



Australian Government

Australian Fisheries Management Authority

Great Australian Bight Resource Assessment Group (GABRAG)

Meeting 1

11 October 2022

Adelaide

Minutes

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Great Australian Bight Resource Assessment Group (GABRAG)

2022 Meeting 1 - 11 October

Mr Lance Lloyd (the Chair) opened the meeting at 09:03 AEDT.

1. Preliminaries

1.1 Welcome and apologise

1. The Chair:
 - Welcomed members and observers to the meeting; and
 - Made an Acknowledgement of Country paying respect to the traditional owners of the land and waters that the meeting was held on (the *Kaurna* people), and further paying respect to the *Mirning* people, who's sea country we fish and study in, and acknowledged all their Elders, past, present, and future.
2. The GABRAG (the RAG) members noted the Acknowledgement of Country, that the meeting was being recorded, and commenced proceedings.
3. The RAG noted the current membership and attendees, ([Table 1](#)) noting that Paul Burch was an apology. Table 1. A list of GABRAG members and other attendees.

Members	Position
Lance Lloyd	Chair
Andrew Penney	Scientific member
Anthony Moore	Scientific member
Eriko Hoshino	Economics member
Jim Raptis	Industry member
Neil MacDonald	Industry member
Marcia Valente	Industry member
Mark Grubert	AFMA member
Executive Officer	Organisation
Rebecca Jol	AFMA staff
Invited Participants	Organisation
Sandra Curin-Osorio	CSIRO ¹
Geoff Tuck	CSIRO
Heidi Pethybridge	CSIRO
Natalie Dowling	CSIRO

¹ [Commonwealth Scientific and Industrial Research Organisation](#)

Kyne Krusic-Golub	Fish Aging Services (FAS)
Ian Knuckey	Fishwell Consulting
Matt Broadhurst	NSW DPI ²
Jamie Allnut	FRDC ³
Observers	Organisation
Daniel Wright	ABARES ⁴
Nathan Bicknell	FRDC extension officer (SA)
Felicity Horn	FRDC extension officer (WA)
Daniel Corrie	AFMA staff
Aaron Puckeridge	AFMA staff
Michelle Henriksen	AFMA staff
Keith Rowling	NMAC (SA)
Apologies	Membership
Paul Burch	Invited participant (CSIRO)

1.2 Declarations of interest

- The RAG attendees declared conflicts of interest as outlined in FAP 12⁵. Members and participants reviewed and updated the Declarations of Interest included at [Attachment A](#).
- The Chair asked attendees to identify if they had any conflicts of interest with specific agenda items ([Table 2](#)).
- Attendees with a declared conflict of interest for any agenda item left the meeting while the remaining members discussed their participation in these items.
- The RAG recognised the attendees' knowledge and ability to contribute to the discussions and agreed that participants would be included for the discussion but would be excused from the meeting for any recommendation made by the RAG.

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

Agenda Item	Potential conflicts of interest	Discussion Participation	Recommendation Participation
3. MYTAC outcomes	Mr Neil MacDonald Ms Marcia Valente Mr Jim Raptis Mr Keith Rowling	Present	Not present for any decisions

² [New South Wales, Department of Primary Industries](#)

³ [Fisheries Research and Development Corporation](#)

⁴ [Australian Bureau of Agricultural and Resource Economics and Sciences](#)

⁵ [Fisheries Administration Paper 12](#)

Agenda Item	Potential conflicts of interest	Discussion Participation	Recommendation Participation
4. Bight Redfish Tier 1 assessment – Base-case development	Geoff Tuck Sandra Curin-Osorio	Present	Not present for any decisions
5. GABFIS Design	Ian Knuckey	Present	Not present for any decisions

1.3 Adoption of agenda

8. The RAG adopted the agenda ([Attachment B](#)) as final.

1.4 Minutes of previous meeting

9. The RAG noted the final minutes of the 2021 GABRAG meeting of 15 October are available on the AFMA website <https://www.afma.gov.au/fisheries-committees/great-australian-bight-resource-assessment-group/great-australian-bight#referenced-section-1>.

1.5 Actions arising from previous meetings

10. The RAG noted the action items from previous meetings and the updates provided by the Executive Officer at [Attachment C](#). Participants noted the progress of action items from previous meetings and the update provided by Mark Grubert. They also agreed to remove Action Item 5, with reasoning given below.

Action Item 5: October 2020 – Agenda Item

AFMA to compare discard records of Deepwater Flathead and Bight Redfish on the (Great Australian Bight Trawl (GABT) against observer records to determine their accuracy.

- Comparing logbook discard estimates with those from observer records was discussed at the South East Resource Assessment Group (SERAG) 2020 meeting to determine whether logbooks can be used to provide a discard estimate for years where on-board observers are not present.
- AFMA proposed to remove this action item noting that observed discard estimates for Deepwater Flathead and Bight Redfish in the GABT are very low.

11. The RAG noted that a list of new action items established at this meeting will be provided in [Agenda Item 8](#).

2. Data, Management, and Industry Updates

2.1 Data Update

12. The RAG noted the written update provided by Franzis Althaus of CSIRO Oceans and Atmosphere, to the 2022 Data Services and Southern and Eastern Scalefish and Shark Fishery (SESSF) Assessment projects. The RAG noted that:
- Each year CSIRO receives an extract of the AFMA fisheries database along with age data from Fish Ageing Services (FAS) and catch data from the States. This document describes the changes, corrections and decisions made in the preparation of the 2021 SESSF data for assessment and

management purposes in 2022. This data has been used in the preparation of the draft catch, data summary and Integrated Scientific Monitoring Program (ISMP) discard reports.

13. This agenda item was ‘taken as read’ and no further questions were raised regarding the changes for the 2022 Data Services and SESSF Assessment projects.

2.2 AFMA Update

14. The RAG noted updates from AFMA regarding key issues relevant to the management of the Great Australian Bight Trawl Sector (GABTS).

Staffing Update

15. AFMA member, Dr Mark Grubert, provided an update on the turnover of staff within the Demersal and Midwater Fisheries team. Those relevant to the Great Australian Bight Trawl Sector (GABTS) include:
 - The promotion of Daniel Corrie to Senior Manager of the Demersal and Midwater Fisheries team.
 - The recruitment of Rebecca Jol, Mark Grubert and Michelle Henriksen to the positions of Senior Management Officer, Trawl Manager and Senior Management Support Officer (all based in the Lakes Entrance office), respectively.
 - Aaron Puckeridge now works primarily on the Commonwealth Trawl Sector and Rebecca Jol has taken on the role of (interim) Executive Officer (EO) for GABRAG.
 - Michelle Henriksen will become EO for GABRAG and GABMAC at the conclusion of the October meeting.
 - Alice McDonald joined AFMA earlier this year as the Senior Program Manager for Climate Adaption with assistance from Nastaran Mazloumi (who is also part of the Demersal and Midwater Fisheries team).
16. AFMA members noted the participation at the GABT Orange Roughy research training workshop in June 2022, as well as the participation at the FishPath workshop hosted by CSIRO.
17. AFMA provided data from the GABT for the Marine Stewardship Council (MSC) certification process and are set to attend the initial assessment meeting in mid-November. AFMA joined working groups in collaboration with Matt Broadhurst and Ian Knuckey on the GAB and South East trawl.
18. Electronic Monitoring (EM) trials will begin over the next couple of months in the GAB and South East trawl sectors. AFMA will establish the best positioning for the trials and recognised there is no one-size-fits-all approach to all vessels within the fishery.
19. Industry member, Jim Raptis, discussed the need for increased observer and sampling coverage for the Danish seine fleet due to concerns for continued catches below the minimum “target” size of 40 cm. Industry expressed concern of these catches undermining the viability of the GABTF code of practice regulations placing unnecessary pressure on future Deepwater Flathead stocks.
 - AFMA will work with the observer team to increase the number of observers and level of sampling on the Danish Seine fleet operating in the GAB.
 - Industry and CSIRO to collaborate with AFMA to determine the optimal harvest size limit for Deepwater Flathead.
 - The AFMA officer, Mark Grubert, noted that the upcoming EM trials will include a Danish Seine boat that operates in this sector.

20. Jim Raptis noted the changing dynamics of the fishery particularly due to the recent pandemic and increased fuel prices and raised concerns about the future economic viability of the GAB fishery.
21. The Chair recognised the need for further economic research to address the financial viability of the fishery and inform management decisions. Economic research will be added as an item for discussion on the forward GABRAG agenda.

Action Item 1: AFMA

AFMA to consider increasing the number of observers and level of sampling on Danish Seine fleets in the GAB.

2.3 Industry Update

22. Industry member, Neil MacDonald, of the Great Australian Bight Industry Association (GABIA) provided the RAG members with an Industry update.

23. The RAG noted:

- Market fishing in the Great Australian Bight Trawl Fishery (GABTF) has been reasonable, with good catches of Deepwater Flathead through winter. Late summer and autumn catches were good, while Bight Redfish were very good both in catch rates and size of the fish.
- The fishery has seen a busy period with three regular trawlers operating in addition to significant fishing activity by up to three Danish seiners out of Port Lincoln.
- GABIA supported increasing observer and sampling coverage across the Danish seine fleet to monitor this increased activity.
- The RAG noted a steady recovery of Bight Redfish and steady catches of Deepwater Flathead. The weather has not been favourable in recent times limiting fishing capacity through the late winter period. Despite the weather limitations, catches of the two key species (Orange Roughy and Deepwater Flathead) have represented a reasonable year.
- Two Raptis boats, *Explorer S* and *Noble Pearl*, were fitted to complete Orange Roughy fishing with some success. Discussions during the June workshop focused on Orange Roughy fishing effort into areas able to provide more consistent information. Increasing capacity over the next year will be assessed for Orange Roughy fishing during the next fishing season.
- GABIA completed the assessment process for MSC certification. The assessment is now out for public comment and internal review, with the next assessment process set to begin mid-November. The RAG noted and gave credit to Industry, AFMA, Ian Knuckey and CSIRO on the work being done to gather the required data for MSC certification.
- GABIA is operating a co-management agreement with AFMA and are working to get a data working group established. Key focus is to revisit the data needs for the GAB including statutory and independent involuntary data as this is critical in driving how industry will be proceeding in the future. Industry is working to have an agreement across the sector to approach the issue of optimal minimal size of Deepwater Flathead. Further development of trawl gear and further conversations are required with the Danish seine fleets on future approaches.
- The RAG supported the establishment of the GAB data working group. Industry member Jim Raptis suggests there should be an introduction of some port observers.

3. MYTAC Outcomes

24. The RAG noted the outcomes of the review of fishery indicator data for Bight Redfish and Deepwater Flathead undertaken by the Multi-Year Total Allowable Catch (MYTAC) Working Group (the working group) and were asked to provide advice on the suitability of extending the MYTAC for Deepwater Flathead during the 2023-24 fishing season (based on the outcomes of the MYTAC Working Group).

A meeting of the MYTAC working group was convened on 12 August 2022 to consider the fishery indicator data for: i) species scheduled for assessments in 2022; and ii) species highlighted through the Decision Tree evaluation process. The working group noted the following:

Bight Redfish

- The RAG previously recommended that the stock assessment for Bight Redfish be brought forward to 2022 (from 2024) due to concerns regarding the index of abundance derived from the Great Australian Bight Fishery Independent Survey (GABFIS).
- Catches of Bight Redfish in Western Australia are not included in the assessment but have increased in recent years.
- CSIRO will investigate prior to the next assessment.

Deepwater Flathead

- The RAG requested that fishery indicators are reviewed annually.
 - Catch was the lowest on record in 2021, though CPUE did increase again that year, continuing the rise in CPUE since 2015.
 - Industry collected lengths that were not available for the Data Summary in time for SESSFRAG but will be included in time for GABRAG.
 - Annual standardised CPUE was cyclical in the early years following the increases and decreases in catches (prior to 2007) and relatively flat and mostly below average since 2005.
 - The Deepwater Flathead assessment has been deferred from 2022 to 2024 to allow for a Bight Redfish assessment in 2022 and the inclusion of 2023/24 GABFIS data in the 2024 Deepwater Flathead assessment.
25. The RAG noted the recommendations brought forward by the working group suggesting MYTAC is maintained for both species.
26. The RAG endorsed the extension of the MYTAC for Deepwater Flathead during the 2023-24 fishing season (based on the outcomes of the MYTAC Working Group).

4. Bight Redfish Tier 1 assessment base case development

27. Bight Redfish was last assessed in 2019. Due to concerns regarding the index of abundance derived from the GABFIS, the RAG ([October 2021](#)) recommended maintaining an RBC of 905 t, subject to rescheduling of the stock assessment from 2024 to 2022.
28. CSIRO invited participant, Sandra Curin, provided the RAG with the results of the preliminary tier 1 base case for Bight Redfish (*Centroberyx gerrardi*) and requested advice from the RAG on a final base case to be presented at GABRAG 2 (November 2022). The recommended base case will be used to determine the Recommended Biological Catch (RBC) for Bight Redfish during the 2023–24 SESSF fishing season.

29. The RAG noted:

- A single biological stock is assumed in the GAB for assessment and management purposes.
- The last assessment in 2019 estimated the spawning biomass of 63% of virgin stock biomass.
- The model structure for the 2019 assessment included:
 - Two sex model
 - One fleet (separated for different sources of data i.e., ISMP, Industry, and GABFIS)
 - CPUE and GABFIS indices
 - Selectivity allowed to vary between GABFIS and trawl fleet
 - Discards minimal (not included)
 - Natural mortality estimated at 0.1025
 - Recruitment deviations 1960 to 2003 (this extended to 2005, in the 2015 assessment)
- The same model structure was included for the 2022 assessment with the inclusion of software and data updates.
- The length frequencies from the 2017-2021 FIS records were excluded from the data due to grading issues.

30. The outcomes of the assessment showed:

- Above average recruitment and spawning biomass levels in the fishery.
- Virgin spawning biomass (SSB_0) is estimated to be 4,189 t (compared to 4,019 t in 2019).
- 2022-23 stock status is estimated to be 68% (compared to 63% in the 2019 assessment).
- A likelihood profile suggests that natural mortality (M) is well estimated and similar to the 2019 assessment (0.1065 in 2022, compared to 0.1025 in 2019).
- There are two years of ISMP port sampling with poor fits (2002/04).
- If WA catch is included in the model, the biomass trajectory does not alter significantly.

31. The RAG discussed the following points:

- Further work is scheduled by CSIRO for the remainder of 2022. This includes:
 - Updating the preliminary base case with advice from the RAG;
 - Generation of more likelihood profiles on stock status and SSB_0 ;
 - Retrospective analysis;
 - Jitter analysis; and
 - Sex-specific growth sensitivity assessments.

32. CSIRO requested advice from the RAG regarding the use of sex-specific growth. CSIRO recommended having sex-specific growth for the 2022 base case or, alternatively, that conditional age at length data should not be sex-specific and the model is limited to a single sex model.

33. Industry noted that ecosystem indices need to be incorporated into the models as well as for possible gaps in knowledge for climate change in the GAB.

34. Scientific member, Andrew Penney, discussed how the model was not sensitive to the GABFIS data. A question to CSIRO was raised regarding if any sensitivity analysis was completed with CPUE and GABFIS looking at doubling/halving it and if it was influential. CSIRO responded indicating this has not been completed as part of this assessment and that this is normally done for GABRAG 2 once a base case is established. Once established, CSIRO can identify how influential the indices are to CPUE and the GABFIS. If interested, points in the GABFIS series can be excluded to see how influential the model is.
35. The RAG discussed that the model is not currently estimating discards, but it can be incorporated in the future if this is non-trivial.
36. Andrew Penney highlighted a strong residual pattern and a linear deviated trend between the GABFIS and CPUE trawl data between 2009-present. He also noted that the model began underestimating abundances compared to the CPUE trend to overestimating in 2021. CSIRO discussed this is concerning regarding the GABFIS and whether it is influential. It was noted that the GABFIS was not done every year. There is currently a concern on whether there is a good correlation between the two data series, however, the model is not fitting the decline in the trawl CPUE.
37. CSIRO noted sensitivities can include down weighting the age and length data and upweighting CPUE and GABFIS data. The RAG was advised to discuss how to evaluate sensitivity If we have more faith in the catch indices rather than the catch length and age.
38. The RAG suggests there is an availability issue rather than a biomass issue.
39. CSIRO noted commercial CPUE is showing a steady and slow incline since 2010. It was noted that fish enter the fishery at a median length of roughly 30 cm and begin to recruit to the fishery at around 25 cm.
40. Jim Raptis noted during some years Bight Redfish do not come into the fishing grounds.
41. The RAG noted that CSIRO sought feedback on possible additional sensitivities to be included in the model for presentation at the next RAG meeting. These sensitivities included:
 - Whether to move to a model that has sex specific growth
 - Whether WA catch data is included into the model
 - Whether unusual length data are included/excluded in the model
 - To accept or remove GABFIS values
42. The RAG noted that there is some sex-specific data in the models already, and that it is appropriate to assess all sex related parameters to produce a better model. It is recommended to estimate both male and female growth curve parameters due to the assumption that length-weight relationships vary between sexes.
43. The RAG noted that the total WA catch from 1988-1989 to 2019-2020 is approximately 535 t and is potentially derived from four species. There are reservations for WA catch data due to the inability for the data to identify different Redfish species. The RAG recommended reporting data to the species level instead of aggregating into one species. If WA catch data consist of species from the same stock, they should be included. The RAG accepted the suggestion to include the WA catch data into the assessment.
44. The RAG discussed clarity is required on the species composition of the WA Bight Redfish catches but a precautionary approach is to include stock if there is uncertainty. The RAG noted that as a precautionary measure, it was accepted that the Bight Redfish are considered one stock.

45. The RAG recommended that a background check is completed on the two years presenting poor length fits (2002, 2004) on the Integrated Scientific Management Program (ISMP) sampling.
46. The RAG agreed to remove the unusual length data and conduct a sensitivity with the last three values of the FIS data removed. The RAG notes that the base case will still include all GABFIS data points.

Action Item 2: CSIRO

Re-run the Bight Redfish assessment models with 1) sex-specific growth curve parameters, 2) including WA catch data, 3) removing the unusual length data, and 4) remove the last three values of the GABFIS data.

5. GABFIS Design

47. AFMA member, Mark Grubert, introduced the agenda item and noted the issues raised by industry regarding iterations of the GABFIS and concerns regarding future surveys.
48. The RAG noted the following points:
- Industry have expressed concerns regarding the validity of the indices of abundance for Deepwater Flathead and Bight Redfish derived from the GABFIS.
 - The GABFIS is the sole research priority included in the 2023-24 GAB annual research statement, but Industry did not provide support for this project when considered by the AFMA Research Committee in August 2022. However, other GABRAG and GABMAC members suggested that the GABFIS is an important source of information and should proceed.
49. The RAG discussed the validity of the GABFIS serving as an indicator of biomass and has assisted in pointing to a change in species composition and long-term changes occurring throughout the GAB.
- The large mass of stingarees in the net's codend are making it difficult to catch target species and may be reducing the effectiveness of a shot and distorting the abundance estimates derived.
 - The catch composition of Bight Redfish (*Centroberyx gerrardi*) has been declining through subsequent GABFIS's. Bight Redfish composed 2 per cent of total catch in 2021.
 - Catches of Deepwater Flathead (*Platycephalus conatus*) have also decreased, although not as substantially as Bight Redfish. Deepwater Flathead comprised 5 per cent of the total catch.
 - The GABFIS provides important information regarding ecosystem change (which is expected to continue in the future) which are of benefit to the management of the fishery and future MSC assessments.
 - Industry stated they have little faith in the validity of the GABFIS and feel that money could be better spent elsewhere. The RAG noted the issues raised by Industry and recommended that Industry revise the current charges applied for operating costs and provide AFMA with an economic evaluation.
 - Invited Participant, Ian Knuckey, agreed that the GABFIS is expensive but reminded the RAG that the ecosystem in the GAB is changing and that the GABFIS is a useful scientific indicator. Dr Andrew Penney (Invited Participant) reiterated Dr Knuckey's concerns and reflected on the importance of ensuring quality of science and if we continue to take elements away from the GABFIS design to save on cost, the index will become more variable.

- AFMA will provide a value statement for the GABFIS for consideration by industry and the GABFIS working group.
- Economics member, Dr Eriko Hoshino, noted that studies are available highlighting how additional assessments translate into economic value. Eriko Hoshino offered to provide research papers on this topic to GABRAG members.

Action Item 3: GABIA

Industry to assess the financial situation, quantify the benefits, and re-assess the design of the GABFIS and provide feedback to AFMA and the GABFIS working group. Industry to determine if GABFIS will progress in the future before the working group is undertaken.

Action Item 4: AFMA

AFMA to generate a value statement for the GABFIS for consideration by industry and the GABFIS working group.

Action Item 5: Dr Eriko Hoshino

To provide the RAG with research papers outlining the economic benefits of GABFIS and how additional assessments translate into economic value.

6.1 – FishPath Outcomes

50. The RAG noted the findings of the CSIRO project '*Synthesis of information and stock assessment options for non-eastern Orange Roughy*', which includes an examination of viable stock assessment options for the GAB Orange Roughy Fishery. The RAG noted the following:

- No formal stock assessment has been undertaken for the GAB due to catches and biological data being sporadic. Stock status is therefore undefined.
- Due to the nature of spawning aggregation in the GAB, CPUE does not provide an unbiased index of abundance and is considered unsuitable for assessment purposes. No relative or absolute index of abundance exists as an estimate of biomass. Age frequency is more informative than length composition for Orange Roughy, with 11 years of data available compared to 1 year for length.
- Designation of caveats determine if the fishery and data characteristics meet minimum qualifications to apply an assessment option. It was noted that 10 out of 49 options were eliminated due to 1) absence of abundance estimates from the GABFIS; 2) no r or K estimates; and/or 3) range or spatial extent is greater than the fished/sampled area. No Tier 1 assessment options were deemed feasible for the GAB due to the absence of indices of abundance or stock status. The options determined viable for the GAB are outlined in [Table 1](#)

51. The RAG noted the advice from CSIRO to apply caution when selecting assessment options. Multiple independent assessment options are needed to compensate for data uncertainty. There is a need to adjust for parameter values to incorporate such uncertainty. CSIRO noted some basic stock assessment parameters can currently be estimated for the GAB (such as growth rates, mortality, von Bertalanffy growth etc). However, when estimating these parameters, some knowledge of variation and uncertainty should be reported and included (where possible) in any future stock assessment.

Table 1. Summary of the most favourable assessment options for non-Eastern Orange Roughy stocks based on FishPath results and the current data available. A 'No' under GAB indicates that the assessment method is not favourable for the GAB with a blank representing the option is available without associated cautions or caveats.

Category	Method	Output of method	GAB
Expert Judgement	Discourse/expert judgement	Catch Limit, Fishing Rate, or Stock Status	
Expert Judgement	Analysis of change in a single (non-CPUE) indicator	Catch Limit, Fishing Rate, or Stock Status	No
Life History-Based	Yield-Per-Recruit	Fishing Rate	
Life History-Based	B-K Life History Model	Catch Limit or Fishing Rate	
Life History-Based	Matrix Models	Fishing Rate	
Life History-Based	Intrinsic Rebound Potential	Fishing Rate	
Life History-Based	Demographic FMSY	Fishing Rate	
Multiple Indicators	CUSUM Control Charts	Catch Limit	No
Multiple Indicators	Traffic lights	Catch Limit or Fishing Rate	No
Multiple Indicators	Hierarchical decision trees	Catch Limit or Fishing Rate	No
Multiple Indicators	Sequential trigger framework (single or multi-indicator)	Catch Limit, Fishing Rate, or Stock Status	No
Risk Analysis	Ecological Risk Assessment for the Effects of Fishing (ERAEF)	Stock Status	
Risk Analysis	Comprehensive assessment of risk to ecosystems (CARE)	Stock Status	
Risk Analysis	Productivity and Susceptibility Analysis (PSA)	Stock Status	No
Risk Analysis	Sustainability Assessment for Fishing Effects (SAFE)	Fishing Rate	No
Size/Age based	Analysis of sustainability indicators based on length-based reference points (LBRP)	Stock Status	No
Size/Age based	Analysis of size relative to size at maturity	Fishing Rate	No
Size/Age based	Catch curve analysis	Fishing Rate	No
Size/Age based	Length-based Spawning Potential Ratio (LB-SPR)	Stock Status	No
Size/Age based	Mean length mortality estimators	Fishing Rate	No
Size/Age based	Length-based Bayesian Biomass Estimation (LBB)	Stock Status	No

52. CSIRO recommended gathering additional age frequency data to improve the age time-series and our understanding of the population trajectory. At least 500 otoliths are recommended to be aged. Any future data collection should occur within the same spatial area to reduce spatial biases.
53. The RAG noted recommendations from CSIRO to acquire further abundance and biomass estimates. Acoustic methods are recommended but would require at least two years of survey estimates to influence the model fitting. It was noted fish populations need to be highly aggregated to achieve viable abundance estimates.
54. The RAG discussed how valuable it is to gather GAB specific estimates. It was noted that stocks are behaving differently in varying locations due to spawning blooms on the sea mounts. Recovery of some Orange Roughy stocks have a habit of re-populating in areas that were just below spawning age or where they could not compete. There is currently some uncertainty on whether west populations are re-aggregating from either a) spread out stock or b) adjacent areas. There is limited information whether this population was re-established or not.
55. Industry noted conversations could begin for acoustic survey estimates in the future.

6.2. Fish Ageing Services Annual Report

56. The RAG noted key points in the update provided by Fish Ageing Services (FAS). Updates from the fish ageing project included the registration and ageing of samples.
- Collection targets reached for Deepwater Flathead but were slightly under for Orange Roughy.
 - A total of 655 samples were aged in the last financial year. Completed 10 species for tier 1 assessments and archiving of samples provided by Fishwell (combination of both GABFIS and industry samples).
 - No concern for Bight Redfish stock based on the age composition and length frequency. Small fish are often not observed due to smaller individuals inhabiting deeper waters or areas closer to shore.
 - Orange Roughy otolith results indicate different zones have different collections and noted the only ageing undertaken thus far is in 2001 from Albany and Esperance.
 - Validity of samples in 1992 were checked and it was determined these samples are from smaller fish suggesting current length data is correct. A closer look at the sampling collection details is required to develop growth curves and gain a better understanding.
 - Results indicated previous samples were interpreted in the same way and that old samples can be used as there is no bias presented.
 - Fishwell received a large number of otoliths this current year including another 853 Orange Roughy samples from the GAB.
 - Current status is to complete the ageing samples and re-read current samples to ensure the otoliths are aged within the precision standards. Fishwell are to determine if additional samples are required for the assessment.
 - Ageing plan for 2023 is to add 1500 Deepwater Flathead for the upcoming assessment. Not a lot of further work outside this plan due to the assessment coming to its duration and currently at the maximum samples to process.
57. Kyne Krusic-Golub discussed that the 1992 samples are not representative of the fishery, and that both industry and GABFIS samples were collected over time causing some difficulties on identifying which locations (hills or mounts) the samples are from. With GABIA input, data capture and vessel information are required to provide a snapshot of what samples are needed to assess for additional ageing and to better understand how particular stocks may have changed over time in the industry.
58. Kyne Krusic-Golub noted to the RAG that preliminary estimates show the fish stocks are presenting older fish (26 to 106 years old) suggesting stocks are in good condition considering the maturity and size of the fish.
59. The RAG noted recommendations to consider the capacity in terms of budget and/or possible trade-offs with other fish stocks that will not be assessed next year for further Orange Roughy sampling to be completed. Further discussions to be held within RAGs and could be facilitated through external funding.

6.3. Orange Roughy 2022 Industry Feedback

60. The RAG noted Industry's summary of Orange Roughy research fishing activities during the 2022/23 SESSF fishing season.
61. Two boats were issued research permits for the first half of the current research period (2022/23). Fishing was targeted at sites within the Central East research zone, in the areas such as the "Racetrack" and "Hamburger Hill".
62. The RAG noted the following research fishing results:
- Fishing occurred between 07/07/2022 and 10/08/2022.
 - Eighteen shots were performed over 12-13 days of fishing.
 - There were three shots which exceeded 5 tonnes catch.
 - As per the Research Plan, AFMA shore-based observer data collection occurred on two occasions and one trip was undertaken with an ISMP observer on-board.
 - Best shot was 25,140 kg and total catch 65,750 kg over the period fished.
63. The RAG noted the intention to use sounders to capture acoustic data on Orange Roughy aggregations in the GAB.
64. The RAG discussed the suggestions from the FishPath workshop, in particular, how the 200 t Research Catch Allowance (RCA) should be used focus data collection in a discrete area.

6.4. Orange Roughy Research Plan 23/24

65. The RAG discussed an RCA for scientific permits to be issued during the 2023-24 SESSF season under the GABTF Orange Roughy Research Plan 2020-24 (the Research Plan).
66. The RAG noted scientific permits were issued to two vessels to fish for Orange Roughy under the Research Plan (with an Olympic RCA of 200 t) during the 2022-23 SESSF fishing season.
67. The RAG noted that at the time of writing, approximately 59 t of Orange Roughy has been caught under these permits.
68. The RAG proposed that the RCA remain unchanged at 200 t for the 2023/24 SESSF season.
69. Industry raised concern regarding the sufficiency of the data analysis. Jim Raptis suggested that five zones are needed each with 200 t to obtain the data that AFMA and CSIRO need for input into the stock assessments. Data that exists has not been analysed. Industry noted that training sessions have been beneficial and would like to see them continue.
70. AFMA staff member, Daniel Corrie, discussed the tonnage required to allow for sufficient Orange Roughy data collection. Mr Corrie highlighted that the 200 t limit is less to do with the distribution of fishing, but rather the tonnage that allows the industry to support the data required. Research fishing is suggested to be focused on one area in a given season, and then moving to the next once enough data is collected to form an assessment.
71. Andrew Penney highlighted that AFMA may not permit directed fishing on a conservation dependant species under the EPBC⁶ act. The agency needs to be able to demonstrate (to the environment

⁶ Environment Protection and Biodiversity Conservation Act 1999.

department) that Orange Roughy stocks in the west are stable and that any future harvest level is appropriate. This could be achieved through a series of acoustic surveys (to show that more fish aggregating on spawning blooms) and conducting a Tier 1 stock assessment (in order to prove that the stock in the west has recovered through re-aggregation - or was never depleted).

72. Industry requested further detail on the data analysis schedule. The RAG noted the plan is to run an assessment with the data currently collected and highlighted that as more data is received, the assessment becomes more robust.
73. AFMA to include a data analysis strategy in the research plan including a time frame.
74. AFMA to work with FAS and CSIRO (FishPath) to provide a stocktake of what Orange Roughy has been aged and what is needed in the data plan and provide to GABRAG at the next meeting.

Action Item 6:

AFMA to include a data analysis strategy for GAB Orange Roughy in the GAB research plan including a possible time frame.

AFMA to work with FAS and CSIRO (FishPath) to provide a stocktake of what Orange Roughy has been aged and to determine what is needed and incorporate into the fish aging data plan.

7. Research and Extension Updates

75. The RAG noted the planned work relating to a research project on trawl selectivity in the SESSF and the appointment of Fisheries Research and Development Corporation (FRDC) Extension Officers in all maritime jurisdictions.
76. The RAG noted the roles of recently appointed FRDC Extension Officers as well as the contact details for extension staff in South Australia and Western Australia.

8. Other Business and Action Items:

77. The Chair noted the proceedings and asked the RAG if there were further items the RAG wished to discuss.
 - The RAG made no further remarks or discussions.
78. The Executive Officer reviewed the action items that arose from the meeting and these were endorsed by the RAG (Table 2). Note that Action items 1 and 2 assume that a Working Group will be convened.

9. 2023 Meeting schedule

79. The RAG agreed GABRAG 2 would be held in November 2022 and the subsequent GABMAC would be scheduled for December, with the final date to be decided based on member availability.

10. Close of meeting

80. The Chair thanked the RAG for their contribution and closed the meeting.

Table 2 - Action items arising from the meeting

No.	Agenda Item / Meeting Date	Action Item	Agency / Person	Timeframe
1	2.2 AFMA Update	AFMA to consider increasing the number of observers and level of sampling on Danish Seine fleets.	AFMA	As soon as practicable
2	4 Bight Redfish Assessment Basecase Development	CSIRO to re-run the assessment models with the following additions 1) sex-specific growth curve parameters, 2) including WA catch data, 3) removing the unusual length data, and 4) removing the last three values of the GABFIS data (as a sensitivity).	CSIRO	GABRAG 2, 2022
3	5 GABFIS	Industry to assess the financial situation, quantify the benefits, and re-assess the design of the GABFIS. Industry to determine if FIS will progress in the future before the working group is undertaken. Industry to propose any changes/additions to the survey for consideration by AFMA and the GABFIS working group.	GABIA	GABRAG 2, 2022
4	5 GABFIS	AFMA to generate a value statement for the GABFIS for consideration by Industry and the GABFIS working group.	AFMA	GABRAG2, 2022
5	5 GABFIS	Dr Eriko Hoshino to provide the RAG with papers outlining the economic benefits of FIS and how additional assessments translate into economic value.	Dr. Eriko Hoshino	As soon as practicable
6	7 Orange Roughy Research Plan	AFMA to include a data analysis strategy for GAB Orange Roughy in AFMA's research plan including a possible time frame AFMA to work with FAS and CSIRO (FishPath) to provide a stocktake of what Orange Roughy has been aged and to determine what is needed and incorporate into the fish aging data plan.	AFMA/FAS/CSIRO	GABRAG 2, 2022

Attachment A – Register of Interests

Name	Membership	Declared interests
Lance Lloyd	Chair	<ul style="list-style-type: none"> • No interest in the fishery pecuniary or otherwise • Member of GABMAC and SESSFRAG • Board Member, AwF – Aquaculture without Frontiers (Australia) • Director – Lloyd Environmental Pty Ltd. • Research Fellow – Federation University Australia
Andy Moore	Scientific member	<ul style="list-style-type: none"> • No personal pecuniary interest • Employed by ABARES – interest in sources of funding for research purposes • Involved in the Gemfish stock structure project and the Western gemfish Tier 1 assessment • Senior Research Fellow – University of Queensland • Principal Investigator on the National Recreational Fishing survey • Co-investigator on school whiting stock structure and biology project • Scientific member on GABRAG
Andrew Penney	Scientific member	<ul style="list-style-type: none"> • 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. • 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. • Independent scientific member on the AFMA South East RAG, the Tropical Rock Lobster RAG and the Small Pelagic Fishery RAG. Member of the AFMA ERA Technical Working Group. • Deputy Scientific Member on the New South Wales Fisheries Total Allowable Fishing Committee Sep 2020 to Sep 2023.

		<ul style="list-style-type: none"> • No shareholding and hold no positions relating to any other companies, including any fishing companies or industry associations.
Eriko Hoshino	Economics Member	<ul style="list-style-type: none"> • Employed by CSIRO, Marine Resource Economics Group • Adjunct with the University of Tasmania, Tasmanian School of Business and Economics (TSBE) & IMAS • Principal investigator (PI) on characterising socioeconomic contribution of the tropical tuna fisheries in Indonesia project • Acquiring funding for research purposes
Jim Raptis	Industry member	<ul style="list-style-type: none"> • GABMAC Industry Member • Operates two boats in the GABT Fishery and owns four GABT SFRs as well as quota in the SESSF
Neil MacDonald	Industry member	<ul style="list-style-type: none"> • Director NMAC (SA) P/L • Executive Officer of the Great Australian Bight Industry Association (GABIA) • Executive Officer of Charter Boat Association South Australia • Executive Officer 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 services South Australian Rock Lobster Management Advisory Committee & Research Sub-Committee • Support services South Australian Professional Fishers Association • Chair of CGG Gippsland MSS Scientific Advisory Committee • GABMAC Industry Member • Gulf St Vincent Prawn Fishery Management Advisory Committee (SVGPBOA) Member • Gulf St Vincent Prawn Fishery Research Sub-Committee (SVGPBOA) Member • Lakes & Coorong Fishery Management Advisory Committee (LCFMAC) • Director of the Australian Council of Prawn Fisheries
Marcia Valente	Industry member	<ul style="list-style-type: none"> • Committee Consultant for Silver Phoenix Holdings who hold two GABT SFRs

Mark Grubert	AFMA Member	<ul style="list-style-type: none"> • Employed by AFMA. Manager of the SESSF Trawl Sectors • No pecuniary or other interest.
Rebecca Jol	Executive Officer (EO)	<ul style="list-style-type: none"> • Employed by AFMA, Senior Management Officer, SESSF Trawl sectors. EO of GABRAG, GABMAC and SEMAC. No pecuniary or other interest.
Geoff Tuck	Invited Participant	<ul style="list-style-type: none"> • Employed by CSIRO. Involved in stock assessments • Interest in obtaining funding for future research • Principal investigator (PI) on SESSF stock assessment project • Project leader CSIRO Marine Visual Technologies project team on automated catch detection and species identification • Scientific member of SERAG
Sandra Curin-Osorio	Invited Participant	<ul style="list-style-type: none"> • Employed by CSIRO, Assessment scientist. Acquiring funding for research purposes
Heidi Pethybridge	Invited Participant	<ul style="list-style-type: none"> • Employed by CSIRO, Assessment scientist. Acquiring funding for research purposes
Natalie Dowling	Invited Participant	<ul style="list-style-type: none"> • Employed by CSIRO, Assessment scientist. Acquiring funding for research purposes
Kyne Krusic-Golub	Invited Participant	<ul style="list-style-type: none"> • Director – Fish Ageing Services Pty Ltd • No pecuniary or financial interest in the fishery other than securing funds for potential projects related to age and growth studies. • Current Related Projects • AFMA R2019/0840 – Undertake fish ageing for the SESSF to support stock assessments, 2020 -2023. • Project collaborator on FRDC 2019-030. An updated understanding of Eastern School Whiting stock structure and improved stock assessment for cross-jurisdictional management
Ian Knuckey	Invited Participant	<ul style="list-style-type: none"> • Director – Fishwell Consulting Pty Ltd • Director – Olrac Australia (Electronic logbooks) • Chair – Northern Prawn Fishery Resource Assessment Group • Chair – Tropical Rock Lobster Resource Assessment Group

		<ul style="list-style-type: none"> • Chair – Victorian Rock Lobster & Giant Crab Assessment Group • Chair – Victorian Central Zone Abalone Fisheries Resource Advisory Group • Chair – Gulf of St Vincent’s Prawn Fishery MAC Research Scientific Committee • Scientific Member – Northern Prawn Management Advisory Committee • Scientific Member – Gulf of St Vincent Prawn Fishery Management Advisory Committee • Scientific Member – Tropical Tuna Resource Assessment Group • Member – Victorian Marine & Coastal Council
Matt Broadhurst	Invited Participant	<ul style="list-style-type: none"> • NSW DPI Senior Principal Research Scientist • No pecuniary or other interest
Jamie Allnut	Invited Participant	<ul style="list-style-type: none"> • Employed by FRDC • No pecuniary or other interest
Daniel Wright	Observer	<ul style="list-style-type: none"> • Employed by ABARES. No interest, pecuniary or otherwise
Keith Rowling	Observer	<ul style="list-style-type: none"> • GABIA
Nathan Bicknell	Observer	<ul style="list-style-type: none"> • Employed by FRDC • No pecuniary or other interest
Felicity Horn	Observer	<ul style="list-style-type: none"> • Employed by FRDC • No pecuniary or other interest
Daniel Corrie	AFMA Staff	<ul style="list-style-type: none"> • Employed by AFMA, Senior Manager of Demersal and Midwater Fisheries. • No pecuniary or other interest.
Aaron Puckeridge	AFMA Staff	<ul style="list-style-type: none"> • Employed by AFMA, Senior Management Officer, SESSF Trawl sectors. Former EO of GABRAG, current EO of SERAG. No pecuniary or other interest.
Michelle Henriksen	AFMA Staff	<ul style="list-style-type: none"> • Employed by AFMA, Senior Management Officer, SESSF Trawl sectors. • No pecuniary or other interest. • Incoming EO of GABRAG and GABMAC.

Attachment B – Agenda

Time (ACST): 0900 - 1700 (+30 minutes for AEST) **Location:** Adelaide - [Click here to join the meeting](#)

Chair Name: Lance Lloyd

Time (ACST)	Item	Purpose	Lead presenter
09:00 – 9:30	1. Preliminaries (30 mins)		
	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 Actions arising from previous meetings	For noting	Rebecca Jol
09:30 – 10:15	2. Data, Management and Industry updates	For noting	CSIRO Mark Grubert Industry
	2.1 Data Update		
	2.2 AFMA Update		
	2.3 Industry Update		
10:15 – 10:30	Break (15 mins)		
10:30 – 11:00	3. MYTAC Outcomes	For advice	Mark Grubert
11:00 – 13:00	4. Bight Redfish Tier 1 assessment – Base-case development	For advice	Geoff Tuck Sandra Curin
13:00 – 13:30	Lunch (30 mins)		
13:30 – 14:00	5. GABFIS Design	For advice	Mark Grubert
14:00 – 15:00	6. Orange Roughy	For noting	6.1 - Heidi Pethybridge 6.2. Kyne Krusic-Golub
	6.1 FishPath Outcomes		
	6.2 Fish ageing services annual report (inc. ageing plan for OR)		
15:00 – 15:15	Break (15 mins)		
15:15 – 16:15	6.3 Orange Roughy 22/23 Industry Feedback	For noting	6.3. Neil MacDonald
	6.4 Orange Roughy Research Plan 2023/24 (including RCA)		6.4 Mark Grubert
16:15 – 17:15	7. Research and extension updates	For noting	7.1 - Matt Broadhurst 7.2 – Jamie Allnut, Nathan Bicknell & Felicity Horn
	7.1 Improving gear selectivity in the CTS and GABTS		
	7.2 FRDC extension officers		
17:15 – 17:25	8. Other business and action items	For advice	Rebecca Jol
17:25 – 17:30	9. 2023 meeting schedule	For noting	Rebecca Jol
17:30	Close		

Attachment C – Progress of Action Items from Previous Meetings

Complete/Redundant	Underway	Yet to start	Advice required
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	Agenda Item	No.	Action Item	Responsible entity	Timeframe	Progress
	Oct 2020	5	AFMA to compare discard records of Deepwater Flathead and Bight Redfish on the GABT against observer records to determine their accuracy.	AFMA	By SESSFRAG Data meeting (Aug 2021)	<u>Advice Required</u> - AFMA propose to remove this action item unless GABRAG see the need to pursue it further.
	1.2 Feb 2020	3	AFMA to consider appointing an additional independent scientific member to GABRAG	AFMA	As soon as practicable	<u>Complete</u> - Andrew Penney has been appointed as a second independent scientific member to GABRAG.
	2.2 Feb 2020	4	AFMA to circulate the report for AFMA Project 2019/0816 <i>Inter-annual variation in FIS abundance indices</i> to CSIRO & GABRAG members.	AFMA	As soon as practicable	<u>Complete</u> – report sent to GABRAG members and CSIRO invited participants in October 2022 as Attachment A to Agenda Item 1.5.
	1.5 / Oct 2020	5	AFMA to contact Dr Paul Burch (CSIRO) to identify the data which resulted in the 190m depth spike recorded for Bight Redfish in 2016; and why this same spike is not evident within data extracted directly from AFMA's database.	AFMA	As soon as practicable	<u>Complete</u> - The outlier in the catch by depth for Bight Redfish in 2016 was due to an error in the reported catch in the logbook data.

2.1 / Oct 2020	10	As an extension component to the 'non-eastern orange roughy data and assessment options' AFMA to consider which lines of evidence and criteria would be used to consider allowing targeted fishing for non-eastern orange roughy stocks.	AFMA	As soon as practicable	<u>Underway</u> - AFMA will consider this item subject to finalisation of the non-eastern roughy assessment and ongoing data collection.
2 / Oct 2020	15	AFMA to instate terms of reference specific to GABRAG meetings; to outline the attendance required for a quorum; based on GABRAG's membership.	AFMA	As soon as practicable	<u>Redundant</u> – The GABRAG membership was renewed on 1 July 2022 and now includes two independent scientific members. The membership structure and quorum requirements will follow the standards outlined in Fisheries Administration Paper 12 .
5 / Oct 2020	16	Dr Knuckey to analyse the impact of environmental variables on catch rates, using data collected during the GABFIS.	Dr Knuckey	As soon as practicable	<u>Underway</u> - Dr Knuckey provided an overview of the 2021 GABFIS at Agenda item 2. AFMA will seek GABRAG advice on how environmental data will be collected and incorporated in future FIS design.
6.3 / Oct 2020	20	GABIA to engage with IMOS to investigate the feasibility of GABT vessels being included as ships of opportunity, for the purpose of collecting environmental data.	GABIA	As soon as practicable	<u>Redundant</u> – action item to be progressed through the FRDC project " <i>Trials of oceanographic data collection on commercial fishing vessels in SE Australia</i> " managed by Fishwell Consulting.
3a/ Oct 2021		Paul Burch to investigate the data provided and contact industry	Paul Burch (CSIRO)	2022 SESSFRAG data meeting	Complete - This action item related to how Bight Redfish were being sampled by a

			regarding the outcome. The results of this are to be reported to the SESSFRAG data or chair's meeting.			particular boat. The issue was resolved at the 2022 SESSFRAG data meeting.
	4/ Oct 2021		AFMA to develop a data collection and sampling protocol working group with GABIA before the SESSFRAG data meeting.	AFMA	2022 SESSFRAG data meeting	Underway - Subject to finalisation of a co-management agreement with GABIA for the 22/23 financial year.
	5/ Oct 2021		Fishwell Consulting and AFMA to work with Fish Ageing Services (FAS) to identify missing orange roughy zone data for archived orange roughy otoliths.	AFMA and Fishwell	As soon as practicable	Underway – Caroline Sutton (CSIRO) is progressing this work with FAS.
	5/ GABMAC Nov 2021		Subject to the FIS being funded in 2024, GABRAG is to consider the sampling design and survey structure of the FIS.	GABRAG		Underway - The AFMA Research Committee deferred the research call for a future GABFIS until after the October 2022 GABRAG meeting (to allow for further discussion and clarification on the lack of industry support for the survey, at this meeting).