



Australian Government

Australian Fisheries Management Authority

Great Australian Bight Resource Assessment Group (GABRAG)

October 2020

Minutes

Date: 7-8 October 2020

Day 1 9:00 – 1:15pm (AEDT)

Day 2 9:10 – 1:07pm (AEDT)

Microsoft Teams Meeting

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Note: All formal recommendations made by GABRAG on Day 1, were undertaken by members (excluding Industry, see [Declarations of Interest](#)) prior to the commencement of Day 2 (8:30-9:10am AEDT 8 October 2020). No formal recommendations were required for Day 2.

Dr Tuck and Dr Sporcic (CSIRO) were only present for Agenda Items 2.1, 5 & 6 (Dr Sporcic only).

The Chair opened Day 1 of the meeting at 9:00am (AEDT).

Agenda Item 1 – Preliminaries

1.1 Welcome and Introductions

1. The Chair welcomed members and observers to the meeting and made an Acknowledgement of Country statement; acknowledging the traditional custodians of the many lands on which we meet today, paying respects to the Mirning people, the custodians of the land on which we fish and study, and acknowledging their Elders past, present and emerging.
2. There was an apology from Ms Marcia Valente who was unable to attend the meeting.
3. The Chair reminded members of confidentiality requirements and outlined the logistics for the Microsoft Teams meeting.
4. A list of meeting attendees is provided at [Appendix A](#).

1.2 Declarations of Interest

5. The RAG followed the conflicts of interest management process (as outlined in [Fisheries Administration Paper 12](#)) and updated the Declarations of Interest ([Appendix B](#)).
6. Industry members declared potential conflicts of interest with the following Agenda Items: Orange Roughy ([Agenda Item 2](#)), Upper Slope Dogfish Management Strategy Review ([Agenda Item 3](#)), MYTAC Analysis ([Agenda Item 4](#)), GABFIS Design Review ([Agenda Item 5](#)) and Research Priorities ([Agenda Item 6](#)).
7. Dr Knuckey declared potential conflicts of interest with both the GABFIS Design Review ([Agenda Item 5](#)) and Research Priorities ([Agenda Item 6](#)).
8. Industry members disconnected from the Microsoft Teams meeting, while the remaining attendees discussed their participation in these agenda items.
9. Recognising their knowledge and ability to contribute to the discussions, remaining members agreed that it was appropriate for Industry members to participate in the discussion; however, they would be asked to disconnect from the meeting when recommendations were made.
10. The same process was undertaken to address Dr Knuckey's conflicts (once Industry had re-joined the meeting).

11. Recognising Dr Knuckey's knowledge and ability to contribute to the discussions, remaining members agreed that it was appropriate for Dr Knuckey to participate in the discussion; however, he would be asked to disconnect from the meeting if recommendations were made for Agenda Items 5 & 6.

1.3 Adoption of Agenda

12. The RAG adopted the agenda at [Appendix C](#) as final.

1.4 Minutes from Previous Meeting

13. GABRAG endorsed the [February 2020 meeting minutes](#) as a true representation of the outcomes of that meeting.

1.5 Action Items Review

14. The AFMA Member provided the RAG with an update on the status of action items arising from previous GABRAG meetings. The following updates were discussed:

November 2019 - Action item 3 – Agenda Item 1.4

AFMA to identify the vessels which recorded depths of 190m for Bight redfish catch in their logbooks and notify the owners of these vessels; such that they can verify depths with their skippers.

- The AFMA member advised the RAG that the depth records in the AFMA database have been reviewed and the 190m depth spike in 2016 (depicted in the CSIRO Data Summary) is not evident. AFMA will follow this up with Dr Paul Burch (CSIRO). The RAG noted that at this time, the spike had not caused too much concern for the assessment. However, as this process is automated, it is important that AFMA ensures this has not occurred in other instances.

The RAG agreed to remove this action item and replace it with the action item outlined below.

ACTION ITEM 1

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.

November 2019 - Action item 7 – Agenda Item 3

AFMA, GABIA, CSIRO and Fishwell to work together to implement electronic recording of GAB crew collected data. Fishwell to update GAB operators' systems to include fields associated with length data collection. All necessary parties to liaise with AFMA's data team to create a schema for crew collected data, such that length data recorded in OLRAC can be entered directly into AFMA's data warehouse. Fishwell to adjust fields in OLRAC to prevent forms from being submitted without all required fields being complete.

- The AFMA member advised the RAG that this action item had not yet progressed and identified two options for digitising crew collected data:

1. Crew to enter data into iPads – to be uploaded on the database later.
 2. Update current e-log systems to incorporate required fields.
- The RAG identified limitations with option (1), and did not recommend implementing this approach for the GABT crew collected program. Limitations included:
 - Exposure of electronic equipment to environmental elements;
 - Inability to operate touch pads with cold/wet hands.
 - Dr Knuckey advised the RAG that the required fields are already available, however, operators' systems would need to be updated to enable them. The AFMA member noted that AFMA's data team have been updating the structure of the data warehouse to allow additional data recorded via e-logs, to be directly entered into AFMA's database.
 - The RAG agreed that updating the current e-log systems was the preferred method for digitising crew collected data. This action item was closed and replaced by the action item below.

ACTION ITEM 2

AFMA, GABIA and OLRAC to work together to implement electronic logbook reporting for GABT crew collected data.

February 2020 – Action Item 5 – Agenda Item 2.2

AFMA and GABIA to incorporate into their data plan, a project that investigates body condition (e.g. fat content) of fish and how this relates to gonad development.

- The RAG agreed to remove this action item and to consider this as a potential research priority at [Agenda Item 6](#).
15. The Chair asked attendees whether there were any other questions relating to action items, before moving on to the next agenda item.
 16. The list of action items was updated after the meeting ([Appendix D](#)). Items that were noted as completed (highlighted green) at the meeting will be removed and an updated list will be provided to the next GABRAG meeting in 2021.
 17. The list of action items arising from this meeting is included at [Appendix E](#).

Agenda Item 2 – Orange Roughy

2.1 Alternatives for Orange Roughy Stock Assessment

18. The AFMA member advised the RAG that the purpose of this Agenda Item was to seek advice from the RAG regarding alternative approaches for assessing the status of the GAB orange roughy stock. The RAG noted the following:
 - In November 2006, orange roughy was listed as 'Conservation Dependent' under the *Environment Protection and Biodiversity Conservation Act 1999* ([EPBC Act](#)). The 'Orange Roughy Conservation Programme 2007' (the Conservation Programme), was

implemented to address specific objectives and requirements associated with this listing. In 2014, the Conservation Programme was reviewed and replaced by the [‘Orange Roughy Rebuilding Strategy 2014’](#) (the Rebuilding Strategy).

- As part of the original listing advice to the then Minister for the Environment and Water Resources (the Minister), the Threatened Species Scientific Committee (TSSC) recommended that the species be listed as ‘Endangered.’ However, the Minister decided to list the species as ‘Conservation Dependent,’ noting that the measures implemented under the Conservation Programme, satisfied the criteria under the [‘Guidelines for assessing the conservation status of native species according to the EPBC Act and Environment Protection and Biodiversity Conservation Regulations 2000.’](#)
- The TSSC’s advice to the Minister noted that catches in the GABT sector declined from a peak of 4,139 t in 1989 to 323 t in 1997; and that catches have not exceeded 1,000 t since 1990, despite an increase in effort compared to the early 1990s. Given the decline in catches, and the absence of a quantitative stock assessment, orange roughy in the GAB were considered as ‘uncertain’ with regards to biomass estimates, and were included in the ‘Conservation Dependent’ listing.
- Under the Rebuilding Strategy, a series of closures were implemented in the GAB – specifically Schedules 19-27 of the [Southern and Eastern Scalefish and Shark Fishery and Small Pelagic Fishery \(Closures\) Direction 2016](#) (the Direction). The ‘Conservation Dependent’ status of orange roughy is dependent on these closures remaining in place across its species range; until such a time as sufficient data can be collected to demonstrate that the stock is above the limit reference point. Once above the limit reference point, the stock may be subject to targeted fishing under the [‘Southern and Eastern Scalefish and Shark Fishery \(SESSF\) Harvest Strategy’](#).
- No quantitative stock assessment has been conducted for orange roughy in the GAB, as the available data are spatially and temporally dispersed, and there are no recent surveys or representative catch-trend data available to determine the abundance of orange roughy in the GAB. Noting this, and given the low levels of catch in recent years, orange roughy in the GAB are assessed as ‘uncertain’ with regards to biomass and ‘not subject to overfishing’ with regards to fishing mortality (ABARES Fishery Status Report 2019).
- The Conservation Programme 2007, recognised the difficulty in undertaking quantitative assessments in areas where no stable spawning aggregations had been defined, such as the GAB. It was proposed that otoliths be collected and analysed to determine whether the fishery has an age composition comparable to St Helens Hill. This would be supplemented by catch per shot analysis and opportunistic surveys in the GABT sector. This is the focus of the current [‘GABT Orange Roughy Research Plan’](#) (the Research Plan).
- The Research Plan was developed in 2007 by the Great Australian Bight Industry Association (GABIA) to meet the requirements of the then Conservation Programme and now Rebuilding Strategy; and was formulated in conjunction with AFMA, relevant RAGs and MACs.
- The aim of the Research Plan is to assess the status of the GAB orange roughy stock and determine sustainable harvest levels for commercial fishing under the SESSF

Harvest Strategy. This will be achieved by collecting robust scientific information, including biological data.

- There has been very little fishing effort under the Research Plan since 2009; with approximately 20 t recorded since 2016.
- GABRAG members have previously questioned whether the GAB orange roughy stock could be delisted.
- Initial advice from the Department has clarified that the TSSC consider the status of a species across its range, and that delisting a stock isn't something that has been considered in the past. As such, the TSSC may require demonstrable proof of the stock having rebuilt across its range before the species could be considered for delisting.
- Noting the ongoing paucity of data, and the likelihood that any future data collected would continue to be spatially and temporally sparse, GABMAC (February 2020) requested that GABRAG consider alternative approaches to estimate the current stock status of orange roughy in the GAB; including whether a model (using historic data) could be developed.

19. The RAG considered alternative approaches to assessing the GAB orange roughy stock and raised the following key points:

- CPUE analyses of GAB orange roughy may have been included in a previous orange roughy (western) stock assessment.

ACTION ITEM 3

AFMA to investigate whether a historical CPUE analysis of GAB orange roughy was included in a previous orange roughy (western) stock assessment.

- Industry advised the RAG that traditional scientific methods present an expense beyond their funding capability and questioned whether a probabilistic approach could be utilised to project the current stock structure; given the longevity of the species, spawning age (~25 years) and the recovery of the St Helens Hill stock.
- Dr Tuck (CSIRO) advised the RAG that such an approach would only provide a relative measure, and would not provide insight into the actual magnitude of the biomass. An index of abundance would be required to accurately set a TAC.
- Acoustic optical surveys are expensive and not currently feasible for GAB orange roughy, due to the highly dispersed nature of the stock.
- CPUE may not be a reliable index of abundance for GAB orange roughy.

20. The RAG agreed that the most appropriate approach was to continue collecting data under the current Research Plan; however, the approach for using this data to update a stock assessment should be more clearly articulated in the Research Plan.

21. The RAG suggested that an evidence based approach may provide an estimate of whether the stock is 'likely' to be above the limit reference point. The RAG identified the following lines of evidence which could be considered:

Currently available:

- Ecological Risk Assessment (ERA)
- Age structure (compare to age structure of an orange roughy stock with known estimates of depletion)
- CPUE (further analyses required to determine if this is an appropriate index of abundance for the GAB stock)

Potentially available (future):

- Acoustic surveys
 - Egg surveys
22. The RAG considered the potential use of 'Close Kin', however this approach was not recommended due to the longevity of the species and intermittent catches.
 23. The RAG recommended establishing a working group to determine the metrics (for each line of evidence) that would be required to demonstrate recovery of the stock.
 24. Industry requested that AFMA investigate the number of otoliths available for ageing; and to obtain an estimate of costs associated with ageing available otoliths.

ACTION ITEM 4

The GAB Orange Roughy Working Group (established at this meeting – Dan Corrie, Ian Knuckey, Geoff Tuck, Andy Moore, Neil MacDonald and Jim Raptis) to meet to determine the metrics, for the identified lines of evidence (i.e. ERA, age structure, CPUE, acoustic & egg surveys), that would be required to demonstrate recovery of the GAB orange roughy stock.

ACTION ITEM 5

AFMA to contact Fishery Ageing Services (FAS) to:

- a. Determine the number of GAB orange roughy otoliths available for ageing; and
- b. Obtain an estimated cost for ageing available otoliths.

25. It was agreed that a more definitive set of criteria needs to be provided; to understand what would be required to allow targeted fishing of orange roughy to recommence in the GABT sector under the SESSF Harvest Strategy.

ACTION ITEM 6

AFMA to contact the Department of Agriculture, Water and Environment, AFMA Commission and ABARES to request a clear set of criteria that would need to be met before commercial orange roughy fishing could recommence in the GABT sector under the SESSF Harvest Strategy.

26. The RAG discussed the plausibility of pursuing delisting of GAB orange roughy as 'Conservation Dependent' species. The RAG questioned how fishing for orange roughy is permitted in the east, given that the species is listed as 'Conservation Dependent.'
27. AFMA explained that there are two separate processes:

1. The listing process under the EPBC Act, guided by the TSSC; and
 2. AFMA's SESSF Harvest Strategy.
 - The 'Conservation Dependent' listing allows for commercial fishing to continue, subject to a plan of management that supports recovery of the species (i.e. the Rebuilding Strategy).
 - The SESSF Harvest Strategy, allows commercial fishing of a rebuilding species to recommence once the stock has recovered to above B_{20} . Management arrangements are still implemented once fishing recommences, to support the continued rebuilding of these species.
28. The RAG noted that delisting the orange roughy eastern stock is currently being pursued by industry; and that the outcome of that process should be considered before pursuing delisting in the GAB.

Summary of key advice:

29. GABRAG agreed to maintain the current structure of the Orange Roughy Research Plan and to provide clarity by establishing a series of metrics around key lines of evidence; to collect the data required to estimate the status of the stock in the future.

2.2 GABT Orange Roughy Research Plan

2.2.1 Industry Update

30. Industry provided an update on their orange roughy fishing trips completed under the '[GABT Orange Roughy Research Plan for the 2020-21](#)' fishing season to date. The RAG noted the following:
 - One boat has undertaken an orange roughy research fishing trip, as part of their normal fishing operations in 2020.
 - Industry have experienced financial loss while fishing for orange roughy; resulting from the minimal catch, increased operating costs associated with orange roughy fishing and lost commercial market fishing opportunities.

2.2.2 Research Catch Allowance (RCA) Recommendation 2021-22

31. Noting the information provided at [Agenda Item 2.1](#), the AFMA member asked the RAG to consider and provide advice on:
 - Whether the orange roughy RCA could be managed as an Olympic RCA instead of equal allocation across scientific permits
 - An appropriate orange roughy RCA (and any triggers) to be implemented under the Research Plan for the 2021-22 fishing season.
32. The RAG noted the following information:
 - Scientific permits allow operators to fish for orange roughy using an RCA. The RCA is currently distributed equally among proponents; and can be utilised across the entire GABT sector (not just within Research Zones).

- A 200 t RCA has been allocated under the Research Plan since 2014.
- While scientific permits have been allocated in most seasons, fishing has not always occurred. There were no applications for scientific permits in the 2019-20 fishing season.
- Three scientific permits were allocated in the 2020-21 fishing season; with one orange roughy research trip undertaken to date (450kg orange roughy recorded).
- In 2019, GABIA submitted a proposal for consideration when reviewing the Research Plan. Part of this proposal was to combine the existing five 'deepwater management zones' into three management zones which encompassed the Orange Roughy Research Zones. To increase the incentive to undertake orange roughy research trips, GABIA also proposed introducing an RCA of 200 t per zone (600 t RCA in total).
- Although this approach was not supported by GABRAG (February 2020), AFMA have since considered alternate options, following the introduction of the '[Western Orange Roughy Research Plan](#)' in the Commonwealth Trawl Sector of the SESSF.
- The RCA implemented under the Western Research Plan is managed as an Olympic RCA (i.e. not distributed as equal allocations). Successful applicants are provided with an equal opportunity to fish for orange roughy, up to the RCA or the triggers for individual research areas. When catches approach either of these triggers, all scientific permits are revoked and fishing in one, or all, of the research areas cease. This system provides the highest likelihood of collecting the maximum amount of representative data.
- Industry referred to the GABIA paper provided to the RAG, and requested that the RAG give consideration to their proposal to allocate a 200 t RCA to each of the five 'deepwater management zones' (Far West, West, Central West, Central East and East) for the 2021-22 fishing season. Industry indicated that this increased allocation would be justifiable, given the extensive coastline of the GAB (1,390 nautical miles) and the area difference between the GAB and 'Western Orange Roughy Zone.' An increased RCA would provide greater incentive for Industry, with Industry stating that any less allocation would not allow for the collection of sufficient data to assist with the scientific evaluation to eventually re-open the fishery.

33. With consideration given to the background information provided, the following key points were made:

- Industry advised the RAG that they had not had the opportunity to contact operators to seek feedback on the proposal for an Olympic RCA, prior to the meeting.
- The RAG requested that Industry contact operators and provide AFMA with out of session advice regarding their feedback.

ACTION ITEM 7

GABIA to provide AFMA with out of session advice regarding Industry’s feedback on the proposal to manage the GABT orange roughy Research Catch Allowance (RCA) as an Olympic RCA; instead of equal allocation across scientific permits.

- Members provided in-principle support for implementing an Olympic RCA, pending feedback from Industry.
- If supported, the RAG recommended that scientific permit conditions include daily reporting requirements, to ensure that the proportion of RCA caught can be communicated to permit holders.
- The RAG were of the opinion that an Olympic RCA would provide an increased incentive for Industry to undertake orange roughy fishing.
- The RAG did not support allocating 200 t per management zone and recommended setting a 200 t RCA across the entire GABT sector. Triggers were not considered necessary from a sustainability perspective, noting that triggers may also be considered a barrier or disincentive for industry.

RECOMMENDATION 1

GABRAG recommended that the orange roughy Research Catch Allowance (RCA) be set at **200 t**, and managed as an **Olympic RCA**, for the 2021-22 fishing season.

2.3 Albany & Esperance Bycatch TAC 2021-22

34. The RAG considered the background on the management of orange roughy in the GABT sector and noted the following:

- Orange roughy in the GABT sector are managed as a non-target, bycatch only species; and are managed under the ‘Orange Roughy Rebuilding Strategy 2014’ (the Rebuilding Strategy, currently under review).
- The Rebuilding Strategy implements a number of management arrangements for orange roughy in the GABT sector including:
 - Orange roughy cannot be targeted by commercial fishing operations anywhere in the GABT sector, unless operating under a scientific permit, issued under the [‘GABT Orange Roughy Research Plan 2020-24’](#) (discussed at [Agenda Item 2.1](#)).
 - Spatial closures – implemented over recognised orange roughy seamounts. These areas have produced >95 per cent of historical orange roughy catch in the GABT sector.

- In the Albany & Esperance Quota Zones, orange roughy are managed under an incidental bycatch TAC; which must be covered by quota.
- At their February 2020 meetings, both GABRAG and GABMAC noted the overlap of the Albany & Esperance Quota Zones with both ‘Albany’ and ‘Humdinger Magic’ Orange Roughy Research Zones. Concerns were raised regarding how the incidental bycatch TAC could be utilised and how the overlap occurred.
- When the Orange Roughy Conservation Programme 2007 (outlined in [Agenda Item 2.1](#)) was implemented, one of the actions outlined was a direction to not fish in waters deeper than 750m in the GABT sector.
- At the time, GABIA expressed concerns regarding the depth closure across the entire fishery and developed a “precautionary and equally effective set of arrangements” as an alternative. These arrangements were outlined in GABIA’s ‘Management strategy for sustainable deepwater fishing in the GABT’ (GABIA’s Strategy).
- Two of the proposed arrangements outlined in GABIA’s Strategy included the implementation of Orange Roughy Research Zones and the management of incidental orange roughy catch.
- GABIA engaged CSIRO to analyse historic roughy shots across the fishery; using 1988-2005 logbook data. The proposed Orange Roughy Research Zones were designed to capture more than 95 per cent of the total orange roughy catches taken in the GABT sector; and were centred over ‘hotspots.’ Two of these hotspots were situated in the Albany & Esperance Quota Zones, which resulted in the proposal of the ‘Albany’ and ‘Humdinger Magic’ Orange Roughy Research Zones in these areas.
- The position of the Orange Roughy Research Zones were based on historical catch data, and were implemented such that any catch of orange roughy outside of these zones would likely be minimal. Through implementation of these zones, commercial fishing could continue for other species, without the risk of large incidental catches of orange roughy. A precautionary trigger limit of 10 t for orange roughy in each of the five deepwater management zones was also proposed.
- The GABIA Strategy was submitted to the AFMA Board in 2007, with the board supporting the proposal; resulting in the implementation of the GAB Orange Roughy Research Zones.
- The Conservation Programme 2007, outlined the requirement of incidental bycatch TACs, to cover the low level of catch that would occur outside of closures.
- At their 2007 meeting, GABMAC, when recommending a bycatch TAC for orange roughy, acknowledged that the vast majority of the Albany & Esperance Quota Zones were closed to commercial fishing, due to an overlap with Orange Roughy Research Zones. The MAC agreed that, as the majority of area could only be accessed under scientific permit, reducing the bycatch TAC to 25 t would be appropriate and sufficient to cover incidental bycatch.
- In subsequent years, the bycatch TAC increased to 50 t. It was not well documented as to why this increase occurred, however the TAC has remained at this level since the 2009-10 fishing season.

- Orange roughy catch in the Albany & Esperance Quota Zones have remained below the incidental bycatch TAC, with no catch recorded since the 2008-09 season (with the exception of 0.1 t recorded in 2015-16).
35. Mr MacDonald identified the possibility of extending the ‘Albany’ Orange Roughy Research Zone to encompass the Albany Quota Zone in its entirety. AFMA agreed to investigate this possibility further.
36. Although the RAG acknowledged that a bycatch TAC lower than 50 t would be more appropriate, given the small area in which it can be utilised, they wished to understand the reasoning behind the initial setting of 50 t, prior to recommending a lower value.

ACTION ITEM 8

AFMA to investigate the feasibility of extending the ‘Albany’ Orange Roughy Research Zone to encompass the entire Albany Quota Zone.

ACTION ITEM 9

AFMA to further investigate the justification for initially setting the Albany & Esperance bycatch TAC at 50 t.

RECOMMENDATION 2

GABRAG recommended maintaining the Albany & Esperance orange roughy bycatch TAC at **50 t** for the 2021-22 fishing season.

Agenda Item 3 – Upper Slope Dogfish Management Strategy Review

37. AFMA introduced the Agenda Item, and asked the RAG to consider and provide advice on the following:
- a. Reinstating access to the ‘Racetrack/Hamburger’ and ‘Kangaroo Island Hill’ closures to orange roughy fishing under scientific permit in waters deeper than 700 m.
 - b. Whether there is sufficient evidence to support a review of the ‘Conservation Dependent’ listing advice for southern dogfish in the GAB, as per GABIA’s proposal.
38. The RAG considered the following background provided for the Agenda Item:

Upper-Slope Dogfish Management Strategy

- Harrison’s and southern dogfish were nominated for threatened species listing in 2009; with the current ‘[Upper Slope Dogfish Management Strategy](#)’ (the Strategy) implemented in 2012 to afford protection to both species. Both species were formally listed as ‘Conservation Dependent’ in 2013, following [advice](#) to the Minister from the Threatened Species Scientific Committee (TSSC).
- The ‘Conservation Dependent’ classification allows commercial fishing to continue, subject to the implementation of a management plan that supports recovery of the

species. If this plan is not upheld, the species may be reclassified to a higher category; which would result in more restrictive management arrangements.

- As there are no biomass estimates for either species, the Strategy introduces a habitat proxy (B_{25}), by way of spatial closures, to protect at least 25 per cent of the species' core habitat. Spatial closures are supplemented by operational measures.
- The Strategy is currently under review. AFMA have received requests from sectors of the fishing industry to review aspects of the Strategy; including [two proposals from GABIA](#). These requests are being considered as part of the Strategy review and will be subject to final approval by the TSSC.

Southern dogfish in the GAB

- The species of concern in the GABT sector is the central stock of southern dogfish; with a portion of its core distribution occurring from western Bass Strait to south of Ceduna in the eastern GAB. Southern dogfish are found on upper-continental slopes with a depth range of 180-900 m, and a core depth range of 200-800 m.
- The central southern dogfish stock is protected in the GAB through a network of closures, which includes the 'Southern Dogfish closure' (the 60 Mile closure). The 60 Mile closure contributes approximately 8.17 per cent to the overall protection of central southern dogfish habitat.
- Although not included in the 23% of protection considered in the EPBC listing advice, Southern dogfish in the GAB are provided additional protection by the 'Racetrack/Hamburger' and 'Kangaroo Island Hill' Orange Roughy Research Zones; which contribute 0.46 and 4.67 per cent to the overall protection of central southern dogfish, respectively.

GAB Orange Roughy Research Zones

- Background on the Orange Roughy Research Zones was provided at [Agenda Item 2.3](#).

Racetrack/Hamburger and Kangaroo Island Hill Closures

- In April 2018, AFMA granted two scientific permits under the Research Plan; which provided proponents access to all Research Zones outlined in the [Closure Direction](#).
- In July 2018, it was recognised that the 'Racetrack/Hamburger' and 'Kangaroo Island Hill' closures (Schedules 26 and 27 respectively), contributed to the closures implemented under the Strategy to protect southern dogfish. This has been overlooked when allocating scientific permits in previous years.
- AFMA management amended existing scientific permits to reinstate both 'Racetrack/Hamburger' and 'Kangaroo Island Hill' as closures; prohibiting trawling (even under scientific permit).

GABIA Submissions

- AFMA have received two submissions from GABIA, which are being considered as part of the Strategy review:
 - Proposal 1: to reopen the 'Racetrack/Hamburger' and 'Kangaroo Island Hill' closures beyond 700 m, to orange roughy fishing (under scientific permit).
 - Proposal 2: to amend the northern boundary of the 'Kangaroo Island Hill' closure to remove waters shallower than 700 m to allow fishing for traditional slope species.
- Scientific advice provided on Proposal 2 stated that this proposal would compromise the closure's objectives for dogfish, as the depth range of the area proposed to be open (depth <700m) is core southern dogfish habitat. SEMAC (2019) agreed with the scientific advice and did not support this proposal. Following this advice, GABRAG decided to focus on Proposal 1.
- Proposal 1 was perceived to pose little risk to southern dogfish, with the following scientific advice provided:
 - There is a relatively small degree of overlap in habitat depths of the two species.
 - The method of fishing for orange roughy (short, ~15 minute shots), reduces the likelihood of interactions with southern dogfish; and would enhance survival of any incidental catch.
 - Dogfish are typically diurnal, moving to shallower water at night to feed.
 - Separating habitat for the two species at 700 m is difficult due to steep seabed topography.
 - There is little risk to southern dogfish from reopening the 'Racetrack/Hamburger' and 'Kangaroo Island Hill' closures to orange roughy fishing; and will not reduce the effectiveness of the Strategy to meet its objectives.
 - 'Kangaroo Island Hill' closure: whilst there is more overlap with southern dogfish habitat than the 'Racetrack/Hamburger' closure beyond 700 m, the impact from orange roughy fishing is likely to be low, as most orange roughy are caught in depths greater than 800 m.
 - Before allowing access to the closures, more recent bathymetry data should be considered.
- The RAG agreed with the scientific advice and agreed that there would be minimal impact if both closures were reopened beyond 700 m. It was also noted that CSIRO could provide updated bathymetry data to assist with implementing a 700 m boundary line.
 - Industry offered their assistance with mapping the 700 m boundary line if necessary.
- GABRAG noted that any changes to the Strategy and/or access to closures that afford protection to southern dogfish, would need to be supported by the TSSC.

- GABRAG recommended that AFMA write to the TSSC, proposing to reinstate access to the closures for the purpose of orange roughy fishing (under scientific permit).

Delisting southern dogfish

- Industry believe that there are at least two separate southern dogfish stocks (eastern and western) and that this characteristic was overlooked during the 'Conservation Dependent' listing process. The species was listed based on historically high levels of exploitation that resulted in the east coast stock becoming depleted.
- Industry referred to their paper provided to the RAG, which noted the following:
 - The majority of trawling effort in the GABT Fishery is deployed between 134°E and 125° E. Southern dogfish are rarely caught in this area. This can be verified through logbook data, AFMA observer records (ISMP), FIS records and orange roughy fishing under scientific permit (with onboard observers).
 - The area west of 125° East has been lightly fished and with substantial marine park closures, poses little risk to the dogfish population in that area of the fishery.
 - The CSIRO report ([FRDC 2006/036](#)) and the '[EPBC Listing advice for Centrophorus Zeehani \(southern dogfish\)](#)' made reference to the Ceduna Terrace being unsuitable for supporting southern dogfish populations.
 - In August 2005, a CSIRO auto longline survey conducted between 134° E and 125° E deployed 100,000 hooks and did not catch a single southern dogfish¹. The conclusion was that the area is unsuitable for southern dogfish. There appears to be no AFMA consideration of this stock characteristic in the AFMA submission on the EPBC listing process.
 - The area between 134° E and 125° E is used in the southern dogfish habitat calculation area and needs to be removed from this calculation.
 - Placing fishing closures over areas where southern dogfish have not been depleted, and are not fished, does not improve protection of the species. The area closures need to be placed over areas where the depletion has occurred, to effectively rebuild stocks.
 - The overlapping southern dogfish closure that extends deeper than 700 meters needs to be removed. Southern dogfish in the GABT Fishery are not overfished and do not extend deeper than 600 meters; with their core habitat between 300 and 600 meters.
 - CSIRO publications reference that species-specific identifications accompanying commercial catches of slope dogfishes (prior to 2008) were unreliable²; due to insufficient training of AFMA observers and fishing crews to accurately identify and record dogfish species in logbooks.

¹ CSIRO Marine and Atmospheric Research unpublished data, 2005.

² [Williams, A., Althaus, F., Smith, A., Daley, R., Barker, B. and Fuller, M.E., 2013. *Developing and Applying a Spatially-based Seascape Analysis \(the "habitat Proxy" Method\) to Inform Management of Gulper Sharks: Compendium of CSIRO Discussion Papers*. CSIRO.](#)

- Dogfish species were landed into markets headed, gutted and with their fins removed, making it impossible to identify dogfish to species level.
- Industry expressed concerns that CSIRO’s recommendations for listing these species were made with insufficient data to verify overfishing.
- An apparent discrepancy in CSIRO advice was detected between the report [‘Developing and applying a spatially-based seascape analysis \(the “habitat proxy” method\) to inform management of gulper sharks](#) (Williams, et al., 2013)’ and advice provided at SharkRAG 2006.
 - Williams, et al., 2013 estimated the decline for the central stock of southern dogfish to be 89 per cent east of Kangaroo Island Hill and 79 per cent on the western side.
 - CSIRO’s presentation at SharkRAG 2006 estimated abundance of southern dogfish to ‘probably’ be 80 per cent of virgin biomass or higher between 135° and 135°30.’ (Williams, et al., 2013).
- The scientific member (Dr Knuckey) advised the RAG of his involvement with CSIRO’s dogfish analyses and noted that although the majority of overfishing occurred in the east, there were lightly fished areas in the GAB that provided the best opportunity for stock recovery.
- The RAG noted that the ‘Conservation Dependent’ listing requires protection of the species across its range, and the closures implemented in the GAB were valid and necessary to assist with rebuilding southern dogfish across its range.
- The RAG recognised that there is a process available to pursue delisting a ‘Conservation Dependent’ species. The RAG determined that there was insufficient new information to support the review of the EPBC listing advice for southern dogfish.
- Industry agreed to focus on their proposal to reinstate access to the ‘Racetrack/Hamburger’ and ‘Kangaroo Island Hill’ closures under scientific permits; provided they are presented with the opportunity to provide feedback on the review of the Strategy. Industry also agreed that if the RAG’s decision was to reinstate access to these closures, then pursuing delisting would not be worth the time or cost involved with this process.
- AFMA clarified that the Strategy review would only consider proposals that were submitted as part of the review process; which does not include reviewing the listing advice for southern dogfish.
- Industry identified that the Strategy states that a monitoring plan would be implemented to gain insight into the rebuilding of stocks across their habitat ranges. To date, no monitoring has been undertaken in the GAB to evaluate the current status of the southern dogfish stock.
- In late 2018, a workshop was held to develop a monitoring program under the Strategy. This was submitted to the Commonwealth Research Advisory Committee (ComRAC) as a research priority. The proposed survey design focused on the east. Following a request from GABMAC in February 2020, AFMA are investigating the inclusion of one or more of the GAB closures for inclusion in the survey design. The

RAG encouraged this course of action and asked AFMA to follow up on the progress of this project proposal.

ACTION ITEM 10

AFMA to contact ComRAC to follow up on the progress of the FRDC project proposal, designed to establish a baseline index of abundance for Harrison's and southern dogfish; with the view to including one or more of the GAB closures in the survey design.

Summary of key advice

GABRAG:

- Supported allowing access to the 'Racetrack/Hamburger' and 'Kangaroo Island Hill' closures to orange roughy fishing in waters deeper than 700 m via scientific permit under the Research Plan; provided that updated bathymetry data is used to inform the implementation of a 700 m depth boundary.
- Noted that any changes to the management arrangements would need to be supported by the TSSC.
- Recommended that AFMA write to the TSSC, proposing to reinstate access to the closures for the purpose of orange roughy fishing (under scientific permit).

Agenda Item 4– MYTAC Analysis

Bight Redfish & Deepwater Flathead

39. The RAG noted the results of the Multi-Year Total Allowable Catch (MYTAC) Analysis ([Appendix G](#)) and reviewed the fishery indicator data for both Bight redfish and deepwater flathead.
40. The RAG did not identify any new concerns from the MYTAC Analysis or review of fishery indicator data. The following points were noted, and considered to be positive signs for the stock:
 - Younger age groups of Bight redfish were evident in the age frequency data provided.
 - The indicators for deepwater flathead remain stable.
41. GABRAG recommended the continuation of the MYTACs for both Bight redfish and deepwater flathead for the 2021-22 SESSF fishing season.

RECOMMENDATION 3

GABRAG recommended the following RBCs for the 2021-22 SESSF fishing season:

Bight redfish: Continuation of 5 year MYTAC – **912 t** RBC

Deepwater flathead: Continuation of 3 year MYTAC – **1,238 t** RBC

The Chair closed Day 1 of the meeting at 1:15pm (AEDT).

The Chair recommenced the meeting at 9:10am (AEDT).

Note: A quorum (as defined in [FAP 12](#)) was not present for the discussions undertaken at Agenda Items 5 & 6. No formal recommendations were required for these Agenda Items.

42. The RAG requested that a terms of reference be established for GABRAG meetings, to outline the attendance required for a quorum, based on GABRAG's specific membership (i.e. recognise the Economic Member as one of the two Scientific Members required for a quorum).

ACTION ITEM 11

AFMA to instate terms of reference specific to GABRAG meetings; to outline the attendance required for a quorum; based on GABRAG's membership.

Agenda Item 5 – GABFIS Design Review

43. GABRAG considered the current GAB Fishery Independent Survey (GABFIS) design and provided advice on whether the design remained appropriate for the current state of the fishery. The RAG also considered whether the GABFIS continues to provide a useful index of abundance for Bight redfish and deepwater flathead. The following background information was noted:
- Prior to 2006, the GABT sector was primarily managed through input controls that restricted the number of concession holders in the fishery, to ten Statutory Fishing Rights (SFRs).
 - Only a small number of SFR holders (four-five) were active in any given year (until 2003). During this time, there were no distinguishable trends in catch rates identifiable from daily fishing logbooks, for either Bight redfish or deepwater flathead.
 - Length and age frequency data did not indicate significant impacts on the stocks from this level of fishing. Due to these lack of trends, there was considerable uncertainty surrounding model outputs from associated stock assessments.
 - Between 2003 and 2005, there was an increase in active vessels (and associated catch and effort) in the GABT sector. Concerns were raised regarding the impact on stocks, given the uncertain biomass estimates for both species.
 - With Industry's support, quota management of Bight redfish and deepwater flathead were introduced in 2006; with quota allocated equally across the ten SFRs.
 - Industry were however concerned that low TACs would be set, based on the highly uncertain biomass estimates.
 - In an attempt to remove some of the uncertainty in stock assessment models, and improve biomass estimates, Industry engaged Fishwell Consulting to assess the feasibility of undertaking a Fishery Independent Survey (FIS) in the GABT sector.
 - Fishwell Consulting's feasibility study demonstrated that industry-based Fishery Independent Surveys were a feasible means of collecting independent indices of fish

abundance in the GABT sector; which could be included as an input into future stock assessment models.

- Fishery Independent Surveys were successfully conducted by Fishwell Consulting during 2005-2009 and 2011; however, due to funding constraints, surveys were not conducted during 2012-2014 (inclusive).
- In more recent years, surveys have been undertaken in 2015 and 2018; with the next FIS scheduled for 2021.
- The objectives of the FIS are to:
 - i. For Bight redfish and deepwater flathead:
 - Obtain a relative abundance index
 - Collect biological and population data
 - ii. Determine a relative abundance index of other main byproduct and bycatch species in the shelf fishery.
 - iii. Continue to collect general species composition data and temperature-depth data to monitor long-term changes in demersal fish assemblages.
 - iv. To prepare all survey information for use in fishery stock assessments.

Current GABFIS design

44. Detailed descriptions of the survey design utilised to undertake the GABFIS, are provided in Fishwell Consulting’s 2006 report ‘[Resource Survey of the Great Australian Bight Trawl Fishery.](#)’
45. Dr Knuckey was asked whether the environmental data collected through the GABFIS survey could be analysed to assess the impact of environmental variables on catch rates.
 - Dr Knuckey advised the RAG that such an analysis was possible and could be undertaken.

ACTION ITEM 12

Dr Knuckey to analyse the impact of environmental variables on catch rates, using data collected during the GABFIS.

Table 1: Strata sampled in the Great Australian Bight Fishery Independent Survey (GABFIS)

Stratum	Depth (m)	Longitude	Area (km ²)
Central 1	120-200	130.75° - 132.50°	5,720
Central 2	120-200	129.00° - 130.25°	3,965
West 1	120-200	127.75° - 129.00°	2,700
West 2	120-200	126.00° - 127.75°	2,600

46. The RAG acknowledged that in 2015, a review of the GABFIS was undertaken by Richard O’Driscoll and Ian Doonan from the National Institute of Water and Atmospheric Research Ltd (NIWA). The following points from the 2015 review were noted:
- The O’Driscoll and Doonan Review (2015) specifically reviewed the design, utility and effectiveness of the FIS survey for providing indices of abundance for key commercial stocks in the GABT sector.
 - Overall, O’Driscoll and Doonan concluded that the FIS is providing useful abundance indices for target and associated species, and should be continued. The reviewers suggested several improvements to the design including:
 - Re-evaluate strata boundaries and potentially reduce the number of sample sites; this may result in cost efficiencies by reducing the number of sites required.
 - Introduction of a randomised sampling design to avoid confounding results (day vs. night sites).
 - Compare night-only and day-only data series for all species. Currently, only night catches are used for Bight redfish; both day and night data (pooled) are used for deepwater flathead.
 - A night-only design may be possible, however this would be counter-intuitive as most commercial trawling operations are undertaken during the day.
 - Survey gear standardisation would be enhanced through the use of sensors to measure net performance, e.g. bottom contact and net width. Net width can be affected by weather and speed variations and directly affect biomass estimates
 - A survey frequency of more than once every four years should be considered due to the large decline in abundance of the target species (e.g. 72% for Bight redfish and 50% for deepwater flathead in the 2015 FIS)
 - The cost of more frequent surveys may be able to be balanced (to some extent) against better optimised sampling.
 - The appropriateness of survey timing was not evaluated.
 - Discontinuing the GABT survey would potentially affect the flathead stock assessment, in which the FIS seems to be important.
47. The RAG discussed and provided advice on the following GABFIS design considerations (identified by GABRAG members out of session):
- a. **Time:** ensure that the timing of the FIS (February – April) remains appropriate for the current Bight redfish spawning period in the GAB.
 - The RAG noted that the timing of the second trip of the GABFIS (March/April) appears to be more appropriate for the spawning of Bight redfish than the first trip (February).
 - Industry questioned whether both trips are still required, or whether the design could be reduced to a single trip in March/April. This would significantly decrease the costs associated with the GABFIS.

- The RAG suggested analysing historic data to identify any potential impacts on CVs, associated with reducing the survey to a single trip; prior to committing to potential changes to this component of the GABFIS design.

ACTION ITEM 13

Dr Knuckey to examine the historical data for the second trip of each GABFIS, to identify any potential impacts on CVs, associated with reducing the GABFIS design to a single trip per survey.

- b. **Depth:** ensure that the depth range sampled in the FIS correlates with depths fished by Industry.
- The RAG agreed that the depth of the survey remains appropriate to sample both Bight redfish and deepwater flathead; and recommended maintaining the current depth distribution in the existing strata. Any changes to the depth range sampled would impact the time series; which the RAG advised should be avoided where possible.
- c. **Stock assessments:** determine whether abundance indices (provided by the FIS) have improved the uncertainty in stock assessment model outputs (as was originally intended).
- The RAG agreed that both the FIS and CPUE indices are important inputs into the stock assessments for both Bight redfish and deepwater flathead.
 - The RAG discussed the possibility of including additional sensitivities in future stock assessments to look at different methods for incorporating the FIS series.
 - Dr Sporic (CSIRO) noted a potential sensitivity that could combine both the FIS and CPUE series; i.e. CPUE series substituted for the FIS series and the CPUE series re-commencing thereafter.

ACTION ITEM 14

At their 2021 meeting, GABRAG to consider sensitivities (including the FIS series) for inclusion in the deepwater flathead stock assessment scheduled for 2022.

- d. **Cost:** determine whether cost efficiencies could be achieved through design improvement i.e. those recommended by O’Driscoll and Doonan (2015).
- The RAG noted that there would be significant cost reductions if only a single trip was undertaken per survey.
- e. **Methodology:** ensure that the methodology remains appropriate for the current state of the fishery; and identify any alternate methodologies that may be more appropriate.
- As noted at [point \(a\)](#), the RAG would consider altering the GABFIS design to one trip (March/April) per survey; pending the outcome of Dr Knuckey’s analysis ([Action Item 13](#)).
 - If reducing the survey to one trip is deemed appropriate, the RAG suggested undertaking a single trip GABFIS every 2 years. Industry supported this approach,

indicating that it would be more appealing to industry, due to the associated reduction in costs.

- If one of the two survey trips is removed, Industry recommended the RAG establish a working group to ensure that the operational requirements are captured appropriately for a single trip GABFIS design.

ACTION ITEM 15

The GABFIS design working group (established at this meeting – Dan Corrie, Ian Knuckey, Miriana Sporcic, Neil MacDonald and Jim Raptis) to meet to determine the operational logistics involved if the GABFIS is re-designed to remove one of the two survey trips.

- f. **Data:** determine whether the current design is collecting the data necessary to support improving stock assessment models.
- The RAG noted that the current GABFIS design is collecting all the necessary data. It was however, recommended that the next GABFIS reports on the environmental data collected within the survey.

Summary of key advice

48. The RAG recommended maintaining the current GABFIS design, with the exception of:
- Investigating the impact of removing one of the two trips undertaken in the GABFIS survey. If deemed appropriate, the first trip (February) should be removed; and a working group established to outline the operational requirements for a single trip GABFIS design.
 - Including environmental data in the next GABFIS report.

Agenda Item 6 – GAB Research Priorities

6.1 GABT Market Development Project

49. Industry advised the RAG that they are working towards finalising their GABT Market Development Project.
50. The specific project deliverables are to:
- Focus on two target and three secondary species identified by Industry that are either undervalued, underutilised or are bycatch within the GABT sector; to optimise quality and value throughout the full supply chain. Species include Bight redfish, ocean jacket, yellowspotted boarfish, latchet and angelsharks.
 - Create consistency of the agreed five species product quality and develop a quality standard.
 - Work with the whole value chain (fishers, wholesalers, processors, retailers and hospitality sector), to improve their returns from their current markets and to identify and understand new market opportunities that will add value to the GABT sector catch.

- Develop a viable market development strategy and implementation plan to access and capitalise on the new market opportunities that will improve the viability and sustainability of business involved in the GABT sector.
- Upskill the supply chain to optimise quality and markets.
- Increase consumer knowledge of the GABT sector and specific products from the fishery to potentially enhance Social Licence to Operate (SLTO).

51. Project outputs have included:

- A comprehensive market analysis, including wholesale, distribution, consumer and retail input;
- In market interviews;
- Structured tasting and evaluation by a range of chefs and food service providers;
- Development of quality standards for each species;
- Temperature and product evaluation throughout the supply chain;
- Development of best practice guides for on-board handling;
- Product naming – alternative marketing name for latchet ;
- A draft marketing program; and
- Crew based induction and training programme to support the on-board handling and quality standards.

52. The project is currently in its last stage (delays associated with Covid-19). This last stage is focused on the industry marketing strategy and on the delivery of the crew training program (online program).

53. Industry advised the RAG of a new processing plant in Port Lincoln, South Australia; designed to handle waste from the tuna farming industry. This processing plant has agreed to take bycatch/byproduct from the GABT vessels and process them down into oils and fertilisers etc.; which will reduce discards in the GABT sector.

6.2 Annual Research Statement 2021-22

54. The AFMA member advised the RAG of the following:
- This Agenda Item was initially included to discuss the out of session conversations (via email) in regards to the GABT Annual Research Statement 2021-22.
 - There were dissenting views on the scope of the [‘fuel price research priority.’](#)
 - The AFMA Research Committee (ARC) considered the GABT Annual Research Statement 2021-22 at their August 2020 meeting and provided feedback on the research priorities included.
 - Due to the feedback provided by the ARC, indicating that the scope of the ‘fuel price research priority’ was too narrow, the discussion on the dissenting views was no longer required.
55. The RAG agreed to further consider the existing research priorities and ARC feedback at [Agenda Item 6.4](#); to gain a better understanding of environmental data collected by IMOS, prior to providing advice on the existing environmental research priority.

6.3 IMOS Presentation

56. Ms Michelle Heupel from the Integrated Marine Observing System (IMOS) presented to the RAG on environmental data currently collected in the GAB. The RAG noted the following:
- IMOS is enabled by the National Collaborative Research Infrastructure Strategy (NCRIS), implemented by the Australian Government (Department of Education, Skills and Employment).
 - IMOS is operated by a consortium of institutions as an unincorporated joint venture, with the University of Tasmania as Lead Agent. Principal participants include:
 - Australian Institute of Marine Science
 - Bureau of Meteorology
 - CSIRO
 - Sydney Institute of Marine Science
 - University of Western Australia
 - South Australian Research and Development Institute
 - IMOS has been operating a wide range of observing equipment throughout Australia’s coastal and open oceans since 2006.
 - All of the data collected, is openly and freely accessible to the marine and climate science community, other stakeholders and users, and international collaborators.
 - IMOS observations are guided by science planning undertaken collaboratively across the Nodes of the Australian marine and climate science community, with input from Government, Industry and other Stakeholders.
 - Nodes identify the major research themes and science questions, and determine what IMOS need to observe, where, when and how.

- IMOS currently has a portfolio of 13 Facilities that undertake systematic and sustained observing of Australia’s marine environment, across scales (from open ocean, onto the continental shelf, and into the coast) and across disciplines (physics, biogeochemistry, and biology and ecosystems). Facilities available in the GAB include:
 - **Argo floats:** provide real-time observations. Measure **sub-surface** and **sea surface temperature, salinity** and **currents** in the upper 2,000 m of the ocean.
 - **Ships of opportunity:** Use a combination of volunteer commercial and research vessels to collect data relating to physical, chemical and biological oceanography and ecology. Measure **bioacoustics, temperature, salinity, dissolved oxygen**.
 - **Ocean gliders:** autonomous underwater vehicles that ascend and descend through the water column. Measure **sub-surface** and **sea-surface temperature, salinity, dissolved oxygen, currents** and **chlorophyll**.
 - **Autonomous underwater vehicles:** Provide high-resolution, accurately geo-referenced and targeted acoustic imagery of the seafloor. Measures **sub-surface temperature, salinity, chlorophyll** and **benthic imagery**.
 - **National Mooring Network:** Measure **sub-surface temperature, salinity, currents, dissolved oxygen, chlorophyll and turbidity**. Includes regional arrays of shelf moorings, acidification moorings, acoustic observatories and a network of National Reference Stations that include additional vessel-based sampling.
 - National Reference Station: Kangaroo Island
 - Moorings: Coffin Bay, eastern Spencer Gulf, upper Spencer Gulf and Gulf St Vincent
 - Acidification mooring: Kangaroo Island
 - **Ocean radar:** Measure **sea state** and **currents**.
 - **Animal tracking:** National acoustic tracking network which can track priority species (fish, sharks and marine mammals) to obtain **depth, temperature, salinity** and **movement** data. Sea lion tracking in the GAB.
 - **Satellite remote sensing:** satellite-borne sensors measure spatial and temporal properties of the sea surface using ranges of the electromagnetic spectrum. Measure **sea-surface temperature, chlorophyll, particulate organic matter, particulate inorganic matter, phytoplankton pigments, wave height, swell period duration, wave-number spectra**.
- IMOS contributes observations to numerous models including the Regional Ocean Modelling System (ROMS), Atlantis, Ecopath, NASA’s MODIS and the CSIRO Atlas of Regional Seas (CARS).
- IMOS data has been used to inform research in the GAB including:
 - Research into deep-sea fish assemblages;
 - [Forecasting spatial distribution of Southern Bluefin Tuna habitat](#) (FRDC);
 - Predictive modelling of oil spills (DHI Pty Ltd);
 - Upwelling, enrichment and primary productivity in the eastern GAB; and

- The [Great Australian Bight Research Program](#)
- All IMOS data are made publicly available via the [Australian Ocean Data Network](#)
- Sea surface temperature and currents plots are available via [IMOS OceanCurrent](#)

57. Noting the information provided by IMOS, the RAG discussed the following:

- The feasibility of GABT vessels to be included as ships of opportunity, for the purpose of collecting environmental data.
 - Ms Heupel advised the RAG that IMOS are currently reviewing their 5 year plan and would be interested in discussing this possibility further.

ACTION ITEM 16

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.

- The data collected by IMOS is invaluable, however it is yet to be determined how this data can be incorporated into stock assessment models. An environmental research priority was considered by the RAG at [Agenda Item 6.4](#).

6.4 Annual Research Statement 2022-23

58. AFMA introduced the Agenda Item, and asked the RAG to consider and provide advice on the research priorities for the 2022-23 financial year, to be included on the 2022-23 GABT Annual Research Statement.

59. The RAG considered the background provided and noted the following key points:

- The timeline for the AFMA research process was revised for the current funding round (research to be undertaken in 2021-22). Further information can be found on the [AFMA website](#).
- In August 2020, the 2021-22 GABT Annual Research Statement was considered by the AFMA Research Committee (ARC). The ARC requested that GABRAG review the current research priorities:

Deepwater shark mitigation research priority

- At their February 2020 meeting, GABMAC identified the need to explore research options for dogfish. The MAC identified the following as potential avenues for pursuing this research:
 - FRDC project 2019-027: ‘Improving and promoting fish-trawl selectivity in the SESSF and GABT.’
 - FRDC project proposal to establish a baseline index of abundance for Harrison’s dogfish and southern dogfish (research scope is currently being considered by ComRAC, see [Agenda Item 3](#)).
 - Developing a GABT specific project to explore mitigation options to prevent capture of deepwater sharks.

- The ARC noted that this research would only be required if it was not included in the FRDC selectivity project (FRDC 2019-027) and recommended that Industry and AFMA management liaise with Mathew Broadhurst (Principal Investigator).
- Industry advised the RAG that Mathew Broadhurst has engaged with GABT industry and will continue to seek their perspective as the project progresses.
- GABRAG decided to not include this research priority on the 2022-23 Annual Research Statement; noting that a ‘gulper shark excluder device’ can be included in the FRDC project (2019-027).

Fuel price research priority

- At their February 2020 meeting, GABRAG identified the need to understand the implications of increasing operational costs on the fleet and to identify the point at which it would become unviable for the fleet to continue operation.
- The ARC did not support this research priority in its current form. They were of the view that the scope to focus solely on fuel impacts was too narrow. They requested that the RAG reconsider and broaden the research priority to include additional economic drivers as part of an assessment of how the fishery operates as a whole. This could include consideration of alternative assessment approaches, developing or updating economic models or other ways of improving general efficiency across the fishery. The ARC also noted that, once broadened, the priority may be better presented to FRDC for consideration.
- Industry expressed concerns that broadening this project to include other economic drivers, may result in confidential information being released. Industry requested time to reconsider this research proposal.
- The RAG decided to not include this as a research priority at this time, following Industry’s request to further consider the logistics of this project and to determine whether it was still a priority they wished to pursue.

Environmental factors and resource availability research priority

- At the February 2020 meeting, GABRAG identified the need to understand the impacts of environmental change on fishery dynamics. SESSFRAG considered this research priority in March 2020, and advised that this project could be undertaken when further information was available.
- The RAG recommended that the GABT Data Plan be amended to incorporate environmental data that currently is/or could be collected by industry. However this would be dependent on the capacity of e-log systems and databases to record/store this data.
- The RAG noted that before stock assessment models are re-developed to incorporate environmental data, it is important to understand how environmental data impacts catch rates and whether it will be useful for inclusion in future stock assessments.
- The RAG agreed to await the results of Dr Knuckey’s analysis of FIS data ([Action Item 12](#)) before exploring whether environmental data should be included in future stock assessment models.

- Although GABRAG noted the environmental data was an invaluable resource that could be accessed and utilised in the future, they decided to not include this as a research priority at this time.
60. The RAG considered whether there were additional research priorities to be included on the 2022-23 Research Statement.
- The AFMA member advised the RAG that the deepwater flathead stock assessment is scheduled for the end of 2022, and would need to be included as a research priority.
 - The RAG recommended including an orange roughy research priority to fund the ageing of orange roughy otoliths and any other potential research requirements that may arise from the alternatives for orange roughy stock assessment working group ([Agenda Item 2.1](#)).
 - Industry requested that a research priority for monitoring dogfish recovery be included; and should outline the request for including one or more GAB closures in the FRDC project survey design (discussed at [Agenda Item 3](#)).

Agenda Item 7 – Other Business

61. The Chair asked members whether there was any other business.
62. No further business was discussed.

Agenda Item 8 – Meeting Close

63. The Chair noted that the Executive Officer will be in touch with members to organise the dates for the 2021 GABRAG meeting.
64. The Chair thanked all attendees for their input into discussions.
65. The meeting was closed at 1:07pm (AEDT).

Signed (Chairperson):



Date: 14 December 2020

Appendix A: Meeting attendees

Name	Membership
Mr Lance Lloyd	Chair
Dr Ian Knuckey	Scientific Member
Mr Anthony Moore	Scientific Member
Mr Neil MacDonald	Industry Member
Mr Jim Raptis	Industry Member
Dr Robert Gale	Economic Member
Mr Daniel Corrie	AFMA Member
Ms Kehani Manson	Executive Officer
Ms Fiona Hill	Observer
Dr Miriana Sporcic	Observer
Dr Geoff Tuck	Observer
Apologies	
Ms Marcia Valente	Industry Member
Ms Anna Willock	Observer

Appendix B: Declarations of Interest

Name	Membership	Declared interests
Mr Lance Lloyd	Chair	<p>No interest in the fishery pecuniary or otherwise.</p> <ul style="list-style-type: none"> • GABRAG Chair • Member of GABMAC and SESSFRAG • Board Member, AwF – Aquaculture without Frontiers (Australia) • Director – Lloyd Environmental Pty Ltd. • Research Fellow – Federation University Australia
Dr Ian Knuckey	Scientific	<p>Positions:</p> <ul style="list-style-type: none"> • Director – Fishwell Consulting Pty Ltd • Director – Olrac Australia (Electronic logbooks) • Deputy Chair – Victorian Marine and Coastal Council • Chair – Northern Prawn Fishery Resource Assessment Group • Chair – Tropical Rock Lobster Resource Assessment Group • Chair – Victorian Rock Lobster and Giant Crab Assessment Group • Chair – Victorian Central Zone Abalone Fisheries Resource Advisory Group • Chair – Gulf of St Vincent’s Prawn Fishery MAC Research Scientific Committee • Scientific Member – Northern Prawn Management Advisory Committee • Scientific Member – SESSF Shark Resource Assessment Group • Scientific Member – SESSF Great Australian Bight Resource Assessment Group • Scientific Member – Gulf of St Vincent Prawn Fishery Management Advisory Committee • Scientific Member – Tropical Tuna Resource Assessment Group <p>Current projects:</p> <ul style="list-style-type: none"> • AFMA 2020/0807 – Bass Strait Scallop Fishery Survey – 2020-22 • Australia Bay – Information to support Wildlife Trade Operation for the Queensland Gulf of

		<p>Carpentaria Developmental Fin Fish Trawl Fishery</p> <ul style="list-style-type: none"> • FRDC 2019/129 – Potential transition of shark gillnet boats to longline fishing in Bass Strait - ecological, cross-sectoral, and economic implications • FRDC 2019/072 – A survey to detect change in Danish Seine catch rates of Flathead and School Whiting resulting from CGG seismic exploration. • FRDC 2019/027 – Improving and promoting fish-trawl selectivity in the SESSF and GABT • FRDC 2018/021 – Development and evaluation of SESSF multi-species harvest strategies • FRDC 2017/069 – Indigenous Capacity Building • FRDC 2017/014 – Informing structural reform of South Australia's Marine Scalefish Fishery • FRDC 2016/116 – 5-year RD&E Plan for NT fisheries and aquaculture • NT Fisheries – Design and implementation of a tropical snapper trawl survey • PEMSEA – Developing EAFM Plan of Red Snapper for Arafura and Timor Seas Region • Sea Cucumber Ass. – Design and implementation of a sea cucumber dive survey • Sea Cucumber Ass. – Information to support non-detrimental finding of fisheries for Black Teatfish and White Teatfish • Tas. Abalone – Scientific Advisor for Tasmanian Abalone Council Ltd • Traffic Project – Shark Product Traceability
Mr Andy Moore	Scientific	<p>No personal pecuniary interest</p> <ul style="list-style-type: none"> • GABRAG Scientific Member • 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; running the national recreational fishing survey and the national survey of SBT recreational catch • Senior Research Fellow – University of Queensland • Scientific Member of Recfishing Research (FRDC) • Principal Investigator on the National Recreational Fishing Survey
Mr Neil MacDonald	Industry	<ul style="list-style-type: none"> • Director NMAC (SA) P/L

		<ul style="list-style-type: none"> • Executive Officer of the Great Australian Bight Industry Association (GABIA) • Executive Officer of Surveyed Charter Boat Owners and Operators 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 • Chair – CGG Gippsland MSS Scientific Advisory Committee
Mr Jim Raptis	Industry	<ul style="list-style-type: none"> • GABRAG/MAC Industry Member • Operates two boats in the GABT Fishery and owns four GABT SFRs as well as quota in the Southern and Eastern Scalefish and Shark Fishery
Ms Marcia Valente	Industry	<ul style="list-style-type: none"> • Consultant for Silver Phoenix Holdings who hold two GABT SFRs
Dr Robert Gale	Economic	<ul style="list-style-type: none"> • Director – Next Level Sustainability • Independent reviewer of the 2018 SA State of the Environment Report for the SA Environmental Protection Authority
Mr Dan Corrie	AFMA member	Employed by AFMA. Manager of Southern Trawl, Scallop and Squid Fisheries. No pecuniary or other interest in the SESSF.
Ms Kehani Manson	Executive Officer	Employed by AFMA. Executive Officer of GABRAG. No interest, pecuniary or otherwise.
Ms Fiona Hill	Observer	Employed by AFMA. Senior Manager of Demersal and Midwater Fisheries. No interest, pecuniary or otherwise.
Ms Anna Willock	Observer	Employed by AFMA. Executive Manager of the Fisheries Management Branch. No interest, pecuniary or otherwise.
Ms Michelle Heupel	Observer	<ul style="list-style-type: none"> • IMOS Director, University of Tasmania • Member, Queensland Sustainable Fisheries Expert Panel

		<ul style="list-style-type: none"> • Ocean Tracking Network, Scientific Advisory Committee, Canada • Member, National Marine Science Committee • Patron, Australian Coastal and Oceans Modelling and Observations (ACOMO) • Member, NESP Marine Biodiversity Hub, Research Partners Committee • Member, NESP Earth Systems & Climate Change Hub Steering Committee • Member, RIMREP interim Executive Committee • Member, National Research Providers' Network (for Fishing and Aquaculture RD&E) • Member, Global Ocean Observing System Regional Alliance Council (honorary) • Australian Antarctic Program Partnership Management Team • Partner representative, Bluelink • Member honorary, COVERAGE Advisory Board • National Earth and Environmental Science Facilities Forum • Member, Indian Ocean Observing System Resource Forum • UTAS Research Leaders Network • AquaWatch Australia National Science Advisory Team
Dr Geoff Tuck	Observer	CSIRO. Involved in stock assessments. Interest in obtaining funding for future research. Principle investigator on the SESSF stock assessment project.
Dr Miriana Sporic	Observer	CSIRO. Assessment Scientist. Acquiring funding for research purposes.

Appendix C: Adopted Agenda

Time (AEDT):

Day 1: 7 October, 09:00-13:15

[Join Microsoft Teams Meeting](#) or [+61 2 8318 0009](#) Conference ID: 137 721 394#

Day 2: 8 October, 09:00-12:30

[Join Microsoft Teams Meeting](#) or [+61 2 8318 0009](#) Conference ID: 529 033 923#

Location: Microsoft Teams Meeting

Chair Name: Lance Lloyd

Item	Purpose	Lead presenter	Time
7 October 2020 (Day 1): 09:00 – 13:15			
1. Preliminaries			9:00 – 9:30
1.1 Acknowledgement of Country Welcome and Apologies		Chair	
1.2 Declaration of interests	For Action	Chair	
1.3 Adoption of agenda	For Action	Chair	
1.4 Minutes of previous meeting	For Endorsement	Chair	
1.5 Actions arising from previous meetings	For Information	AFMA	
2. Orange Roughy			9:30 – 11:00
2.1 Alternatives for updating the stock assessment	For Advice	AFMA	
2.2 GAB Orange Roughy Research Plan			
2.1.1 Industry update	For Noting	GABIA	
2.1.2 Research Catch Allowance Recommendation 2021-22	For Recommendation	AFMA	
2.3 Bycatch TAC Recommendation 2021-22 (Albany & Esperance)	For Recommendation	AFMA	
Morning Tea			11:00 – 11:10
3. Upper-Slope Dogfish Management Strategy Review			11:10 – 12:40
	For Advice	AFMA/GABIA	
4. MYTAC Analysis			12:40 – 13:15

Item	Purpose	Lead presenter	Time
a. Bight redfish	For Advice	AFMA	
b. Deepwater flathead	For Advice	AFMA	
Meeting Close			

Item	Purpose	Lead presenter	Time
8 October 2020 (Day 2): 09:00 – 12:30			
5. GABFIS Design Review			9:00 – 10:30
	For Advice	AFMA	
Morning Tea			10:30 – 10:40
6. GAB Research Priorities			10:40 – 12:10
6.1 GABT Market Development Project Update	For Noting	GABIA	
6.2 Annual Research Statement 2021-22	For Advice	AFMA	
6.3 IMOS Presentation	For Noting	IMOS	
6.4 Identify Research Priorities for 2022-23	For Advice	AFMA	
7. Other Business			12:10 – 12:30
Meeting Close			



Appendix D: List of all GABRAG items (updated)

- Complete/Redundant
- Underway
- Yet to start
- Need advice

Table 2 Action item summary

Note: All items marked green (complete) will be removed from the list of action items that is prepared for the next meeting (GABRAG 2021)

	Agenda Item	No.	Action Item	Agency/Person Responsible	Timeframe	Progress
	1.4/ Nov 2019	1	CSIRO/AFMA to provide the RAG with the outcomes from Andre Punt’s research looking at age and length sampling across stock assessments of SESSF species; when they become available. Outcomes and how they apply to the GAB will be considered at a future GABRAG meeting.	CSIRO/AFMA	As soon as the research report becomes available.	The work is currently underway. It is anticipated that results will be ready to be presented at the SESSF Chairs’ Meeting in March 2021.
	1.4/Nov 2019	2	AFMA to provide the Economics Member with a summary of information surrounding the cost/benefit analysis for the Bycatch Research and	AFMA	As soon as practicable	Economic information from previous minutes was collated and provided to Dr Gale. Dr Knuckey provided copies of the FRDC report – FRDC 2015-104 <i>Realising economic returns of reducing</i>

		Development Plan; as well as any other relevant economics items from previous meetings			<i>waste through utilisation of discards in the GAB Trawl Sector of the SESSF (Agenda Item 2 – Attachment D, December 2019 meeting) and associated paper by van Puttin 2018 Fresh eyes on an old issue: Demand-side barriers to a discard problem.</i>
1.4/Nov 2019	3	AFMA to identify the vessels which recorded depths of 190m for Bight redfish catch in their logbooks and notify the owners of these vessels; such that they can verify depths with their skippers.	AFMA	As soon as practicable	AFMA investigated the data (AFMA database) and detected no apparent spike in catch at 190m in 2016. This does not appear to be an issue in subsequent years. The RAG to determine whether AFMA progresses this issue further with CSIRO.
1.4/ Nov 2019	4	Dr Paul Burch (CSIRO) to contact FAS to request age data for Bight redfish for 2017-19 and query the absence of age data for Bight redfish in 2018-19	CSIRO	As soon as practicable	Dr Burch received a response from FAS during the meeting. No FIS fish were aged in 2018 as the ISMP samples were sufficient.
1.4/ Nov 2019	5	The Chair to compose letters to Mr Day, Dr Haddon and Professor Tisdell, thanking them for their contributions to GABRAG over the years. The Chair to also compose a letter to Ms Hill on behalf of GABRAG, welcoming her to her new position at AFMA as Senior	The Chair	As soon as practicable.	The Chair sent letters via email to all recipients on 10 September 2020.

		Manager of Demersal and Midwater.			
3/ Nov 2019	6	GABIA, AFMA and Dr Burch to collaborate and review Section 5: <i>Data collection and research</i> of the Great Australian Bight Trawl Fishery boat Operating Procedures Manual, to ensure that all data required by CSIRO for stock assessments is clearly identified and the procedures for collecting this data are outlined	GABIA, AFMA and CSIRO	As soon as practicable	Dr Burch is drafting an industry data collection plan; which he hopes will be available to circulate to RAG members prior to the October 2020 meeting.
3/ Nov 2019	7	AFMA, GABIA, CSIRO and Fishwell to work together to implement electronic recording of GAB crew collected data. Fishwell to update GAB operators' systems to include fields associated with length data collection. All necessary parties to liaise with AFMA's data team to create a schema for crew collected data such that length data recorded in OLRAC can be entered directly into AFMA's data warehouse. Fishwell to adjust fields in OLRAC to prevent forms from being submitted without all required field being complete	AFMA, GABIA, CSIRO and Fishwell	As soon as practicable	AFMA have included a 'structure' to allow for lengths to be included in e-log software as part of the Agency Data Capture project. However, e-log vendors have not been asked to include this function in the next versions of the software. Updating e-log software is not a trivial task at this stage while vendors are rolling out the new changes. Alternatively, AFMA and GABIA have discussed developing software, similar to that used in the Western Orange Roughy Research Program, which allows industry to record various data, including length information, on an i-pad and send it to AFMA for inclusion in the database.

4/ Nov 2019	8	AFMA to provide the RAG with recent catch rates (non-standardised) of deepwater flathead at the next meeting (December 2019). This should include data up to the end of November 2019. Catch rates for previous years (2016-19) should also be included for comparison.	AFMA	Before GABRAG 2 December 2019	The catch data was provided in the Action Item Review Paper provided to GABRAG members for the February 2020 meeting.
4/Nov 2019	9	CSIRO to add interpolated values for the FIS data series for 2011, 2012 and 2013. The deepwater flathead assessment to be re-run with additional points; to determine whether the large gap between FIS years is impacting the overall data trend. Note: this is not a suggestion for inclusion as a base-case sensitivity for TAC setting.	CSIRO	Before GABRAG 2 December 2019	A model with interpolated GABFIS biomass indices where the FIS was not conducted in recent years was conducted as a sensitivity to the base case model. The interpolated GABFIS model was suggested to look at how influential FIS data points are to the estimated biomass trajectories. Results conclude that the GABFIS can have a strong influence on the biomass predicted by the model.
5/ Nov 2019	10	CSIRO to communicate with Fish Ageing Services (FAS) to understand how the error* with the ageing error matrix occurred for the Bight redfish assessment. * When ageing younger fish, there is a smaller error (otolith rings are	CSIRO	As soon as practicable	Dr Jemery Day provided the following advice: “I wouldn’t call this an error. Any model results are dependent on assumptions going into the model. Sometimes results don’t make a lot of sense and sometimes we revise assumptions. That is what happened here, only the revision happened late in the process. There is no need for further investigation.”

		largely spaced, easy to count) compared to older fish (larger error, otolith rings closely spaced, more difficult to count). The ageing error matrix displayed the opposite to the initial assessment.			
6.2/ Nov 2019	11	AFMA to investigate why GAB closures, that were implemented based on the stock depletion in the East, are still required. Scientific evidence demonstrates that stocks have recovered in the east and eastern closures have now been reopened to roughy fishing.	AFMA	As soon as practicable	This will be discussed at the GABRAG October 2020 meeting (Agenda item 2.1 – Orange Roughy: Alternatives for updating the stock assessment).
6.2/ Nov 2019	12	Mr Moore to follow up the 2012 molecular work on gemfish stock structure conducted by CSIRO and circulate the paper to the RAG	Mr Moore	As soon as practicable	<p>This item related to the process of biological sampling for stock discrimination; and how it could potentially be utilised in the GABT Orange Roughy Research Plan.</p> <p>Mr Moore advised that to his knowledge, there has been no molecular work done by CSIRO on Gemfish.</p> <p>Gemfish samples were collected by Colgan and Paxton in the 1990s and are in the Australian Museum (stored in a -70°C freezer).</p> <p>The best method to take samples from fish is either to remove a fin clip or muscle tissue and store in a preservative (e.g. ethanol). These are catalogued to the research facility where they are stored at -70°C. It</p>

					is best to take the sample as soon as possible after capture, as delay in preservation substantially degrade DNA quality.
6.2/ Nov 2019	13	Industry to investigate whether their multi-frequency acoustic systems have the capacity to record and log information such that an index of abundance for orange roughy can be established using this data.	Industry	As soon as practicable	Mr Raptis advised that his echo sounders do not have the capacity to print paper logs. GABIA asked Mr Raptis whether the echo sounders are able to digitally record data. GABIA have advised that there is only one boat with capacity and Mr Raptis has advised that they have no process for storing and transferring the data.
6.2/ Nov 2019	14	AFMA to provide an overview of the approval process to finalise amendments to the GABT Orange Roughy Research Plan, including whether the final version needs to be signed off by the Commission.	AFMA	As soon as practicable	The AFMA Commission reviewed the proposed amendments to the GABT Orange Roughy Research Plan. The final version of the document was not required to be signed off on by the Commission. The revised research plan was officially implemented in May 2020.
1.2 Feb 2020	1	AFMA to consider appointing an additional independent scientific member to GABRAG	AFMA	As soon as practicable	AFMA will consider this as part of the upcoming RAG/MAC appointment process.
2.2 Feb 2020	2	AFMA to circulate Fishwell's report for AFMA Project 2019/0816 <i>Inter-annual variation in FIS abundance indices</i> to CSIRO and GABRAG members.	AFMA	As soon as practicable	AFMA have requested a copy of this report. Once it becomes available, it will be circulated to members.

2.2 Feb 2020	3	Mr Moore to circulate to the RAG, the report relating to research undertaken in the SESSF investigating factors that influence recruitment and abundance.	Mr Moore	As soon as practicable	The document can be found here .
2.2 Feb 2020	4	AFMA to invite IMOS to the next GABRAG meeting (late 2020) to present on the environmental data they collect in the GAB, with a view to including the data in future stock assessments for Bight redfish and deepwater flathead.	AFMA	Before the next GABRAG Meeting (October 2020)	Michelle Heupel (IMOS) is attending the meeting on 8 October to present on the environmental data collected in the GAB by IMOS.
2.2 Feb 2020	5	AFMA and GABIA to incorporate into their data plan, a project that investigates body condition (e.g. fat content) of fish and how this relates to gonad development.	AFMA	As soon as practicable	This should be considered for inclusion in the GABT Annual Research Plan. If body condition is deemed to be a data need, it can be incorporated into the data plan. To be discussed at Agenda Item 6.4 'Research Priorities for 2022-23' (October 2020).
2.2 Feb 2020	6	CSIRO to consider including additional information within future stock assessments for Bight redfish and deepwater flathead; including environmental factors, economic/market information and	CSIRO	As soon as practicable	CSIRO provided comment that similar work has already been undertaken in the SESSF (FRDC Project 2005/006). CSIRO also advised that this will require broader discussion as "factors" should not be thrown into CPUE standardisation without considerable thought.

		catch of other key commercial species.			
2.2 Feb 2020	7	AFMA and the Economic Member to develop a research priority – the effect of operational costs on the Great Australian Bight Trawl Fishery Dynamics. Issues should include increasing fuel prices and the cost associated with modernising the GAB fishing fleet.	AFMA and Dr Gale	As soon as practicable	<p>A line item was included in the GABT sector Annual Research Statement to investigate the effect of fuel prices on the Great Australian Bight Trawl Fishery Dynamics.</p> <p>The research priority was not supported by the ARC. To be discussed further at Agenda Item 6.2 'Annual Research Statement 2021-22 (October 2020).</p>
3.1 Feb 2020	8	GABMAC to provide advice on whether the 200 t research catch allowance is restricted to the orange roughy research zones	GABMAC	As soon as practicable	GABMAC agreed that the 200 t research catch allowance should be utilised across the whole of the GABT sector, not just within the research zones.
3.2 Feb 2020	9	AFMA to clarify how the Albany and Esperance bycatch TAC can be utilised; noting the quota zones overlap with orange roughy closures. Include an overview of how these management arrangements were implemented (previous RAG/MAC meetings).	AFMA	As soon as practicable	<p>As a response to the blanket 750m deepwater closure implemented under the 'Orange Roughy Conservation Programme 2007,' GABIA submitted the 'Management strategy for sustainable deepwater fishing in the GABT.' GABIA's Strategy outlined a series of Orange Roughy Research Zones.</p> <p>Research Zones (positioned over 'hotspots') comprised >95% of the total orange roughy catch in the GABT sector between 1988 and 2005. Two of these 'hotspots' were situated in the Albany & Esperance Quota Zone; which resulted in the proposal</p>

					<p>of the 'Albany' and 'Humdinger Magic' Research Zones.</p> <p>The Conservation Programme outlined the requirement of incidental bycatch TACs to cover the low level of incidental catch that would occur outside of the closures/Research Zones.</p> <p>The Albany & Esperance Orange Roughy Bycatch TAC can be utilised in the small area of the Quota Zone that is not included within the 'Albany' Research Zone.</p>
6 Feb 2020	10	<p>AFMA to include an agenda item for the 2020 GABRAG meeting, to consider a review of the GABFIS design, to ensure it provides a useful index of abundance for Bight redfish and deepwater flathead.</p> <p>GABRAG members to develop a list of considerations regarding GABFIS design and provide these to Dr Knuckey, with a view to presenting these at GABRAG in 2020.</p>	AFMA	As soon as practicable	<p>There is an Agenda Item scheduled for the 8 October 2020 to discuss the GABFIS design.</p> <p>Members were contacted and asked to provide points for consideration when discussing the GABFIS design. This list was compiled and provided to Dr Knuckey on 16 September 2020.</p>

Appendix E: Summary of Action Items arising from GABRAG October 2020

Action Item	Agenda Item	Description	Responsibility	Timeframe
1	1.5	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
2	1.5	AFMA, GABIA and OLRAC to work together to implement electronic reporting for GABT crew collected data.	AFMA/GABIA/ OLRAC	As soon as practicable
3	2.1	AFMA to investigate whether a historical CPUE analysis of GAB orange roughy was included in a previous orange roughy (western) stock assessment.	AFMA	As soon as practicable
4	2.1	The GAB Orange Roughy Working Group (established at this meeting – Dan Corrie, Ian Knuckey, Geoff Tuck, Andy Moore, Neil MacDonald and Jim Raptis) to meet to determine the metrics, for the identified lines of evidence (i.e. ERA, age structure, CPUE, acoustic & egg surveys), that would be required to demonstrate recovery of the GAB orange roughy stock.	Working Group	As soon as practicable
5	2.1	AFMA to contact Fishery Ageing Services (FAS) to: <ul style="list-style-type: none"> a. Determine the number of GAB orange roughy otoliths available for ageing; and b. Obtain an estimated cost for ageing available otoliths. 	AFMA	As soon as practicable
6	2.1	AFMA to contact the Department of Agriculture, Water and Environment, AFMA Commission and ABARES to request a clear set of criteria that would need to be met before commercial orange roughy fishing could recommence in the GABT sector under the SESSF Harvest Strategy.	AFMA	As soon as practicable
7	2.2.1	GABIA to provide AFMA with out of session advice regarding Industry's feedback on the proposal to manage the GABT orange roughy Research Catch Allowance (RCA) as an Olympic RCA; instead of equal allocation across scientific permits.	GABIA	As soon as practicable

8	2.3	AFMA to investigate the feasibility of extending the 'Albany' Orange Roughy Research Zone to encompass the entire Albany Quota Zone.	AFMA	As soon as practicable
9	2.3	AFMA to further investigate the justification for initially setting the Albany & Esperance bycatch TAC at 50 t.	AFMA	As soon as practicable
10	3	AFMA to contact ComRAC to follow up on the progress of the FRDC project proposal, designed to establish a baseline index of abundance for Harrison's and southern dogfish; with the view to including one or more of the GAB closures in the survey design.	AFMA	As soon as practicable
11	Start of Day 2	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
12	5	Dr Knuckey to analyse the impact of environmental variables on catch rates, using data collected during the GABFIS.	Dr Knuckey	As soon as practicable
13	5	Dr Knuckey to examine the historical data for the second trip of each GABFIS, to identify any potential impacts on CVs, associated with reducing the GABFIS design to a single trip per survey.	Dr Knuckey	As soon as practicable
14	5	At their 2021 meeting, GABRAG to consider sensitivities (including the FIS series) for inclusion in the deepwater flathead stock assessment scheduled for 2022.	GABRAG	As soon as practicable
15	5	The GABFIS design working group (established at this meeting – Dan Corrie, Ian Knuckey, Miriana Sporic, Neil MacDonald and Jim Raptis) to meet to determine the operational logistics involved if the GABFIS is re-designed to remove one of the two survey trips.	Working Group	As soon as practicable
16	6.3	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

Appendix F: Summary of Recommendations from GABRAG October 2020

	Recommendation
1	GABRAG recommended that the orange roughy Research Catch Allowance (RCA) be set at 200 t , and managed as an Olympic RCA, for the 2021-22 fishing season (pending feedback from Industry).
2	GABRAG recommended maintaining the Albany & Esperance orange roughy bycatch TAC at 50 t for the 2021-22 fishing season.
3	GABRAG recommended the following RBCs for the 2021-22 SESSF fishing season: Bight redfish: Continuation of 5 year MYTAC – 912 t RBC Deepwater flathead: Continuation of 3 year MYTAC – 1,238 t RBC



Appendix G: MYTAC Analysis

Species	MYTAC Year	Stock Biomass (or proxy) Above TRP?	TAC <50% Caught	TAC <50% caught for operational reasons only?	Comments
Bight Redfish	1 st of 5 year MYTAC	Yes (2019) 64% B₀ Target: 41% B ₀ Limit: 20% B ₀	Yes 28% 170 t of 600 t TAC	Yes	Industry have raised concerns about the availability of Bight Redfish during the FIS, this will be considered at GABRAG in October 2020. GABRAG have requested that fishery indicators are reviewed annually.
Deepwater Flathead	1 st of 3 year MYTAC	Yes (2019) 45% B₀ Target 43% B ₀ Limit: 20% B ₀	No 61% 694 t of 1,128 t TAC	-	Assessed in 2019 with the next assessment scheduled for 2022. GABFIS due to be undertaken in 2021. GABRAG have requested that fishery indicators are reviewed annually.
Orange Roughy (Rebuilding Strategy)	-	Unknown	Yes 0% 0 t of 50 t TAC (incidental bycatch)	Yes	Reviewed by SERAG and GABRAG under the Orange Roughy Rebuilding Strategy.