Deepwater shark assessment approach

63. The RAG noted that they last considered the deepwater shark basket (*Centroscyllium* spp., *Centroscymnus* spp., *Centroselachus crepidater., Scymnodon plunketi, Dalatias* spp, *Deania licha* and *Etmopterus* spp.) in October 2021. At this meeting it was apparent that there was insufficient information to support a quantitative stock assessment and it was recommended that the existing TACs of 24 t (east) and 235 t (west) be continued into the 2022–23 fishing season based on indicators of stock health. The RAG also recommended that AFMA engage with a deepwater shark subject matter expert to summarise and compile data sources relevant to the deepwater shark basket, to support a stock assessment for *Deania* spp.

64. The RAG noted that Dr Ross Daley (Horizon Consulting) had been engaged by AFMA to compile information relevant to a deepwater shark stock assessment for *Deania* spp. Dr Ross Daley provided the RAG with a preliminary overview of the information he had compiled:

- A FishPath analysis was completed to identify the data available for an assessment and the types of assessment that would be supported as well as relevant caveats.
- It was decided by SERAG in 2021 that assessment effort should focus on the *Deania* species because they are the most biologically vulnerable so that management that is sustainable for them is likely to be sustainable for the other species. Also, *Deania* have relatively low discard rates, and form a large proportion of the landed catch so that catches and CPUE are likely to be representative of that group. The work presented to SERAG in 2022 examined the data available for *Deania* and the result of an application of FishPath to *Deania* alone (in 2021 FishPath was used to consider assessment options for the Deepwater Shark group as a whole).

65. The RAG noted the existing fishery data, time series and total removals:
    - Deepwater Shark catches are most likely limited by the presence of sizable closures in core Deepwater Shark depths.
    - Historical fishery independent surveys could be used to supplement commercial CPUE data both by providing catch rate information that is unaffected by discarding and poor species identification, as well as information on the size and sex composition of Deepwater Sharks in non-commercially fished areas. However, much of those data exist only as paper data sheets.
    - A suggestion was made to calculate standardised CPUE indices for each of nine identified habitat bioregions which have unique seafloor and oceanographic conditions.

66. The RAG noted the existing data relating to deepwater shark biological parameters:
    - Ageing data and *M* values are a missing piece and expanding on this would help work towards a higher tier assessment. However this data does exist, at least as a range of parameter values, for *Deania* from New Zealand and the EU.
    - Reading growth rings on shark vertebra and spines have been shown to underestimate ages for mature sharks. This might apply to Deepwater Shark as well. Genetic ageing methods may be viable but must be calibrated against a known age set.
    - Additional essential information on the length-weight relationship for Deania, maturity at length, and litter size is also available, from Australia and/or overseas.

67. The RAG noted the available information on size and age structure:
    - AFMA observer data have occasional records of large females but these are often absent. It has been shown overseas that pregnant females occupy different areas from mature but non-pregnant females, and that males also frequent different areas from females. The locations of these three classes of *Deania calcea* and *Deania longispinosa* have yet to be identified in Australia. In particular, pregnant females and young pups are infrequently recorded, perhaps indicating that they are more prevalent in unfished areas. The absence of the youngest pups, however, might simply be the result of gear selectivity as they have been recorded off NSW in surveys that used finer mesh gear than commercial nets. (Kapala surveys recorded such juveniles off NSW in the 800–1200 m depth range).
    - The size distribution of deepwater sharks is likely closely linked to depth, with juveniles occurring in different areas
    - Data relating to juveniles and large adults is patchy, indicating migrations could occur or sub-populations could exist. These migrations could be as large as between NSW and Tasmania.
    - Understanding the fishing effort being applied to various age classes is important for a stock assessment.

68. The RAG made the following comments regarding the data presented:
    - The RAG's industry and scientific members noted that fishing effort in the CTS is largely shallower than 700 m. Some members felt that current Commonwealth commercial fishing would have very little impact on deepwater shark populations, with both juveniles and large adults likely existing in unfished closed areas as well as in open areas.

- An attempt should be made to calculate the level of protection deepwater sharks have, noting that this would require improved information on what components, and proportions, of the stock are in the closed versus open areas.
- Dr Robin Thomson noted that CSIRO are not planning an age-structured SS-style assessment and will explore data limited assessment options. Quantifying the amount of protection that the closed areas provide would be desirable but currently difficult without more information from within closed areas. There is a Deepwater Shark Working Group which will continue to meet and discuss future work.
- In the past, deepwater shark species identification workshops were held for observers. It may be worth reviving this to assist observers and skippers in identifying the 18 species in the deepwater shark basket in order to improve the value of the logbook and Observer datasets.
- AFMA attendees reiterated that AFMA is looking to confirm whether the current TACs are suitable or should be adjusted.
- The RAG noted that the gulper longline monitoring program is operating in some of the trawl closures and may be able to provide some valuable information. However Dr Thomson reported that she had had discussions with those running the surveys and that Dr Alan Williams had indicated that the gulper surveys are taking place in shallower waters than those in which mid-slope dogfish typically occur so their value for monitoring that group is low. In addition, their work will focus on processing gulper shark quickly so that they can be returned to the water in good condition, limiting capacity for observing additional species. Also, the existing Animal Ethics permit would have to be modified before data could be collected on additional species.

Action item 8: AFMA to confirm whether observers record deepwater shark sexes and if not, consider adding this to data collection protocols.

Agenda item 11 – Research and extension updates

69. Dr Mark Grubert introduced the agenda item and the RAG noted the various research projects relevant to the SESSF.

11.1 Trawl selectivity

70. Dr Matt Broadhurst (NSW DPI) presented the FRDC funded research project '[Improving and promoting fish-trawl selectivity in the CTS and the GABTS of the SESSF]'. The project has 3 goals and phases:
    - Phase 1 was a literature review of trawl selectivity projects.
    - Phase 2 was a review of existing work and how it could apply to the CTS and GABTS.
    - Phase 3 will apply new and alternative modifications in the CTS and GABTS based on what was identified in phases 1 and 2.

71. Dr Matt Broadhurst provided some background on existing trawl selectivity projects and the modifications those projects studied:
    - Trawling occurs in over 40 countries and accounts for a quarter of marine production at 20 million tonne of fish per annum.
    - Common issues are bycatch and fuel and cost efficiency.
    - Majority of fish trawl studies are in Europe, particularly in Scandinavia.
    - Gear modification studies were defined by the part of the trawl they affect with most studies focussing on the codend and extension.
    - Many of the studies concluded that the following is important:
        - the correct mesh size and shape;
        - the narrowest possible codend;

    - the narrowest possible twine diameter;
    - in some instances, installing horizontal separator panels to exclude species with certain behaviours;
    - optimising the bridal and sweep lengths;
    - optimising the spread ratio;
    - having escape windows present; and
    - having stimulants such as lights to guide fish towards escape points.
- Unaccounted escape mortality and depredation is an ongoing issue.
- Some industry studies combine several changes at once which makes it difficult to identify what is making changes to the catch.
- Some species have had a large amount of study such as the Atlantic cod (*Gadus morhua*) in Europe.
- In areas where there hasn't been much research, there should be ways to incrementally improve trawl selectivity.

72. Dr Matt Broadhurst presented phase 2 of the project, and the existing modifications that are being trialled in the CTS and GABTS:
    - T90 mesh is being used to target deepwater flathead (*Platycephalus conatus*) and Bight redfish (*Centroberyx gerrardi*) in the GABTS. The T90 mesh had no effect on deepwater flathead selectivity in the GABTS but the quality of the flathead increased. This is believed to be caused by less turbidity in the net, resulting in less physical trauma for the fish.
    - Horizontal separator panels have been trialled in the CTS off NSW to examine how various species behave within trawl nets. Pelagic species such as yellowtail scad (*Trachurus novaezelandiae*) and barracouta (*Thyrsites atun*) appear in the upper codend, eastern school whiting, red gurnard (*Chelidonichthys kumu*) and squid occur throughout the entire trawl and demersal species such as grey morwong (*Nemadactylus douglasii*), tiger flathead and John dory (*Zeus faber*) occur in the lower trawl.
    - A fine mesh codend cover was trialled to measure the codend selectivity for conventional eastern school whiting gear in the CTS. The conventional 96 mm diamond mesh codend allowed for approximately 30% of fish over 17 cm to escape and many smaller fish were not excluded. Adding a bycatch reduction device allowed for some fish smaller than 15 cm to escape.
    - The effects of varying ground-gear bobbin discs were trialled in the CTS and the discs did not influence the species distribution or the amount of retained and discarded species.

73. Dr Matt Broadhurst presented phase 3 of the project, and the new modifications that are being trialled in the CTS and GABTS:
    - The first experiment will test a 105 mm T90 mesh in the GABTS.
    - The second experiment will test a horizontal separator panel and tickler chains in the GABTS. This will possibly identify modifications to separate unwanted rays and flathead.
    - There is capacity to complete 2 more experiments in the CTS although they are undecided. Experiments are limited by funding to place observers at sea.

74. The RAG discussed the following:
    - Data collected on grey morwong could be comparable to jackass morwong and their management. The current experiments have strong sample sizes of John dory, grey morwong and redfish. Further analysis of these catches may be of interest to Commonwealth management.
    - Most of the trawl size selectivity occurs in the bag and codend. This may also occur at the boat side when the net is hauled with the net acting like a teabag. Species selectivity occurs at the front end of the trawl. Mesh size tends to be regulated to the smallest target species which is problematic in multi species fisheries.
    - If gear regulations are lax, it is easy for operators to work around them. If new gear regulations are to be adopted, they need to be enforced by compliance. Furthermore, if operators are positively incentivised to make modifications, this will have a larger positive impact.

11.2 Eastern school whiting stock structure

75. Dr Karina Hall (NSW DPI) introduced the agenda item and provided the following background regarding the FRDC funded research project '[An updated understanding of Eastern School Whiting stock structure and improved stock assessment for cross-jurisdictional management]'.
    - A previous genetic study of eastern school whiting using allozyme markers suggested there was a weak stock division in the eastern school whiting population, although these results could not conclusively prove whether the stock was split. Given the complex spatial fisheries management arrangements for trawl fisheries in south-eastern Australia there is a need to resolve the stock structure for cross-jurisdictional stock assessments and harvest strategy management.
    - The early life history and adult movements of eastern school whiting are largely unknown.
    - This project is re-examining the stock structure of eastern school whiting across its range.

76. The project has the following goals:
    - clarify the stock structure of eastern school whiting in south-eastern Australian waters using a range of modern methods;
    - investigate the spatial and temporal variation in the main biological parameters (length and age structures, growth and reproductive biology) of eastern school whiting across the species' distribution;
    - investigate the species composition of mixed trawl whiting catches in northern NSW to improve the quality of state catch data used in stock assessments; and
    - explore the effects of the findings from the first 3 objectives on the outputs of an updated Tier 1 stock assessment for eastern school whiting.

77. To address these goals, the project examined a range of variables including genetics, morphometrics, otolith microstructure and otolith chemistry.
    - To examine the delineation of *Sillago* species, samples of various species were obtained from around Australia. All eastern school whiting and other whiting species that were sampled formed distinct species clades.
    - Within the eastern school whiting species, there is strong genetic flow between NSW and eastern Victorian fish.
    - Tasmanian fish have the most genetic differentiation and are a separate population.
    - Some differentiation is occurring in western Victoria and South Australia (SA). SA fish may be a separate population although there was a low sample size, so results are inconclusive.
    - Some isolation by distance among the mainland populations may be occurring.

78. The RAG made the following comments:
    - One of the project's goals is to explore the effects differentiating the stock would have on the Tier 1 stock assessment. Given this information, Tasmanian catches would be excluded from the Commonwealth Tier 1 stock assessment. Despite this, Tasmanian catches of eastern school whiting are very small and excluding this data from the assessment would have a small effect.
    - While the genetic data provides clarity for Tasmania and SA, it does not provide insightful management information for NSW. It may be worth seeing the remainder of the study's results before the stock assessment is changed. The other results may provide more insight into eastern school whiting movements on the NSW coast.
    - If eastern school whiting were depleted in a single area of the NSW coast, it would be unlikely to influence the genetic variability of the population.

11.3 FRDC Extension Officers

79. Mr Jamie Allnutt (FRDC) introduced the agenda item, and provided the RAG with background on the FRDC Extension Officer network:
    - The goal of the Extension Officers is to improve the extension and adoption of research and development generally through the end users of all fishery sectors. This means working with a broad group of stakeholders and end users.

- FRDC has made a 3-year funding commitment to the Extension Officer network.
- There is one Extension Officer employed in every state and territory, excluding the ACT.
- Extension Officers have a range of tasks which vary depending on the requirements of the end users. Included in this, is communicating end user needs to FRDC Research Advisory Committees, building marine literacy and an understanding of fisheries management and stock assessments and connecting different end users together.
- A risk of the program is the officers being spread too thin, as they attempt to connect with stakeholders through large and diverse states.

Agenda item 12 – Other business and action items review

80. The RAG noted the action items raised through the meeting (Attachment C).

Close of meeting

81. The Chair thanked the RAG for their contribution and closed the meeting at 13:55.

Attachment A – Register of interest

Member	Declaration
Dr Paul McShane (Chairperson)	Chair of SERAG and a member of the South East MAC (SEMAC) and SESSFRAG. No pecuniary interest in the SESSF. Principal of Global Marine Resource Management Pty Ltd. Adjunct Professor (Fisheries and Aquaculture) College of Science and Engineering, James Cook University.
Dr Mark Grubert	Employed by AFMA, Manager of the South East Trawl (SET) sector and GABTS. AFMA member of SERAG, the Great Australian Bight Resource Assessment Group (GABRAG) and the Great Australian Bight Management Advisory Committee (GABMAC). No pecuniary or other interest.
Dr Sarah Jennings	Economics member on SERAG, SESSFRAG and SEMAC. Economics coordinator, FRDC Human Dimensions Research Subprogram. Member of AFMA Economics Working Group. Adjunct Senior Researcher, TSBE, University of Tasmania. Casual employee, IMAS, University of Tasmania. Independent economics consultant. No pecuniary or other interest.
Dr Geoff Tuck	Employed by CSIRO and involved in stock assessments. Interest in obtaining funding for future research. Principal investigator on SESSF stock assessment project.
Dr Ian Knuckey	**Ian Knuckey positions:** Director – Fishwell Consulting Pty Ltd Director – Olrac Australia (Electronic logbooks) 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 – Gulf of St Vincent's Prawn Fishery Management Advisory Committee Scientific Member – Tropical Tuna Resource Assessment Group Scientific Member – SESSF Resource Assessment Group Councillor – Victorian Marine and Coastal Council Member – The Geelong Agri Collective **Fishwell current projects:** Department of Agriculture Water and the Environment (DAWE) Project Multi-sector fisheries capacity building AFMA 2022 – Annual monitoring, reporting and assessment of SPF marine mammal interactions, including effectiveness of mitigation measures AFMA 2020-0807 Bass Strait Scallop Fishery Survey – 2020–22 AFMA project Design sea cucumber fishery-independent survey for Coral Sea FRDC 2019-027 Improving and promoting fish-trawl selectivity in the SESSF and GABTS FRDC 2018-021 Development and evaluation of SESSF multi-species harvest strategies Traffic Project Shark Product Traceability Sea Cucumber Ass. Design and implementation of various sea cucumber dive surveys.

	Australia Bay Queensland Gulf of Carpentaria Developmental Fin Fish Trawl Fishery Expert Witness Gladstone Harbour development impacts
Mr James Woodhams	Employed by ABARES. On behalf of ABARES, has a minor financial stake in the project '2019-036: Implementation of dynamic reference points and harvest strategies to account for environmentally-driven changes in productivity in Australian fisheries'. Non-financial roles on the steering committee for the Multi species harvest strategy project led by CSIRO, the Reviewing biological parameters project led by CSIRO and Alternate indicators for the SESSF (working group reporting to SESSFRAG).
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 Will Mure	Sole Director of Mures Fishing P/L Commonwealth fish receiver permit Tasmania fish processing licence Scalefish hook boat SFR, SEQ Quota Holding Permits, Auto longline fishing permit High Seas permit Blue-eye trevalla SFRs, Ling SFRs, Ribaldo ITP Mixed species Individual Transferable Quotas (ITQs) and SFRs Member of various fishing related associations including Seafood Industry Australia (SIA), South East Trawl Fishing Industry Association (SETFIA), Southern Shark Industry Alliance (SSIA), Tasmanian Seafood Industry Council (TSIC)
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. SSIA was engaged by AFMA to collect biological data in the shark fishery. Non-beneficiary Director of 2 fishing companies in the SESSF one of which is a significant quota owner. Industry member on SERAG and SEMAC. Member (Chair) of Seine and Trawl Advisory Group (STAG).
EO Mr Aaron Puckeridge	Employed by AFMA, Senior Management Officer, SET and GABTS. Executive Officer (EO) of SERAG. No pecuniary or other interest.
Invited Participants	**Declaration**
Dr Robin Thomson	CSIRO Assessment Scientist. Acquiring funding for research purposes. Principal Investigator (PI) for close kin project for school shark. PI on close kin scoping study for blue-eye trevalla.
Dr Miriana Sporcic	CSIRO Assessment Scientist. Acquiring funding for research purposes.
Dr Paul Burch	CSIRO Assessment Scientist. Acquiring funding for research purposes. CSIRO representative on the Fisheries Statistics and Information Working Group. PI on the data services contract.
Dr Pia Bessell-Browne	CSIRO Assessment Scientist. Acquiring funding for research purposes.

Dr Geoff Liggins	NSW DPI, Fisheries scientist. Involvement in NSW resource assessments. Potential interest in the acquisition of funding for research/assessment purposes concerning cross-jurisdictional stocks.
Dr Ashley Fowler	NSW DPI, Fisheries scientist involved in NSW resource assessments. Potential interest in the acquisition of funding for research/assessment purposes concerning cross-jurisdictional stocks.
Ms Frances Seaborn	Department of Natural Resources and Environment (DNRE) Tasmania Senior Fisheries Management Officer. No pecuniary or other interest.
Dr Ross Daley	Former employee of CSIRO 1993-2014 Member of the International Union for Conservation of Nature (IUCN) Shark Specialist Committee. Director of Horizon Consultancy: Member of Marine Stewardship Council Peer Reviewer group. Receives funding from non-government Conservation organisations for Shark Research. Received funding from FRDC. Provided paid fisheries advice to Western Australian Fisheries. Provided paid advice on fisheries matters to Caribbean Fisheries Council, Ministry of Fisheries in Peru, Kuwait Institute of Scientific Research.
Dr Karina Hall	NSW DPI Senior Research Scientist No pecuniary or other interest
Dr Matt Broadhurst	NSW DPI Senior Principal Research Scientist No pecuniary or other interest
Mr Chad Lunow	Fisheries Manager, Management and Reform DAFF QLD No pecuniary or other interest
Mr Jamie Allnutt	Employed by FRDC No pecuniary or other interest
Dr Matthew Jones	FRDC Extension Officer (Victoria) No pecuniary or other interest
Observers	**Declaration**
Dr Sandra Curin Osorio	CSIRO Assessment Scientist Acquiring funding for research purposes
Mr David Maynard	FRDC Extension Officer (Tas). No pecuniary or other interest
Mr Nathan Bicknell	FRDC Extension Officer (SA) No pecuniary or other interest
Mr Kris Cooling	FRDC Extension Officer (NSW) No pecuniary or other interest
Mr Les Scott	Chief Executive Officer, Peter and Una Fishing Co Pty Ltd which holds various fishing rights and operates a longline vessel in the GHAT fishery/Coral sea and High Seas fishery. Pecuniary interests are limited to the extent of being an employee of the company.
Dr Krystle Keller	Employed by ABARES. No pecuniary or other interest.
Dr Daniel Wright	Employed by ABARES. No pecuniary or other interest.

AFMA Attendees	Declaration
Mr Daniel Corrie	Employed by AFMA, Senior Manager of Demersal and Midwater Fisheries. No pecuniary or other interest.
Dr Lara Ainley	Employed by AFMA, Manager of the Gillnet Hook and Trap (GHAT) sector. No pecuniary or other interest.
Dr Nastaran Mazloumi	Employed by AFMA, Senior Management Officer for the GHAT sector. EO of SESSFRAG. No pecuniary or other interest.
Mr Roshan Hanamseth	Employed AFMA, Senior Management Officer for the GHAT sector. EO of SharkRAG. No pecuniary or other interest.
Ms Rebecca Jol	Employed by AFMA, Senior Management Officer, SET and GAB Trawl sectors. EO of GABRAG, GABMAC and SEMAC. No pecuniary or other interest.
Mr Nathan Jackson	Employed by AFMA, Graduate. No pecuniary or other interest.
Ms Alice McDonald	Employed by AFMA, Climate Adaptation Senior Program Manager. No pecuniary or other interest.

Attachment B – Action items

Complete/Redundant	Underway	Yet to start	Needs further advice

	Meeting and Agenda Item	No.	Description	Responsibility	Timeframe	Status
	2020.12 Agenda Item 2	1	AFMA to investigate the peak of 24 cm fish in the 2018 trawl onboard length data for school whiting.	AFMA	By SESSFRAG Data Meeting (August 2021)	Complete. Data from a Danish seine shot, not otter trawl. Corrected in AFMA database. Use of this data to be considered at the next School Whiting assessment.
	2020.12 Agenda Item 2	2	SESSFRAG to consider updating the 'TAC setting and assessment guidelines' document to include priorities for undertaking sensitivities, likelihood profiles, retrospectives etc. by SESSFRAG 2021 Data meeting.	AFMA (refer to SESSFRAG)	SESSFRAG Chairs' Meeting March 2022	Complete.
	2020.12 Agenda Item 3	3	Daniel Corrie (AFMA) and Dr. Michael Steer (Chair), to draft a letter to the AFMA Commission for its March 2021 meeting on behalf of SERAG (and to be endorsed by SERAG) expressing its concern around: - the difficulty of disentangling environmental changes, recruitment failure and fishing mortality as reasons for several depleted stocks failure to rebuild. - the increasing number of SESSF quota species assessed as declining.	Mike Steer and Dan Corrie	By March 2021	Complete

	2020.12 Agenda Item 6	4	Dr Miriana Sporcic (CSIRO) to work in collaboration with Geoffrey Liggins (NSW DPI) to develop a preliminary historical catch time series for offshore ocean perch. It should be noted that the early-period catch history may require further validation before an agreed series can be reached.	Miriana Sporcic (CSIRO) and Geoff Liggins (NSW DPI)	By next Tier 4 assessment (2023)	This is being considered as part of a broader catch history project. This action item is to be closed.
	2020.10 Agenda item 2	5	AFMA to compare logbook discard records of deepwater flathead and bight redfish in the GABT against observer records to determine their accuracy.	AFMA	By SESSFRAG Data meeting (Aug 2021)	This work has not started and will be scheduled for 2022. This action item will be referred to GABRAG and removed from SERAG's action item list.
	2020.10 Agenda item 5	6	Mr Daniel Corrie (AFMA) and Simon Boag (SETFIA) to engage with industry regarding identification issues between oxeye and spikey oreo to improve logbook records	AFMA (Mr Daniel Corrie) and Mr Simon Boag (SETFIA)	As soon as possible	AFMA have communicated this issue to operators and the issue is amended. Furthermore, AFMA have developed an industry communication workshop for Commonwealth Trawl Sector operators. This workshop covers species misreporting issues and may be delivered in 2023.
	2019.12 Agenda item 7	7	AFMA to ensure the revised pre-1998 ISMP dataset is captured into the AFMA database and Dr Koopman's code corrections are stored and the old data rebadged appropriately.	AFMA	Early 2022	The pre-1998 data has been integrated into AFMA's database.

	2019.11 (Action items review)	8	AFMA to ensure that the 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 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.	AFMA (GHAT manager)	As soon as possible	The SIDAC data contract was revised and updated in June 2022 and length data collection for sharks is included. The project to scope the sampling required for blue-eye trevalla CKMR has been further delayed. AFMA will look into the current SIDAC contract to determine scope to include some preliminary sampling.
	2019.11 Agenda item 3	9	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	AFMA have confirmed the species is blue warehou. The skippers have been informed and will record future catches as blue warehou. AFMA are yet to update the database – and will update SERAG once done. **Keep item open until records are corrected.**
	2021.09 Agenda item 4.1	10	AFMA to capture historical RAG advice and the basis for setting the 150 t TAC for Cascade smooth oreo in species summary reports.	AFMA	As soon as possible	The 2010 Tier 4 stock assessment of Cascade smooth oreo produced an RBC of 750 t. When setting the TAC, the RAG agreed on a Discount Factor of 15% but were further constrained by the "Large and Small" change limiting rule outlined in the SESSF Harvest Strategy, which dictates that TACs cannot be altered by more than 50% of a previous year's value. The TAC was therefore lifted from 100 t in 2009 to 150 t in 2010. This is different from the explanation offered in the minutes for SESSFRAG's September 2021 meeting, which claim that the TAC was set at 150 t against the recommendation due to uncertainty and lack of confidence in the outcomes of the tier 4 stock assessment. In 2010, the RAG recognised the need to improve the data for the smooth oreodory (Cascade) stock. This is one reason that the TAC for this stock has not changed. Another reason is consistently low catches. In October 2014, a 10 t trigger was enforced for the revision of the smooth oreodory

						(Cascade) TAC. According to CDR data, there has been a recorded catch of 0 t for all years except for 2020, where 6.28 t were retained. This action item will be closed.
	2021.09 Agenda item 4	11	AFMA to confirm that Cascade orange roughy otolith ageing is present in the FAS workplan.	AFMA	As soon as possible	Cascade orange roughy otolith ageing is present in the FAS workplan. Some data will be available to contribute Cascade TAC advice agenda item at SERAG 2 2022.
	2021.09 Agenda item 6	12	AFMA to interrogate data of those vessels that have increased redfish catch in recent years in collaboration with Paul Burch (CSIRO). This could include developing a statistic or a plot that captures vessels returning to locations of high Redfish bycatch.	AFMA	As soon as possible	AFMA investigated redfish catches through time, vessels returning to locations of high redfish bycatch and catches with a high proportion of redfish to examine targeting. Some vessels displayed evidence of targeting, although targeting is difficult to define in multi species catches. AFMA will have conversations with operators of interest and reiterate that they should not target redfish.
	2021.09 Agenda item 6	13	AFMA to investigate recent redfish catch records and observer data to clarify: a. whether the eastern redfish targeting analysis has mistakenly incorporate GABT Bight redfish catches; and b. the composition of eastern redfish and Bight redfish catches in the western part of the CTS.	AFMA	As soon as possible	AFMA investigated observer data in the western part of the CTS. *Centroberyx* catches were 4.71% Bight redfish and 95.29% eastern redfish. This information will be provided to CSIRO to inform future catch analyses.

	2021.09 Agenda item 7	14	AFMA to compile a report detailing the history and decision making used to set previous catch triggers and TACs for the non-quota species of ECDWT for SERAG 2022.	AFMA	SERAG 2022	The SESSF currently has TACs in place for 2 non-quota species including boarfish and orange roughy (both in the ECDWT sector). These were introduced in response to 'Southern and Eastern Scalefish and Shark Fishery (Minimum Gear Requirements) Direction No. 1 2012', which was revoked in June 2013. Boarfish catches in the ECDWT have been below 100 kg for the past 3 fishing seasons and no orange roughy catch has been reported since 2003-04 for the ECDWT. Based on low catch and a lack of information, there have been no changes to these TACs. Despite a thorough investigation into old records, the decision-making process used to set these TACs remains unclear. This action item will be closed.
	2021.09 Agenda item 9	15	AFMA and CSIRO to produce a background paper summarising the outputs of the 2010 eastern gemfish stock assessment, including how the model considers discards and how this informs current management advice relative to the status of eastern gemfish.	AFMA and CSIRO	As soon as possible	While the 2010 eastern gemfish influences current management arrangements, this assessment is outdated and discard estimates from the 2010 assessment should not be used to update management advice. Discard estimates from the Deng *et al.* 2022 report would be more informative of current trends. As the current status of the eastern Gemfish stock is unknown the impact of discards on the stock is unknown.
	Agenda item 2 – November 2021	16	Mr Daniel Corrie, Dr Paul Burch, and Dr Tim Ryan of AFMA and CSIRO to meet prior to the ISMP working group meeting (15th Dec 2021) to clarify the eastern orange roughy biological data collection program.	AFMA and CSIRO	December 2021	The ISMP was revised to remove biological data collection from the ISMP and will only collect biologicals from the acoustic survey now.

Attachment C – Action items arising from the meeting

No.	Agenda Item / Meeting Date	Action Item	Agency / Person	Timeframe
1	Agenda item 2. Data updates	Dr Miriana Sporcic (CSIRO) is to present 2 CPUE series to SESSFRAG data meeting in 2023, one including and one excluding catches from the Cascade Plateau so that SESSFRAG can advise which should be used for the 2023 Tier 4 for the blue-eye trevalla slope stock. Furthermore, CSIRO should create a third zone, 'Cascade Plateau', when presenting blue-eye trevalla catches in future data reports.	Dr Miriana Sporcic (CSIRO)	By the 2023 SESSFRAG data meeting
2	Agenda item 2. Data updates	SERAG are to write a letter the AFMA Commission, outlining data issues in the SESSF and methods to address some of these issues.	AFMA and SERAG	As soon as possible
3	Agenda item 4. Silver trevally	AFMA to generate heatmaps of Commonwealth silver trevally catch to help inform the discussion at SERAG 2 (November 2022).	AFMA	SERAG 2 November 2022
4	Agenda item 5. Blue grenadier	Dr Geoff Tuck (CSIRO) to run the final blue grenadier assessment with and without the acoustic survey data from 2019, 2020 and 2021 so that SERAG can examine the value of the survey data.	Dr Geoff Tuck (CSIRO)	SERAG 2 November 2022
5	Agenda item 6. Flathead Tier 1 preliminary base case	CSIRO are to further examine the interaction between the steepness (*h*), mortality (*M*) and maximum sustainable yield (B_{MSY}) and summarise this for consideration at SERAG 2.	CSIRO	SERAG 2 November 2022
6	Agenda item 6. Flathead Tier 1 preliminary base case	Dr Pia Bessell-Browne to add an additional sensitivity to the standard model runs which excludes the Tasmanian trawl CPUE series so that SERAG can examine its effect on the flathead RBC.	Dr Pia Bessell-Browne	SERAG 2 November 2022
7	Agenda item 9. Blue-eye trevalla Tier 4 assessment (slope)	AFMA to examine the possibility of adding 'bait type' as a field in e-logs so that it can be included as a factor in the blue-eye trevalla CPUE series.	AFMA	SERAG 2023
8	Agenda item 10. Deepwater shark assessment approach	AFMA to confirm whether observers record deepwater shark sexes and if not, consider adding this to data collection protocols.	AFMA	As soon as possible