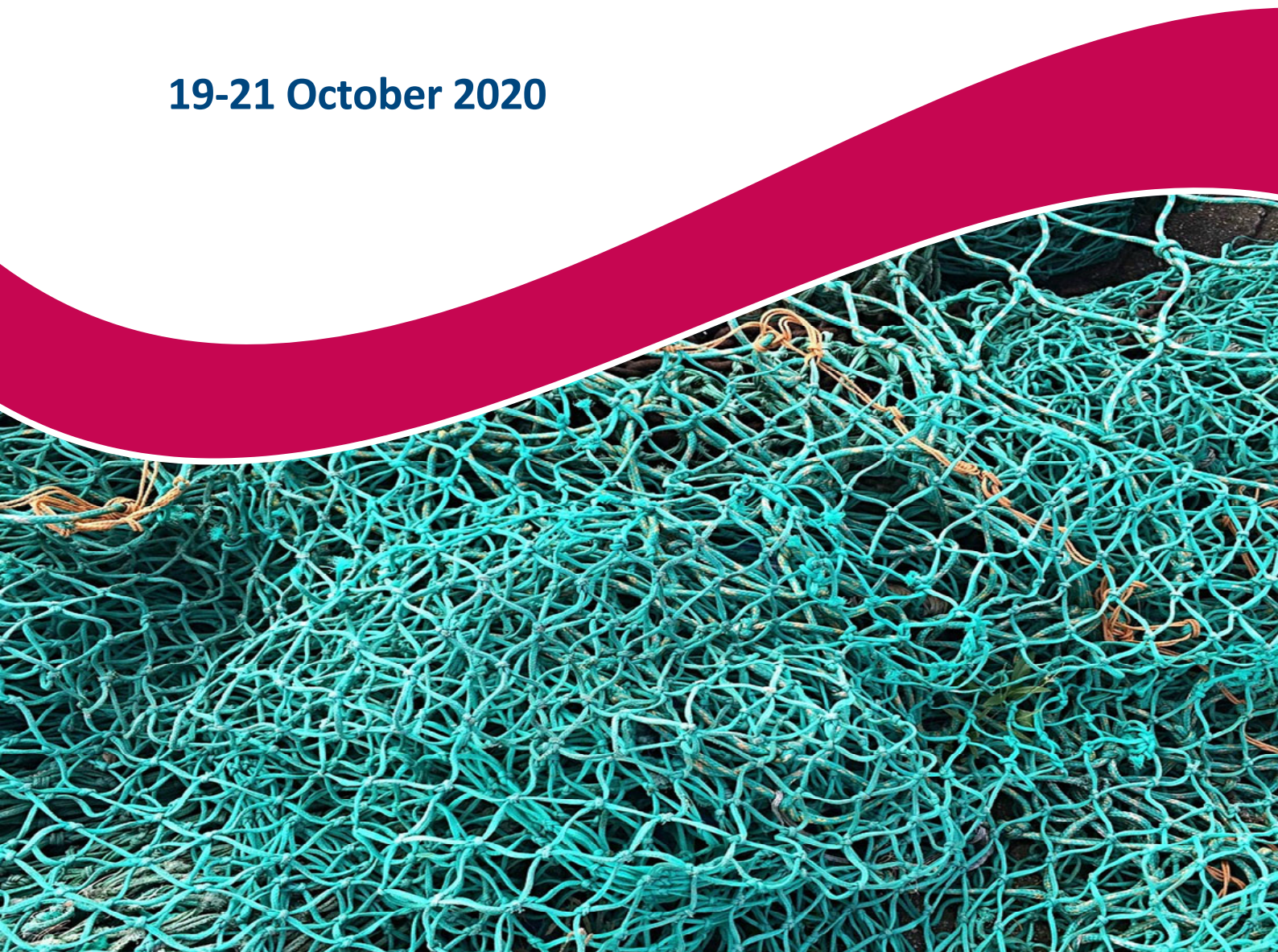


**South East Resource  
Assessment Group  
Meeting 1 (2020)  
Minutes**

**19-21 October 2020**



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# Agenda Item 1: Preliminaries

## 1.1 Welcome and apologies

1. Dr Mike Steer (Chair) welcomed members, invited participants and observers to the meeting and made an Acknowledgement of Country Statement recognising the Aboriginal people as the traditional custodians of the land on which we meet and paid our respects to their Elders, both past and present. Attendees introduced themselves, outlined their relevant background and/or experience. Each attendee's Declaration of Interest was provided prior to meeting and noted by exception. Some attendees arrived later and at that point, they introduced themselves.

Member	Role
Dr. Michael Steer	Chair
Dr. Ian Knuckey	Scientific member, Fishwell Consulting
Mr. Ross Winstanley	Recreational member
Dr. Sarah Jennings	Scientific (economics) member
Mr. Daniel Hogan	Industry member
Mr. Simon Boag	Industry member
Mr. James Woodhams	Scientific member, ABARES
Dr. Geoff Tuck	Scientific member, CSIRO
Mr. Andrew Penney	Scientific member, Pisces Australis
Mr. Daniel Corrie	AFMA member
Ms. Mardi Albert	AFMA, executive officer
Mr. John Jarvis	Industry member - east

Invited Participants	
Dr. Miriana Sporcic	Assessment scientist, CSIRO
Dr. Robin Thomson	Assessment scientist, CSIRO
Dr. Jemery Day	Assessment scientist, CSIRO
Dr. Paul Burch	Assessment scientist, CSIRO
Dr. Pia Bessell-Browne	Assessment scientist, CSIRO
Dr. Geoff Liggins	Fisheries scientist, NSW DPI
Dr. Veronica Silberschneider	Fisheries manager, NSW DPI
Dr. Ashley Fowler	Fisheries scientist, NSW DPI
Ms. Natalie Couchman	AFMA, GHAT manager
Dr. Karina Hall	Fisheries scientist, NSW DPI
Mr. Nicholas Hill	Fisheries scientist, IMAS (minute taker)

## 1.2 Declarations of Interest

2. A copy of the declarations of interest ([Attachment A](#)) were declared prior to the meeting.

3. Additional declarations of interest were provided for each agenda item:
  - Agenda item 2 – Data reports. No conflicts.
  - Agenda item 3 – School whiting assessment. Industry members Simon Boag and Daniel Hogan.
  - Agenda item 4 – Hagfish research plan. Veronica Silberschneider noted conflict given hagfish are a NSW/Commonwealth shared resource. Ian Knuckey noted conflict given contacts in the fishery.
  - Agenda item 5 – Tier 4 assessments. Industry members Simon Boag and Daniel Hogan.
  - Agenda item 6 – Oreo smooth (other). Industry members Simon Boag and Daniel Hogan.
  - Agenda item 7 – Tier 1 eastern redfish. Industry members Simon Boag and Daniel Hogan.
  - Agenda Item 8 – Eastern orange roughy. Industry members Simon Boag and Daniel Hogan.
  - Agenda item 9 – Western orange roughy research plan. Industry members Simon Boag and Daniel Hogan.
  - Agenda item 10 – TAC advice. Industry members Simon Boag and Daniel Hogan.
4. The RAG decided that when management advice was being determined, any member with declared conflicts of interest would leave the meeting but remain present during the discussions.

### 1.3 Adoption of agenda

5. The agenda was adopted with no major changes ([Attachment B](#)).

### 1.4 Action items review

6. Action items from previous meetings ([Attachment C](#)) were reviewed. The following updates were discussed.

#### **2019.12 Agenda item 2: soft-skinned sharks catch**

7. Daniel Corrie (AFMA) and Simon Boag have found it difficult to identify ‘soft skinned’ sharks in the Catch Disposal Records (CDRs). Only a small amount of catch is reported as ‘soft skinned’ shark in the historical logbooks and CDR’s. Ongoing item.

#### **2019.12 Agenda item 11: E-log software issue**

8. Daniel Corrie (AFMA) has spoken to the data and licensing team and determined the issue is software-related. This issue needs to be addressed by industry in association with AFMA to the e-log software provider. Ongoing item.

#### **Recommendation 1: Orange roughy removal from rebuilding strategy.**

**Action item 1** – Daniel Corrie (AFMA) to produce a document outlining the process for a) delisting a conservation dependent species, noting this is not an AFMA process, and b) transitioning a species from management under an approved rebuilding strategy to management under a harvest strategy. To be completed for the next SESSFRAG or SERAG 2021 meeting.

9. Simon Boag provided a [link](#) to a document from the Department of Agriculture, Water and Environment (DAWE) outlining the process for delisting a conservation dependent species. He also noted a group of eastern orange roughy quota holders have engaged Atlantis FCG, Fishwell Consulting and Future Catch Consulting and intend to apply for de-listing.

#### **2019.11 (Action items review): Blue-eye trevalla biological sampling for close-kin analysis**

10. Natalie Couchman (AFMA) is sourcing ongoing funding and tissue samples. Ross Winstanley is helping to collect length data. Ongoing item.

#### **2019.11 Agenda item 10.2. Catches of eastern redfish in western Tasmania**

11. There is minimal catch recorded (i.e. negligible influence on stock assessments) of redfish on the western coast of Tasmania. Catches from this zone are not used in the stock assessment. This item can be closed.

#### **2019.11 Agenda item 10.1. Targeting of blue warehou**

12. This item will be addressed at SERAG 2. Ongoing item.

#### **2017. 11 Agenda item 5. NSW recreational catch of redfish**

13. This item was addressed at the SESSFRAG Data meeting in August 2020. This item can be closed.
14. The list of action items arising from this meeting is included at [Attachment D](#).

## **Agenda Item 2: Data reports**

15. Dr. Paul Burch (CSIRO) provided an overview of recent changes to three reports:
  1. Data summary for the Southern and Eastern Scalefish and Shark Fishery: Logbook, Landings and Observer Data to 2019 (the Data Summary).
  2. Southern and Eastern Scalefish and Shark Fishery catches and discards for TAC purposes using data until 2019 (the Catch and Discard Report).
  3. Integrated Scientific Monitoring Program for the Southern and Eastern Scalefish and Shark Fishery – discards for 2019 (the Discard Report).
16. The RAG was asked to comment on changes outlined to each report.

### **2.1 General discussion**

#### **Modifications to depth records**

- Where depth information was not recorded by an operator in the logbooks, CSIRO extracted depth from a bathymetry map in combination with shot location as the nearest approximation to the correct depth, modifying the default e-log depth value which appears the records.
- AMFA have contacted the two e-log providers and requested that this field be made mandatory.

### *Revision of NSW catches from 2008 – 2018*

- Catches received from NSW were different to previous years due to confusion around processed vs. whole weight. This year the NSW stock assessment branch provided catch in both processed and whole weight which identified that previous catch extracts received from NSW catch records branch had been processed weights.
- SESSFRAG (August 2020) agreed to use the best available data going forward – this resulted in changes to some species, though relatively minor in most cases.

### *Application of discard rates to state catches*

- Estimates of discard estimates from Commonwealth catches are currently applied to state catches regardless of gear types, i.e. Commonwealth trawl discard estimates might be applied to state line catches. This is not an issue for Tier 1 species.
- SESSFRAG (August 2020) were presented with an overview of state catches of Commonwealth species separated by gear type. A SESSF working group was created to establish decision rules and determine what discard rates should be applied to each species/gear type/Tier level.
- Dr. Ian Knuckey noted that discard rates will be influenced by factors such as market demand and management controls in some states (e.g. size or trip limits).
- Simon Boag thought this analysis was a positive, logical development and was supportive of it.

### *Correction of 2016 – 2018 discard estimates*

- Errors in the discard estimation process were identified whereby those species that were wholly retained were excluded from the discard calculation rather than included as shots with zero discards of that species.
- This error has been identified and corrected.
- Discard estimates between 2016 and 2018 were revised using the corrected data and the current discard estimation method. Discard estimates for most species either declined or were unchanged, however, discard estimates for some species increased. The increases resulted from a correction to the discard method made in 2018, changes in the validity rule adopted by SESSFRAG in 2019 and the use of bathymetry data to provide depth estimates for vessels reporting invariant depth.
- This error was mostly confined to Tier 4 stocks since most Tier 1 stocks either assume discards are negligible or estimate them within the assessment.
- The RAG recommended determining the impact (if any) this error has had on the setting of TACs for species within the SESSF from 2016-2018 (Action Item 2).

### *Checks of discard estimates*

- The 2016 revised discard estimate for eastern pink ling of 28.7% was determined to be accurate.
- Royal red prawn discards failed the validity test. Discards are negligible (~2%).
- Checks of 2019 discard estimates were provided for blue grenadier, school whiting, mirror dory, deepwater sharks, orange roughy (GAB), school shark, gummy shark, jackass morwong, john dory, eastern gemfish, smooth oreo and redfish.

- There were some changes to discard estimates for species incorrectly recorded as discarded when they had been 'mealed' by the factory freezer boat in 2019, particularly silver warehou and blue grenadier. It was clarified that 'mealed' product is retained (as fish meal).
- Dr. Ian Knuckey suggested comparing logbook discard estimates with those from observer records for certain GAB species to determine whether logbooks can be used to provide an estimate for years where onboard observer are not present.

#### *Change of method used to estimate discards for Tier 1 stocks*

- Tier 1 stock assessments using Stock Synthesis estimate discards within the assessment by fitting to discard proportions or mass calculated by fleet. Discard proportions are estimated for a population (stock) by fleet, year, zone and season (usually a quarter) and then scaled to landed (CDR) catch to obtain estimates by population, fleet and year.
- Two methods have been used to estimate discard proportions for Tier 1 stocks. Method 1 estimates discard proportion as the sum of the discarded catch divided by the sum of discarded catch and the landed catch, while Method 2 estimates discard proportions as the average of the proportion discarded in each shot.
- Method 2 does not scale the mean discard proportion by shot weight and it is therefore sensitive to the discarding practices from shots with small catches and, as such, may not be representative of the overall fishery.
- SESSFRAG recommended use of Method 1 for 2020 and going forward.
- The RAG endorsed Method 1.

#### *Minor changes to discard report layout*

- Discarded catch estimates are now separated into two tables; those used for assessment and management purposes presented in Table 2 and those for Tier 1 species where discard estimates are obtained from the relevant stock assessment model are provided in Table 3, along with alternative discard estimates calculated using the Bergh method which are provided for comparison.

## 2.2 Actions/recommendations for agenda item 2

**Action Item 2** – Dr. Paul Burch (CSIRO) to undertake retrospective analysis on discarded catch from 2016-2018 to determine the impact of the discard estimation error where the error resulted in a change of 5% or more in discarded catch. Provide information discerning if this has impacted management advice and resultant RBCs and quotas before the end of 2020 calendar year to provide context to the 2021-22 TAC setting process.

**Action Item 3:** AFMA to compare logbook discard records of deepwater flathead and bight redfish in the GABT against observer records to determine their accuracy.

## Agenda Item 3: Tier 1 School Whiting

17. Dr. Jemery Day (CSIRO) presented the paper “School whiting (*Sillago flindersi*) stock assessment based on data up to 2019 – development of a preliminary base case” (the Stock Assessment).
18. The purpose of this paper was to present an updated Tier 1 stock assessment for school whiting and present a preliminary alternative base case stock assessment model, outlining changes relative to the previous stock assessment from 2017.
19. Changes from the 2017 base case included three years of additional data (catch, discard estimates, CPUE, length and conditional age-at-length data (with updated ageing error matrix)), updating the version of Stock Synthesis and updates to the tuning procedures. This resulted in improved fits to several data sources (e.g. Danish seine CPUE, discard rates, length data). The assessment estimated the 2019 spawning stock biomass to be 31.7% of virgin stock biomass. The updated model estimated the 2021 spawning stock biomass to be 44.9% of virgin stock biomass (assuming the same catch by fleet in 2019 would also be taken in 2020).

### 3.1 Industry update

20. Simon Boag provided SERAG with an industry update for school whiting:
  - There was uncertainty in March/April in the fishery given the impacts of COVID-19 on demand and operations.
  - However, following this various Government stimulus, an increased demand for domestic product (given a lack of NZ fresh imports), reduced fuel prices and a relatively low \$A (something that does not generally occur with low fuel prices) has provided a surprisingly positive operating environment.
  - Preliminary results of a study currently being undertaken by Fishwell Consulting (Dr. Ian Knuckey) looking at the impact of seismic surveys on the abundance of flathead and school whiting showed a decline in CPUE for tiger flathead of 80 per cent inside seismic survey areas, and 99 per cent for school whiting after 28 days. Sampling at 100 and 200 days after seismic survey showed recovering CPUE, but that declines persisted. SERAG noted that it would need to consider these impacts when using data (particularly tiger flathead and school whiting) from the 2020 calendar year from January onwards.

### 3.2 2020 stock assessment

21. The Chair provided background and context for the updated school whiting stock assessment with regards to a review undertaken by Dr. Tony Smith:
  - Previous RAG discussions noted the possibility of multiple stocks of school whiting.
  - Dr. Karina Hall (NSW DPI) is the principle investigator for an FRDC-funded research project currently exploring the stock structure of school whiting. The results from this project will help inform future stock assessments.
  - An independent review of the school whiting stock assessment was requested by SERAG and undertaken by Dr. Tony Smith.



- This review provided multiple recommendations which were considered by SESSFRAG (August 2020). As a result, SESSFRAG recommended a five-step process to update the stock assessment:
  1. Status quo assessment excluding new NSW CPUE and age/length data (not preferred).
  2. Include various NSW data sources (CPUE/length/age data) from Ocean trawl fleet (preferred).
    - A. If this results in poor fits to the model, return to Step 1.
    - B. If this results in reasonable fits to the model, move to Step 3.
  3. Include CPUE/length/age data from the NSW Prawn Trawl fleet.
    - A. If this results in poor fits to the model, return to Step 2
    - B. If this results in reasonable fits to the model, move to Step 4.
  4. Explore a sensitivity by running two separate assessments, one north and one south of the NSW/Vic border. This sensitivity test will not be used for RBC calculations.
  5. Run a series of projections with reduced Commonwealth catches to explore the potential ramifications of seismic impacts.

### 3.3 General discussion

22. General points discussed throughout Dr. Day's presentation included:

- Dr. Jemery Day has completed SESSFRAG recommendations for step 1 and made considerable progress for step 3, but is yet to address steps 4 and 5.
- Dr. Jemery Day requested advice from SERAG on how to address steps 4 and 5 given time constraints, workload, and likely outcomes. Unresolved issues included:
  - Should natural mortality be estimated or fixed (at  $M = 0.6$ )?
  - Should work continue on the step 3 model, incorporating two additional fleets and new NSW state data?
  - How to address the potential stock structure splits either at Barrenjoey or at the NSW/VIC border?
  - Lack of Tasmanian catch data from 2015-2019.

#### *Base case stock model (Step 1)*

- Recruitment was estimated to 2016. SERAG discussed whether to project the model with average recruitment (from 2017 onwards)
- The standard procedure is to assume average recruitment (from the stock-recruit relationship) for the last few years of the model, where there is insufficient information to estimate recruitment.

#### *Alternative base case model (Step 3)*

- The preliminary model including additional NSW trawl and prawn trawl fleets and new NSW state data (Step 3 above) resulted in improved fits to a number of data sources (e.g. Danish seine CPUE, discard rates, length data).
- SERAG members noted that this model (Step 3) resulted in improved fits and reduced uncertainty in key parameters and derived outputs, in particular the stock status in 2021).

### *Recruitment*

- Concerns were expressed by SERAG members that recruitment may be below average, given the poor estimated recruitment in 2016 from Step 1 and downwards trend in recruitment deviations from 2013-2016.
- However, the RAG also noted that only the 2016 estimate of recruitment was the lowest estimated recruitment deviation, but this may be revised in future assessments, when more data is available to estimate this recruitment event, especially given that this is the last recruitment deviation to be estimated in this model
- The pattern of recruitment deviations for the step 3 model was slightly different than for Step 1, with the 2016 estimate still being below average, but no longer the estimated lowest recruitment deviation in the time series
- The RAG recommended the exploration of low recruitment sensitivity runs. The RAG suggested using the mean of the previous 3 and 5 years of recruitment as an estimate of current/future recruitment in the sensitivities.

### *Natural mortality*

- The likelihood profile for M was fairly flat from 0.55 - 0.9 and therefore not as informative on the most likely value for M as would be hoped.
- The RAG members agreed to fix natural mortality at 0.6, the fixed value used in previous stock assessments.
- Future assessments will need to consider whether to fix or estimate M.

### *Length frequency bias*

- Differences were observed between length frequency distributions from port and onboard samples.
- The potential causes may include:
  - different gear configurations/selectivity across fleets.
  - different stocks being fished.
  - observers were potentially over-sampling vessels with larger mesh sizes.
  - Catch was being graded and port samples did not take this into account.

### *Stock structure split*

- Dr. Jemery Day noted the considerable workload required to finalise a step 3 assessment model. Concerns were raised around delivering this model by SERAG 2, scheduled for late November 2020.
- SERAG members noted that although the stock structure split between NSW/VIC border was an important scenario to investigate, that other factors were of more immediate concern.

## 3.4 Actions/recommendations for agenda item 3

**Recommendation:** The RAG supported Dr. Jemery Day (CSIRO) in proceeding with step 3 school whiting stock assessment. This model structure addresses several of the recommendations outlined in the review by Dr. Tony Smith and by SESSFRAG. The preliminary step 3 model reduced uncertainty in

biomass estimates, improved the fit of the model to the data, and provided revised estimates of recruitment. Scenarios to be explored for SERAG 2 include:

- Step 1 model (backup) – same structure as 2017 stock assessment. 3 fleets and M estimated.
- Continue to work on the step 3 model which incorporates new NSW data with 5 fleets (including 2 new NSW fleets), additional NSW length data, previously unavailable NSW conditional age-at-length data and a new ageing error matrix for the NSW age data. This requires some more data processing and checking, in particular the split of the catch series into 5 fleets and the NSW age data and ageing error matrix. If these outstanding issues can be resolved, and the resulting model appears to be reasonable, this is the preferred model for the base case for the 2020 assessment.

Scenarios unlikely to be explored in time for SERAG 2:

- New base case + stock separation (VIC/NSW border) sensitivity (step 4).
- Varying catches to explore potential seismic ramifications will not be included.

**Action Item 4** - Daniel Corrie (AFMA) to investigate the possible grading of school whiting catches at some ports which may be influencing the port-based size frequency distributions being input into the stock assessment. To be completed in time for SERAG 2.

## Agenda item 4: Hagfish research plan

23. Stephanie Blake (AFMA) introduced this agenda item addressing the Hagfish research plan. The purpose of this plan is to support an assessment of common hagfish (*Eptatretus cirrhatus*) in the waters of the SESSF and advise on how this fishery should be managed going forward.
24. This research plan was considered at SERAG in December 2019, however SERAG requested AFMA develop it further and compile a summary of existing data and a literature review on international experience with hagfish.
25. A literature review was undertaken and presented, synthesising information on the available life history of the common hagfish and management approaches undertaken by other jurisdictions globally that also manage hagfish fisheries. The key conclusions were that little is known about the life history of the common hagfish species harvested in the SESSF to support effective management, and many hagfish fisheries globally have become overfished, indicating that hagfish are susceptible to overexploitation, in part due to the low reproductive potential of hagfish, recruitment dependent and localised population structures and high mortality rate for discarded animals.
26. AFMA are seeking advice from SERAG on:
  - the suitability of a base Sustainability Assessment of Fishing Effects (bSAFE) assessment for common hagfish, noting data and cost constraints.
  - the suitability of the proposed data collection plan to inform a bSAFE assessment, or an alternative assessment if advised.
  - the appropriateness of the proposed hagfish research zones.

- the appropriateness of the proposed catch allowance in each hagfish research zone.
- the proposed gear requirements.

27. The following individuals were invited to observe the discussion:

- Chris Spurrier – Hagfish Australia (industry).
- Dr Ric Martini – hagfish expert.
- Max Bayly – AFMA.
- Denis Brown – Commercial fisher (industry).
- Lachlan McKinnon – Southern Eels Australia (industry).

#### 4.1 General discussion

28. A single operator has been active in the fishery for 5 years, utilising a fishing permit in the Gillnet, Hook and Trap (GHAT) sector of the SESSF in what is in effect an exploratory and developing fishery.

29. SERAG members expressed their disappointment with regards to the quantity and quality of data collected over the last five years, including that data collected by observers (less than 100 length and sex samples had been collected). Furthermore, it was emphasised that SERAG had previously advised on the need for better data but this had not been actioned to date.

30. SERAG members advised there is an urgent need for greater data collection concerning hagfish given the current lack of life history information and paucity of biological data collected for the species. Hence, the need for a formal research plan outlined in this agenda item. General points discussed included:

- More information is required regarding the selectivity of the fishing gear. Dr Ric Martini suggested that escape hole size could be explored to determine its effect on the size of hagfish retained.
- Dr Ric Martini also suggested that escape holes can become clogged with slime when there are large numbers of hagfish in a trap, preventing smaller hagfish from escaping, and influencing selectivity.
- The draft research plan suggested that one ‘control’ trap per line should be set with no escape holes to understand the selectivity of current traps used in the fishery. SERAG noted that a larger proportion of control traps (5-10%) would be required to obtain meaningful results.
- Hagfish are challenging to handle due to their excessive production of slime and eel-like morphology which compromises an effective on-board biological sampling program. SERAG suggested freezing hagfish at sea and measuring their length at port, however, it was noted that individual shrinkage of 10-15% occurs in other similar species and needed to be accounted for.
- It was suggested that a sub-sample of hagfish would need to be measured prior to freezing, and again once thawed to determine shrinkage rates.
- Research plan data should be collected at a fine spatial scale given the aggregative nature of the common hagfish and its susceptibility to localised depletion.

- The proposed assessment within the research plan was a bSAFE. The SERAG suggested that either an eSAFE or CPUE based assessment was a preferred option, assuming there is sufficient data to support such an analysis.
- Simon Boag noted that the duty of responsibility for the operation and sustainability of the fishery should rest on the proponent and noted that in his view the taking of a significant catch of hagfish with essentially zero biological data was irresponsible

## 4.2 Actions/recommendations for agenda item 4

**Recommendation:** The RAG recommended that a more explicit and thorough research plan be considered at SERAG 2 in November 2020, including:

- existing logbook and observer data to be analysed to determine catch, effort and CPUE trends in the fishery to assist SERAG to provide further advice on the hagfish research plan and to inform a spatial scale to assess changes to stock status over time.
- consideration of the use of an eSAFE or CPUE based assessment, noting hyperstability should be considered in considering the use of CPUE.
- increase in the number of control traps per line to 5-10% to determine the selectivity of the gear. Separate hagfish captured in these traps to be able to quantify the selectivity of the current traps. A power analysis could be used to inform the appropriate percentage. Longer term, additional research should be undertaken into the efficacy of escape hole diameter.
- Explore port sampling and freezing of samples as an alternative to observers measuring live animals onboard a boat. If frozen samples are to be collected, a sub-sample of hagfish will need to be measured prior to on-board freezing and thawed at port to determine a conversion factor that captures the amount of shrinkage that occurs. Observers will still be required for discards and bycatch data.
- Once this conversion factor is estimated, hagfish lengths can be determined at port from frozen samples.
- Catches in research zone 60 should be re-examined as the depth range in this zone does not align with hagfish distribution.
- Advice to be provided concerning the catch allowance per hagfish research zone once additional analyses have been considered.
- The proposed change to the escape hole diameter looks to be justified. Longer term, additional research should be undertaken into discard mortality.
- 
- Logbook data must be at a high resolution given the susceptibility of hagfish to localised depletion.

**Action item 5** - Natalie Couchman (AFMA) to arrange for the analysis of the existing 5 years of hagfish logbook and observer data to help inform the design of the hagfish research plan. To be completed and presented at SERAG 2.

## Agenda item 5: Tier 4 assessments

31. Dr. Miriana Sporcic (CSIRO) provided an overview of the data to be used for the 2020 Tier 4 stock assessments for a number of the SESSF's stocks based on data to 2019. SERAG was asked to provide advice on multiple issues regarding Commonwealth and state catch and discard estimate time series, focusing on obtaining missing state catch data and assumptions about discard estimates for years where data were not available. These discussions are broken down by species below in a series of recommendations and actions.

### 5.1 Actions/recommendations for agenda item 5

**Action item 6** - AFMA and CSIRO to undertake a process of improving and validating historical catch time series to get accurate 'total' catch records for species across all jurisdictions. This will include a process of validating catch time series currently within CSIRO's database which have been constructed from multiple sources (logbooks, CDRs, Neil Klaer spreadsheet), and via the sourcing of additional, verified data from state jurisdictions.

**Action Item 7** - AFMA to facilitate greater cooperation and participation of state fishery representatives in future RAG meetings to improve data sharing and insights into fleet behaviour, gear configurations etc. This may be assisted by discussion at the Fisheries Statistics Working Group (a sub-committee of the Australian Fisheries Managers Forum). This action will occur outside of the 2020 assessment period.

**Recommendation:** Where Dr. Miriana Sporcic (CSIRO) does not receive data or feedback pertaining to recommended changes to revised NSW catch time series (below) by 28 October 2020, the analyses will continue using current data and be presented at SERAG 2. If the accuracy of the state data (e.g., duplication of catch records in the early to mid-1990's) could not be verified by NSW Fisheries by 6 November 2020, state data presented at SERAG 1 would be used in Tier 4 analyses.

#### *Silver trevally*

- Use the mean discard estimate from 1998-2001 to backfill discard estimates, excluding any forward fills.
- Forward fill missing discard data entries in the catch time series from previous years. Include note in table where this has occurred.

#### *Ribaldo*

- CDR records begin in 2005 – the agreed catch history from the previous Tier 4 assessment will be used again in 2020 (catch history B) which is the higher tonnage.
- Use mean discard estimate from 1998-2004 to backfill missing discard estimates.

#### *John Dory*

- Use mean discard estimate from 1998-2006 to backfill discard estimates.
- John Dory was previously assessed as a Tier 3 species and was recommended by SESSFRAG to be assessed as a Tier 4 species in 2020.

- The SESSF Harvest Strategy states that a default reference period of 1986-1995, and a depletion of 48%B<sub>0</sub>, should be applied unless the fishery was not fully developed in 1986.
- The RAG noted there were large NSW catches prior to 1986, but the status of the stock is not known.
- Given uncertainties in historical catch and application of the reference period, the RAG recommended not applying a Tier 4 analyses to John Dory in support of an RBC for 2021-22.
- As such, the RAG acknowledged that a weight of evidence approach would likely be required to set the TAC for 2021-22.
- AFMA/CSIRO to determine the Tier 4 reference period over the next year. It is suggested that a weight of evidence approach be used to assess the John Dory stock.

**Action Item 8** – Dr. Geoffrey Liggins (NSW DPI) to provide Dr. Miriana Sporcic (CSIRO) with historical John dory catch from NSW with an emphasis on reconciling discrepancies in 1994-1996 catches in time for SERAG 2.

**Action Item 9** - AFMA and CSIRO to establish an approach for determining a reference period for the John dory Tier 4 assessment, with a particular focus on early state catches and the likely stock status for the selected reference period. To be completed for the SESSF 2021 Data meeting and outcomes reported back to SERAG in 2021.

#### *Mirror dory East*

- Use mean discard estimates from years where data exists to backfill discard estimates.
- The same average discard estimates will also be used to forward fill any missing years.
- This decision was made given the variability in historical discard estimates – using a single year estimate to predict the next years' discard estimate is not appropriate.

**Action Item 10** – Dr. Miriana Sporcic (CSIRO) to explore if the discrepancy in mirror dory west historical catch time series between logbook and CDR data is also present in mirror dory east in time for SERAG 2.

#### *Mirror dory west*

- Use CDR catch time series for mirror dory west as these were considered more accurate than logbook catch records by the RAG.

#### *Ocean perch offshore*

- Use zone 10 and zone 20 CPUE time series.
- Use the mean discard estimate from years where data exists to backfill discard estimate estimates (i.e. exclude any years that have been forward filled).
- The ocean perch basket TAC will be informed by the outcomes of the Tier 4 offshore ocean perch assessment.

### *Oreo mixed*

- Spikey oreodory (quota species) are possibly being reported as oxeye oreodory (non-quota) in logbooks. For the purpose of the Tier 4 assessment, logbook records of oxeye are assumed to be spikey oreodory.
- Discard estimate estimates for oxeye oreodory are based on observer data. It is unlikely there are species ID issues with observers – these estimates will not be used in the Tier 4 assessment.
- Use mean discard estimate from years where data exists to backfill discard estimates.

**Action Item 11** - Daniel Corrie (AFMA) and Simon Boag to engage with industry regarding identification issues between oxeye and spikey oreo to improve logbook records.

### *Royal red prawn*

- Bathymetry data was used to modify logbook recorded catch at depth information for the CPUE standardisation.
- The modified catch at depth data still appears to be too shallow. There were minimal differences between the modified-depth standardized CPUE compared with the unmodified-depth standardized CPUE
- Use mean discard estimate from years where data exists to backfill discard estimates.

**Action Item 12** – Dr. Geoffrey Liggins (NSW DPI) to provide Dr. Miriana Sporcic (CSIRO) with NSW state catch data for royal red prawn pre-1993 in time for SERAG 2.

### *Blue-eye trevalla*

- Tasmanian catch of blue-eye trevalla from 2016 onwards is not available. The current protocol is to forward fill from the last year where data is available. However, the most recent catch recorded in 2015 appears to be inconsistently high. The RAG therefore recommended contacting the Department of Primary Industries, Parks, Water and Environment (DPIPWE) to update the catch data (Action Item 14).
- In the absence of data from DPIPWE, zero catch from 2015 onwards will be used. This was agreed because the most recent catch record in 2015 was a potential outlier and deemed spurious to use to forward fill.
- The CPUE time series uses data from zone 20-50, but catch from zone 10 and the GAB are included in  $C_{\text{targ}}$ . This is consistent with the previous blue-eye trevalla Tier 4 analyses.

**Action Item 13** – CSIRO to contact DPIPWE TAS to provide blue-eye trevalla catches from 2015 onwards in time for SERAG 2. DPIPWE will clarify the 2015 Tas catch estimate. In the absence of clarification from DPIPWE, by 6 November 2020, a zero catch will be used instead.

**Action Item 14** – Dr. Geoffrey Liggins (NSW DPI) to provide NSW 1992-1993 blue-eye trevalla catch to Dr. Miriana Sporcic (CSIRO) by SERAG 2.



## Agenda item 6: Smooth oreo (other) TAC recommendation

32. Daniel Corrie (AFMA) introduced agenda item 6 and provided background on the item. The intent of agenda item 6 was to provide SERAG with an overview of the 2020-21 TAC setting process for smooth oreo (other) and to seek a TAC recommendation for the 2021-22 SESSF fishing season.

### 6.1 General discussion

33. The RAG discussed the following:

- Catch of smooth oreo (other) has increased in recent years as the TAC and targeting of eastern and Pedra Branca orange roughy stocks has also increased.
- 85-90% of the smooth oreo (other) TAC has been caught over the last two fishing seasons. Smooth oreo (other) has the potential to become a choke species for orange roughy.
- In 2019, SERAG recommended a TAC of 90 t for the 2020-21 fishing season. The TAC had been set at this level based on the outputs of a Tier 5 stock assessment by Dr. Malcolm Haddon.
- The South East Management Advisory Committee (SEMAC) recommended an increased TAC of 135 t for the 2020-21 fishing season which was a proportional increase in line with the increased TAC for eastern and Pedra Branca orange roughy.
- As a precaution, SEMAC also set a 70 t trigger for smooth (other) oreo with a view to holding an out of session SERAG meeting to determine whether the full TAC could be caught.
- The RAG discussed the relative risk of depletion to the stock from an increase in TAC given the stocks productivity and the outcomes of the most recent Tier 5 stock assessment, which ran several different catch projection scenarios.
- Given concerns around the robustness of Tier 5 and potential violation of assumptions, an ERA was also undertaken which assessed smooth oreo (other) as low risk.
- The RAG noted that although only 15% of the TAC had been caught this season, most of the catch occurs late in the season.

### 6.2 Actions/recommendations for agenda item 6

**Recommendation:** No new information was available to the RAG to change its previous advice at SERAG #1 2019. The RAG recommended a TAC of 90t for Oreo (smooth other) for the 2021-22 fishing season.

**Action Item 15** - AFMA to hire contractor to undertake a risk assessment to explore the risk associated with increasing the smooth oreo (other) TAC to 135 t. This will occur outside of the 2020 assessment period.

## Agenda item 7: Tier 1 eastern redfish

34. Dr. Pia Bessell-Browne (CSIRO) presented the paper “Redfish (*Centroberyx affinis*) stock assessment based on data up to 2019 – development of a preliminary base case.” (the Stock Assessment).
35. The intent of this paper was to present an updated Tier 1 stock assessment including bridging the addition of new and updated data into the base case and presentation of an alternative base case for eastern redfish. The base case, that maintained the agreed model structure from the 2017 assessment, was presented, including updated catch, discard, CPUE and biological data. This model has two selectivity patterns to account for differences in the length distributions of fish sampled in NSW and the eastern Bass Strait.
36. An alternative base case was also presented. This model was split into two regions, NSW (zone 10) and Eastern Bass Strait (EBASS, zones 20 and 30). The model had one selectivity pattern common to both regions, but with separate retention functions for each region. This change in the model structure resolved the problem of fitting to different length structures from port sampling between NSW and EBASS. The model had improved fits to data with less uncertainty around spawning stock biomass estimates.
37. The base case estimated the eastern redfish spawning stock biomass to be at 7.30 per cent of virgin biomass at the start of 2021. The estimate of spawning stock biomass in 2017 from the previous assessment was 7.72 per cent.
38. Simon Boag noted there was little information to provide regarding the industry update given the depletion of the stock, low catches and effort by the fleet to avoid catching redfish.

### 7.1 Stock assessment 2020

- Used input information from Zones 10-30.
- Fixed natural mortality (M) at 0.1. This value fell outside the 95% confidence intervals of the likelihood profile for M.
- Two model structures were presented, the base case from the 2017 assessment and a two region model. See points 35 and 36 above for model details.
- Bridging analysis included:
  - Updated version of Stock Synthesis software.
  - Use of new/improved protocols from Stock Synthesis.
  - Updated input data including catch, CPUE, discard, length frequencies and conditional age-at-length data. Recruitment deviations were also estimated for an additional three years
- This bridging led to changes in estimated recruitment deviations, but with minimal change to the spawning stock biomass trajectory in comparison with the previous assessment results.
- The latest year of data included in the assessment was 2019, with recruitment estimated to 2015.
- Updated standardised CPUE had the greatest influence on spawning stock biomass out of all the data updates.

- Recruitment deviation estimates were revised downwards .
- As a result, recruitment deviations have been below average since 2000.
- Dr. Pia Bessell-Browne (CSIRO) noted a retrospective pattern in recruitment ,where the most recently estimated recruitments (the last 2-3 years of estimated recruitments) are typically revised down as additional years of data are added to the assessment, suggesting a potential structural problem with the model.. This retrospective pattern in recruitment was not apparent in the two region model.
- The estimated discard proportions, used as inputs to this model, appear to be qualitatively different before and after 2013, potentially suggesting a change to discarding practices – it is unclear what may be driving this change. It was suggested that incorporating a time block on discarding may improve model fits, allowing for a change in the model estimated discarding practices after 2013. Identifying a mechanism to explain why or how discarding practices had changed after 2013 would be preferable from a modelling perspective, if this is to be incorporated in the base case.
- Likelihood profiles on M were informative and indicated that M could be estimated. The current fixed value for M of 0.1 was outside the 95% confidence intervals, suggesting a lower value was more appropriate.

## 7.2 General discussion

39. SERAG noted their concern that there is no evidence of recovery present for redfish. The RAG discussed potential reasons for this including:
- There may be climate change related impacts leading to poor recruitment conditions or reduced productivity.
  - The current level of catch and discarding appears to be exerting enough pressure on the stock to slow recovery.
  - A lack of targeting by the fishery means there may be challenges reliably estimating stock status and detecting recovery of the population.
  - Possible depensation due to low abundance.
40. The RAG also discussed how to account for the consistent trend of poor recruitment, what may be driving this, and how to consider this in the stock assessment. The RAG suggested running low recruitment scenarios.
41. Dr. Geoffrey Liggins (NSW DPI) suggested that NSW had historical catch data for redfish that would help inform early years of the catch time series.
42. Post meeting note\*: James Woodhams (ABARES) noted that the updated HSP now requires consideration of rebuilding in relation to TMIN (minimum time to reach the LRP in absence of fishing – pg 14 of Harvest Strategy Policy; pg 30-33 of Harvest Strategy Policy Guidelines). The current Rebuilding Strategy runs to 2021. If this will be the last investment in an assessment before a review of the Rebuilding Strategy is required, it may be prudent to undertake projections to support a new/updated Rebuilding Strategy.

## 7.3 Actions/recommendations for agenda item 7

**Recommendation:** SERAG supports CSIRO in proceeding with the two region preliminary alternative base case redfish stock assessment. This preliminary alternative base case reduces uncertainty, addresses selectivity issues, and remediates the retrospective pattern in recruitment (repeated downward revision of the most recent recruitment estimates as more data is added) from the original base case. Scenarios to be explored for SERAG 2 include:

- Alternative base case (two regions: NSW and EBASS, M estimated, single selectivity across regions with different retention function for each region).
- Alternative base case + catch projections of 50, 100 and 150 t.
- Alternative base case + catch projections of 50, 100 and 150 t – including low recruitment scenarios for recruitment from 2016 onwards (average of recruitment deviations over last 5 and 10 years).
- Alternative base case with additional discard time block from 2013-2019 as a sensitivity (no projections) (if time allows).
- If problems with the preliminary alternative base case arise: present the original base case – single region, separate selectivity for port and onboard, M fixed at 0.1.

**Action item 16** - CSIRO to provide Dr. Geoffrey Liggins (NSW DPI) with historical redfish catch data to allow for confirmation and cross-checking with NSW DPI records – results to be provided to Dr. Bessel-Browne and Dr. Geoff Tuck (CSIRO) prior to SERAG 2.

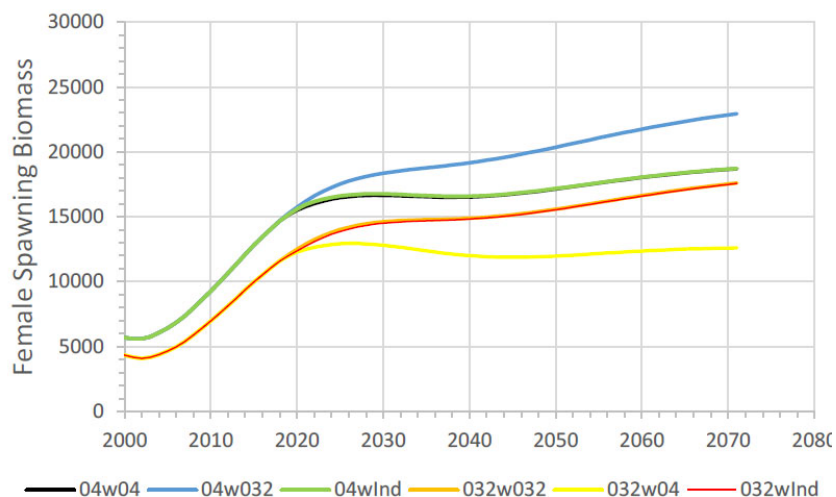
## Agenda item 8: Orange roughy (eastern) TAC recommendation

43. The purpose of this agenda item was for AFMA to seek a recommendation from SERAG on setting the Recommended Biological Catch (RBC) for the 2021-22 fishing season for eastern and Pedra Branca orange roughy stocks.
44. The TAC for the 2020-21 fishing season was 1375t. This agenda item discussed outcomes from the most recent stock assessment in 2017 and how the outputs could be used to inform the RBC for 2021-22 season, noting this will be the fourth year of what was initially a three-year Multi-year TAC (MYTAC)
45. Dr. Malcolm Haddon, the author of the 2017 eastern orange roughy stock assessment was an invited participant for this agenda item.

### 8.1 Current stock status

- The last stock assessment was undertaken in 2017 and estimated the female spawning stock biomass to be 34 per cent of virgin spawning stock biomass. A lower productivity model was also considered, which estimated the female spawning stock biomass to be 30 per cent of virgin spawning stock biomass.
- There is substantial uncertainty in spawning stock biomass based on assumptions around the productivity of eastern orange roughy and the estimate of natural mortality (M) used.

- Recent acoustic surveys have estimated an increase in abundance, which supports the estimated increase in abundance over the same timeframe from the Tier 1 stock assessment.
- Catches over the first two years of the three-year MYTAC were approximately 1500 t in total, 1200 t less than the combined (summed) annual RBCs from the base case assessment. i.e. the combine two-year RBC was approximately 2700 t.
- The RAG noted that there is increasing uncertainty in the spawning stock biomass estimate of orange roughly given the time elapsed (three years) since the last stock assessment and therefore need to be precautionary in their advice.
- A cross-catch risk analysis undertaken in November 2018 estimated that, even under the lower productivity model ( $M=0.032$ ), catches from the more productive model (with higher resultant catches;  $M=0.04$ ) were not expected to cause the stock to decline during the period of the current MYTAC (Fig. 1; 032w04).
- Given the life history characteristics of orange roughly, the recent positive trends in CPUE and acoustic survey data, and the persistent under-catching of TACs, SERAG noted there would be little risk to the sustainability of the stock if the 2020-21 TAC were rolled over for the 2021-22 season.



**Figure 1 Female spawning biomass (t) for eastern orange roughly under various productivity and catch scenarios. The yellow line represents the expected biomass where the lower productivity model is assumed, and catches from the higher productivity model are caught.**

## 8.2 Natural mortality

46. SERAG discussed the uncertainty surrounding the value of  $M$  used in the most recent stock assessment, and other assessments more broadly, and what value or values to use for  $M$  in the stock assessment to be conducted in 2021.
47. A range of potential techniques for setting a fixed value for  $M$  were discussed including:
  - Using a fixed value of  $M=0.04$  which is informed from analyses undertaken on New Zealand's orange roughly stocks. The RAG noted that estimates should preferably be based on information from Australia's stocks given differences in the productivity of Australia's waters compared to other nations.

- Allowing the stock assessment model to estimate of M within the model, and consider uncertainty in its estimation using likelihood profiles.
  - Use of a prior on M.
48. Use of likelihood profiles in the 2017 stock assessment produced a range of M values from 0.023-0.07 (95%CI).
49. Biomass estimates and consequent RBCs were sensitive to changes in M.
50. Dr. Andre Punt (CSIRO) provided a paper outlining a potential method for choosing a value of M in future stock assessments. This process involves:
- Use of a prior on M.
  - Calculate likelihood profile.
  - Construct a decision table with different values of M and catch to weigh up management options.
  - Estimate M.
51. It was noted by the RAG that the approach undertaken in the 2017 stock assessment was similar to that recommended by Dr. Andre Punt (CSIRO) and therefore the value of M=0.032 (and other sensitivities) should be considered.
52. In a subsequent email, Dr. Malcolm Haddon also elaborated on a process that could be undertaken to assess risk associated with the use of different values of M. This process involved:
- Use a fixed estimate of M of ~0.04 or 0.036 or similar in the updated stock assessment.
  - Conduct a likelihood profile to determine the M value indicated by the assessment as providing the lowest productivity (ideally where the initial assessment M lies away from the edge of this new likelihood profile).
  - Use the M that generates the lowest productivity to run projections.
  - Project catches forward under a range of different M values for ~20 years.
  - Select the largest value of M that avoids the decline in spawning biomass that has been apparent in previous cross-catch risk examinations.

### 8.3 TAC setting process

53. Eastern orange roughy has now extended beyond the three-year MYTAC period with the next stock assessment scheduled for 2021.
54. The RAG noted that the assessment should not be deferred beyond 2021.
55. The SESSF Harvest Strategy does not provide guidance on how to set TACs when a MYTAC period is exceeded.
56. The RAG discussed this lack of guidance and the implications for providing TAC advice for eastern orange roughy, and for other species going forward.
57. The RAG noted that as time between stock assessments increases, so too does the uncertainty in an estimate of a stock's biomass and the risk of depletion.
58. A precautionary approach should be considered, and potentially the application of some form of buffer or discount factor – as applied in other AFMA managed fisheries like the Small Pelagic Fishery.

59. The RAG suggested that a procedure be formalised in the TAC setting process document that captures this scenario where the MYTAC period has expired.
60. However, it was noted that the sustainability risk will be species-specific, and noted the sustainability risk is likely acceptable for orange roughy given the life history characteristics of the species, and because the TAC was undercaught in 2018 and 2019.

#### 8.4 Over and under-catching of TAC

61. The RAG noted that in 2020/21 E ORS has 100% under and 10% over catch provisions. This means that:
- up to 100% of an individual quota holder's quota can be carried into the following year if it is uncaught (under-catch).
  - Up to 10% of individual quota holder's quota in the following year can be carried into the current year (over-catch).
  - Daniel Corrie (AFMA) confirmed that this was the case but could only be done for a single year, i.e. neither under nor over-catch can accumulate for more than a single year.
62. The RAG discussed the implications of this in terms of risks of stock depletion and calculating/setting TACs.

#### 8.5 Actions/recommendations for agenda item 8

**Recommendation:** In the absence of new information, and noting the increasing uncertainty with the time since the last assessment, the RAG recommended applying the RBC from the 2017 assessment (1375 t) for eastern orange roughy for the 2021-22 fishing season (one year only). As has been the case in previous years, 93 per cent will be apportioned to the eastern stock, and 7 per cent to the Pedra Branca area of the Southern Zone.

- The RAG noted the need to reach agreement on how to determine M for the 2021 stock assessment. The RAG expressed its concern about continued deferment of the stock assessment, however noted the RBC has been under-caught in recent years and acoustic surveys suggest increasing abundance.
- The RAG therefore judged that the sustainability risk to the stock for an additional year at this catch level was acceptable.

**Action Item 17** - AFMA to consider updating the SESSF Harvest Strategy to provide a process for setting TACs when a species is no longer within the MYTAC period and a new assessment has not been completed. To be undertaken in time for SERAG 2021.

**Action Item 18** – Dr. Paul Burch, Dr. Geoff Tuck, Dr. Andre Punt, Dr. Malcolm Haddon and Nicholas Hill to produce a document that outlines a robust process (or range of potential processes) that account for uncertainty in natural mortality for the 2021 eastern orange roughy stock assessment. This work is to be presented at SERAG 2.

**Action Item 19** - Lead stock assessor (Dr. Paul Burch, CSIRO) to develop a steering committee that will meet as required to help inform/guide the development of the 2021 eastern orange roughy stock assessment. Members: Daniel Corrie, Dan Hogan, Dr. Mike Steer, Dr. Geoff Tuck, Dr. Paul Burch, one independent scientific rep (Dr. Ian Knuckey and/or Dr. Andrew Penney), Dr. Andre Punt.

## Agenda item 9 – Western orange roughy research plan

63. Daniel Corrie (AFMA) presented the paper titled “Western orange roughy research plan”. The intent of this agenda item was to seek SERAG advice on a western orange roughy Research Catch Allowance (RCA) and any changes to the program required for the 2021-22 SESSF fishing season.
64. AFMA are also seeking advice regarding the minimum data requirements, including timeframes expected to provide a signal of stock status to assist the Commission with setting the RCA for the 2021-22 SESSF fishing season.
65. Daniel Corrie (AFMA) presented data from the research plan in 2020. The RAG discussed the outcomes of this data and the implications for the research plan going forward along with recommending an RCA for the 2021-22 SESSF fishing season.
66. AFMA requested recommendations from the RAG across four points for this agenda item:
1. Spatial and temporal coverage - Is the collection of biological samples and catch and effort spread across a sufficient spatial and temporal scale?
  2. Can the scientific permits be allocated for the period 1 August 2021 to 31 January 2022 without undermining the data collected in 2020?
  3. Does the 200t RCA and 100t trigger for each sampling area remain appropriate for the 2021-22 SESSF season?
  4. With reference to question (1) above, what are the possible minimum data requirements (samples and iterations) expected to provide a signal of stock status, including the likely timeframes?
67. The report – Statistical CPUE Standardisations for Western Zone Orange Roughy (1989 - 2006) – was provided to support this advice.

### 9.1 Outcomes of 2020 data collection

- Sampling targets under the western orange roughy research plan were successfully met in 2020 with over 3,000 length (only) samples collected and 2,816 otoliths (and length) for ageing spread across the three zones.
- Approximately 132 t of orange roughy was caught across the three zones (at the time of the meeting and this is expected to increase), with most fishing and sampling occurring in the Northern sampling area. The RCA of 200 t is unlikely to be caught as the scientific permits end on 31 October 2020.
- Sampling was focused on a two-month period at the start of the season given uncertainties of sales and operations brought about by COVID-19.



- AFMA observers were only able to participate in two trips given COVID-19 safety concerns. Observers were present for 5% of shots and 11% of orange roughy caught.
- There was a total of 210 shots across the season, with data collected from 126 shots.

## 9.2 General discussion

68. SERAG noted the following:

- The research plan design is broadly endorsed and adequate, but given the long-lived nature of orange roughy, it will take multiple years before the data can be used to provide informed advice about the recovery of western orange roughy.
- Ideally data collection should be spread throughout the duration of the fishing season to collect more temporally representative data.
- The current otolith and length sampling targets should be maintained, with an emphasis on ensuring otolith targets are successfully met again.
- Permits are able to be allocated for the period 1 August 2021 to 31 January 2022 without undermining the data collected in 2020.

69. RAG discussed the difficulties and uncertainties associated with providing clear advice on how long it will take to determine the status of western orange roughy and whether or not it has recovered.

70. The RAG broadly recommended that it will annually review data collected under the research plan and update their advice on this basis.

71. The RAG noted that this is an ad-hoc and limited approach. It identified the need for a more formalised process or set of indicators/benchmarks that would inform the RAG of when enough data had been collected, or when a stock could be confidently assessed.

72. The RAG noted the good work of the program in achieving all targets.

## 9.3 Actions/recommendations for agenda item 9

**Recommendation:** The RAG supported continuing the western orange roughy research plan for the 2021-22 season with no change to the research catch allowance (200 t) and catch triggers for each sampling area (100 t). The RAG supported the request to shift the scientific permit period to August 2020 – January 2021.

**Action Item 20** - AFMA to update the western orange roughy research plan to include guidance on how the data collected under the program can be used to inform future management decisions – include likely timeframes and metrics.

## Agenda item 10 - Smooth Oreo cascade TAC advice

73. The intent of this agenda item was for AFMA to seek recommendations from SERAG on the TACs and catch triggers for the 2021-22 SESSF fishing season for the following stocks:

- Smooth oreo (Cascade) – TAC .

- Boarfish (East Coast Deepwater Trawl Sector) (ECDWT) - catch trigger.
- Orange roughy (ECDWT) – incidental catch trigger.

74. Daniel Corrie presented an overview of recent catches and previous TACs set for each of the stocks above.

## 10.1 General discussion

- The Tier 4 for the smooth oreo (cascade) has not been updated since 2010 due to a lack of catch and effort. This assessment estimated the stock to be above the target reference point.
- The 2019-20 TAC for smooth oreo (Cascade) was 150 t with a 10t review trigger.
- There has been very little catch recorded for smooth oreo (Cascade) since 2015-16.
- As of 14 October 2020, 6.3t of smooth oreo (Cascade) have been landed as part of targeted orange roughy fishing.
- Boarfish catches in the ECDWT have been below 100 kg for the past two fishing seasons.
- No orange roughy catch has been reported since 2003-04 for the ECDWT.
- The RAG noted that a lack of new information limited their ability to update/amend previous recommendations.
- Given the lack of catches, the RAG recommended a continuation of previous TACs and catch triggers.

## 10.2 Actions/recommendations for agenda item 10

**Recommendation:** In the absence of new information, the RAG recommended the following for the 2021-22 SESSF season:

- 150 t TAC for smooth oreo (Cascade).
- 50 t catch trigger for boarfish and 200 t incidental catch trigger for orange roughy in the ECDWT.

# Attachment A: Declaration of Conflicts of interest

Member	Declaration
<p>Dr Michael Steer  (Chairperson)</p>	<p>A/Research Director SARDI Aquatic Sciences Chair of SERAG Member of SEMAC Member of SESSFRAG No pecuniary interest in the SESSF..</p>
<p>Dr Sarah Jennings</p>	<p>Economics member on SESSFRAG. Economics member on SEMAC. Economics member on SERAG. Economics coordinator, FRDC Human Dimensions Research Subprogram. Member of AFMA Economics Working Group. Adjunct Senior Researcher, TSBE, University of Tasmania. Casual employee, IMAS, University of Tasmania Independent economics consultant. No pecuniary or other interest.</p>
<p>Mr Daniel Corrie</p>	<p>Employed by AFMA. Manager of Southern Trawl, Scallop and Squid Fisheries. No pecuniary or other interest in the SESSF.</p>
<p>Dr Geoff Tuck</p>	<p>CSIRO. Involved in stock assessments. Interest in obtaining funding for future research. Principal investigator on SESSF stock assessment project.</p>
<p>Mr Andrew Penney</p>	<p>Director of Pisces Australis Pty Ltd, an Australian registered marine/coastal research and management consultancy based in Canberra - interests in any opportunities in this regard.</p> <p>Currently Principal Investigator on FRDC Projects Nos 2017-180: Design and implementation of an Australian National Bycatch Report: Phase 1 – Scoping; and 2019-036: Implementation of dynamic reference points and harvest strategies to account for environmentally-driven changes in productivity in Australian fisheries.</p> <p>Independent scientific member on the AFMA Southeast RAG, the Tropical Rock Lobster RAG and the Small Pelagic Fishery RAG. Member of the AFMA ERA Technical Working Group.</p> <p>Deputy Scientific Member on the New South Wales Fisheries Total Allowable Fishing Committee Sep 2020 to Sep 2023.</p> <p>No shareholding and hold no positions relating to any other companies, including any fishing companies or industry associations.</p>
<p>Dr Ian Knuckey</p>	<p><b>Positions:</b></p> <p>Director – Fishwell Consulting Pty Ltd Director – Olrac Australia (Electronic logbooks) Deputy Chair – Victorian Marine and Coastal Council Chair – Northern Prawn Fishery Resource Assessment Group</p>

	<p>Chair – Tropical Rock Lobster Resource Assessment Group</p> <p>Chair – Victorian Rock Lobster and Giant Crab Assessment Group</p> <p>Chair – Victorian Central Zone Abalone Fisheries Resource Advisory Group</p> <p>Chair – Gulf of St Vincent’s Prawn Fishery MAC Research Scientific Committee</p> <p>Scientific Member – Northern Prawn Management Advisory Committee</p> <p>Scientific Member – SESSF Shark Resource Assessment Group</p> <p>Scientific Member – SESSF Great Australian Bight Resource Assessment Group</p> <p>Scientific Member – Gulf of St Vincent’s Prawn Fishery Management Advisory Committee</p> <p>Scientific Member – Tropical Tuna Resource Assessment Group</p> <p>Scientific Member – SESSF Resource Assessment Group</p> <p><b>Current projects:</b></p> <p>FRDC 2019-027 Improving and promoting fish-trawl selectivity in the SESSF and GABTS</p> <p>FRDC 2019-072 A survey to detect change in Danish Seine catch rates of Flathead and School Whiting resulting from CGG seismic exploration.</p> <p>FRDC 2019-129 Potential transition of shark gillnet boats to longline fishing in Bass Strait - ecological, cross-sectoral, and economic implications</p> <p>FRDC 2017-069 Indigenous Capacity Building</p> <p>FRDC 2016-116 5-year RD&amp;E Plan for NT fisheries and aquaculture</p> <p>FRDC 2018-021 Development and evaluation of SESSF multi-species harvest strategies</p> <p>FRDC 2017-014 Informing structural reform of South Australia's Marine Scalefish Fishery</p> <p>AFMA 2020/0807 Bass Strait Scallop Fishery Survey – 2020-22</p> <p>Traffic Project Shark Product Traceability</p> <p>NT Fisheries Design and implementation of a tropical snapper trawl survey</p> <p>Sea Cucumber Ass. Design and implementation of a sea cucumber dive survey Information to support non-detrimental finding of fisheries for Black Teatfish and White Teatfish</p> <p>Australia Bay Information to support Wildlife Trade Operation for the Queensland Gulf of Carpentaria Developmental Fin Fish Trawl Fishery</p> <p>Tas. Abalone Scientific Advisor for Tasmanian Abalone Council Ltd</p> <p>PEMSEA Developing EAFM Plan of Red Snapper for Arafura and Timor Seas Region</p>
Mr James Woodhams	ABARES. No current interest pecuniary or otherwise. Any potential future interest in research funding will be declared as necessary.

Mr Ross Winstanley	No pecuniary interest in SSSF however declares he has a brother-in-law that holds a Victorian Inshore Trawl Licence.
Mr Daniel Hogan	Owner operator of trawler Zeehaan out of Portland, Vic. Commonwealth Trawl Sector boat and quota SFR holder.
Mr John Jarvis	Commonwealth Trawl Sector boat and quota SFR holder. Member of SETFIA. Worked with NSW Primary Industry Minister for Comfish.
Mr Simon Boag	Runs a fisheries consulting firm Atlantis Fisheries Consulting Group. Clients include associations such as SETFIA, SSIA, SPFIA, BSSIA but also other private clients.  SSIA was engaged by AFMA to collect biological data in the shark fishery.  SETFIA and SSIA operate co-management agreements with AFMA.  Non-beneficiary Director of two fishing companies in the SSSF one of which is a significant quota owner.  Industry member on SERAG and SEMAC.  Member (Chair) of Seine and Trawl Advisory Group (STAG).
EO Ms Mardi Albert	Employed by AFMA. Executive Officer of SERAG. No interest in SSSF, pecuniary or otherwise.
<b>Invited Participant</b>	<b>Declaration</b>
Dr Robin Thomson	CSIRO, assessment scientist. Acquiring funding for research purposes. Principal Investigator for close kin project for school shark. PI on close kin scoping study for blue-eye trevalla.
Dr Miriana Sporcic	CSIRO, Assessment scientist. Acquiring funding for research purposes.
Dr Jemery Day	CSIRO, Assessment scientist. Acquiring funding for research purposes. PI – SSSF species stock structure review. Scientific member on Sub-Antarctic Resource Assessment Group (SARAG). Interests in promoting good science.
Dr Paul Burch	CSIRO, assessment scientist. Principal Investigator for data services project. CSIRO representative at the Fisheries Statistics and Information Working Group (a sub-committee of the Australian Fisheries Management Forum). Acquiring funding for research purposes.
Dr Pia Bessell-Browne	CSIRO. Assessment scientist. Acquiring funding for research purposes

Dr Geoff Liggins	NSW DPI, Fisheries scientist. Involvement in NSW resource assessments. Potential interest in the acquisition of funding for research/assessment purposes concerning cross-jurisdictional stocks.
Dr Ashley Fowler	NSW DPI, Fisheries scientist. Involvement in NSW resource assessments. Potential interest in the acquisition of funding for research/assessment purposes concerning cross-jurisdictional stocks.
Dr Karina Hall	NSW DPI, Fisheries scientist. Involvement in NSW resource assessments. Potential interest in the acquisition of funding for research/assessment purposes concerning cross-jurisdictional stocks.
Mr Nick Hill	IMAS UTAS/CSIRO, Fisheries scientist. Potential interest in the acquisition of funding for research/assessment purposes concerning cross-jurisdictional stocks.

# Attachment B: SERAG #1 2020 meeting agenda

## Draft AGENDA

Day 1: Monday 19 October 2020

Time: 9am to 4.30pm

Chair: Dr Michael Steer

Time	Item	Presenter
09:00	<b>Agenda item 1. Preliminaries</b> Acknowledgement of country, introductions and apologies Meeting logistics Declarations of interest Adoption of agenda Action items review	Chair (45 mins)
09:45	<b>Agenda item 2. Data reports</b> Discards and Catch reports ISMP Discards report	Paul Burch (1 hours)
10:45	<i>15 min break</i>	
11:00	<b>Agenda item 3. Tier 1 school whiting</b> Industry update Chair update: recommendations from Tony Smith's review Overview of recent data Preliminary base case presentation Discussion including accounting for seismic impacts	Jemery Day (3 hours)
14:00	<i>LUNCH – 30 min break</i>	
14:30	<b>Agenda item 4. Hagfish research plan</b> Presentation Discussion Decision  <i>(10 min break during afternoon when convenient)</i>	Max Bayly (2 hours)
16:30	<i>End of Day 1</i>	

## Day 2: Tuesday 20 October 2020

Time: 9am to 4.30pm

Chair: Dr Michael Steer

Time	Item	Presenter
09:00	<b>Agenda item 5. Tier 4 assessments</b>  Overview of recent data Discussion  Species: john dory, mirror dory, ocean perch, mixed oreo basket, ribaldo, silver trevally, royal red prawn, blue eye trevala (slope)	Miriana Sporcic (4 hours)
10:30	<i>15 min break</i>	
10:45	<b>Tier 4 assessments continued</b>	
13:15	LUNCH – 30 min break	
13:45	<b>Agenda item 6. Oreo (smooth other)</b>  Review catch and effort data Review SEMAC advice TAC recommendation/advice	Miriana Sporcic (45 mins)
14:30	<b>Agenda item 7. Tier 1 eastern redfish</b>  Industry update Overview of recent data Preliminary base case presentation Discussion  <i>(10 min break during afternoon when convenient)</i>	Geoff Tuck Pia Bessell-Browne (2 hours)
16:30	<i>End of day 2</i>	



**Day 3: Wednesday 21 October**

**2020 Time: 9am to 3.15pm**

**Chair: Dr Michael Steer**

<b>Time</b>	<b>Item</b>	<b>Presenter</b>
09:00	<b>Agenda item 8. Orange roughy (eastern)</b> Overview of 2019 catch data MYTAC advice Discussion about determining natural mortality	Dan Corrie (3.5 hours)
10:30	<i>15 min break</i>	
10:45	<b>Orange roughy - continued</b>	
12:45	LUNCH – 30 min break	
13:15	<b>Agenda item 9. Western orange roughy research pan</b> Progress update and preliminary results Research catch allowance recommendation Discussion re minimum data for stock status signal (request for advice from the Commission)	Simon Boag Dan Corrie (1 hour)
14:15	<b>Agenda item 10. TAC Advice</b> Oreo smooth cascade ECDWT: boarfish and orange roughy (triggers)	Dan Corrie (30 mins)
14:45	<b>Other business and summarise action items</b>	Chair (30 mins)
15:15	<i>Close of meeting</i>	

## Attachment C: 2020 SERAG #1 meeting action item review

Complete/Redundant	Underway	Yet to start	Need further advice
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Table 1. Progress of action items from previous meetings

	Meeting & agenda item ref	No.	Description	Responsibility	Timeframe	Status update after SERAG #2 (2019)
	2019.12 Agenda item 2	1	AFMA and Simon Boag to investigate with industry to identify 'soft skinned shark' that is caught inside 300 metres, including species ID and whether it is part of the deepwater shark quota basket. If not part of the quota basket, then AFMA to ensure industry are not incorrectly recording it as part of the deepwater shark quota species in CDRs.	AFMA and Simon Boag	ASAP	AFMA and SETFIA are yet to confirm the species ID for 'soft skinned shark'. CSIRO will provide an overview of deepwater shark data to SERAG in November 2020, for the purpose up implementing a Tier 5 assessment in 2021. Currently, catches in water shallower than 300m are not included in the Tier 4, and so clarifying the species ID should not impact the outcomes of the assessment. Regardless, it is an issue for decrementing quota and needs to be resolved.
	2019.12 Agenda item 2	2	For each of the species in the DW shark basket, investigate catch at depth and provide data to Robin Thomson, including the CAAB codes for each species.	AFMA	Before the AFMA/CSIRO pre data transfer meeting (March 2020 TBC)	Data was provided to Robin Thomson in September 2020. This will be discussed at SERAG in November 2020.

	2019.12 Agenda item 2	3	In addition to decision rules being considered by the discard working group, Paul Burch to consider the decision rules regarding application of Commonwealth discard rates to state fisheries catches with a particular focus on different gear types.	Paul Burch	SESSFRAG Chair's meeting	At its August 2020 data meeting, SESSFRAG established a working group to discuss application of Commonwealth discard rates to state gear types. An update can be provided to SERAG once this is resolved.  There will be no change for 2020.
	2019.12 Agenda item 5	4	AFMA, SIDAC program and Robin Thomson to confirm biological sampling targets for hook caught blue eye trevalla, noting SERAG's advice to include the dropline method for blue eye trevalla.	Brodie Macdonald, SIDAC program + Robin Thomson	ASAP (after Robin Thomson's meeting on 4/12/19)	Complete. Targets now included in SESSF Data Plan.
	2019.12 Agenda item 8	5	AFMA to finalise the Hagfish research plan for consideration by SEMAC at its February 2020 meeting. SERAG have requested additional information before the plan is taken to SEMAC, including a thorough analysis of:  (1) the existing scientific literature,  (2) the management arrangements in other jurisdictions, and  (3) the current operator's logbook data from the preceding four years to better understand spatial extent of catches.	AFMA	By SEMAC Feb 2020	This has been scheduled to be presented at SERAG #1 2020. Item can be closed after meeting.

2019.12 Agenda item 2	6	AFMA to summarise results from the eastern school whiting catch projections in a table for the purpose of providing advice to the Commission. Confirm accuracy with Jemery Day.	AFMA	By SEMAC Feb 2020	Completed.
2019.12 Agenda item 3	7	At its first meeting in 2021, SERAG to consider how to fix steepness (h) for Tiger Flathead, in preparation for the 2022 stock assessment.	AFMA	SERAG #1, 2021	Not yet started, will commence in 2021.
2019.12 Agenda item 7	8	AFMA to ensure the revised pre-1998 ISMP dataset is captured into the AFMA database and Dr Koopman's code corrections are stored and the old data rebadged appropriately.	AFMA	SERAG #1, 2020	This has been referred to John Garvey (AFMA) and is in progress. Note that data not included in 2020 transfer to CSIRO.
2019.12 Agenda item 10	9	AFMA to provide advice to SEMAC about the process for transitioning stocks or a species from rebuilding strategies to harvest strategies, once it has been demonstrated they have rebuilt to be above the limit reference point.	AFMA	By SEMAC Feb 2020	This has been added to the Nov 2020 SEMAC agenda.
2019.12 Agenda item 11	10	AFMA to liaise with e-Log providers regarding the inability to change species in the "targeted species" field in the e-Log software.	AFMA	ASAP	This is a software issue, and not one that AFMA has the ability to change. The AFMA data and licencing team have requested that industry engage directly with the relevant e-log provider to address the issue.

	2019.12 Agenda item 9	11	AFMA to investigate and document the original justification for setting incidental TACs for all rebuilding species. This includes documenting the evidence base for showing where the bycatch TACs are currently set or historically set, and providing to the RAG when setting bycatch TACs in future RAG meetings.	AFMA	SERAG #1, 2021	AFMA will provide a response at SERAG in November 2020.
	2019.12 Agenda item 9	12	AFMA to ensure the 60 t by-catch TAC for Western Orange Roughy cannot be utilised in addition to the 200 t research catch allowance allocated under the Western Orange Roughy Research Plan.	AFMA	Before the WORRP is finalised.	Incorporated into the plan and scientific permits. Completed.
	2019.12 <b>RECOMMENDATION</b>		<b>RECOMMENDATION 1</b> SERAG recommends that eastern Orange Roughy is removed from the rebuilding strategy.	AFMA	SERAG #1, 2020	AFMA have been advised by the Department of Agriculture, Water and Environment that the stock must remain in the Strategy for the species across its range to continue to be classified as conservation dependent.

**Table 2. Action items from all previous meetings that are outstanding**

	Meeting & agenda item ref	No.	Description	Responsibility	Timeframe	Status update after SERAG #2 (2019)
	2019.11 (Action items review)	1	Geoff Tuck to provide feedback from CAPAM workshop (Seattle, March 2020) to the SESSFRAG data meeting in August 2020, to inform discussions and the stock assessment for Orange Roughy, including issues around natural mortality and stock recruitment relationships.	Geoff Tuck, CSIRO	By Aug 2020 (SESSFRAG data meeting)	Due to Covid, the workshop has been delayed until March 2021 and will be held online.  An agenda item has been included in the SERAG #1 meeting to discuss natural mortality for orange roughy.
	2019.11 (Action items review)	2	AFMA to ensure that the SiDAC data collection includes total and partial lengths of school and gummy shark including school sharks larger than 160cm, and tissue samples of Blue-eye trevalla for CSIRO's close-kin work and for ageing: (a) Start collecting 20 samples from approximately 20% of the shots, and (b) The SSIA co-management contract needs to be finalised and this action item incorporated into the SiDAC Data Plan.	AFMA (Brodie MacDonald)	As soon as possible	SharkRAG to discuss ongoing collection of this data at their next meeting, scheduled for December 2020. AFMA has had discussions with the SiDaC Program and CSIRO concerning the collection of blue-eye trevalla tissue samples. AFMA is looking to source funding for this work, and notes that operational limitations caused by COVID may delay commencement.
	2019.11 (Action items review)	3	AFMA to schedule in-depth discussion about stock assessments of Deepwater Sharks and how to set an RBC, at SERAG in 2020 in preparation for the 2021 assessment.	AFMA (EO)	By SERAG #1, 2020	This has been scheduled for SERAG #2 agenda. Item can be closed.

	2019.11 Agenda item 3	4	AFMA to investigate logbook records of catches of 'Black Trevally' (also called Black Snotty) from the last 2 years and verify with skippers whether species recorded on CDRs is Blue Warehou. If so, AFMA will correct data records and correct recording practices.	AFMA	By SERAG #2, Dec 2019	AFMA have confirmed the species is blue warehou. The skippers have been informed and will record future catches as blue warehou.  AFMA are yet to update the database – but will close this action item once done.
	2019.11 Agenda item 3	5	CSIRO to investigate Bight Redfish discrepancy (page 5 of Data Summary), between logbooks and CDR catches in 2017, to understand where the discrepancy coming from.	CSIRO, Robin Thomson	By GABRAG, 21 Nov 2019	Error identified as an incorrect entry in logbooks. On 14 June, a vessel recorded a 125 t shot in their logbooks. This was corrected in the 2019 assessment, item completed.
	2019.11 Agenda item 8	6	Dr Sporcic to check whether the latest PSA methodology have incorporated the new way susceptibility is calculated.	CSIRO, Miriana Sporcic	By SERAG #2, Dec 2019	Completed. Dr Sporcic has confirmed the new methodology has been applied in recent ERAs.
	2019.11 Agenda item 10.2	10	AFMA to investigate CDR data for redfish catches in the west - how it is reported as either Bight Redfish or redfish, and correct errors.	AFMA	By SERAG #2, Dec 2019	This has not been resolved. Since 2010, 97% of the catches in the west are recorded as eastern redfish. Observer data could be reviewed to determine if there is a mixing of the species in the western part of the CTS.
	2019.11 Agenda item 10.1 <b>OUTCOME</b>		SERAG recommends a targeting analysis for Blue Warehou is completed as part of the March 2020 package to the Commission, to inform the TAC for the 2020/21 season.			Dr Burch presented a draft targeting and companion species analysis at SERAG #2 (2019), Agenda Item 11. SERAG requested to keep this item open.

						An updated targeting analysis will be provided at SERAG #2, 2020 for all rebuilding species. Check if this item can now be closed.
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2017.11 Agenda item 5	5	Dr Thomson to include NSW recreational catch data in the SESSF catch and discard summary for redfish.	CSIRO	2018 Data Summary.	<p>SESSFRAG considered the availability of recreational catch data for various SESSF species at the August 2020 data meeting. The RAG recommended that CSIRO request recreational catch data from the relevant states as part of the annual request to be included in catch reports. There is also a SESSFRAG action for AFMA to liaise with the states to discuss, amongst other things, which SESSF species are considered important recreational species.</p> <p>AFMA recommend closing off this action item for SERAG and pursuing further work associated with the SESSFRAG action items.</p>
2017.11 Agenda item 6.4	10	AFMA to investigate records of oxeye oreo dory in logbooks and CDRs.		Prior to 2020 assessment.	<p>AFMA understand most of the oxeye oreodory recorded in logbooks and CDRs on the east coast are spikey oreodory.</p> <p>AFMA have contacted operators to ensure they are reporting correctly.</p> <p>How to deal with this in the Tier 4 assessment will be discussed as part of Agenda Item 5 at SERAG #1 2020.</p>



	2018.09 Agenda item 8	6	AFMA/Industry to clarify how observers have recorded discards of Silver Warehou on the factory boats (suggesting it was discarded but covered by quota, so should be in CDR records).	Dan Corrie	ASAP	AFMA have confirmed that all silver warehou are retained and processed as fish meal on the factory boats.  However, a discrepancy remains in the logbooks and CDRs. AFMA are following up.
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Executive Officer  
October 2020

## Attachment E: Summary of actions arising from SERAG 1 (Oct 2020)

ACTION ITEM	Agenda Item Ref	Description	Responsibility	Timeframe
1	1	Daniel Corrie (AFMA) to produce a document outlining the process for a) delisting a conservation dependent species, noting this is not an AFMA process, and b) transitioning a species from management under an approved rebuilding strategy to management under a harvest strategy. To be completed for the next SESSFRAG or SERAG 2021 meeting.	AFMA – Daniel Corrie	By SERAG 2021
2	2	Dr. Paul Burch (CSIRO) to undertake retrospective analysis on discarded catch from 2016-2018 to determine the impact of the discard estimation error where the error resulted in a change of 5% or more in discarded catch. Provide information re if this has impacted management advice and resultant RBCs and quotas before the end of 2020 calendar year to provide context to the 2021-22 TAC setting process.	CSIRO – Paul Burch	By end of 2020
3	2	AFMA to compare logbook discard records of deepwater flathead and bight redfish in the GABT against observer records to determine their accuracy	AFMA	By SERAG 2021
4	3	Daniel Corrie (AFMA) to investigate the possible grading of school whiting catches at some ports which may be influencing the port-based size frequency distributions being input into the stock assessment. To be completed in time for SERAG 2	AFMA – Daniel Corrie	By SERAG 2 (Dec 2020)
5	4	Natalie Couchman (AFMA) to arrange for the analysis of the existing 5 years of hagfish logbook and observer data to help inform the design of the hagfish research plan. To be completed and presented at SERAG 2.	AFMA – Nat Couchman	By SERAG 2 (Dec 2020)
6	5	AFMA and CSIRO to undertake a process of improving and validating historical catch time series to get accurate 'total' catch records for species across all jurisdictions. This will include a process of validating catch time series currently within CSIROs database which have been constructed from multiple sources (logbooks, CDRs, Neil Klaer spreadsheet), and via the sourcing of additional, verified data from state jurisdictions.	AFMA + CSIRO	By June 2021

7	5	AFMA to facilitate greater cooperation and participation of state fishery representatives in future RAG meetings to improve data sharing and insights into fleet behaviour, gear configurations etc. This may be assisted by discussion at the Fisheries Statistics Working Group (a sub-committee of the Australian Fisheries Managers Forum). This action will occur outside of the 2020 assessment period.	AFMA	By SERAG 2021
8	5	Dr. Geoffrey Liggins (NSW DPI) to provide Dr. Miriana Sporcic (CSIRO) with historical John dory catch from NSW with an emphasis on reconciling discrepancies in 1994-1996 catches in time for SERAG 2.	Geoff Liggins	By SERAG 2 (Dec 2020)
9	5	AFMA and CSIRO to establish an approach for determining a reference period for the John dory Tier 4 assessment, with a particular focus on early state catches and the likely stock status for the selected reference period. To be completed for the SESSFRAG 2021 Data meeting and outcomes reported back to SERAG in 2021	AFMA + CSIRO	By SESSFRAG 2021 (data meeting)
10	5	Dr. Miriana Sporcic (CSIRO) to explore if the discrepancy in mirror dory west historical catch time series between logbook and CDR data is also present in mirror dory east in time for SERAG 2.	CSIRO – Miriana Sporcic	By SERAG 2 (Dec 2020)
11	5	Daniel Corrie (AFMA) and Simon Boag to engage with industry regarding identification issues between oxeye and spikey oreo to improve logbook records	Dan Corrie + Simon Boag	By SERAG 2021
12	5	Dr. Geoffrey Liggins (NSW DPI) to provide Dr. Miriana Sporcic (CSIRO) with NSW state catch data for royal red prawn pre-1993 in time for SERAG 2.	Geoff Liggins	By SERAG 2 (Dec 2020)
13	5	CSIRO to contact DPIPWE TAS to provide blue-eye trevalla catches from 2015 onwards in time for SERAG 2. DPIPWE will clarify the 2015 Tas catch estimate. In the absence of clarification from DPIPWE, by 6 Nov 2020, a zero catch will be used instead.	CSIRO – Miriana Sporcic	By SERAG 2 (Dec 2020)
14	5	Dr. Geoffrey Liggins (NSW DPI) to provide NSW 1992-1993 blue-eye trevalla catch to Dr. Miriana Sporcic (CSIRO) by SERAG 2.	Geoff Liggins	By SERAG 2 (Dec 2020)

15	6	AFMA to hire contractor to undertake a risk assessment to explore the risk associated with increasing the smooth oreo (other) TAC to 135 t. This will occur outside of the 2020 assessment period.	AFMA	By SERAG 2021
16	7	CSIRO to provide Dr. Geoffrey Liggins (NSW DPI) with historical redfish catch data to allow for confirmation and cross-checking with NSW DPI records – results to be provided to Dr. Bessel-Browne and Dr. Geoff Tuck (CSIRO) prior to SERAG 2.	CSIRO	By SERAG 2 (Dec 2020)
17	8	AFMA to consider updating the SESSF Harvest Strategy to provide a process for setting TACs when a species is no longer within the MYTAC period and a new assessment has not been completed. To be undertaken in time for SERAG 2021.	AFMA	By SERAG 2021
18	8	Dr. Paul Burch, Dr. Geoff Tuck, Dr. Andre Punt, Dr. Malcolm Haddon and Nicholas Hill to produce a document that outlines a robust process (or range of potential processes) that account for uncertainty in natural mortality for the 2021 eastern orange roughy stock assessment. This work is to be presented at SERAG 2.	Geoff Tuck, Paul Burch and others	By SERAG 2 (Dec 2020)
19	8	Lead stock assessor (Dr. Paul Burch, CSIRO) to develop a steering committee that will meet as required to help inform/guide the development of the 2021 eastern orange roughy stock assessment. Members: Daniel Corrie, Dan Hogan, Dr. Mike Steer, Dr. Geoff Tuck, Dr. Paul Burch, one independent scientific rep (Dr. Ian Knuckey and/or Dr. Andrew Penney), Dr. Andre Punt.	Paul Burch, Dan Corrie and others	By SESSFRAG 2021 (data meeting)
20	9	AFMA to update the western orange roughy research plan to include guidance on how the data collected under the program can be used to inform future management decisions – include likely timeframes and metrics	AFMA	By January 2021