Australian Government
Australian Fisheries Management Authority

Southern and Eastern Scalefish and Shark Fishery Resource Assessment Group (SESSFRAG) Chairs' Meeting 2022

Meeting minutes

27-29 April 2022

Microsoft Teams Meeting

Southern and Eastern Scalefish and Shark Fishery Resource Assessment Group (SESSFRAG)

Meeting Chars' Meeting 2022– April 27-29

Agenda

Time (AEST): 0830
Location: Canberra/MS Teams
Chair Name: Dr Cathy Dichmont

Approximate time	Item	Purpose	Lead presenter
27 April (Day 1): 08:30am – 05:00pm			
08:30 (1 hr 15 min)	**Agenda item 1. Preliminaries**		
	1.1 Welcome and apologies	For action	Chair
	1.2 Declaration of interests	For action	Chair
	1.3 Adoption of agenda	For action	Chair
	1.4 Minutes from previous meeting	For noting	Chair
	1.5 SESSFRAG Terms of Reference (ToR)	For noting	Chair
09:45 (45 min)	**Agenda item 2. Actions arising from previous meetings**	For information	Executive Officer
10:30 (15 min)	**Break**		
10:45 (15 min)	**Agenda item 3. SESSF History document update**		
	3.1 Corrections and additions to document	For noting	AFMA member
	3.2 Further items for inclusion in document	For advice	AFMA member
11:00 (15 min)	**Agenda item 4. SESSFRAG working groups and out of session updates**	For information	AFMA member
11:15 (15 min)	**Agenda item 5. Update from the RAGs, EWG and MMWG (verbal update)**		
11:30 (30 min)	**Agenda item 6. Overview of TAC setting process for fishing season 2022-2023**	For discussion	AFMA Member
12:00 (30 min)	**Agenda item 7. Operationalising management of climate change impacts on the SESSF**		
	7.1 Outcomes of FRDC Project	For information	AFMA member
	7.2 Key climate impacts expected in SET	For advice	AFMA member
	7.3 Climate change adaptation options	For advice	AFMA member
12:30 (2 hr)	**Break**		

Approximate time	Item	Purpose	Lead presenter
14:30 (2.5 hr)	**Agenda item 7 - continued**	For discussion	AFMA member
17:00	**Close**		
28 April (Day 2): 08:30am – 05:00pm			
08:30 (1.5 hr)	**Agenda item 7 - continued**	For discussion	AFMA member
10:00 (15 min)	**Break**		
10:15 (2 hours)	**Agenda item 7 - continued**	For discussion	AFMA member
12:15 (45 min)	**Break**		
13:00 (1 hr 45 min)	**Agenda item 7 - continued**	For discussion	AFMA member
14:45 (30 min)	**Break**		
15:15 (1 hr 45 min)	**Agenda item 8. Research statement and assessment schedule**		
	8.1 Strategic research priorities	For noting	AFMA Member
	8.2 Priorities for SERAG and GABRAG	For noting	AFMA Member
	8.3 Research priorities for inclusion in SESSF 2023-2024 Annual Research Statement	For advice	AFMA Member
	8.4 Stock assessment schedules in SESSF and GABT Annual Research Statements	For advice	AAFMA Member
17:00	**Close**		
29 April (Day 3): 08:30am – 12:15pm			
08:30 (2 hr 15 min)	**Agenda item 9. Application of discount factors in SESSF**	For advice	CSIRO Member
10:45 (15 min)	**Break**		
11:00 (1 hr)	**Agenda item 10. East Gippsland seismic survey (M-BACI analysis)**	For information	Ian Knuckey
12:00 (5 min)	**Agenda item 11. 2022 Data meeting dates**	For decision	Executive Officer
12:05 (10 min)	**Agenda item 12. Other business**		
12:15	**Meeting close**		

Day 1: Wednesday 27 April 2022

The Chair opened the meeting at 08:30 am (AEST).

Agenda item 1: Preliminaries

1.1 Welcome and apologise

1. Dr Cathy Dichmont (the Chair), welcomed members, invited participants and observers 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 Chair outlined the logistics for the Microsoft Teams meeting and commenced proceedings.
3. There was an apology from Neil MacDonald, who was unable to attend. The Chair acknowledged Keith Rowling (GABIA) would attend in his place. Paul McShane (South East Resource Assessment Group (SERAG)) was an apology for the afternoon session on the 28th of April and Sandy Morison (Shark Resource Assessment Group (SharkRAG)) was an apology for the morning of the 29th of April.
4. **Table 1: Meeting attendees**

Membership	
Cathy Dichmont	Chair
Lance Lloyd	Scientific member (GABRAG Chair)
Cathy Bulman	Scientific member (Commonwealth Scientific and Industrial Research Organisation (CSIRO))
Paul McShane	Scientific member (SERAG Chair)
Sandy Morison	Scientific member (SharkRAG Chair)
Sarah Jennings	Economic member
Daniel Corrie	AFMA member
Rebecca Jol	A/executive officer
Invited Participants	
Beth Fulton	CSIRO
Simon Boag	South East Trawl Fishing Industry Association (SETFIA) Southern Shark Industry Alliance (SSIA)
Paul Burch	CSIRO
Neil MacDonald	Great Australian Bight Industry Association (GABIA)
James Woodhams	Australian Bureau of Agricultural Resource Economics and Sciences (ABARES)
Miriana Sporcic	CSIRO
Pia Bessell-Browne	CSIRO

Invited Participants	
Geoff Tuck	CSIRO
Robin Thomson	CSIRO
Rich Little	CSIRO
Keith Rowling	Great Australian Bight Industry Association (GABIA) Associate NMAC (SA)
AFMA	
Dan Corrie	AFMA
Mark Grubert	AFMA
Anna Willock	AFMA
Aaron Puckeridge	AFMA
Ryan Murphy	AFMA
Alice McDonald	AFMA
Lara Ainley	AFMA
Roshan Hanamseth	AFMA
Phebe Rowland	AFMA
Nastaran Mazloumi	AFMA
Presenters / Observers	
Ian Knuckey	Fishwell Consulting
Sandra Curin	CSIRO
Tim Emery	ABARES
Kurt Davies	ABARES
Krystle Keller	ABARES
Ian Butler	ABARES

1.2 Declarations of interest

5. The RAG followed the conflict of interest management process (as outlined in *Fisheries Administration Paper 12*) and updated the Declarations of Interest (Attachment A) via email prior to the meeting**.**
6. The RAG members considered the potential for some pecuniary interest for particular research and industry attendees with agenda items 8 and 9 (Table 2).
7. The RAG recognised the attendees' knowledge and ability to contribute to the discussions and agreed that it was appropriate for them to participate in the discussion. However formal recommendations would be finalised by the members (in the absence of all other attendees) out of session.

Table 2: Agenda items with declared conflicts of interest

Agenda Item	Person/Organisation with Potential Conflict
8. Research statement and assessment schedule	Ian Knuckey Simon Boag CSIRO ABARES
9. Application of discount factors in SESSF	Simon Boag Keith Rowling

1.3 Adoption of agenda

8. The RAG adopted the agenda (Pages 2 & 3) as final. Agenda item 6 will be extended.

1.4 Minutes of previous meeting

9. The RAG endorsed the August 2021 Data Meeting minutes as a true representation of the outcomes of that meeting.

Agenda item 2: Actions arising from previous meetings

10. AFMA provided the RAG with an update on the status of action items arising from previous SESSFRAG meetings. The following points were discussed:

March 2021 (Chairs' Meeting) – Action Item 7 – Agenda Item 9

AFMA to incorporate the process for periodic review of stock assessments in the document 'Total Allowable Catch (TAC) setting process – Guidelines for provision of data and stock assessment processes' for further consideration by SESSFRAG. Timeline is subject to other priorities.

- SESSFRAG noted that Natalie Couchman (former Gillnet, Hook and Trap (GHAT) manager) presented a paper to this action at the last Chairs' meeting in March 2021 and this work was to be incorporated into the TAC setting guidelines document. However, due to staff shortages this work is yet to be completed. AFMA management acknowledged that this work is an important process and remains a priority for AFMA when the time permits.
- AFMA will progress this work, subject to resource availability.
- The RAG agreed to maintain this action as an on-going item.

March 2021 (Chairs' Meeting) – Action Item 17 – Agenda Item 16

AFMA to liaise with CSIRO (Dr Miriana Sporcic and Dr Cathy Bulman) to identify non-quota species to remain as discard reporting options in e-logs, outside of the bycatch discard groups (i.e., those that are high-risk as identified through the ERA).

- Dr Paul Burch (CSIRO-scientific participant) cautioned the reporting and data accuracy with reference to the way the bycatch discard reporting options were constructed, highlighting that there may be potential for overlap, where a species could be reported into 2 groups.
- AFMA acknowledged that there may have been some instances where fishers have opted to report into the broader category titled "other fishes" when unsure of the species caught. The

RAG noted that a way to resolve this could be through the development of education programs and industry learning modules to improve group level reporting.

- The RAG noted Phebe Rowland (AFMA) will be leading the development of the industry education program.
- Dr Miriana Sporcic (CSIRO-scientific participant) raised concern with data not being attributed at a species level and highlighted that there will be direct consequences with a lower level of data reporting particularly with respect to Ecological Risk Assessments (ERAs).

The RAG noted the following points raised by AFMA in response to the discard reporting options in e-logs:

- The alternative is to require species level reporting but have less confidence in those results.
- Identification manuals have been developed in the past with little effect during busy fishing operations.
- The observer data has always been AFMA's main source for species level information.

AFMA will continue to work with industry to improve their reporting capabilities but will rely on species level information to come from the observer program.

The RAG supported AFMA Management's recommendation to exclude species level reporting from the e-log software, on the basis that species-level reporting is not always possible for many species. The RAG agreed to mark this action item as complete/redundant.

August 2021 (Data Meeting) – Action Item 2 – Agenda Item 6a

AFMA and CSIRO to discuss further potential refinements to the ISMP sampling targets for some species to ensure representative sampling whilst avoiding broadscale changes to the plan.

- A meeting between AFMA and CSIRO occurred in December 2021 to discuss potential refinements to the ISMP program. The group examined the Integrated Scientific Monitoring Program (ISMP) sampling plan and what was being achieved.
- The group resolved to remove non-survey orange roughy otolith targets from the plan, but to retain length targets.
- No other changes were made to the sampling plan.

The RAG agreed to mark this action item as complete noting that the fishery is going to look very different in 12 months' time.

August 2021 (Data Meeting) – Action Item 6 – Agenda Item 7b

Establish a sub-committee to drive the process for updating catch history data for both Tier 1 and Tier 4 species. Report to be provided at the SESSFRAG Chairs' 2022 meeting for consideration and adoption.

- This sub-committee and the work that would support this has been incorporated into the CSIRO stock assessment contract.
- CSIRO confirmed that he establishment of members for this sub-committee has been budgeted for but is yet to be scheduled.
- The work is scheduled to be undertaken this year; however, the report is unlikely to be finalised until the following year (2023).

The RAG agreed to mark this action as underway.

August 2021 (Data Meeting) – Action Item 12 – Agenda Item 8

SERAG to consider an alternative assessment approach for western jackass morwong for 2022.

- SERAG discussed the western jackass morwong stock at their October 2021 meeting, noting the management changes resulting from the eastern jackass morwong assessment (AFMA are not proposing to undertake a western jackass morwong assessment in 2022).
- Future approaches to assessments and TAC setting process for western jackass morwong will be considered in the context of both stocks.

The RAG agreed to close this action item.

11. The Chair asked attendees whether there were any other questions relating to action items, before moving onto the next agenda item.

12. The list of action items from previous meetings was updated after the meeting (Attachment B). Items that were noted as completed (highlighted green) at the meeting, will be removed and an updated list will be provided to the SESSFRAG Data Meeting (August 2021).

13. The list of action items arising from this meeting, is included at **Attachment C**.

Agenda item 3: SESSF History Document Update

14. AFMA advised the RAG that the purpose of this agenda Item was to provide an updated version of the Southern and Eastern Scalefish and Shark Fishery (SESSF) History Document, and to seek advice for the inclusion of additional line items. The RAG noted the following:

- The SESSF History Document provides a historical overview of significant changes to management arrangements or changes in the fishery that may influence future management decisions and/or would need to be considered when assessing aspects of the fishery.
- The document is reviewed annually by relevant Resource Assessment Groups (RAGs), or as required by AFMA
- Since the March 2021 SESSFRAG Chairs' Meeting, the following (as per the recommendations from that meeting) have been incorporated in the SESSF History Document:

Corrections:

Event 9 – added in the name of the management plan

Event 236 – included information about when the boat size restriction moved to fishing capacity unit restrictions

Event 237 – added the determination date, changed the year to 1988, and included the name of the management plan and the date when the fishery moved to output controls.

Additions:

Event 246 – direction closure: SESSF (closures) direction no. 1 2016

Event 247 – information about the temporary gillnet to hook permits

Included the information from the blue-eye trevalla history document

Event 248 – Commonwealth non-trawl logbook was introduced

Event 249 – freeze on issuing new Commonwealth fishing boat licences

Event 250 – system of permits and fishery specific Commonwealth Fishing Boat licences

Event 251 – gear restrictions on line methods south of 40° South

Event 252 – quota rights made transferable

Event 253 – Cascade Plateau closed to the non-trawl sector.

Event 254: February 3rd, 2022 – Additional sealion closure implemented via Fisheries Management (Southern and Eastern Scalefish and Shark Fishery and Small Pelagic Fishery Closures) Amendment Direction No. 1 2022.

Event 255: Jackass morwong and John dory assessed as overfished (late 2021) and bycatch TACS introduced for the 2022-23 fishing year (formal letter to industry 18 March 2022). (PROPOSED)

Agenda item 4: SESSF working groups and out of session updates

15. Daniel Corrie (AFMA member) gave a brief update on the following SESSFRAG working Groups:

Deepwater Shark Working Group (DWSWG)

Established to work through the fish path tool to develop the DWS Tier 5 assessments approach and provide advice to SERAG for the purpose of providing RBC advice for the 2022-23 SESSF fishing season. The group which is made up of predominantly AFMA and CSIRO members will pull together the Fish Path program with the view to having a tier 5 assessment ready by the end of the calendar year.

ISMP Working Group (ISMPWG)

This group met in December 2021 and examined the Integrated Scientific Monitoring Program (ISMP) sampling plan (as previously discussed in agenda item 2). The group resolved not to modify the plan except to remove non-survey orange roughy otolith targets. No other changes were made to the sampling plan and the group is no longer required.

Fishery Independent Data Working Group (FIDWG)

Established to explore further opportunities for obtaining independent fishery and environmental data e.g.

- explore close kin technologies
- utilising the RV Investigator

The RAG noted that the work progressing through this group will be discussed in agenda item 8 Research Statement and Assessment schedule.

16. AFMA management questioned the ongoing need for numerous working groups and stated that additional working groups add more work for members of the wider team. Working groups whilst necessary should only be established for high priority issues especially as the fishery will change significantly in the next year.

Agenda item 5: Update from the RAGs, EWG and MMWG (verbal update)

17. The RAG members provided verbal updates from their respective RAGs and working groups.

South East Resource Assessment Group (SERAG):

18. The SERAG Chair (Paul McShane) provided a written update to SERAG and expressed appreciation to the SERAG members (at the conclusion of their current term), participants (particularly researchers) and AFMA staff for the work done in providing and considering evidence-based advice on Recommended Biological Catches (RBCs) and ERAs within the SESSF.

19. There were three SERAG meetings conducted in 2021. All were conducted virtually by teleconference (given COVID-19 restrictions).

20. Paul's update included the following key items:

Tier *1 Assessments:*

- Jackass morwong (east): SERAG noted that the eastern stock has been assessed to be below the limit reference point and that there was no updated assessment for the western stock due to reduced catches.
- Blue grenadier: SERAG noted that a strong recruitment pulse was increasing the stock size. Accordingly, SERAG recommended updating the stock assessment in 2022 but the large change limiting rule will constrain the TAC.
- Orange roughy (east): SERAG recommended a decrease in the RBC following updated natural mortality estimates (from Markov Chain Monte Carlo (MCMC)).
- Pink ling (east and west): SERAG received advice that the eastern stock was above the limit reference point (~34% B_0) and the western stock well above (91% B_0)
- Silver warehou: SERAG noted that none of the catch scenarios result in rebuilding to the target reference point but stock status is above the limit reference point, 29% B_0.

Tier 4/5 Assessments:

- Blue-eye trevalla: SERAG noted uncertainty regarding orca depredation, climate change and closed areas and recommended applying a discount factor of 15% to the RBC for the slope stock (52 t discount factor calculated from the 349 t RBC). While SERAG recommended using the 349 t RBC, SEMAC opted not to because of declining CPUE in eastern zones (RBC increased largely due to a CPUE data change rather than a stock trend). They instead recommended using the previous year's TAC of 241 t (which is based on an RBC without a discount factor for the slope stock).
- This was not applied previously but was recommended because of declining CPUE despite closures. They supported modifications to logbooks to require longline operators to record orca interaction and evidence of depredation.
- John dory: SERAG noted the output of the 2020 Tier 4 and recent métier analysis. Stocks were assessed as being below the limit reference point, but uncertainties remain for this valuable byproduct species.
- Silver trevally: SERAG noted that the large-change TAC limiting rule may need to be considered in recommending TACs for this species.
- Mirror dory: SERAG noted that the eastern mirror dory stock is near the limit reference point and consideration should be given to ensure that the proposed eastern RBC of mirror dory is not overcaught in this region.
- Deepwater sharks: These are assessed as a Tier 5 basket of species. This stems from fisher's inability to discriminate among species and consequent lack of species-specific catch rates.

Further research is required given the conservation status of some deepwater shark. SERAG noted protection offered by current spatial closures (offering protection to deepwater sharks) in recommending RBCs with no discount factor applied.

Long-term overfished stocks:

- SERAG noted concerns relating to overfished stocks off the east coast of Australia that have not recovered. These include the following stocks that are currently below the limit reference point for applicable harvest strategies:
    - Jackass morwong (Tier 1)
    - John dory (Tier 4)
    - Eastern gemfish (Tier 1)
    - Redfish (Tier 1)
    - Blue warehou (Tier 4)
- The recovery of these species is constrained by:
    - Unavoidable incidental catch whilst targeting other species, particularly flathead, blue grenadier and pink ling. Métier analysis has been used to build on current stock assessments (including analysis of area and depth fished, gear type).
    - The economic impact of reducing catches on valuable target species which co-occur with overfished byproduct species.

Issues influencing current stock assessments:

- SERAG noted that many currently overfished species are not targeted and are subject to unavoidable bycatch TACs. It is therefore questionable whether CPUE is a useful index of stock abundance for such stocks. This is particularly relevant to stocks assessed as Tier 4 where harvest strategy decision rules are linked to reported catch rates. This prompts consideration of other issues including:
    - Alternative indicators (other than CPUE).
    - Climate change (potentially affecting distribution range, predator/prey relationships, and general population dynamics e.g., reproductive success). Changes in distribution (range and/or depth). Changes in the distributional range of some species (e.g., John dory) can also affect catch rates and fleet dynamics with impact on traditional assessment outcomes.
    - Research input to this includes:
        - Dynamic B_0 (Andrew Penney's work)
        - Ecosystem Based Fisheries Management (EBFM) (Beth Fulton's work)
    - Targeting behaviour/fleet dynamics. For example, one vessel dominates the redfish fishery; spawning aggregations of eastern gemfish are no longer targeted; blue warehou are actively avoided. Have fleet dynamics changed in relation to changes in distribution, markets, or economics?
    - The economic and social impact of discarding valuable species such as John dory to comply with RBC decisions emerging from Harvest Strategies.

New Fisheries:

- SERAG considered the available information for a new (trap) fishery for hagfish off the NSW coast.
    - One operator: fishing over a large area. Requires relevant data to support analyses of stocks and RBC.
    - Insufficient information to set RBCs other than precautionary levels required to develop the fishery.

Ecological Risk Assessments:

- SERAG noted that an assessment of the automatic longline sub-fishery of the GHAT sector of the SESSF revealed low risks to target, bycatch and habitat.

Research Priorities:

- SERAG supported the following recommendations in relation to the 2023 research priorities:
    - ISMP data services.
    - Orange roughy acoustic survey.
    - Blue grenadier acoustic survey (last done on spawning aggregation in 2010).
    - Upcoming SESSF stock assessment projects.
    - Fish ageing for SESSF quota species.
- SERAG also recommended (as a high priority) an independent review of stock assessments applied to key and depleted SESSF stocks noting that many long-term overfished stocks that have not recovered even under zero RBCs.

<u>Great Australian Bight Resource Assessment Group (GABRAG):</u>

21. The Great Australian Bight Resource Assessment Group (GABRAG) Chair, Lance Lloyd, updated the RAG on the following key points:

    - The Great Australia Bight RAG has oversight of a large area that supports a relatively small fishery (and small number of fishers). Deepwater flathead and Bight redfish are the two main species for which we conduct modelling and make TAC recommendations.

22. In the last year GABRAG have noted the following:

    - Deepwater flathead: have recovered from previous poor catches.
    - Bight redfish: length frequencies skewed towards young fish, low numbers of large fish, patchy and reducing catches – GABRAG decided to recommend that the Stock Assessment for Bight redfish be brought forward and delay the assessment for deepwater flathead, given that the stocks appear to be stable enough to continue the previous fisheries settings (RBCs/TACs, etc).
    - Membership of GABRAG was refreshed in early 2022 with several members ongoing and some new members. Mr Lloyd stated that he looked forward to continuing to work with the members for the benefit of the fishery.
    - GABRAG will meet twice this year to consider the Bight redfish assessment towards the end of the year (September to December).

23. Daniel Corrie (AFMA) informed the RAG that the deepwater flathead assessment has been deferred from 2022 to 2025 due to the Fishery Independent Survey (FIS) being scheduled for 2023.

Shark Resource Assessment Group (SharkRAG):

24. The SharkRAG Chair Sandy Morison updated the RAG on the following key outcomes from SharkRAG:

- An ERA was agreed for Manual Longline subject to some suggested amendments. The updated final report was submitted in December 2021.
- A workplan for the lead up to the next gummy shark assessment was completed.
- An overview of the Close Kin Mark Recapture method for school shark was presented to members for information.
- The RAG provided input to the Review of the School Shark Rebuilding Strategy and noted that no significant changes to management were justified at that point, but that once proposed work on a new harvest strategy was completed, and the assessment is updated, another review of the rebuilding strategy will be required.
- The RAG discussed how to produce a revised estimate of the incidental bycatch of school shark. It agreed that the preferred method to calculate the school shark bycatch TAC should be based on the best estimate of total, unavoidable mortality (both retained and discarded), and that it should also take account of the reduction in gummy shark TAC, and the projected increase in biomass estimated from the CKMR model. Mr Morison noted that a reduction in TAC of gummy shark that was anticipated did not eventuate. Instead, the incidental bycatch of school shark was increased.
- The RAG considered a draft report on a comparison of logbook and Electronic Monitoring (EM) data and made several suggestions to the authors for revisions and further work. The RAG also agreed that logbook reported discards for school and gummy shark could be used to estimate discard weights for gillnet and set longline (shark hook) methods in the 2022-23 TAC setting process (inferring that the ABARES work that verified the piece count reports might also indicate that the weight reports are accurate, however SharkRAG noted that the veracity of that assumption would need further investigation).

Economic Working Group (EWG):

- Sarah Jennings (Economic member) reported that the EWG have not met since the last SESSFRAG meeting update. An out of session item arose in early 2022.
- The RAG recommended a follow up on the status of the working group be scheduled and an update provided to the RAG, out of session.

ACTION 1: AFMA to follow up on the status of the EWG and report back to the RAG out of session.

Marine Mammal Working Group (MMWG):

- The RAG noted that the MMWG is not operational and therefore no update to report.
- The RAG agreed to remove this group from the agenda as it is no longer operational.

Agenda item 6: Overview of TAC setting process for fishing season 2022-2023

25. Daniel Corrie (AFMA) introduced the agenda item and discussed the process and outcomes of the March 2022 Commission meeting regarding the 2022-23 TAC setting process, noting that the Commission (in some instances) deviated from SESSFRAG advice and that the actions AFMA and the government will need to take for the ongoing success of this fishery, will have implications for climate change discussions and future research priorities. The following points were noted and discussed:

- The total allowable catch (TAC) for 34 quota and non-quota species in the SESSF is set every year in accordance with the SESSF Harvest Strategy and the SESSF Management Plan 2003. A broad outline of this process is described in Attachment A.
- In collaboration with research providers, stock assessments are conducted across all species as required which, along with catch and effort rates, informs the RAGs to determine the RBC for each species. The advice is then provided to the South East Management Advisory Committee (SEMAC) and the Great Australian Bight Management Advisory Committee (GABMAC) to provide advice on recommended TACs for each species.
- To gather TAC setting advice for the 2022-23 season, AFMA consulted with the GABRAG on 15 October 2021, the SharkRAG on 15-16 November 2021, the SERAG on 28-29 September, 19-20 October, and 29 November – 1 December, GABMAC on 17 November 2021 and the SEMAC on 8-10 February 2022.
- The primary document that captures the information and advice relative to informing the TAC decision process is the 2021 Species Summary, which is available on the AFMA website.
- Along with additional advice from AFMA Management, the AFMA Commission reviews this information for each species and determines the TAC for the upcoming fishing season, along with determinations for undercatch and overcatch. The AFMA Commission met for its 81st meeting in Canberra on 9 March 2022 to set TACs and associated management measures for the SESSF 2022-23 fishing year. The decisions are implemented through Determinations which are legislative instruments. Once final, AFMA provides written correspondence to all SESSF concession holders informing them of these decisions and where and why the AFMA Commission may have deviated from the advice provided. This letter is available through the AFMA website.
- Attachment A – Total Allowable Catch (TAC) setting process Guidelines for provision of data and stock assessment processes.

Orange roughy:

- The stock assessment was updated last year (2021).
- There were 2 major recommendations from that stock assessment:
    - Instead of a fixed value for natural mortality, the value of natural mortality was estimated. The methodology and process to reach that value was considered by a working group and the RAG. This led to a lower mortality value (<4%), resulting in a lower estimate of stock status and lower RBC.
    - MCMC analysis was also recommended for this assessment, forming the basis for the RBC recommendation. The resulting RBCs from the MCMC analysis (both 3-year

averages and single year average) were significantly lower (~50%) compared to the RBC from the last stock assessment (1500 t-700 t).

- Fixed catch projections were generated to understand the risk associated with higher RBCs and TACs for the status of the stocks.
- Industry requested that SEMAC and the AFMA Commission consider a step-down approach when setting the TAC.
- The Commission considered the new projections and noted that the risk of breaching the limit reference point remains very low (0.4%), and that the stock will continue to rebuild under this level of catch, albeit slightly slower than it would under the recommendation from the MAC and AFMA Management (spawning stock biomass status in 2024 of 30.93%, rather than 31.15%).
- The Commission took the decision on that basis and considered that a step-down approach mitigates some of the economic impacts of a significant reduction in the TAC. The Commission agreed that this is an appropriate balance of AFMA's core objectives.
- After detailed consideration, the Commission decided to implement a step-down in the TAC for this stock, as follows:
    - 2022-23 – 1,074 tonnes (TAC)
    - 2023-24 – 1,055 tonnes (RBC)
    - 2024-25 – 950 tonnes (RBC
- Simon Boag (Industry member) noted the move to MCMC has only been executed for one other stock. This brought about an RBC that is about half of the current projection. He added that potential TAC reductions by 50% in one-year could demonstrate to the market that the fishery is not sustainable, despite having been awarded Marine Stewardship Council (MSC) certification which was then lost on appeal due to a historical Australian Government categorisation. Mr. Boag also noted appreciation to the Commission for considering industry when taking the step-down approach.
- Dr Paul Burch (CSIRO) commented on the orange roughy assessment and highlighted that most of the variability in the RBCs is due to the harvest control rule applying a lower exploitation rate when stock status is lower. Most of the difference between the RBCs from the maximum likelihood and MCMC scenarios is due to the harvest control rule applying a lower exploitation rate to the MCMC scenario that estimates a lower stock status **Attachment D**.

Gummy shark:

- In the 2022-23 season, gummy shark will be in the second year of its 3-year Multi-Year Total Allowable Catch (MYTAC).
- It was last assessed in 2021.
- A step-down TAC approach was recommended by SharkRAG.
- This approach has presented some challenges to industry due to catch rates for gummy shark (as a proportion of TAC) being very strong and ultimately being overcaught (within the over-catch provisions). This means that the coming year's TAC would be even lower if the step-down approach is implemented.

- Industry therefore requested AFMA to consider running a partial update to that stock assessment to get a more recent estimate of stock size and understand what RBC the population might be able to support.
- Feedback from CSIRO was that the gummy shark assessment is a "bespoke" (complicated) assessment and will require substantial resources.
- A second option was to consider holding the TAC constant; on the basis that two out of three of the stocks that are assessed in this fishery are above target reference points and the other (Bass Straight stock) is at the target reference point (48%).
- The final decision was made based on economic prosperity in the fishery, but also because risks to stock levels were low. The Commission determined to deviate from the 3-year MYTAC and maintain the TAC at 1,672 t for 2022-23.
- The RAG and MAC will review the basis for this decision for the TAC setting next year.

School shark:

- School shark is managed as a Rebuilding Species based on the most recent assessment and estimates of unavoidable bycatch as part of the gummy shark fishery.
- SharkRAG recommended an increase to the bycatch TAC (225 tonnes):
- This was driven by several factors:
    - An increased size of the stock.
    - The relationship between retained and discarded catch - without targeting, discards can be considered as unavoidable catch.
- The Commission determined a TAC of 250 t for school shark (this is higher than the MAC recommendation, noting that it equates to the best estimate of a true bycatch TAC that will result from maintaining the gummy shark TAC at 1,672 t, as discussed above).

Silver trevally:

- The stock assessment was updated this year.
- Average CPUE (4-year), which contributes to the RBC in a tier 4 assessment, is only just above the limit reference point.
- One of the point estimates within that four-year average CPUE fell below the limit reference point.
- The Commission took note of the ongoing decline of silver trevally and the differences in stock assessments between NSW and Commonwealth assessments.
- In line with SEMAC's advice, the Commission determined a TAC of 51 t and reduced the undercatch allowance for silver trevally to 0%

Redfish:

- Redfish was last assessed in 2020.
- The Commission took note of the very low biomass of redfish, and the lack of recovery despite very low catches over a sustained period and reduced the TAC from 50 to 30 t. This was done to better reflect unavoidable bycatch of this species and monitor catch levels more closely.

Jackass morwong:

- Jackass morwong was assessed as overfished in last year's assessment.
- The TAC was reduced from 463 t based on the previous assessment.
- SERAG recommended that the TAC be reduced to 50 t. The Commission agreed on a 20 t TAC, accounting for undercatch.
- This will equate to an available catch of approximately 60 t (the bycatch TAC recommended by SEMAC). This is a significant reduction from the 463 t TAC for the 2021-22 season but is expected to limit catch in the east to around 50 t, as recommended by SERAG, to allow rebuilding within the timeframe set out in the Commonwealth Fisheries Harvest Strategy Policy.
- The main drivers for the dramatic change in biomass (from 30% to 15%) was attributed to a lack of recruitment for the last 12-13 years. When jackass morwong was last assessed, recruitment projections were low however, the recruitment deviations in the 2018 assessment were trending towards average, so the RAG used an average recruitment scenario for the TAC setting process, which was overly optimistic. Those recruitment deviations were revised downwards in the most recent assessment.
- It is clear, that the stock has experienced an obvious downward shift in productivity and as a result, AFMA are now working under the regime of a much lower recruitment potential for that stock.
- Projecting forward with fixed low recruitment deviations has led to a much smaller biomass estimate (15%). The bycatch TAC of 50 tonnes is expected to allow for recovery to the limit reference point over the next 6-7 years, under the current low productivity scenario. However, it is unlikely the stock will ever recover to the target reference point.

Flathead:

- The assessment will be updated in 2022.
- In 2021, this stock was assessed as being below the target reference point but above the limit reference point and is expected to be moving towards the target reference point under an increasing RBC, assuming average recruitment. However, given the trends we are seeing in other species, concerns about the accuracy of this upwards trend are growing.
- The assessment also showed a positive trend in CPUE across two of the three fleets used in the assessment, so there are no sustainability concerns over this stock.
- Given these projections, SERAG and SEMAC recommended increasing the TAC, consistent with the RBC recommendations from the 2019 assessment.
- The Commission supported an increase to the TAC at its 76th meeting in March 2021, for the 2021-22 fishing season, however given the association between flathead targeted fishing and several of the species listed above – jackass morwong in particular – the Commission agreed to maintain the flathead TAC constant for the 2022-23 fishing season, rather than implement the proposed increase, to prevent additional catch of associated species. As such, the Commission determined a TAC of 2,333 t noting that the assessment will be updated this year.

Blue grenadier:

- The stock assessment was updated in 2021.
- The assessment predicted a large increase to stock status (from ~120 to 130% B_0).
- This has resulted in a large increase to the RBC (from 13,000 to ~22,000 t).
- The large TAC change rule will prevent the TAC from increasing to anything beyond 18,275 t.
- Before a TAC is set for the 2023-24, SERAG and the Commission recommended that the stock assessment be updated again as additional acoustic survey data is now available.
- Only single year TAC is set for now subject to the stock assessment being updated later this year.

Additional measures:

- The Commission is concerned that maintaining the flathead TAC, in addition with TAC reductions of at-risk species would, in the absence of additional measures, result in a high degree of discarding of the at-risk species. As such, the Commission agreed that significant spatial closures would be required in the Commonwealth Trawl Sector to ensure that trawling does not occur in areas of high abundance of these at-risk species.
- AFMA Management presented the Commission with a preliminary analysis of the extent of closures required by analysing hotspots of jackass morwong catch as an indicator.
- The Commission agreed in principle to implement spatial closures, as well as associated measures, such as trip limits, to constrain the catch of at-risk species and minimise the risk of discarding.
- The magnitude and location of closures will be subject to detailed consultation with industry, RAGs and SEMAC over the coming months.
- The Commission also noted that potentially significant reductions to the flathead TAC may be required in future seasons to constrain fishing effort to regulate the catch and discarding of species of concern.

26. Daniel Corrie presented the RAG with further information on the closures and structural adjustments being considered by AFMA. The RAG noted the following:
    - The Australian Government announcement of $24 million for structural adjustment in SESSF.
    - $20 million buy-back trawl boat SFRs.
    - $1 million program design and fishery dynamic study.
    - $3 million levy relief for remaining industry.

    Closure options:

    - Jackass morwong was used as a primary indicator of priority areas (areas of critical abundance)
    - Objective is to reduce actual catch to 50 t (total mortality) from 110 t. This means closures need to represent a minimum of 60 t of the catch.

- Closures were recommended for areas of high catch whilst maintaining their effectiveness for protecting jackass morwong and minimising the effect on flathead catch. These areas are still being refined.
- The maps are based on logbook data. Maps should also be generated based on observer data (discards data is lacking from logbook data).
- Jackass morwong hotspots were historically offshore at Eden, Mallacoota and SE Tasmania. In 2019-21, these hotspots are off the eastern side of the Bass Strait. This may be driven by a southward range shift and/or changes in fishing effort.
- A shift in John dory catch is also evident. Catches in northern NSW and eastern Victoria almost disappear in the recent 3 years. Hotspots move from central NSW and east of Flinders Island.
- The closures in effect will have significant impacts as they have been proposed in areas where flathead catch is high (especially south of Lakes Entrance and east of Flinders Reef).
- This information will be overlaid on much finer scale contour maps to provide more clarity to industry.
- Jackass morwong hotspots are defined based on actual catches.
- Seasonal variations were considered to account for the possibility of spawning aggregations when determining the hotspots, but no clear variation was noted.
- The closure will have implications for the fleet size and future stock assessments. The CPUE series will become less reliable and a shift in assessment structure from CPUE to close kin and other sources of independent data is likely.
- Dr Paul Burch (CSIRO) has been putting together a summary on how closures are likely to impact the assessments and will send a copy to members over the coming days.
- The goal is to reduce the catch (total mortality) on eastern jackass morwong to 50 t (or less).
- If reduction in eastern jackass morwong catch is not achieved, then AFMA will need to consider additional measures.
- It was noted that the cost of EM has caused a reduction in observer coverage in the GHAT. The RAG questioned how discard measurements would be supported if observer coverage declined in the trawl sector. The gillnet sector shows that logbook estimates of discards are potentially good enough to be used for the basis of estimates for some species.
- EM on trawl boats will be vastly different from the GHAT because of the sheer quantity of fish being landed on the deck and moved around.
- We can expect more discards reported in logbooks as a result of EM.
- The frequency of observer coverage under the ISMP may change as (cost prohibitive) however, both EM and observer data is a high priority given the critical needs of the fishery.
- The RAG discussed the long-term objective of these closures and noted the following:
    - The closures are not temporary. They will be adapted over time based on the stock levels and the fishery's impact on those stocks.

    - The eastern coast stocks no longer have the capacity to support the level of fishing it has in recent decades. We are considering a phase shift to a smaller fleet operating in a smaller area.
    - To modify set closures, we need good data to understand what is going on inside the closures. This becomes difficult if no commercial fishing is occurring there.
    - The Department of Agriculture, Water and the Environment (DAWE) will need to note the following during the design phase:
        - State of the fishery now
        - What we would like the fishery to look like in the future
        - Reduction in the number of board trawlers will most likely have the most impact
        - Heavy impacts and possible reductions to the Danish seine sector.
- Closures would come into force later in the calendar year.
- Closures are the most effective way to reduce catch.
- Additional measures such as trip limits and TAC reductions rely quite heavily on accurate reporting.
- Flathead TAC reductions may be considered if closures themselves haven't been effective.
- The RAG noted that these changes will have a definite impact on industry. Creating a new Harvest Strategy for this fishery will be critical and discussions will be ongoing as flow-on implications become clear.

Agenda item 7: Operationalising management of climate change impacts on the SESSF

7.1 Outcomes of FRDC project

27. Alice McDonald (AFMA) introduced the agenda item providing context to the FRDC Project, “Guidance on Adaptation of Commonwealth Fisheries to Climate Change” to start the thinking and conversations on future planning, next steps in management, and future discussions with industry.

28. The RAG noted the following:

- Oceanographic conditions around the world are changing at a rapid pace, resulting in altered marine habitats and fish stocks.
- Regulatory and industry adaptation to the shifts (negative and positive) in the distribution, abundance, and phenology (timing) of fish stocks is needed by all Australian fisheries sectors and jurisdictions.
- Some of the most valuable target species, as well as protected and bycatch species, are highly vulnerable to climate change.
- Monitoring and forecasting capacity will become key to understanding system change, evidence-based decision making, and maximising sustainability and profitability.
- A Climate Adaptation Handbook was produced as part of the FRDC project to assist fisheries operators and managers to understand climate impacts and consider adaptation options .

7.2 Key climate impacts expected in SESSF

29. Beth Fulton (CSIRO – scientific participant) provided the RAG with further information on the projections of climate impacts on the SESSF.

30. The RAG members discussed and noted the following:

- The climate sensitivity ratings provided in the report (noting the varying levels of uncertainty and confidence in the projections) are dependent on the data utilised in the models on life history, spatial distributions, trophic connections, and physical processes.
- The predicted changes in abundance are over a 20-year period, relative to conditions in 2010-2015.
- The model-based projections are based on simulations of what the stocks are likely to do given the expected environmental change resulting from climate impacts and assuming that the current fisheries management framework is maintained.
- The model results were verified against Tier 1 stock assessments, and the overall pattern of projections were similar.
- It was noted that declines in Jackass morwong are already occurring, as indicated by the model results, although further declines are predicted.
- A small number of simulations predicted significant ecosystem shifts associated with changes in the East Australian Current (EAC) and associated eddies. The EAC has already moved 380 km south, bringing warmer water to southern areas. If the EAC continues to extend south, some species that cannot tolerate the warmer water temperature will need to shift south and may run out of suitable habitat on the shelf. Models predict this could happen by 2050-2060.
- AFMA is currently working with CSIRO to model different future scenarios in terms of closures, structural changes and management arrangements using Atlantis, one of the ecosystem models used for these climate projections.
- Stock structure and regional variances are recognised in the Atlantis model although spatial resolution is not possible to a fine scale (this can be done using species distribution models like those provided for a subset of SESSF species by William Cheung's lab).
- Updated information on existing management arrangements is currently being provided to CSIRO to inform the modelling.
- Many species are moving south with the EAC, however at different rates depending on factors like habitat dependency. Pelagic species are moving faster than demersal species, and sedentary species are having to adapt to these changes by forming novel ecosystems (a combination of sub-tropical and temperate species) or they live poorly. This will in turn influence juvenile habitats for SESSF species.
- Not all species will move south. Some will move deeper. The issue with this is the discrepancy between life stages. Some adult fish may thrive in the deep, but release their larvae to surface waters, where it may be too warm/acidified for them to survive.
- Phenological mismatch may be occurring (for example, environmental cues for spawning may not line up with food availability).
- Spring plankton blooms are occurring later and may not be as intense as in the past. There is now also an Autumn bloom that has never happened before.

- Sub-tropical species are moving into southern fisheries and management arrangements will need reflect this shift. For instance, turtles are now more common than they used to be, so additional protection measures may need to be considered in southern fisheries.
- Geography can make a large difference to the rate of change in a fishery; for example, the Northern Prawn Fishery in the Gulf of Carpentaria will be heavily impacted because of the land barrier to the south.
- More resolved climate models indicate that upwelling should continue in the Great Australian Bight (GAB) (previous models suggested this might stop).
- Planktonic productivity is declining on a national scale.
- Pelagic species are more likely able to cope with these changes as they can move and adapt to new more suitable areas.
- Invertebrates such as prawn and squid (although highly productive and robust) have a short life history making them vulnerable to prolonged periods of unfavourable conditions (i.e., conditions that last for multiple years). Having, an adaptive, responsive management structure will be important.

31. The RAG discussed other uncertainties that need to be factored into future assessment models. The following points were noted:

- Oil and gas companies in southern Australia are intending to decommission some assets.
- There is an increased interest in renewable energy infrastructure in the fishery area; up to seven wind farms are planned for southern Australia and two wind farms proposed for Victoria.
- The Sea-dragon project off Seaspray is a proposed windfarm that will have large impacts on the Danish seine fishery. This is the only project (proposed so far) that industry considers is likely to have a major impact on the SESSF.
- Oil and space industries also have the potential to impact the Great Australian Bight (GAB) fisheries.
- The RAG recommended Beth Fulton (CSIRO) summarise the results of the climate impact models in a way that is more accessible for industry (e.g., compartmentalising according to Danish seine, otter trawl and other sectors).

Recommendation 1: Beth Fulton CSIRO to summarise the results of the species sensitivity analysis by industry sector.

7.3 Climate change adaptation options

32. RAG attendees separated into two working groups to discuss the potential adaptation options available for the South East Trawl Fishery in response to the predicted impacts of climate change.

33. Alice McDonald (AFMA) presented the RAG with a summary of one group's discussions, while Beth Fulton (CSIRO) summarised the discussion of the other group. The following key points were noted and discussed by the members:

- Industry response shifts are already being observed in response to species shifts and changes in structure (changing targeting behaviour and moving fishing location).
- Industry adaptation responses could include:

- Shifts to new target species (mainly driven by conservation) and movement of fishing activities,
- Potential vertical integration through small business ventures (e.g., onshore businesses like shops or restaurants) rather than through gear changes,
- Stopping fishing altogether,
- Teaching of transferable skills and creating a process for fishers to leave the industry with dignity as well as buy outs and structural adjustments,
- Diversification of gear types is unlikely (other types of diversification are possible (into lower value species, restaurants, etc.),
- Improving industry data collection, and
- Improving selectivity of gear.

- Potential barriers to adaptation include:
  - OCS management arrangements,
  - Increased travel time,
  - changing interactions with other Commonwealth and state fisheries,
  - undermining of CPUE and abundance indices for stock assessments,
  - Concentrated effort and localised depletion because of changing fishing locations.
- Other influences on adaptation include:
  - Lack of supply drives demand. Prices affected by many external factors (examples include third party certification and product quality,
  - high levels of maladaptation are likely (i.e., stress may lead to poor compliance behaviours, which are barriers to change),
  - behavioural changes will affect stock assessments, Perception of smaller fleet may result in a greater politicisation of what's going on.
- The need for new assessment methods, which integrate anticipation of future environment conditions, was flagged.

34. The Chair closed the meeting at 4:54pm AEST.

Day 2: Thursday 28 April 2022

Agenda item 7: Operationalising management of climate change impacts on the SESSF

35. Beth Fulton (CSIRO – scientific participant) introduced the next steps of the workshop and provided a summary of key points raised in the previous day's session.

36. The RAG noted the change currently occurring in the SESSF, particularly in the CTS, and recognised the relevance to analyse the predicted impacts of climate change and discuss the operational management responses available.

37. The RAG noted that the results of the following sessions will inform the future planning currently underway in the fishery.

38. The RAG separated into two groups and discussed potential adaptation responses available to the CTS fishery, which drew from the list of potential adaptation responses in the Climate Adaptation Handbook (Attachment A).

39. The following items were discussed:

- Catch and effort management responses that AFMA are already undertaking (including TACs, closures, move-on rules and catch triggers).
- A Harvest Strategy and bycatch policies review to build in adaptations to climate changes, including review of reference points to incorporate consideration of ecosystem functioning and trigger reference points - derived on an international scale (Australia's productivity is between 10-25% of that of the northern hemisphere ecosystems which has a lot more trophic interactions and therefore a faster climate effect).
- Management responses will need to be adaptable and flexible.
- The incorporation of ecosystem triggers and triggers for environmental factors and bycatch species.
- Better data collection for future assessments on new emerging species.
- Policy frameworks that encapsulate a dynamic B_0 assessment approach– may work for some species but not others.
- Considering the use of indicator species, noting that specific indicator species may not be reliable long-term proxies in an ecosystem that is changing, however if reviewed periodically (changing species as needed) the method could still be a useful 'data limited' approach to managing the ecosystems that interact with the fishery.
- We should not overcomplicate things (or overspend) from a regulatory perspective and investment should be driven by the size of the fishery. As such, monitoring, data collection, stock assessments, reference points and harvest strategies etc should be prioritised, potentially utilising an indicator species approach.
- Avoiding species that are overfished restricts adaption of industry (moving to new areas).
- The closures that have been put in place over time are potentially going to act as a barrier for the uptake of new fishing opportunities.
- The south east trawl fishery will be dramatically reduced in size and therefore may be overtaken by imports and aquaculture.
- The blue grenadier fishery may continue to be targeted by international freezer boats.
- Low TACs and closures competing with the rising fossil fuel costs and maintenance of the fishery, will critically undermine the viability of the fishery. There will be no investment.
- A reduction in fishing effort will lead to reduced risk but also reduced uncertainty.
- Management effort should be prioritised, with species that deliver the highest value to the fishery having the "full suite of management", while less important species (in terms of catch and vulnerability) having less data collection, monitoring and sophisticated management. Species that are permanently constrained by climate change impacts could be categorised such that excessive resources are not put into monitoring and management of a species that cannot recover (under the

current Harvest Strategy there is a requirement to continue monitoring depleted species through a rebuilding strategy).

- Establishing another category for species management (i.e., target, bycatch, rebuilding and under monitoring) could be considered but this comes at a cost.
- Utilising fishery independent sources to obtain data (such as the Investigator or monitoring required/undertaken by other industries, where useful) will play a vital role in future fisheries management.
- Learning from past applications of output control rules (quota management and harvest control rules). Data is lacking to allow the output management of some species. Perhaps using more input controls may be a possibility.
- Consider if there is a cross-industry or government appetite for investment into independent surveys and data collection at the risk of remaining "data light" (this will be especially important as the industry size drops and activity by other industries increases).
- Buffers within TACs or catch/effort controls could be used to allow for uncertainty.

40. The RAG reassembled into groups to refine the conversation by talking about possible management options and management barriers for a specific sector. The following key points were discussed:

Group 1 Discussion Outcomes - Gillnet Fishery:

- The RAG noted:
  - The gillnet fishery is a very selective and targeted fishery (mainly catches of gummy shark).
  - There are no new species emerging at present that may become significant to the gillnet fishery.
  - Close-Kin Mark-Recapture (CKMR) assessments are being considered for the assessment of school shark. This will require a review of the Harvest Strategy and associated policies.
  - Preliminary scoping suggests that we could do CKMR assessments for gummy shark also.
  - Ecosystem indicators and triggers should be incorporated into management, but more work is needed to enable this.

Barriers to industry and management:

- Gear-type restrictions (e.g., automated longlining not permitted for sharks in Bass Strait).
- Global TACs mean Bass Strait stocks may not be able to handle extra pressure under current restrictions.
- High catch rates of young school shark in eastern Bass Strait.
- High mortality in shortfin makos and increasingly sea lions.
- Consideration for the gummy shark stocks in particular zones and whether the stocks could handle the increased fishing pressure.
- Targeted hook fishing could benefit from new and emerging species not otherwise captured by the gillnet fishery – there would be a need to implement ecosystem indicators and triggers.
- The impact of extra effort moving into particular regions and what triggers might be established to respond to them, and how we adapt.

- Change in the current consultative regulatory framework.
- We need to re-evaluate policy and decision-making process structure.
- Ian Knuckey (Fishwell Consulting) has produced a FRDC report on the pros and cons of hook fishing in Bass Strait.
- Policy or decision-making process structure - climate signals have been discussed for years why have they not been addressed by management earlier? How can we prevent this in future?

Group 2 discussion outcomes:

- Group 2 focused on blue-eye trevalla scalefish longline - small number of boats with a high-quality product.
- Advances in EM with AI will provide a clear indication of actual catch size however:
  - Larval dynamics may complicate things.
  - Complex oceanography – sea mounts and sea slopes.
  - Dealing with deep water shark and orca interactions.
- Protected species are likely to move into this fishery.

Potential management responses:

- Adjust TAC
- Change reference points to reflect depredation and ecosystem change
- Move-on rules
- Better data would assist with seasonal forecasting and increase the viability of this method.
- Investment from AFMA and government may be important. Otherwise, the fishery will remain a low data fishery and its value may be jeopardised.
- Relationship with B_0 may change, which should be reflected in changes to the Harvest Strategy, which is "climate aware".
- Species being divided into sub-stocks and managed regionally.
- Seasonal differences in closure directions still important.
- Climate Services from AFMA to provide a clear avenue for climate change information coming out of the agency.
- Change in management structure will be directed at changes in the objectives of RAG/MAC meetings. Associated policies may also require changes. The membership of this group could be enhanced to ensure there is ecosystem (conservation representation), economic and other expertise.

41. The RAG noted the following:

- To specify ecological indicators that are useful in predicting ecosystem change (catch vs primary production is an example), depends on thresholds/triggers that are specific to regional-scale environments and system-specific reference points will need to be set for environmental triggers to be effective.

- The Basic Ecosystem Trait and Health (BETH) index (recently renamed the Ecosystem Traits Index) is currently being developed, which considers the trophic structure, the relative biomasses of the groups within that system, and the pressure put on the system by fishing. The paper is not out yet, but the RAG will be notified when the paper comes out.

ACTION 2: Beth Fulton to deliver a presentation to the SESSFRAG data meeting on the Ecosystem Traits Index paper.

42. The RAG took a moment to consider some of the key management options discussed in the workshop and reflected on the approaches taken. The following points were made:
    - There was a commonality in the discussions relating to the constraints of the current harvest strategy and its considerations around climate.
    - There is a need for large-scale investments from the broader community in management and science, including the development of ecosystem management triggers.
    - We are lacking robust information to make informed decisions on catches.
    - The RAG discussed the concept of a dynamic B_0.
    - The RAG noted that future assessments will be complicated given current concerns about certain stocks and a lack of data available with less species being caught, less data and smaller TACs.
    - Establishing alternative indices has been put forward as a research priority in the last two MAC meetings.
    - The cost associated with environmental indices and additional research requirements has been a key barrier to this objective moving forward.
    - Concerns were raised that both closures and climate change impacts on fishers at the same time may undermine the industries response to climate change.
    - The RAG noted that there will be opportunities to work closely with the fishers that remain in the fishery on planning for the future of the fishery.
    - Discussions with industry will be a necessary element of determining appropriate industry responses.
    - The RAG noted that the combined SESSF risk table in the handbook will be broken into sectors. AFMA and CSIRO will plan together how to tackle the next steps for industry.
43. Alice McDonald informed the RAG that inputs from these discussions will be used to inform ongoing discussions and industry consultations. CSIRO modelling of future management scenarios will also assist with upcoming decisions.
44. The Chair closed the agenda item at 12:10pm.

Agenda item 8: 2023-2024 Research statement and assessment schedule

45. Lara Ainley (AFMA) introduced the agenda item and advised the RAG that the purpose of this Agenda Item was to seek advice from SESSFRAG on research priorities to be included in the Great Australian Bight Trawl Sector (GABTS) and SESSF Annual Research Statements 2023-24, including the assessment schedule for the relevant SESSF species.

46. The RAG noted the following:

- Each year, relevant RAGs are asked to provide advice on upcoming research needs for their fisheries, this is required in the context of the Strategic Research Plan. As part of this process, RAGs are asked to prepare an Annual Research Statement and complete a research Gap ID form for each new priority.
- The Annual Research Statement includes consideration of the cost-effectiveness, priority and timeframes for achieving identified priorities.
- Where research has already been funded, the Annual Research Statement identifies this, including the source of funding. It will be used by the AFMA Research Committee (ARC) at its annual meeting in August, to develop the annual research call for proposals for potential AFMA funding in September each year.
- Priorities for potential funding by the FRDC are also included in the Annual Research Statement. Research proposals submitted to both AFMA and FRDC will be circulated to relevant RAGs/MACs for comment out of session.

47. The RAG discussed the research priorities identified for AFMA funding in 2023-24 and made the following points:

Non-extractive survey methodology to establish abundance index for Eastern Gemfish:

- Dr Robin Thomson (Scientific Participant & Assessment Scientist, CSIRO) noted that there is no formal scoping work planned under the FRDC project therefore that project will not deliver gemfish close kin scoping.
- Daniel Corrie (AFMA) explained that this research item was raised as a possible alternative to close kin assessments. He proposed that the eastern Gemfish tier 1 assessment be cancelled in favour of developing an abundance index that will allow for a more accurate assessment of the same species in future.
- The Chair advised the RAG to be very clear and distinguishable when preparing close kin mark recapture scoping research projects to the FRDC.
- Concern was raised by some of the members questioning the validity and cost of the proposal.
- The RAG agreed to move on from this discussion and revisit the item when prioritising the research proposals.

Acoustic Optical Surveys (AOS) of the Cascade Plateau and Eastern Zone orange roughy stocks:

- The RAG noted that this proposal be considered as two separate surveys that could potentially be undertaken at the same time.
- Daniel Corrie (AFMA member) explained that the eastern survey is critically important and that the Cascade Plateau is becoming a more important fishery. It's been 12 years since the last assessment (last assessed in 2009) and in the absence of those assessments uncertainty of the stocks increases.
- Simon Boag (Industry member) supported the eastern zone survey but requested that the cost of an AOS for the Cascade be considered in the context of the fishery being 90% under-caught over 10 years and having been overfished.
- The RAG noted that one of the impediments to getting orange roughy delisted as conservation dependent was the lack of knowledge about the stocks and highlighted the need for improving the data on orange roughy.

- Paul Burch (CSIRO-scientific participant) suggested using age data to provide an indicator of stock status until the stock assessment is updated.
- The RAG noted that fish ageing is being pursued through the Fish Ageing Services contract.
- The RAG endorsed the proposal.

Integrated Scientific Monitoring Program (ISMP) data services in the SESSF 2023:

- The RAG noted that the ISMP is an integral part of the work that generates the catch and discard summaries for TAC setting. (Logbook information is used to predict the discard and bycatch level for depleted species for the following year - assuming that the dynamics of the fishery remain relatively stable).
- The closures being introduced on the east coast over the next 6 months are likely to reduce the number of fishing vessels on the water and this will compromise any predictions from the discard reports.
- The RAG was asked to consider deferring the métier and targeting analysis for the trawl sector until the fishery becomes more stable. The proposed closures in the trawl fishery will result in changes to the spatial distribution of fishing that will invalidate the analysis.
- Paul Burch also requested advice from SESSFRAG on whether to undertake a métier analysis for school shark this year given that the report costs about $30,000 to AFMA. School shark are predominantly caught by the GHAT, so would likely be less impacted by the closures in the east coast trawl sector.
- Daniel Corrie confirmed that a métier analysis and targeting analysis needs to be undertaken for school shark to support this year's decision to increase the TAC.
- This was endorsed by the RAG.

Fish ageing for SESSF quota species (3-year project ending 2025-26):

- The project is to undertake fish ageing for the SESSF species to support stock assessments for the period 2023-24 to 2025-26. This is ongoing work, building from a previous research project ending in 2022-23.
- Due to an administrative error, this project was supported by the ARC for inclusion in the 2022-23 call but was not included because the current contract does not end until June 2023.
- This was endorsed by the RAG.

Independent review of key SESSF stock assessments:

- SERAG suggested the need to reflect on historical advice provided for jackass morwong, including how the estimates of biomass and RBCs had changed so dramatically between assessments.
- While the RAG accepted that industry would be unlikely to support a review of stock assessments, noting a preference research focussed on future initiatives, it supported an independent review of key SESSF stock assessments to ensure the issues with the jackass morwong assessment are not repeated for other species.
- The RAG endorsed this proposal with a preference focussed on future assessments.

Research priorities supported by GABRAG at their November 2021 meeting to be included in the GABT 2023-24 annual research statement:

- The Great Australian Bight Trawl Fishery Independent Survey (GABFIS) is the sole research priority.
- The project will provide additional data for the time series of (fishery independent) abundance indices to be included in stock assessments of target, byproduct, and bycatch species. The GABFIS also provides temporal and spatial information across many non-commercial species.
- Industry did not provide support for the GABFIS in its current state, however other GABRAG and GABMAC members suggested it be put forward for funding. If supported, the design of the GABFIS will be discussed and refined at the next GABRAG meeting in October 2022.
- The deepwater flathead Tier 1 stock assessment is scheduled for 2024 and will be considered for inclusion in the 2024-25 GABT Annual Research Statement, including ageing requirements.
- The RAG endorsed this proposal noting the design of the GABFIS will be refined at the next GABRAG meeting in October 2022.

Research priorities not yet considered by SharkRAG at their upcoming meeting in July 2022 for inclusion in the SESSF 2023-24 annual research statement:

- Fish ageing for SESSF quota species (3-year project ending 2025-26) was supported by SERAG.
- Improving CPUE standardisations for sharks seeks to improve the relationship between CPUE and net length, the effects of Australian Sea Lion and other closures on CPUE and account for changing dynamics of the fleet with new entrant - this project was previously supported by ARC. However, due to a lack of funding for 2022-23, this will be considered again for funding in 2023-24, subject to continued support from SESSFRAG and SharkRAG.
- Stock assessments for SESSF quota species for the 2024-25 and 2025-26 financial years (including preparatory work in 2023-24) This project was endorsed by the RAG and preliminary work has been undertaken.

Additional research priorities:

Application of Close-Kin Mark-Recapture assessments for key and rebuilding species in the Southern and Eastern Scalefish and Shark Fishery (SESSF) including those previously submitted to either FRDC or the ARC, but not funded/supported.

- Perform scoping studies for Close-Kin Mark-Recapture assessments for key and rebuilding species in the Southern and Eastern Scalefish and Shark Fishery (SESSF).
- The use of fishery dependent CPUE as the primary index of abundance for key commercial species is likely to become less reliable due to factors that cannot be effectively accounted for in the standardisation process. Future changes in the CTS, such as closures and changes in fleet dynamics will only exacerbate the problem and make conventional assessments less reliable.
- Acoustic surveys currently provide a source of fishery independent data for blue grenadier and orange roughy (Eastern and Cascade Plateau), however there are no equivalent, independent data sources for other commercial species. Traditional surveys (such as the previous trawl FIS) are not considered a cost-effective way of collecting fishery independent data and so alternative methods need to be considered.
- CKMR has already been implemented for school shark, and in 2019 the ARC funded a scoping study for blue-eye trevalla (currently underway ~$37k). There is the potential for two other SESSF species to be considered as part of other projects related to CKMR.

- Dr Robin Thomson (CSIRO) noted that some of this work to develop a CKMR-based management strategy for the SESSF could possibly be incorporated into generic scoping studies because of overlap in the work needed to develop a viable management strategy for a multi-species fishery.
- Dr Rich Little (Assessment Scientist, CSIRO) added that there may be three or four projects that this work could potentially fall under including other CKMR projects around Australia and suggested an audit could be done as part of a working group to look at some of the critical species that may be involved in this work.
- The RAG ultimately endorsed the research as a priority noting that the scoping component may be incorporated into the multi species project whilst the tissue collection component, could possibly begin sooner through co-management arrangements or the ISMP.

Application of Close-Kin Mark-Recapture (CKMR) for gummy sharks (separately considered by SharkRAG):

- This should be combined with the broader SESSF research priority, if supported.
- The RAG supported this research as a priority noting that it would be part of the CKMR scoping component as discussed above.

Evaluating contributing factors to catch per unit effort (CPUE) standardisation in the Southern and Eastern Scalefish and Shark Fishery:

- This project was included in AFMA's call for strategic research (November 2021). The Expression of Interest (EOI) received was not supported by the ARC for development into a full proposal as it lacked a novel approach, and the ARC recommended including this project in a future call for research. The project was endorsed by the RAG as a priority noting that it may be considered by FRDC.

Collecting oceanographic data on commercial fishing vessels in South East Australia:

- There is an opportunity to increase the spatial resolution of oceanographic data collected in Australia's inshore, shelf, upper-slope, and offshore waters by fitting commercial fishing vessels, or fishing gear, with environmental sensors and/or data loggers. Data transfer and processing could potentially be managed through the 'Ships of Opportunity' Facility within the Integrated Marine Observing System (IMOS). This information could be used to improve our understanding of the environmental drivers of fish abundance and distribution to improve fisheries management outcomes. This was endorsed by the RAG as a priority.

Identification and monitoring of school shark pupping grounds to understand stock structure:

- This project was proposed for FRDC funding in 2022 but feedback suggested that SharkRAG better refine the scope of the project and develop clear objectives and deliverables, including the potential budget and ongoing costs. This project also relates to other work to identify nursery grounds in South Australia.
- The RAG supported the feedback above to better refine the scope of the project before it is considered as a priority.

School shark post-release survival:

- Estimate the post-release survival of gillnet-caught school sharks to understand the fate of discards and improve accuracy of total fishing mortality estimates.
- The RAG agreed that this project is not currently a priority noting that a management response might be a better way to go given budget restraints.

Finalising research priorities for 2023-24:

- The RAG noted that the effectiveness of the current SESSF Harvest Strategy, and the science that underpins it, has been a topic of discussion in SESSF RAGs and the focus of several research projects in recent years, most notably the FRDC multi-species harvest strategy project. The reliability of fishery dependent data, particularly CPUE, as the main input to SESSF stock assessments is a known issue. The need to transition towards new and innovative approaches, including fishery-independent data sources and the use of genetic technologies, has been explored through several recent projects focused on the SESSF.

- AFMA requested advice from the RAG on whether there are any newly identified research priorities identified in recent discussions that need to be considered in the SESSF 2023-24 Annual Research Statements for the SESSF. The RAG discussed the following projects:

    1. The Investigator Survey – discussion between FRDC, CSIRO and stakeholders to determine project/s to be facilitated using the RV Investigator.

        - The RAG suggested that this be included in the research plan as a priority noting that the work is currently funded and underway to avoid confusion to seek additional funding from ARC or FRDC.

        - Dr Rich Little (Assessment Scientist, CSIRO) provided some wording on this project to be incorporated into the research plan:

        - *The marine waters of southeast Australia are warming at twice the global average. As a result, species are shifting their distributions and marine habitats are changing. The region contains a range of important economic activities such as fisheries, oil and gas production, and emerging renewable energy industries. It also contains nationally important amenities such as marine parks. Recent concerns about the ecological, economic and social sustainability of the region have been raised by resource managers, industry and governments. An urgent need to understand the changes occurring in the marine ecosystem has been identified to better prepare for and adapt to future conditions.*

        - *The Southeast Australian Marine Ecosystem Survey (SEA-MES) will revisit sites of previous surveys using RV Investigator and establish new sites for the future. Physical, chemical and biological samples collected from these sites will be compared with historical data to document changes that have occurred over the last 25 years. The results will provide key information on what is causing any changes and what the future might hold. SEA-MES will thus provide essential information for better planning and managing current and emerging industries and for protecting and conserving important habitats and species throughout the region.*

        - *The primary questions that SEA-MES is aiming to address are:*

        - *Q1. How and why have fish assemblages and species abundances changed in the southeast ecosystem, and can continued changes be mitigated?*

        - *Q2. How do assemblage changes affect the multiple-use management of the region, particularly conservation and biodiversity management of Australian Marine Parks and activities by the fisheries, oil & gas, and renewable energy sectors?*

        - *Q3. What are the implications for marine spatial planning and adaptive management in sectors that use the marine ecosystem and the managers that regulate it?*

        - *These questions will be addressed by multi-season surveys and subsequent data analysis structured around three hypotheses: (i) impacts to benthic habitat driven by exposure to*

bottom-contact fishing (Habitat Hypothesis, H1), (ii) the physical impacts of the water column driven by changing ocean conditions (Climate Hypothesis, H3) and (iii) interactions of these two impacts through changes to the food web (Trophic Hypothesis, H2). The prime motivation for exploring these hypotheses is centred on observed changes in the catch rates of commercial fish species (see also Section 12 for the context for the project), but the study is not limited to focusing on these species as a greater understanding of the whole ecosystem (and food webs associated with fisheries species) is needed to understand what is causing the changes observed.

- *The species include tiger flathead (Platycephalus richardsoni), pink ling (Genypterus blacodes), jackass morwong (Nemadactylus macropterus), eastern school whiting (Sillago flindersi), redfish (Centroberyx affinis), ocean perch (Helicolenus barathri and H. percoides), and ocean jacket (Nelusetta ayraud).*

2. Operationalising Ecosystem Indicators:

    - AFMA suggested that this work is included in our research plan as a future research priority.

    - Need to consider MSHS outcomes and redesign of SESSF Harvest Strategy.

    - Need to consider research gaps as climate change impacts are realised and new opportunities emerge.

- The RAG noted that our ability to fund and implement these projects quickly and effectively is constrained by the research budget and the need to maintain Business as Usual (BAU) research, including data collection programs and stock assessments.

- The 2022-23 research budget in the SESSF is approximately $1.66m, of which $1.3m is cost recovered. Within the $1.66m, approximately $1.12m is allocated to BAU research, including otolith ageing, stock assessment and ISMP data services (data summary, discard estimates etc). Another $0.24m is allocated towards acoustic surveys (orange roughy and blue grenadier) and $0.26m towards the upper-slope dogfish monitoring program.

- Daniel Corrie talked through the Assessment Schedule and asked the RAG to consider which components of our BAU research could be possibly rescheduled or postponed in the short term, with the view to reallocate research dollars towards those more strategic and important priorities. AFMA proposed the following changes to the assessment schedule:

    1. Eastern Gemfish Tier 1 assessment be cancelled in favour of developing an abundance index that will allow for a more accurate assessment of the same species in future.

        - James Woodhams (ABARES) noted that although abundance indices are outdated, there had been discussion at SERAG regarding updating the current stock assessment with recent catch data. He also mentioned than some of the assumptions underpinning projections from the previous assessment were unclear and required clarification.

        - Paul Burch suggested using age data to provide an indicator of stock status until the stock assessment is updated. This was ultimately endorsed by the RAG.

    2. Postpone 2023 Tier 4 stock assessments for all species other than mirror dory until 2024.

        - Mirror dory was highlighted as an exception with a consistent downwards trend, which needs to be revised on an annual basis.

    3. Cancel the Tier 1 redfish stock assessment in 2023.

- The RAG noted that there is a precedence to postpone stock assessments for species that are severely depleted and have species-specific management responses designed to conserve affected stocks.

4. School whiting 2023 Tier 1 assessment be postponed.

    - The RAG noted that this may have flow-on effects including the postponements of stock assessments for other species but will free up space in the research schedule (and budget) for other priorities.

    - This RAG endorsed the proposal noting that the stock assessment should take place in 2024.

5. Cancel the métier and targeting analysis (part of the ISMP data contract) for all species except school shark.

    - This was endorsed by the RAG members.

48. The Chair closed the meeting to all attendees except the RAG members at 4:44 pm. Members remained to decide on research priorities and stock assessment schedule adjustments. The key discussions points are summarised below:

- Cathy Bulman (CSIRO) questioned whether the new closures justify the cancellation of métier analyses.

    - The RAG noted that the assumptions of the analyses will not hold with predicted changes within the SESSF.

    - The RAG endorsed the cancelation of the métier and targeting analysis (part of the ISMP data contract) for all species except school shark.

- Upper-slope dogfish monitoring program has already been funded (for a second year) and should not be altered.

- Postponing stock assessments will reduce stock assessment cost from $650,000 to somewhere in the order of $400,000.

- The blue grenadier acoustic survey should remain a high priority (particularly with in kind contribution from the freezer boats).

- Eastern orange roughy survey to remain a high priority - there was interest from industry for orange roughy quota holders to pay for the cost of that survey. It is a $350,000 investment. This survey is a priority because quota is currently fully utilised.

- Cascade Acoustic Optical Survey (AOS) assessment is a lower priority because TAC is not being fully utilised ($700,000 represents half of AFMA's research budget).

- SESSF data services - was not considered as part of the research cycle.

    - The RAG suggested that this remains a high priority and left in the ARC budget (excluding the metier analyses, which will reduce the cost). This may be pulled back into the fishery budget to make room for other priorities in the research budget.

- Fish ageing services for SESSF quota species (~$250,000).

    - This is to remain a priority. There is a need for an ageing contract to continue this work for several species.

49. The RAG noted that the cost of all items above are recovered by the Commonwealth Trawl Sector, which is likely to decline in size due to structural changes in the SESSF.

- GABFIS - this is the only project that is funded by the GAB sector. Industry have raised concerns about the cost-benefit. Support for this project will be subject to GABRAG advice later in 2022.
- Independent review of key SESSF stock assessments – this is separate to the RAG process (not part of the RAG/MAC review that Ryan Murphy is currently conducting).
    - Daniel Corrie expressed hesitancy for allocating funding to reviews of previous assessments when money could be spent on the future of the fishery.
    - Cathy Bulman (CSIRO) noted that climate variability and trophic interactions represent shortfalls in previous stock assessments and suggested that a summary of known issues with stock assessments may be useful.
    - The RAG noted that CSIRO and the Bureau of Meteorology (BOM) have done this in the past to refine weather prediction models and that this may be a research priority.
    - Sarah Jennings suggested a retrospective desktop study taking 5-7 days ($2-5k) however Daniel Corrie (AFMA) noted that this project would require much more time and a higher level of funding to conduct adequately (~$90k) and suggested that there may be more value in reviewing how RAGs are engaged in stock assessments than running stock assessments through a desktop study.
    - Cathy Dichmont (the Chair) suggested that the latter would take 21 days and would require input from various consultants, fisheries scientists, and managers. This is very expensive.
    - Daniel Corrie suggested that blue grenadier acoustic survey and catch data be used as a trial of the desktop process for other species.
    - The Chair suggested that this research priority has two elements:
        1. Strategic research into future stock assessment methodology that could be a cross-cutting project.
        2. An independent review of SESSF stock assessments.

ACTION 3: Establish a process for reviewing stock assessments using blue grenadier as a case study.

    - First step will be scoping, further discussion will be needed for future steps.
- Application of CKMR assessments for key and rebuilding species in the SESSF:
    - Daniel Corrie noted that an expansion to the MSHS project (FRDC funded) may cover this, however it should be included as an ARC priority initially.
    - The first step will be identifying important species, then move into the scoping phase.
    - CKMR for Gummy shark research will be integrated into this one.
- Evaluating contributing factors to CPUE standardisation in the SESSF:
    - The Chair raised concerns that this research may not be relevant in light of future changes.

- Daniel Corrie addressed this concern by suggesting that the RAG wait for additional data, including environmental/oceanographic data, to be accumulated before this priority is considered again.
- The final recommendation to the RAG was that this item be left in the document as a research priority that is data dependent.
- The RAG members endorsed this.

- Improving CPUE standardisations for sharks:
  - The gillnet length component of this research is still a priority. This will be highly influential in the TAC setting process in future.
- Collecting oceanographic data on commercial fishing vessels in South East Australia:
  - FRDC is currently considering this project for funding however, this will not be disclosed in the research plan and the project will be listed as high priority.
- Identification and monitoring of school shark pupping grounds to understand stock structure:
  - This work was requested by Industry.
  - Feedback to industry will be to refine the scope of the project and make the benefits clear.
  - This will be put into the Research Plan as a low-medium priority with the reason above.
- School shark post-release survival:
  - This will be put into the Research Plan as a low-medium priority.
  - This project will inform mortality estimates.
- FRDC Investigator Funding:
  - AFMA proposed this work to be a medium research priority with a note that FRDC funding has already been acquired but AFMA will work with FRDC to refine objectives.
- Establish ecosystem indicators to inform fisheries management:
  - The revised SESSF Harvest Strategy (and the HS Policy) will need to take account of outcomes of the dynamic B_0 project and any work to establish ecosystem indicators. This will involve the following:
    1. Consider how environmental indicators could be incorporated as part of the FRDC MSHS project,
    2. A separate project for establishing environmental indicators for management purposes.
  - The Chair noted that the goal is to bring these two outcomes together to inform management process.
  - The RAG noted that this research priority will be raised again subject to the findings of other projects (i.e., integration of dynamic B_0, CKMR and consideration of environmental indicators).

- The RAG noted that the minutes plus a draft version of the SESSF and GAB research plans will be circulated to all SESSFRAG members for comment.
- The Chair closed the meeting at 5:56pm.

Day 3: Friday 29 April 2022

Agenda item 9: Application of discount factors in the SESSF

50. The Chair introduced the agenda item and noted that a background paper was sent out to SESSFRAG members outlining CSIRO's approach for applying discount factors in the SESSF.
51. The RAG was advised that the purpose of this agenda item was to consider the methodologies proposed by CSIRO and consider how to calculate the risk according to policy.
52. The Chair welcomed and introduced Dr Sandra Curin (CSIRO) to the meeting. Dr Curin gave a presentation on CSIRO's approach for measuring risk associated with uncertainty of parameters for data rich SESSF species.
53. The RAG noted the following:
    - CSIRO is in the process of developing an approach to ascertaining risk for data rich (Tier 1) stocks in the SESSF and incorporating that risk, through a 'species buffer', into harvest control rules that set a RBC. The approach is, however, not fully specified and requires guidance from SESSFRAG.
    - There is need for the RAG to:
        1. Understand and agree to the overall approach being suggested.
        2. Specify operationally what is meant by risk
        3. Specify how to integrate across multiple risk values for each mismatch between the operating model and the assessment (in this case the natural mortality and steepness parameter-grid), and
        4. Suggest the key parameters over which uncertainty should be considered (such as *M, h*, growth and/or other factors).

        h = steepness and *M* = natural mortality. These combine to give a productivity value.
54. The RAG were presented with two possible methods for determining the level of risk:

Method 1: determines the level of risk using the number of times biomass estimates fall below the limit reference point within a specified period. Method 2: determines the level of risk based on whether biomass estimates drop below the limit reference point at all within a year.

55. The following points were discussed:
    - High productivity simulation vs low productivity simulations - high productivity simulation captures the extreme of a healthy ecosystem state and the low productivity simulation captures the opposite.

- When considering possible simulations, stocks need to remain above the limit biomass level at least 90% of the time under the application of the Harvest Strategy, in other words AFMA aims to remain below 10% probability of falling below the limit reference point - this rule is focused on the risk over time rather than the risk for any specific year.
- Comparing Methods 1 and 2 is expected to produce the same results. However, it is important to note that the uncertainty of the assessment (i.e., recruitment variability) is going to impact the result - if future stock assessments have greater variability in the underlying catch data, then variability between mis-classification scenarios and the mathematical probability of dropping below B_{lim} will increase.
- The RAG noted the large and significant differences in the results produced by the different risk assessment methods.
- Daniel Corrie questioned whether the same buffer (calculated by either Method 1 or 2) would be used for species with low data.
- Dr Rich Little further clarified that calculating actual buffers would be the next step in this process.

The RAG noted the following:

- The most logical way to proceed in alignment with the policy would be to use Method 1, which more explicitly accounts for risk over time.
- The level of productivity that would be included in an assessment would depend on risk appetite. High values with higher weighting would be more risk averse.
- High/low productivity scenarios would lead to a high buffer - medium and average productivity scenarios would be met with moderately sized buffers.
- Sandy Morison (SharkRAG) explained that in the Pacific, a grid of multiple parameters is used to generate risk for >70 scenarios before decisions are made. He claimed that if AFMA selects a variety of scenarios that best capture the possible variation and they are transparent about how they approach the risk assessment process, then Method 1 will receive support - he added that this would assist with the MSC certification process.
- The RAG agreed that the scenarios are weighted equally.
- There was a consensus amongst RAG members that Method 1 is more appropriate than Method 2. However, the RAG acknowledged that the challenge is in calculating the actual risk and associated buffer values.
- The Chair proposed further discussion on this topic to seek further advice on the two methods and whether any additional parameters other than *M* and *h* should be considered in the sensitivity test.
- The progression and discussion of these documents will be placed as an agenda item for the August data meeting.

ACTION 4: CSIRO team to seek feedback from MSC, ABARES and DAWE on the two methodologies identified for measuring risk under the discount factor project.

- The Chair closed the agenda item at 10:05am.

Agenda item 10: East Gippsland seismic survey (M-BACI analysis)

56. The Chair introduced Ian Knuckey (Fishwell Consulting) to the meeting. Mr Knuckey gave a presentation on his key findings for the east Gippsland seismic survey.

57. The RAG noted and discussed the following points:

- The Marine Seismic Survey (MSS) conducted by the geo-exploration company CGG in Bass Strait overlapped important commercial fishing areas, particularly those of the Lakes Entrance Danish seine fleet targeting tiger flathead, other species of flathead and eastern school whiting.
- The MSS involved a 3D survey acquiring sonic data from the emission of high-intensity low-frequency sound waves from airguns.
- The high intensity sound generated during the MSS presents a potential disturbance to marine organisms.
- Lakes Entrance fishers were concerned about the impact of the CGG 3D MSS with respect to interruption of commercial fishing activities during the MSS and a potential negative impact on fish catch rates during and after the MSS. This was noted in the CGG Environmental Plan.
- Post-MSS survey data from control and impact sites were evaluated using a Generalised Linear Mixed Model (GLMM), considering pre-MSS spatial and temporal variation in commercial catch rates at the same control and impact sites.
- The proportion of zero catches increased in MSS-impacted areas, particularly for eastern school whiting. These impacts were detected despite high natural spatial and temporal variation for each species.
- The greatest and most highly significant impacts were observed in January to March 2020 (during and immediately following the MSS), but catch rates remained depressed at impact sites for many months following the MSS.
- Flathead catch rates in Impact sites significantly decreased again about six months after the MSS and eastern school whiting catch rates significantly decreased again about nine months following the MSS.
- Catches of eastern school whiting have consistently declined since 2017 and average catch per day during 2020 was lower than the average catch per day for the three previous years.
- Flathead, on the other hand, had more consistent catches with no apparent trend over the last four years and, taken across the entire year, there was no noticeable difference in the catch per day of flathead during 2020 compared to 2017–2019 inclusive. However, inside the MSS area, average flathead catch per day during 2020 was consistently and considerably lower during the first eight months of 2020, when the MSS was operating than the average during the previous three years.
- The results of the Multiple Before After Control Impact (M-BACI) were conclusive with respect to the very clear and significant initial negative impact for both flathead and eastern school whiting
- Use of post-MSS survey data may better reflect the difference in the underlying abundance or availability of whiting and flathead at the control and impact sites
- Consistent with other studies, it is likely that reduced catches arose not from mortality, but from behavioural affects causing movement of fish away from affected sites, or from reduced vulnerability to the Danish seine gear.

- The nature of the MSS, the species involved, and the surrounding environment or oceanographic conditions are likely critical factors in determining the level of MSS impact on fisheries. Future research should be designed to explore these factors so future impacts can be regulated.
- Whether Ian's findings need to be accounted for in the standardisation of CPUE abundance indices in future.
- Zero catch data entries in the pre-MSS logbook data analysis and what assumptions were made.
- The 'tweedie distribution' was applied to the logbook data.
- If no whiting was caught, then a 0 was entered.
- Dr Miriana Sporcic (Scientific Participant, CSIRO) expressed concerns that the 0 values may not be included in the bar plots Ian presented to industry (artificial inflation of the results may be occurring) and Ian agreed to investigate this.

Recommendation 2: SESSFRAG recommended that CSIRO exclude shots that do not represent normal commercial fishing (i.e., for the vessels which participated in the seismic survey) from the flathead and school whiting catch rate analyses (high priority).

- Concern was raised over the fate of school whiting despite the RAG decision to postpone the stock assessment for school whiting for a year.
- The TAC has not been fully caught for school whiting for some years this was flagged as a potential indicator of decline.

  The RAG noted that there would be an opportunity to consider this information for the school whiting assessment at the 2022 August Data Meeting.
- The school whiting assessment is set for 2023 and an in-depth data meeting will be required to inform this decision.

ACTION 5: SESSFRAG to review school whiting indicator data as part of the MYTAC agenda item in August 2022 and provide advice on whether the 2023 stock assessment can be postponed.

- Dr Sporcic indicated that seismic survey data will need to be linked with logbook shots. Therefore, seismic data will need to be provided to CSIRO to determine whether this could be successfully achieved.
- The Chair thanked Ian for his work and closed the agenda item at 11:45am.

Agenda item 11: 2022 Data meeting dates

- The RAG's consensus was for the meeting to be in person. It will take place in either Canberra or Hobart.
- AFMA have dates scheduled for 23-25 August 2022. Meeting dates will be sent in a calendar invite.

Agenda item 12: Other business

58. The Chair thanked Cathy Bulman for her contributions.

Close of meeting

59. The Chair thanked the RAG for their contribution and closed the meeting at 11.56 AM (AEST).

Attachment A - register of interest

Chair	
Dr Cathy Dichmont	Director of Cathy Dichmont Consulting. Chair of ComRAC (FRDC) Contracted by various state and Commonwealth agencies to undertake various reviews and consultancies not related to SESSF. No pecuniary interest in the SESSF.
Members	
Dr Cathy Bulman	Honorary Fellowship, Ecological Modelling Team, Oceans and Atmosphere CSIRO (Dr Fulton is Dr Bulman's fellowship supervisor). No interest, pecuniary or otherwise.
Mr Daniel Corrie	Employed by AFMA, Senior Manager of Demersal and Midwater Fisheries. No interest, pecuniary or otherwise.
Dr Sarah Jennings	Adjunct Senior Researcher, TSBE Economics member of SERAG Economic member of SEMAC Member of AFMA EWG Independent economics consultant No pecuniary or other interest in the SESSF.
Mr Lance Lloyd	GABRAG Chair Member of GABMAC Board Member, AwF – Aquaculture without Frontiers (Australia) Director; Lloyd Environmental Pty Ltd. Research Fellow; Federation University Australia No pecuniary interest.
Dr Paul McShane	Chair of SERAG and a member of 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.
Mr Sandy Morison	Director of Morison Aquatic Sciences Chair of SharkRAG

	Contracted by government departments, non-government agencies and companies for a range of fishery related matters including research and for MSC assessments of AFMA managed and other Australian and international fisheries. No pecuniary or other interest in the SESSF.
Executive Officer	
Ms Rebecca Jol	Employed by AFMA, Senior Management Support Officer – no interest, pecuniary or otherwise.
Invited Participants	
Dr Pia Bessell-Browne	Employed by CSIRO, Assessment scientist. Acquiring funding for research purposes.
Mr Simon Boag	EO SETFIA (trawl) EO SSIA (sharks) EO SPFIA (SPF) Non-beneficiary Director of two fishing companies in the SESSF one of which is a significant quota owner. Industry member on both SERAG and SEMAC. SSIA is engaged by AFMA to collect shark industry biological data SETFIA is the PI on the orange roughy east AOS and ORS Cascade survey SETFIA is engaged by participants within the W ORS research fishery to collect biological samples SETFIA is engaged by AFMA under co-management to undertake a variety of tasks including snapper management, ling management and consultation
Dr Paul Burch	Employed by CSIRO, assessment scientist. CSIRO representative on the Fisheries Statistics and Information Working Group. Acquiring funding for research purposes. PI on data services contract.
Dr 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 – SESSF Shark Resource Assessment Group Scientific Member – SESSF Great Australian Bight Resource Assessment Group Scientific Member – Gulf of St Vincent Prawn Fishery Management Advisory Committee Scientific Member – Tropical Tuna Resource Assessment Group Member – Victorian Marine and Coastal Council Member – The Agri Collective **Current projects:** DAWE Project – Multi-sector fisheries capacity building AFMA 2020-0807 – Bass Strait Scallop Fishery Survey – 2020-22 AFMA 2019-0836 – Information the Bass Strait Central Zone Scallop Fishery Harvest Strategy and TAC setting process with economic data and MEY proxies FRDC 2019-027 – Improving and promoting fish-trawl selectivity in the SESSF and GABTS FRDC 2019-072 – A survey to detect change in Danish Seine catch rates of Flathead and School Whiting resulting from CGG seismic exploration. FRDC 2019-129 – Potential transition of shark gillnet boats to longline fishing in Bass Strait - ecological, cross-sectoral, and economic implications FRDC 2018-021 – Development and evaluation of SESSF multi-species harvest strategies Traffic Project – Shark Product Traceability NT Fisheries – Design and implementation of a tropical snapper trawl survey Sea Cucumber Ass. – Design and implementation of various sea cucumber dive surveys. Australia Bay – Queensland Gulf of Carpentaria Developmental Fin Fish Trawl Fishery Tas. Abalone – Scientific Advisor for Tasmanian Abalone Council Ltd PEMSEA – Developing EAFM Plan for Red Snapper in Arafura and Timor Seas Beach Energy – BACI study of Prion Marine Seismic Survey impacts relative biomass of scallops on beds in the immediate vicinity. BCI Minerals – Potential impacts on commercial fishing and aquaculture operations resulting from the Mardie Project development Expert Witness – Gladstone Harbour development impacts

Mr Neil MacDonald	Executive officer of the Great Australian Bight Industry Association Executive officer of Surveyed Charter Boat Owners and Operators Association South Australia Executive officer of Southern Fishermen's Association Executive officer of Saint Vincent Gulf Prawn Boat Owner's Association Executive officer of Marine Scale Net Fishers Association Committee support South Australian Rock Lobster Advisory Council Director NMAC(SA) P/L Director Australian Council of Prawn Fisheries Ltd. Chair CGG SAC Gippsland MSS
Dr Miriana Sporcic	Employed by CSIRO, Assessment scientist. Acquiring funding for research purposes Project Leader CSIRO Ecological Risk Assessments
Dr Robin Thomson	Employed by CSIRO, Assessment scientist. Acquiring funding for research purposes PI on close kin project for school shark. PI on blue-eye trevalla close kin scoping project
Dr Geoff Tuck	Employed by CSIRO. Involved in Stock assessments. Interest in obtaining funding for future research. Principle investigator on the SESSF stock assessment project. Project leader CSIRO Marine Visual Technologies project team on automated catch detection and species identification
Dr Beth Fulton	Employed by CSIRO, ecosystem and climate scientist, Portfolio Leader for Integrated Marine Management. Adjunct with the University of Tasmania (Deputy Director for the Centre of Marine Socioecology). Acquiring funding for research purposes
Dr Rich Little	Employed by CSIRO, assessment scientist. Acquiring funding for research purposes. Member of the Total Allowable Fishing Committee for NSW, conflicts with all items with state fisheries and in particular involved with setting the TAC for school whiting. Principal Investigator of the SESSF Multi-species Harvest Strategy project

	Project leader CSIRO Marine Visual Technologies project team on automated catch detection and species identification. Project leader Southeast Australian Marine Ecosystem Survey (SEA-MES)
Mr James Woodhams	Employed by ABARES. A/g Director. Steering committee member – multispecies harvest strategy project. A minor element (funding) on the DRPs project. Has been involved in conversations of the FIDWG and higher-level project steering committee for the FRDC-CSIRO project biological parameters used in Commonwealth fishery assessments. No pecuniary interest.
Mr Keith Rowling	Associate – NMAC(SA) P/L Executive Officer - Great Australian Bight Industry Association (GABIA) Executive Officer – Charter Boat Association of South Australia Executive Officer – Southern Fishermen's Association Executive Officer – Saint Vincent Gulf Prawn Boat Owner's Association Executive Officer – Marine Scale Net Fishers Association Consultant with Bluefin Consulting Lakes & Coorong Fishery Management Advisory Committee – Committee Support Gulf St Vincent Prawn Fishery Management Advisory Committee – Committee Support
AFMA	
Mr Mark Grubert	Employed by AFMA, South East Trawl & Great Australian Bight Trawl Manager – no interest, pecuniary or otherwise.
Ms Anna Willock	Employed by AFMA, Deputy Chief Executive Officer – no interest pecuniary or otherwise.
Mr Aaron Puckeridge	Employed by AFMA, Senior Management Officer – no interest pecuniary or otherwise.
Mr Ryan Murphy	Employed by AFMA, Senior Manager Policy, Environment, Economics and Research (PEER) – no interest pecuniary or otherwise.

Ms Alice McDonald	Employed by AFMA, Climate Adaptation Senior Program Manager – no interest pecuniary or otherwise.
Mr Roshan Hanamseth	Employed by AFMA, Senior Management Officer – no interest pecuniary or otherwise.
Dr Lara Ainley	Employed by AFMA, Small Pelagic Fishery Manager, Scallop and Squid – no interest, pecuniary or otherwise.
Ms Phebe Rowland	Employed by AFMA, graduate – no interest pecuniary or otherwise.
Dr Nastaran Mazloumi	Employed by AFMA, Senior Management Officer – no interest pecuniary or otherwise.
Observers / Presenters	
Dr Daniel Wright	Employed by ABARES No interest, pecuniary or otherwise.
Ian Butler	Employed by ABARES No interest, pecuniary or otherwise.
Kurt Davies	Employed by ABARES No interest, pecuniary or otherwise.
Dr Krystle Keller	Employed by ABARES No interest, pecuniary or otherwise.
Dr Tim Emery	Employed by ABARES. No current interest pecuniary or otherwise. Any potential future interest in research funding will be declared as necessary.
Dr Sandra Curin-Osorio	Employed by CSIRO No interest, pecuniary or otherwise
Mr George Day	Employed by DAWE, Assistant Secretary, Fisheries. No interest, pecuniary or otherwise.
Jo Elphinstone	Employed by DAWE, Director – Commercial Fisheries Policy. No interest, pecuniary or otherwise.

Attachment B- Actions arising from previous meetings

60. Complete/Redundant	Underway	Need SESSF RAG advice	Not yet started

Action Items from SESSFRAG

No.	Ag. Item / Mtg Date	Action Item	Agency / Person	Timeframe	Progress as of SESSFRAG Data meeting 2020
4	4 SESSFRAG Chairs' 2019	AFMA to obtain and include in its database-historic blue warehou industry collected data	AFMA	As soon as practicable	Blue warehou data – Not yet started - AFMA to follow up.
3	8 SESSFRAG Data 2020	The RAG to discuss the implications of the MSHS project on the ageing plan and the inclusion of non-quota species, such as leatherjackets, at the Chairs' 2021 meeting.	SESSFRAG	Chairs' meeting 2021	Not yet started A summary of non-quota species collections held was provided as part of the FAS annual report at the 2021 SESSFRAG Data meeting. Until the MSHS project has progressed further, it is unclear which data/ages will be required to support ongoing assessments and management. Until then, the ageing plan will continue to be based on the current ISMP and Harvest Strategy Design.
13	11 SESSFRAG	AFMA to evaluate the benefits of undertaking another analysis of discard reporting for fisheries that have EM to	AFMA	As soon as practicable	Underway AFMA has engaged ABARES to update its analysis comparing

	Data 2020	determine if there are continuing improvements in reporting (as per the review that ABARES undertook).			logbook data to EM data for the GHATF. SharkRAG will consider the analysis at its June 2022 meeting.
17	12 SESSFRAG Data 2020	AFMA and CSIRO to liaise with the states regarding estimates of discards for SESSF quota species and consider establishing a discard and recreational fishing working group to consider a set of decision rules, in particular: a. whether to apply Commonwealth discard rates to state catches when Commonwealth and state gear types or management controls differ; b. how to estimate state discard rates and total catches where Commonwealth discard rates are not applied because of differences in gear type or management controls; and c. whether the approach used to determine recreational catch weights for shark species should be extended to other SESSF species as part of the 2021-22 Data Services Contract.	AFMA / CSIRO	As soon as practicable	a-b: Underway AFMA will progress this work, subject to resource availability. c: Complete This was discussed at SERAG in November 2020, and it was decided not to extend the approach to other SESSF species at this stage – state catches are either low, or not provided to CSIRO. Dr Burch will continue to request recreational catch data from state agencies each year and include the figures in the Catch and Discards report.
7	9 SESSFRAG Chairs' 2021	AFMA to incorporate the process for periodic review of stock assessments in the document 'Total Allowable Catch (TAC) setting process – Guidelines for provision of data and stock assessment processes' for further consideration by SESSFRAG. Timeline is subject to other priorities.	AFMA	As soon as practicable	Underway A discussion was held at the SESSFRAG March Chairs 2021 meeting to establish a process for reviewing stock assessments. This item was to be further considered at the April 2022 Chair's meeting, however, has been postponed due to resource

					constraints.
8	10 SESSFRAG Chairs' 2021	Dr Paul Burch (CSIRO) to liaise with Dr Ian Knuckey (Fishwell Consulting) and Fish Ageing Services, to determine the spatial and temporal data associated with Cascade Plateau orange roughy otolith samples.	Dr Paul Burch	August 2021 meeting	Underway
16	16 SESSFRAG Chairs' 2021	AFMA to compare discard data reported in logbooks, to those recorded by the ISMP program, to determine the accuracy of operator reported discards.	AFMA	Include in future discard reviews to SESSFRAG	Underway AFMA is currently developing the reporting templates. This project has been put on hold due to resource constraints.
17	16 SESSFRAG Chairs' 2021	AFMA to liaise with CSIRO (Dr Miriana Sporcic and Dr Cathy Bulman) to identify non-quota species to remain as discard reporting options in e-logs, outside of the bycatch discard groups (i.e., those that are high-risk as identified through the ERA).	AFMA / CSIRO	August 2021 meeting	This was discussed at the August 2021 SESSFRAG data meeting. Species identified included southern bailer shell, leafscale gulper shark, endeavour dogfish, southern dogfish, bight skate, sandy skate, ogilby's ghost shark, ghost sharks, gould's squid, rosecone cuttlefish, pale octopus and maori octopus. While these species have been identified as high risk, industry are unlikely to be able to report to the species level for many of them. As an alternative, action items have been included in the 21-25 CTS bycatch and discarding workplan to improve species identification for AFMA observers, as well as industry learning modules to improve group level reporting. AFMA management propose that individual species are not

					included in the e-log software, on the basis that species-level reporting is not possible for many species.
1	4 SESSFRAG Data 2021	GABRAG to consider catches of wide stingaree in the 2021 GABFIS in the context of the species distribution ERA trigger for otter board trawl in the Great Australian Bight Trawl Sector.	GABRAG	Next GABRAG meeting	GABRAG discussed wide stingaree catches at the October 2021 meeting. The spike in stingaree catches likely indicates an increase in abundance. The RAG has no information that suggests that the stingaree's productivity or susceptibility scores would have changed and this would not change the ERA results.
2	6a SESSFRAG Data 2021	AFMA and CSIRO to discuss further potential refinements to the ISMP sampling targets for some species to ensure representative sampling whilst avoiding broadscale changes to the plan.	AFMA /CSIRO	January 2022	The meeting between AFMA and CSIRO occurred in December 2021. The group resolved to remove non-survey orange roughy otolith targets from the plan, but to retain length targets. No other changes were made to the sampling plan.
3	6c SESSFRAG Data 2021	FAS to provide a summary of orange roughy otolith samples they hold to GABRAG.	Kyne Krusic-Golub (FAS)	Next GABRAG meeting	Mr Kyne Krusic-Golub (FAS) attended the October 2021 GABRAG meeting. FAS has an archive of 10,390 orange roughy otoliths from the GAB which were caught between 1990 and 2021, although many otoliths do not have an orange roughy zone attached to them. GABRAG have an action item to identify the missing orange roughy zone information.
4	7a SESSFRAG Data 2021	Robin Thomson to present an options paper to SERAG and SharkRAG investigating the utility of historical logbook data to use average grid depth to adjust recent 'invariant depth' records.	Robin Thomson (CSIRO)	Next SERAG and SharkRAG meeting	Redundant Rather than presenting an options paper, CSIRO are looking at the proposed solution for estimating depth from the SESSFRAG Data 2021 meeting, i.e., using recorded location and historical logbook depth data. This will be presented to AFMA prior to the

					2022 data meeting, giving time for CSIRO to use the CPUE standardisations.
5	7a SESSFRAG Data 2021	Robin Thomson to provide Dan Corrie with the details of the boat reporting effort in depths outside the area of the sector.	Robin Thomson (CSIRO)	As soon as practicable	Complete – the boat was nominated under both VIT and SET – no issue as depths were from SET.
6	7b SESSFRAG Data 2021	Establish a subcommittee to drive the process for updating catch history data for both Tier 1 and Tier 4 species. Report to be provided at SESSFRAG Chairs' 2022 meeting for consideration and adoption. Membership – Paul Burch (CSIRO - lead) Geoff Liggins (NSW DPI) and Dan Corrie (AFMA). A member to be included from Victorian Fisheries Authority if needed. Other agency members to be included if needed.	CSIRO / NSW DPI / AFMA	SESSFRAG Chairs' 2022 meeting	Underway: Geoff Tuck & Paul Burch to co-ordinate. This was not completed in time for the 2022 Chair's meeting. The establishment of members for this sub-committee has been budgeted for but is yet to be scheduled. The work will probably be undertaken this year; however, the report is unlikely to be finalised until next year.
7	7c SESSFRAG Data 2021	AFMA/CSIRO/SETFIA to investigate the reason for discards of orange roughy in the Southern Zone (prior to SERAG meetings in 2021).	AFMA / CSIRO / SETFIA	SERAG September 2021 meeting	The reasons for discarding were not able to be resolved. The discards were deducted from the 2022 RBC and AFMA will continue to monitor future discarding to establish whether there is an ongoing issue.
8	7c SESSFRAG Data 2021	CSIRO to include colour-coding in the discard tables in future discard reports to highlight the criteria for which discard estimates fail validity tests to enable easier consideration of these by SESSFRAG.	CSIRO	SESSFRAG Data 2022 meeting	Underway

9	7c SESSFRAG Data 2021	CSIRO and AFMA to discuss assessment scheduling and provide an out-of-session paper for SESSFRAG to consider; prior to the Chairs' meeting in April 2022.	CSIRO / AFMA	SESSFRAG Chairs' 2022 meeting	Completed – to be considered as part of agenda item 8 'Research statement and assessment schedule'
10	8 SESSFRAG Data 2021	Consider how the outputs of uncertain Tier 1 assessments should be considered in the SESSF harvest strategy framework: including the application of discount factors when setting Total Allowable Catches (TACs) or inclusion of additional tier levels.	AFMA	Next SEMAC meeting 2021	Complete – To be considered as part of agenda item 9.
11	8 SESSFRAG Data 2021	Dr Pia Bessell-Browne to present the analysis of lengths by month for Tier 1 species to SERAG in 2021.	Pia Bessell-Browne	SERAG September 2021	This was provided to SERAG in the data summary for the SESSF: Logbook, Landings and Observer Data to 2020.
12	8 SESSFRAG Data 2021	SERAG to consider an alternative assessment approach for western jackass morwong for 2022.	SERAG	SERAG 3 2021	SERAG discussed the western jackass morwong stock at their October 2021 meeting. Noting the low catches, and the management changes resulting from the eastern jackass morwong assessment, AFMA are not proposing to undertake a western jackass morwong assessment in 2022. Future approaches to assessments and TAC setting process for western jackass morwong will be considered in the context of both stocks.
13	9a	AFMA to work with SETFIA to develop a revised bycatch group list for consideration by SESSFRAG for inclusion in	AFMA /	As soon as	A final list of bycatch groups is provided in the SESSF Data Plan

	SESSFRAG Data 2021	the data plan.	SETFIA	possible	2021-23. No changes were made to the original list of bycatch discard groups.
14	11b SESSFRAG Data 2021	Establish a working group to develop the deepwater shark and blue eye trevalla (seamount) Tier 5 assessments and provide advice to SERAG in 2021. Membership: lead from CSIRO (Natalie Dowling, Geoff Tuck & Robin Thomson), AFMA (Dan Corrie), SERAG independent scientific (Andrew Penney) & Colin Simpfendorfer (for deepwater shark – AFMA to check his availability).	CSIRO	SERAG September 2021	Complete – T5AWG meeting outcomes at Attachment A or refer to Agenda item 6.
15	12 SESSFRAG Data 2021	Develop a consistent approach for constructing decision tables for consideration at the SESSFRAG Chairs' 2022 meeting.	CSIRO (Paul Burch)	SESSFRAG Chairs' 2022 meeting	Not yet started – AFMA will consider this, subject to resource constraints. Until a formal process is agreed, relevant RAGs will be asked to provide advice on the use of decision table on a species basis.
16	13 SESSFRAG Data 2021	AFMA to provide SESSFRAG with an update about the process of operationalising the climate change handbook, particularly with respect to the SESSF, at the SESSFRAG Chairs' 2022 meeting.	AFMA	SESSFRAG Chairs' 2022 meeting	Completed – to be considered at agenda item 7.

Attachment C Summary of Action Items and Recommendations arising from SESSFRAG Chairs' meeting April 2022

Action Item	Agenda Item	Description	Responsibility	Timeframe
1	5	AFMA follow up on the status of the EWG and report back to the RAG out of session	AFMA	As soon as possible
2	7	Beth Fulton to deliver a presentation to the SESSFRAG data meeting on the Ecosystem Traits index paper when it is available	Beth Fulton	August 2022 meeting
3	8	Establish a process for reviewing stock assessments using blue grenadier as a case study.	AFMA	As soon as practical
4	9	CSIRO team to seek feedback from MSC, ABARES and DAWE on the two methodologies identified for measuring risk under the discount factor project.	CSIRO	Chairs' meeting 2023
5	10	SESSFRAG to review school whiting indicator data as part of the MYTAC agenda item in August 2022 and provide advice on whether the 2023 stock assessment can be postponed.	AFMA	August 2022 meeting

	Recommendation
1	SESSFRAG recommended that Beth Fulton (CSIRO) summarise the results of the species sensitivity analyses by industry sector in the climate adaptation work.
2	SESSFRAG recommended that CSIRO exclude shots that do not represent normal commercial fishing (i.e., those impacted by seismic surveys identified in the Fishwell project) from the flathead and school whiting catch rate analyses (high priority).

Attachment D - The Impact of the Harvest Control Rule on the Different Estimates of Current Stock Status.