



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

Meeting minutes

**Date: 28 February – 1 March 2019
Venue: Grosvenor Room – Mercure
Canberra**

Attendees

Members	
Dr Cathy Dichmont	SESSFRAG Chair
Mr George Day	AFMA Member
Dr Sarah Jennings	Economics Member
Mr Lance Lloyd	GABRAG Chair
Mr Sandy Morison	SERAG and SharkRAG Chair
Executive officer	
Ms Cate Coddington	AFMA
Invited Participants	
Mr Simon Boag	Executive Officer, South East Trawl Fishing Industry Association (SETFIA) and Southern Shark Industry Alliance (SSIA)
Dr Paul Burch	CSIRO
Mr Daniel Corrie	South East Trawl and Great Australian Bight Trawl Manager, AFMA
Mr Ryan Keightley	A/g Gillnet, Hook and Trap Manager, AFMA
Dr Jemery Day	CSIRO
Dr Ian Knuckey	Fishwell Consulting
Mr Neil MacDonald	Executive Officer, Great Australian Bight Industry Association (GABIA)
Mr Andrew Penney	Pisces Australis
Mr David Stone	Executive Officer, Sustainable Shark Fishing Association (SSFA)
Dr Robin Thomson	CSIRO
Ms Natalie Rivero (Agl 8)	AFMA
Mr Callum Tyle (Agl 8)	AFMA
Mr Mick Roses (Agl 8)	AFMA
Mr Tamre Sarhan (Agl 12)	AFMA
Mr Nate Meulenberg (Agl 12)	AFMA
Dr Geoff Tuck	CSIRO
Observers	
Dr Fay Helidoniotis	Australian Bureau of Agricultural and Resource Economics (ABARES)
Mr Michael Le	AFMA
Mr Sayan Chakrabarty	AFMA
Dr Veronica Silberschneider	NSW Department of Primary Industries
Dr Karina Hall	NSW Department of Primary Industries
Ms Lucy Crawford (Agl 12)	AFMA

Preliminaries

1. Welcome & apologies

1. The meeting commenced at 1.05pm.
2. Dr Cathy Dichmont (SESSFRAG Chair) welcomed members and invited participants to the meeting. The Chair stated that no apologies had been received. Each of the participants introduced themselves to the rest of the group.

2. Declarations of interest

3. Members, invited participants and observers provided declarations of conflicts of interest as prescribed in *Fisheries Administration Paper 12* ([Attachment 1](#)).
4. Participants noted conflicts of interest with the following agenda items:
 - CSIRO participants, Mr David Stone, Mr Simon Boag, Mr Neil MacDonald, Dr Ian Knuckey and Dr Fay Helidoniotis declared conflicts for agenda items 9, 10 and 15. Dr Knuckey also raised a potential conflict of interest for Agenda Item 8 (AFMA's ICT, Agency Data Capture and e-fish) given his interest in providing e-log software, however, the RAG agreed that this was an information item only.
 - The SESSFRAG members and AFMA attendees did not declare any conflicts of interest.
 - Dr Sarah Jennings noted potential sensitivities around agenda item 15 (research planning) given her role coordinating the Fisheries Research and Development Corporation's Human Dimensions Research Sub Program. However, given she does not intend to apply for research, the RAG determined that there was no conflict of interest.
5. All participants with specific conflicts of interest left the room so that the RAG could discuss their participation under specific agenda items:
 - For agenda item 9 (recommendations from the SESSFRAG Technical Working Group) the RAG agreed to all participants with potential conflicts of interest participating in the discussion and recommendation.
 - For agenda item 10 (recommendations from the SESSFRAG Data Strategy Working Group) the RAG agreed to all participants with potential conflicts of interest participating in the discussion but not the recommendations.
 - For agenda item 15 (research planning) the RAG agreed to all participants with potential conflicts of interest participating in the discussion but not in the recommendation.

3. Adoption of Agenda

6. The RAG adopted the agenda ([Attachment 2](#)) with the exception of the presentation of Agenda Item 8 prior to all other agenda items.

4. Action Items

7. The RAG reviewed and commented on the status of the actions from previous meetings as detailed in [Attachment 3](#). A list of new Action Items established at this meeting are listed in [Attachment 4](#).

Action Item #2 (1.4 Data Meeting 2017) Provision of Fishwell otolith inventory

8. Dr Knuckey advised he had completed an inventory of otoliths in Fishwell Consulting's possession and provided the list to the RAG's executive officer during the meeting for distribution. The RAG agreed the action to be marked as completed.

Action Item #9 (4.3 2018 Chairs' meeting) Blue eye trevalla fishery history

9. The RAG noted the blue-eye trevalla fishery history draft report was collated from information extracted from the AFMA database and blue-eye trevalla stock assessment reports. The RAG advised that there is further data that should be included from NSW, Dr Malcolm Haddon and Victorian data.

Action Item 1: AFMA

AFMA to consider adding data from NSW, Dr Haddon and Victoria and provide a revised blue-eye trevalla history report to SESSFRAG in August 2019.

Action Item #11 (2.3 SESSF RAG Data Meeting 2018) Overlap between observers and EM

10. The RAG noted the update provided by Mr Ryan Keightley with regards overlap between observers and electronic monitoring coverage. Fifteen shots have been reviewed where observers and electronic monitoring (EM) footage overlap. There were additional shots where EM and observers were present but the footage has not been reviewed. EM footage is deleted after six months and so some of the footage may not be available.

Action Item 2: AFMA (Ryan Keightley)

AFMA to ensure existing footage where there is overlap between observers and electronic monitoring is retained, and advise the SESSFRAG about how many additional shots this constitutes.

Action Item #24 (2.4 SESSF RAG Data meeting 2018) summary of the school shark close kin project for consideration by SharkRAG

11. The RAG noted that CSIRO is in the process of producing a simple one-page explanation summary of the school shark close kin project for the FRDC.

Action Item 3: CSIRO

CSIRO to provide a copy of the school shark close kin project summary for distribution to SESSFRAG.

Action Item #26 (3.1 SESSF RAG Data meeting 2018) clarifying advice regarding natural mortality likelihood profile analysis paper

12. The RAG noted that Andre Punt had nothing further to add and his current advice stands:
 - If the likelihood of a fixed value falls outside the 95% confidence interval, the review panel could enquire why the parameter was fixed and not estimated. If the value is to be fixed, on what basis, and to what extent should inconsistency with the data be ignored.

Action Item #1 (2017.04 1.4) FIS surveys in tiger flathead assessments

13. The RAG agreed that the action item relating to development of a discussion paper for inclusion of winter/summer FIS (Fishery Independent Survey) length

data should be added to the SERAG (South East Resource Assessment Group) agenda as part of the stock assessment.

Action Item #7 (2017.11) quantifying area of deepwater shark habitat

14. The RAG agreed to remove the action item relating to quantifying the area of suitable deepwater shark habitat as a proxy for stock protection. Deepwater shark will now be assessed as a Tier 5 species.

Action Item #3 (SharkRAG 3 2018 3.1) collation and storage of various data streams

15. The RAG discussed the SharkRAG action item relating to reviewing the appropriateness of how and where data such as State, recreational, ageing and FIS data are collated and stored and noted that State and recreational data are included in the CSIRO Catch and Discards Report and will meet the requirements for the action item for these data.

Action Item 4: AFMA

AFMA to obtain and include in its database the following data sets:

- Great Australian Bight (GAB) and South East Trawl Fishery Independent Surveys
- crew collected data (inc. GABT and the GHAT)
- historic blue warehou industry collected data

5. SESSF history document update

16. The RAG noted the updates made to the history document and recommended that the recently released bycatch and harvest strategy policies be included.

Review of last year's assessment process

6. Review of 2019-20 TAC setting process

17. George Day summarised the outcomes of the SESSF 2019-20 total allowable catch (TAC) setting process and thanked all those involved. The RAG noted the proposed edits in the SESSF Harvest Strategy Framework; in particular that:
 - discard estimates should be based on the best available information which includes observer data, verified logbook information or other sources
 - for Tier 4 assessments, if discards or state catches are included in the reference period for target catch they should be deducted from the RBC in calculating the TAC.
18. The RAG agreed with the proposed edits to the Harvest Strategy Framework ([Attachment 5](#))
19. The RAG also noted that:
 - the AFMA Commission is meeting next week and will be setting the TACs for the fishery.
 - a. the TACs on East Coast Deepwater Trawl Sector non-quota species boarfish and orange roughy were not considered in session by SERAG and SEMAC because of an oversight by AFMA. Out-of-session comment had been sought from RAG and MAC members. Mr Penney stated that notional catch limits were unlikely to have changed given the low effort in the fishery.

- b. The discard estimate for blue warehou, a rebuilding species, had increased significantly in 2017 such that the combined landed catch and estimated discards was above the incidental bycatch TAC. The RAG noted that the discard estimate was likely driven by substantial numbers of juvenile fish being discarded on one trip. It was noted that the discard estimate was uncertain, however the presence of juvenile fish indicates potential increasing recruitment.

Action Item 5: AFMA

AFMA to inform the RAG of the outcome of the Commission on the TAC setting.

Action Item 6: Paul Burch

Paul Burch to upload to GovDex the final catch report that explains the change in process for scaling up the discards of blue warehou.

7. Update from the RAGs

Great Australian Bight Resource Assessment Group (GABRAG)

20. The GABRAG Chair, Lance Lloyd, provided an update on recent meetings. The RAG noted:

- that effort in the fishery is down to two boats for four to six months
- that industry is actively pursuing markets for bycatch/secondary species such as ocean jackets and latchets.

Deepwater flathead

- There has been some mixed signals with an increase in the number of old and big fish in recent years, and a consistent length/frequency distribution. However, there has been declining catch rates for the last few Fishery Independent Surveys (FISs) and commercial CPUE has been declining. Operators have reported lower catches, although recently catches appeared to have recovered.
- Industry has been concerned about an apparent temporal shift in catches over the past two seasons with spawning occurring later in the season.
- GABRAG recommended that the RBC be maintained at 1128 tonnes and that the stock assessment is run in 2019 as planned.

Bight Redfish

- There has been a reduction in the length of Bight redfish seen in FIS length frequencies, and a continued reduction in the estimated relative biomass. The depth distribution also appears to have shifted with movement inshore apparent.
- Industry has indicated that commercial CPUE has been increasing.
- The risk to the stock over the next twelve months is low as the TAC is less than 50 per cent caught.
- GABRAG recommended bringing the stock assessment forward to 2019 (from 2020) and reducing the MYTAC from 800 tonnes to 600 tonnes.

South East Resource Assessment Group (SERAG)

21. The SERAG Chair, Sandy Morison, provided an update on SERAG activities. The RAG noted:

Assessments advice

- Many assessments have been considered,
 - a. Tier 1 assessments have been completed for four species: blue grenadier, pink ling, silver warehou and jackass morwong. There were some concerns regarding the lack of biological data and uncertainties in the assessments, however it was considered acceptable for providing RBC advice.
 - b. Tier 4 assessments have been completed for blue eye trevalla (shelf), mirror dory and deepwater shark east and west. RBC advice was provided.
 - c. A new tier 5 assessment was completed for blue eye trevalla for the seamount component of the fishery.
 - d. TAC advice was given for eastern gemfish, redfish, blue warehou and orange roughy (southern & western) which are under rebuilding strategies.
- Mr Morison acknowledged the efforts of the team in putting together the information.

Pink ling

- The pink ling assessment was undertaken by Patrick Cordue from New Zealand, benefits were realised from having a fresh perspective in the room, not only for pink ling.
- SERAG considered a range of constant catch scenarios for eastern pink ling to assess the risk of setting the TAC at a point higher than the harvest control rule RBC.

Shark Resource Assessment Group (SharkRAG)

22. The SharkRAG Chair, Sandy Morison, provided an update on SharkRAG activities:

- There were three SharkRAG meetings and a workshop for the school shark close kin project.

Close kin meeting

- Mr Morison acknowledged the work of CSIRO on close kin which has led to major advances in understanding school shark stock status.
- There is a need to resolve how the close kin work can be used in providing RBC advice as it does not fit neatly into the harvest strategy framework.
- SharkRAG agreed that the previous school shark stock assessment model should be retired, as it is complex and heavily reliant on untested assumptions.
- The close kin work for school shark found that the 20 per cent ratio of school shark to gummy shark used for management was roughly equal to the relative available abundance of the two species

23. SharkRAG further considered the proportion of bycatch of school shark to gummy shark. Mr Stone raised that the total mortality (landed catch, state catch and discards) of school shark proposed by the RAG was only about 10 per cent of the gummy shark TAC. The RAG noted the current 20 per cent ratio used in management arrangements is based on industry advice on incidental catch of school shark in one part of the fishery. Further, the 20 per cent ratio rule is applied at a concession holder level not boat level.
24. Mr Penney informed the RAG that for the 2018 *Status of Australian Fish Stocks* (SAFS) report ABARES assessed and reported on species that are not currently assessed through the AFMA RAG process, for example, hapuku has been included.
25. Following discussion regarding the activities of AFMA's Economic Working Group (EWG) and Marine Mammal Working Group (MMWG), the RAG requested that reports from the most recent EWG and MMWG meetings be included as a standing agenda item for future SESSFRAG Chairs' meetings.

AFMA e-fish project and ICT strategy

8. AFMA's ICT strategy, agency data capture and e-fish projects

[This item was presented prior to Agenda Item 1]

26. The RAG noted and discussed the presentation provided by Callum Tyle, Mick Roses and Natalie Rivero about the ICT strategy, Agency Data Capture (ADC) and e-fish project.

ICT strategy

27. AFMA is undertaking a digital transformation to align itself with the Government's *Digital Continuity 2020 Policy*. AFMA's IT capability is undergoing a number of improvements to enable efficient business processes with less manual handling to better integrate with industry and stakeholders. A number of deliverables in the ICT strategy have been achieved (e.g. the rollout of laptops to AFMA staff and upgrade of standard operating environment) while others are currently underway (for example the Agency Data Capture project described below).

Agency data capture project

28. The aim of the ADC project is to improve the way in which data is exchanged between AFMA, fishers and external clients (such as CSIRO and ABARES).
 - The proposed IT solution will address a number of shortcomings that currently exist in AFMA data capture process, there will be the ability to:
 - a. reject submitted data that is clearly wrong (for example when a haul is reported to be before the setting of gear)
 - b. add or remove data fields without onerous system/software changes
 - c. enable data software providers to enter the market with greater ease.
 - An agile approach is being used to build and test the solution, so that infrastructure is tested and improved throughout the project. The first stage is the development of a pilot which will be extended to other fishing methods.
 - It is anticipated that external stakeholders will be starting to test the system alongside the current system throughout May 2019. The pilot will go live in

June 2019. AFMA is engaging with software vendors early to ensure any system changes will work for with their systems.

29. The RAG discussed the ADC project with key points of the discussion being:
- Current CSIRO processes rely on the data format that AFMA has been providing. Any changes made will need to ensure that stock assessment timelines are not disrupted, and there could be considerable cost to AFMA if changes to the data formats mean that CSIRO's automatic processing software has to be re-written.
 - The key recommendations from the *Strategic Review of the SESSF* undertaken by Dr Knuckey should be considered. It was noted that a number of the recommendations made that were specific to SESSF data needs will not be initially addressed as the project's scope is to provide a proof of concept for an IT solution using line-fishing method as an example. Following this, the project's outcomes will be extended to other fishing methods including the SESSF gears.
 - Greater controls in the data software will help to ensure that data is entered correctly. Fishers will also be able to edit their own data. Version control will be important to ensure that any edits are recorded.
 - Timeliness of data received by AFMA and provided to CSIRO is important and could be virtually live for logbook data. However, currently observer data can take months to be entered after the conclusion of a trip. Solutions were suggested, such as an observer interface for digital data transfer noting that software solutions for use in AFMA face a number of challenges with respect to requirements for security and accessibility guidelines. As a result, they cannot be developed as rapidly as they can be externally.

FRDC e-fish project

30. The FRDC funded e-fish project focusses on integrating the different sources of data and information sources that are received by AFMA that are disparate currently. The project will:
- develop design principles for an event-based infrastructure capable of linking and integrating fisher reported data.
 - develop a proof of concept prototype that is tested with real time fisheries data to demonstrate how the design principles can be applied.
31. The project is in the early stages and will be completed in mid-2020.

Outcomes from pre-meeting workshops

9. Technical Working Group

32. The RAG discussed the outcomes from the SESSFRAG Technical Working Group (TWG) meeting held on 25 February 2019.
33. The RAG agreed to adopt the outcomes from the TWG, as amended, at [Attachment 6](#). Noting that Section 1.3 (Presentation of base case and final assessments) of the *TAC setting process: Guidelines for provision of data and stock assessment processes* (annexed to Attachment 6) will be finalised for SESSFRAG to consider at the 2019 SESSFRAG Data meeting.

34. SESSFRAG recommended that the current Tier 3 assessment approach is no longer used given the methodology has been shown to be unreliable.
35. The RAG considered flowcharts of the 'SESSFRAG review of data adequacy' and 'assessment review and TAC setting' processes that had been developed following discussion at the TWG ([Attachment 7](#)). The RAG agreed to consider the approach further at its Data Meeting in July/August 2019 before finalising the document.

Action Item 7: AFMA and CSIRO

AFMA and CSIRO to update the document *TAC setting process: Guidelines for provision of data and stock assessment processes*:

- Section 1.3 (Presentation of base case and final assessments) and
 - Include the summary flowcharts 'SESSFRAG review of data adequacy' and 'assessment review and TAC setting'
- prior to SESSFRAG consideration at the Data meeting in August 2019. Real-life examples to be included for the meeting, possibly gummy shark, to explain the flowcharts to enable participants to work through the process.

Action Item 8: AFMA

AFMA to contact CSIRO regarding undertaking SAFE assessments for species that were unable to be assessed using Tier 4 assessments.

Action Item 9: AFMA

AFMA to check whether it is possible to undertake ageing for all species annually within the existing budget, rather than when the assessment is due, noting that there may be efficiencies to batching them.

Action Item 10: AFMA

Include the Fishery Management Strategy as an agenda item at the next SESSFRAG meeting.

-----Day 1 closed – 5.30pm-----

-----Day 2 opened – 9am-----

10. Data strategy working group meeting

36. The RAG discussed the outcomes from the Data Strategy working group meeting and noted that:
 - NSW has undertaken a process of prioritising research and monitoring needs and have developed a multi-criteria decision matrix that may be useful to consider. The matrix incorporates different variables, like conservation status or importance to the fishery, and helps to prioritise needs for different species.
 - SETFIA considers that there should be a cap on annual levy costs of \$3 million annually, and the FIS needs to be included in this.
 - there are fundamental concerns about the use of standardised CPUE as the only index in an assessment in the long term, particularly as;
 - a. southeast Australia is a hotspot for climate change, which is likely to cause shifts in productivity, and

- b. the CPUE index is likely to become less reliable due to effort creep or changed fishing practices.
 - it may be possible to get discard estimates and length frequencies from electronic monitoring footage, and further work is needed to implement the initiative.
 - The reanalysis of the FIS shows that the current survey design, coupled with an improvement to the model process, is performing well for three key species (pink ling, tiger flathead and blue grenadier) and potentially jackass morwong.
37. The RAG recommended:
- that the FIS be undertaken in 2019 but if the FIS does not proceed in 2019, then it should go ahead in 2020, noting that the value of the FIS indices degrades each year it is delayed
 - the next FIS does not need to await the completion of the survey redesign, as the gain from such a redesign is likely to be small (especially compared with the substantial gain already attained from the recent change to the underlying survey analysis model)
 - the value of a redesign of the FIS should be considered by SESSFRAG at its data meeting in August 2019
 - considering other data collection scenarios, including reduced, or more cost efficient, biological collection targets, will be necessary to enable the FIS to continue within an appropriate budget.
38. The RAG acknowledged the budget implications of running the FIS, observers and electronic monitoring programs each year. Tradeoffs are likely to be required, and the reliability of estimates of protected species interactions may be impacted by running the FIS. Less certainty around bycatch estimates, or having biennial estimates, may be necessary to allow for the FIS but would not significantly impact on effective management of bycatch species.
39. The RAG noted that it was important not to focus on reducing uncertainty around estimates of bycatch species interactions at the expense of effective monitoring of target species.
40. After persons with a declared conflict of interest left the room, the RAG undertook the final recommendations:
- Endorsed, with edits, the data strategy meeting outcomes ([Attachment 8](#)).
 - A working group be established to explore tradeoffs in monitoring and assessment scenarios (FIS, ISMP, EM, assessments etc.) and provide an out-of-session information paper to SESSFRAG prior to the 2019 data meeting. When considering tradeoffs, it is important to note that EM and the FIS provide different data – the FIS provides fishery independent information for commercial species while EM, at least for trawl, may be able to provide information for TEPs and bycatch.
 - The ISMP program for work in the SESSF should be examined to ensure that work is focussing on providing required data for relevant species.
 - The FIS should be undertaken in 2019, recognising the 2019-20 budget constraints, which is currently out for consultation.

Action Item 11: Dr Hall – NSW DPI / Mr Day - AFMA

NSW DPI to provide their Multi-criteria Decision Matrix for prioritising research and monitoring needs to AFMA. AFMA and NSW DPI to discuss further and provide an update to the SESSFRAG 2020 Chairs' Meeting.

Action Item 12: SESSFRAG

SESSFRAG to discuss at the SESSFRAG 2019 Data meeting whether a redesign of the FIS is worthwhile undertaking.

Action Item 13: CSIRO

Dr Sporcic to consider whether there are any learnings from the FIS optimisation work that can be applied to improve CPUE standardisation and provide an update to the SESSFRAG 2019 Data Meeting.

Action Item 14: AFMA

AFMA to consider how the outcomes of the discard weight estimate project may be implemented and report to the SESSFRAG 2019 Data Meeting.

Action Item 15: AFMA

AFMA to ensure there is sufficient overlap of observer coverage and electronic monitoring data collection to enable comparison from the trawl electronic monitoring trial.

Action Item 16: AFMA

AFMA to establish a working group to explore trade-offs in monitoring and assessment scenarios to allow for a FIS, including:

- reducing biological collection targets
- potential to postpone assessments and
- examining the ISMP program to ensure work is focussing on providing required data for relevant species.

The outcomes of the working group, including a design framework, to be provided for information out-of-session to SESSFRAG prior to June 2019.

11. Declining indicators and multi-species harvest strategies implementation workshop

41. The RAG noted the update provided by Dr Knuckey about the Declining indicators and multi-species harvest strategy workshop.

Declining indicators implementation workshop

- A range of background papers were provided to assist with understanding the issues
- A number of recommendations were developed, including those related to:
 - a. fisher behaviour:
 - i. information that can be captured within the current range of data, such as vessel efficiency, which has an impact on catch rates.
 - ii. additional indicators that can be brought in, for example, using dollar per unit effort to explain undercaught TACs and decreasing catch rates.
 - b. climate change:
 - i. the potential influence of climate change on stocks as southeast Australia is in a hotspot for change.

- ii. a range of life parameters can be impacted including distribution and productivity, noting that some species will be impacted positively and some negatively.
- A number of decisions need to be made to implement the project. Some of these will be AFMA's responsibility, while others will need to be included in the FRDC Multi-species Harvest Strategy Project.

Multi-species harvest strategy workshop

- The FRDC Multi-species Harvest Strategy Project has just commenced and will examine a range of potential harvest strategies to address some of the shortcomings of the current SESSF Harvest Strategy.
 - Currently the fishery is essentially managed via several individual species harvest strategies, some are using MEY targets, others MSY.
 - The next step for the project is to develop the 'straw dog' harvest strategies and model them under a MSE approach.
42. The RAG discussed the potential value of using dollars per unit effort as an metric in assessments, the RAG noted:
- a similar metric has been found to be useful in the Northern Prawn Fishery; comparing tiger prawns to endeavour prawns, which are half the value and influence fishing behaviour.
 - FRDC are seeking expressions of interest for a project that will look across all possible metrics for measuring the economic efficiency and productivity in fisheries.

Action Item 17: Economic Working Group / AFMA management

The Economic Working Group to assess the potential value of the dollars per unit of effort metric as an index. If there is potential, ensure it is considered as part of the FRDC considering metrics for measuring economic efficiency and productivity in fisheries.

Research, monitoring and assessments

12. Integrated Scientific Monitoring Program 2018 report and plan for 2019

43. The RAG noted the presentation provided by Tamre Sarhan and Nate Muelenburg of the observer program. In particular:
- ISMP Targets were met in three of the four quarters for 2018.
 - GAB redfish biological samples targets were not achieved as there were only four trips during the year and not many were caught. When observer trips are scheduled for the calendar year, coverage should be conducted in March or April to ensure redfish samples are collected.
 - Fishing effort in the western Tasmania area was low and hence only 16 days were undertaken.
44. The RAG discussed observer program:
- onboard coverage has improved and this should continue.
 - Port sampling should be considered as an alternative to onboard coverage for collecting biological samples

- NSW DPI have a port based sampling program and have offered to assist with collection of samples.
 - AFMA observer section is looking to train another person for port collection of samples of ling in the west. SSIA are also interested in obtaining western samples for the shark industry data collection program (SiDAC).
 - Some observer data for the 2018 calendar year is missing from the ISMP report and needs to be included in the final report.
 - Biological targets in the ISMP need to be reviewed including potential consideration of non-quota species, e.g. ocean jackets which are currently the 5th most caught species in the SESSF.
 - Representative sampling, both temporally and spatially, is important. Noting observer target days are set based on recent effort across all strata.
 - If the number of target days cannot be achieved in each quarter, while not ideal, it is possible to increase the effort in the fourth quarter.
 - Seadays allocated to NSW gemfish spawn will be removed because eastern gemfish is now a bycatch fishery.
45. RAG discussed rationalising the design of the ISMP to reduce overall costs, including the potential to:
- reduce the number of measurements for some species that overran their targets
 - target the program, for example, undertake observer trips every second year rather than every year, however it may be difficult to retain observers.

Action Item 18: AFMA observers

Observers to update the 2018 ISMP report to include the missing data, including jackass morwong west, gemfish, grenadier, warehou, pink ling and trevalla.

13. Shark Industry Data Collection

46. The RAG noted the information provided by Simon Boag of the Southern Shark Industry Association (SSIA) regarding the shark industry data collection program (SiDAC).
- The first quarter of the project established capacity by ensuring that people had the right gear and training to undertake the task. As such only about a quarter of the required number of samples was collected during the first quarter. The quantity of samples has now improved.
 - Collection of data is reported to AFMA quarterly, and the industry is managing the process internally. Sampling methodology is working for gummy shark as they take the first 50 sharks per shot. However, reaching the target for school shark using this method was challenging given they did not constitute a large part of the catch - now sampling boats are tagging all school shark carcasses.

14. Incorporating the effects of marine spatial closures in risk assessments and fisheries stock assessments

47. Due to time constraints this presentation was not given.

48. The RAG agreed that Dr Geoff Tuck will circulate the presentation to the RAG attendees (via GovDex) and for it to be presented at a later meeting.

Action Item 19: Dr Tuck CSIRO

Circulate the marine spatial closures in risk assessments presentation to SESSFRAG and present at either SESSFRAG 2019 Data meeting or SERAG in September.

15. Five year strategic plan (2016-20) & 2020-21 Research Statement

49. The 'GAB Trawl Sector Annual Research Statement 2020-21' was updated during the meeting and is at [Attachment 9](#). Key points included:
- The Bight redfish assessment was brought forward to 2019 (as per the GABRAG/GABMAC recommendation) subject to CSIRO having enough resources to undertake it.
 - To spread out the costs, the GAB FIS was delayed until 2020, noting this will result in a three-year gap in the series.
 - In-principle support was provided for the project *market barriers to increased demand and consumption of GAB products* as long as its aim is to reduce discards and increase profits. A scoping document needs to be drafted to provide further detail.
 - Further clarity about the project *cost/benefit analysis of the bycatch research and development plan* is needed before inclusion in the research statement, noting it can be added prior to ComRAC consideration later in 2019.
50. The *SESSF Annual Research Statement 2020-21* was updated during the meeting and is at [Attachment 10](#). Key points included:

Stock assessment schedule:

- Alfonsino – Tier 3 assessments no longer used. Assessment subject to periodic review of data.
- Blue warehou – will remain unlisted for assessment as catches continue to be low, although discards were higher in 2017. However, if catches increase this will be reviewed. In the meantime information about lengths and otoliths should be kept. This species is a candidate for close kin work.
- Deepwater shark – assign to tier 5 level.
- Elephant fish – assign as a SAFE methodology (elephant fish were assessed recently as low risk).
- Gemfish east - Tier 1 assessment retained, but it will be reviewed at the SESSFRAG data meeting in August to see if sufficient data are available for assessment in 2020.
- Gummy shark – delayed to 2020 to allow for outcomes of GHAT CPUE standardisation project and SiDAC collection.
- John Dory – change from a tier 3 to a tier 4
- Oreo smooth cascade – Tier 3 assessments no longer used. Assessment subject to periodic review of data.
- Oreo smooth other – Tier 3 assessments no longer used. Assign as a Tier 5 for 2019.
- School whiting – the Commonwealth could undertake assessment with NSW in 2021 and share the costs. Assessment moved to 2021, subject to the

NSW catch of whiting as a proportion of the basket, and outcomes of stock structure work.

Fish Ageing

- The RAG supported the *fish ageing for SESSF quota species* subject to review of biological requirements and budgeting needs.

Fishery Independent Survey

- The SESSF Fishery Independent Survey didn't go ahead in 2018. The RAG recommended that the wording be changed to include "essential for 2019".

Review SESSF catch history

- Undertake a scoping project as a high priority with a starting budget of \$5,000. The proponent to concentrate on the Tier 1 species.
- It may be possible to compare Dr Neil Klaer's dataset to information contained in the Fishery Assessment Reports (FARs) to focus attention on areas of concern. Catch for some species such as school whiting and redfish may exist on other databases that are more accurate than the FAR.

Examination of data acquired through electronic monitoring, logbooks and on-board observers

- Separate projects are required for the GHAT and the CTS. Both projects will need a detailed scoping document before it goes to the ARC.
 - i. GHAT – high priority
 - It is possible determine the length of the net from EM using sensors on the net drums and compare to logbook records.
 - Some footage may have already been deleted because of the 6 month retention policy.
 - ii. CTS – lower priority until there is more data
 - Currently determining the data that cameras can capture on trawl vessels.
 - Additional projects to be considered pending the results of this work.

Implications of biennial data collection in the GHAT

- Remove from the list, alternately a data exclusion analysis should be undertaken during the next gummy shark assessment.

Analysis of the issues with orange roughy assessments

- Remove this item from the list, as it is not expected that this project will achieve the anticipated outcomes.
- There needs to be broader consideration about approaches to determine natural mortality across multiple species.
- Previously, the RAG and MAC recommended a MCMC analysis be carried out during the next orange roughy assessment and then MSE analyses after the next assessment.

Close kin feasibility desktop study

- Determine if close kin can be used to as a monitoring tool for the SESSF by identifying key species that drive effort in the fishery and scoping close kin monitoring for those species.
- Include as a feasibility study and include sampling design and likely cost.
- Close kin may be an alternative to the FIS for fishery independent indices but only for selected species.
- Project proposal to be considered by the SESSFRAG at the 2019 Data meeting.
- NSW DPI Recently submitted an expression of interest to FRDC to investigate use of environmental DNA methods to estimate the biomass of mulloway and murray cod (as case studies). This was in response to a priority put forward by NSW RAC for 'proof of concept' projects to investigate ways to estimate the stock biomass of fish stocks using novel genetic techniques;
 - a. while the project does not include close kin as a focus, there is interest across jurisdictions for developing genetic techniques as alternative methods to estimate stock biomass.

Investigate options for use of dynamic reference points for SESSF species

- Project to remain on the list noting that there is an expression of interest submitted to FRDC. If the project is funded through that process it can be removed from the list

Improving the SESSF stock assessments – the recreational component

- Remove from the list as this is not typically something ComRAC would consider.

51. The RAG endorsed the edited SESSF and GAB Annual Research Statements, noting that the SESSF research statement will be circulated out of session for items that were not covered during the meeting

Action Item 20: CSIRO and AFMA

CSIRO and AFMA to determine whether there are enough resources to undertake the bigt redfish and deepwater flathead assessments for the GABTF in 2019.

Action Item 21: AFMA and CSIRO

AFMA and CSIRO to develop a detailed project proposal for a comparison of overlapping GHAT EM and observer data for submission to the ARC / ABARES.

Action Item 22: GABIA

Review the project description for '*market barriers, demand and consumption of GAB products*' and further define the project for inclusion in the GABT Research Plan.

Action Item 23: AFMA/GABIA

Obtain further clarity from Professor Tisdell regarding the project '*cost/benefit analysis of the bycatch research and development plan*' for inclusion on the GABT research plan.

Action Item 24: AFMA and CSIRO

Review, and include, the costs of the stock assessments in the SESSF Research Plan, to allow for an estimate of annual cost in the scheduling table.

Action Item 25: Mr Morison

Mr Morison to provide AFMA with the 2004 *South East Fishery: Fishery Assessment Report* for conversion into a datasheet.

Action Item 26: CSIRO – Dr Thomson

Data exclusion to investigate the effect of biennial sampling to be undertaken during the next gummy shark assessment to determine the impact of biennial data collection by removing every second year of length and age data.

Action Item 27: SESSF RAG

SESSF RAG to discuss how estimates of natural mortality should be addressed across all Tier 1 assessments at its 2019 Data meeting.

Action Item 28: AFMA

Circulate the SESSF Annual Research Statement 2020-21 for comment for items that were not covered in the meeting.

15 a – Blue-eye trevalla close-kin project proposal

52. The RAG noted the information on a blue-eye trevalla close kin scoping proposal provided by Robin Thomson of the CSIRO;
- Blue-eye trevalla is the one of the few target species not assessed at a tier 1 level; it is a tier 4 assessment species on the shelf and a tier 5 on the sea mounts.
 - A close kin study could help determine blue-eye trevalla population characteristics. The proposed study:
 - a. will provide a sample design and costing for a sampling study
 - b. that subsequent study would aim to determine whether current catches are sustainable and if the stocks are at target levels using close kin samples.
53. The RAG suggested expanding the scope of the project:
- It would be possible to expand the scope to enable the project to test the close kin method as an approach to other data poor stock assessments, with the proposal to include extension options. At this level it becomes more likely to be considered as an FRDC project, noting:
 - a. linkages can be made with the FRDC project '*Common Harvest strategies and Catch Sharing: Developing a proposal for a national framework/guide using case studies and experience*'.
 - b. it may be possible to include other species such as eastern gemfish
 - c. other jurisdictions, including NSW, may also be interested in contributing funds.
 - d. FRDC allows for other funding partners and do not mind a phased approach to projects.
 - e. Alternatively, close kin scoping could be done for just a few key driving species in the SESSF (e.g. pink ling, tiger flathead, jackass morwong, a GAB species, gummy shark) those whose TACs actually limit catches. In this way, effort in the SESSF could be managed through close kin monitoring of a relatively small set of species.

Action Item 29: CSIRO

Dr Thomson to consider the feedback from the RAG and determine whether to expand the scope of the blue-eye trevalla close kin project proposal.

SESSF ERA

16. SESSF ERA triggers

16 a – Update on ERA status

54. The RAG noted that the otter board trawl, Danish seine and gillnet ERAs are currently being revised.
55. The RAG agreed that this agenda item will be considered at the SESSF data meeting in August 2019 when the updated ERA results are available

Action Item 30: AFMA

Include results of the update ERAs for otter board trawl, Danish seine and gillnet the 2019 SESSFRAG data meeting.

16 b – Identification of triggers

56. The RAG agreed that this agenda item will be considered at the 2019 SESSFRAG data meeting in August.

Action Item 31: AFMA

Include the identification of ERA triggers as an early item on the agenda for the 2019 SESSFRAG data meeting.

Next meeting and other business

17. Dates for the data meeting

57. The RAG discussed the next meeting, this is the last meeting of the RAG with this group as the tenures of the chair and members are expiring, and a process of membership renewal is being undertaken.

-----Day 2 closed –3pm-----



Signed (Chairperson):

Date: 13 May 2019

Attachments

- 1) [Declared conflicts of interest](#)
- 2) [Final adopted agenda](#)
- 3) [Status of previous Action Items](#)
- 4) [New Action Items as of end of meeting](#)
- 5) [Harvest Strategy Framework](#)
- 6) [Technical Working Group meeting outcomes](#)
- 7) [Flowchart of the pre-processing and assessment and TAC setting process cycles](#)
- 8) [Data Strategy meeting outcomes](#)
- 9) [Updated GAB annual research statement](#)
- 10) [Updated SESSF annual research statement](#)

Declared Conflicts of Interest

Participant	Declared interest
Members	
Dr Cathy Dichmont	<p>Proprietor of Cathy Dichmont Consulting. Chair of TT RAG.</p> <p>Contracted by various State and Commonwealth agencies to undertake various reviews and consultancies not related to SESSF.</p> <p>No pecuniary interest in the SESSF.</p>
Mr George Day	<p>Employed by AFMA; Senior Manager of Demersal and Midwater Fisheries.</p> <p>No interest, pecuniary or otherwise.</p>
Mr Lance Lloyd	<p>GABRAG Chair. Member of GABMAC and SESSFRAG.</p> <p>Director; Lloyd Environmental Pty Ltd.</p> <p>Research Fellow; Federation University Australia</p> <p>No pecuniary interest.</p>
Mr Sandy Morison	<p>Director of Morison Aquatic Sciences.</p> <p>Chair of SharkRAG, SERAG and the Tropical Rock Lobster Working Group.</p> <p>Scientific member on SEMAC.</p> <p>Contracted by government departments, non-government agencies and companies for a range of fishery related matters including research and (by SCS Global Services) for MSC assessments of AFMA managed and other Australian and international fisheries.</p> <p>No pecuniary or other interest in the SESSF.</p>
Dr Sarah Jennings	<p>Economics member on SERAG.</p> <p>Invited economics participant on SEMAC.</p> <p>Economics coordinator, FRDC Human Dimensions Research</p> <p>Member of AFMA Economics Working Group.</p> <p>Adjunct Senior Researcher, TSBE, University of Tasmania.</p> <p>Independent economics consultant.</p> <p>No pecuniary or other interest.</p>
Ms Cate Coddington	<p>Employed by AFMA, Executive Officer of SESSF RAG. No interest, pecuniary or otherwise.</p>
Invited Participants	
Dr Andrew Penney	<p>Director of Pisces Australis Pty Ltd, an Australian registered marine and coastal research and management consultancy based in Canberra. As such, I have an interest in any opportunities in this regard.</p> <p>Principal Investigator on FRDC Project No 2017-180: Design and implementation of an Australian National Bycatch Report: Phase 1 - Scoping</p> <p>Scientific Member of AFMA Tropical Rock Lobster RAG and Small Pelagic Fishery Scientific Panel</p> <p>Member of the AFMA ERA Technical Working Group.</p> <p>No shareholding and hold no positions relating to any other companies, including any fishing companies or industry associations</p>

Participant	Declared interest
Mr Dan Corrie	Employed by AFMA, South East Trawl Manager, Coral Sea Fishery Manager. No interest, pecuniary or otherwise.
Mr David Stone	Executive Officer for Sustainable Shark Fishing Industry Inc. Declared interests in representing hook and gillnet industry member interests. Declared interest in RBCs
Dr Geoff Tuck	Employed by CSIRO. Involved in Stock assessments. Interest in obtaining funding for future research. Principle investigator on the SESSF stock assessment project.
Dr Ian Knuckey	Positions: Director – Fishwell Consulting Pty Ltd Director – Olrac Australia (Electronic logbooks) Deputy Chair – Victorian Marine and Coastal Council Chair / Director – Australian Seafood Co-products & ASCo Fertilisers (seafood waste) Chair – Northern Prawn Fishery Resource Assessment Group Chair – Tropical Rock Lobster Resource Assessment Group Chair – Victorian Rock Lobster and Giant Crab Assessment Group Scientific Member – Northern Prawn Management Advisory Committee Scientific Member – SESSF Shark Resource Assessment Group Scientific Member – Great Australian Bight Resource Assessment Group Scientific Member – Gulf of St Vincent Prawn Fishery Management Advisory Committee Scientific participant – SEMAC, SERAG Current projects: AFMA 2018/08 Bass Strait Scallop Fishery Survey – 2018 and 2019 FRDC 2017/069 Indigenous Capacity Building FRDC 2016/116 5-year RD&E Plan for NT fisheries and aquaculture AFMA 2017/0807 Great Australian Bight Trawl Survey – 2018 Traffic Project Shark Product Traceability FRDC 2018/021 Development and evaluation of SESSF multi-species harvest strategies
Dr Jemery Day	CSIRO, assessment scientist. Acquiring funding for research purposes. Interests in promoting good science.
Mr Neil MacDonald	Executive officer of the Great Australian Bight Industry Association Executive officer of Surveyed Charter Boat Owners and Operators Association South Australia Executive officer of Southern Fishermen's Association Executive officer of Saint Vincent Gulf Prawn Boat Owner's Association Executive officer of South Australian Blue Crab Pot Fishers Association Executive officer of Marine Scale Net Fishers Association Committee support South Australian Rock Lobster Advisory Council Director NMAC(SA) P/L Chair CGG SAC Gippsland MSS
Dr Paul Burch	Employed by CSIRO, assessment scientist. Acquiring funding for research purposes. PI on data services contract.

Participant	Declared interest
Dr Robin Thomson	Employed by CSIRO, Assessment scientist. Acquiring funding for research purposes PI on close kin project for school shark.
Mr Ryan Keightley	Employed by AFMA, A/g Gillnet, Hook and Trap, High Seas and Norfolk Is Manager. No interest, pecuniary or otherwise.
Mr Simon Boag	Executive Officer South East Trawl Fishing Industry Association (SETFIA) Non-beneficiary Director of two fishing companies in the SESSF one of which is a significant quota owner. Industry member on both SERAG and SEMAC. SETFIA receives funding from various bodies to complete projects. Engaged by AFMA to collect shark industry biological data PI on the fishery independent survey SETFIA is the PI on the orange roughy east AOS EO on SSIA EO on SPFIA
Observers	
Dr Veronica Silberschneider (Friday only)	Cross-jurisdictional research and management interests for DPI NSW, no pecuniary interests.
Dr Karina Hall	Cross-jurisdictional research and management interests for DPI NSW.
Sayan Chakrabarty	Employed by AFMA as an Economist. No interest, pecuniary or otherwise.
Fay Helidoniotis	Employed by ABARES – interest in research.
Michael Le	Employed by AFMA, Senior Management Officer. No interest, pecuniary or otherwise.

Adopted Agenda

<i>Agenda item</i>	<i>Purpose</i>
<i>Preliminaries</i>	
1. Welcome and apologies	For information
2. Declarations of interest	For action
3. Adoption of Agenda	For action
4. Action Items status	For information
5. SESSF History Document update	For information
<i>Review of last year's assessment process</i>	
6. Review of 2019-20 TAC setting process (paper)	For Information
7. Update from the RAGs (verbal update)	For Information
<i>AFMA e-fish project and ICT strategy</i>	
8. Presentations: a. e-fish project b. AFMA ICT strategy	For information
<i>Outcomes from pre-meeting workshops</i>	
9. Technical Working Group a. Quota species 'breaks out' under decision tree support tool – when to review b. Developing a process for considering new approaches to assessment c. Species that are difficult to assess d. When to reject an assessment e. Setting TACs for species without an accepted assessment	For recommendation
10. Data strategy meeting a. FMS data plan – prioritising needs b. FMS data plan – considering data collection scenarios and costing	For recommendation
11. Declining indicators and multi-species harvest strategies implementation workshop	For information

<i>Agenda item</i>	<i>Purpose</i>
<i>Research, monitoring and assessments</i>	
12. Integrated Scientific Monitoring Program (ISMP) 2018 report and plan for 2019	For Information
13. Shark Industry Data Collection	For information
14. Presentation: Incorporating the effects of marine spatial closures in risk assessments and fisheries stock assessments	For information
15. Five Year Strategic Plan (2016-20) & 2020-21 Research Statement a. Blue Eye Trevalla close kin scoping proposal	For recommendation
<i>SESSF ERA</i>	
16. SESSF ERA triggers a. Update on ERA status b. Identification of triggers	For advice
<i>Next meeting and other business</i>	
17. Dates for the data meeting	For Decision
18. Other business	

Status of Previous Action Items

Complete/Redundant		Underway	Need SESSF RAG advice	Not yet started	
Prev No.	Agenda Item / Meeting Date	Action Item	Agency / Person	Timeframe	Progress as of SESSF RAG Meeting February 2019
2	1.4 2017 Data meeting	Dr Knuckey to provide an inventory of all otolith samples in Fishwell Consulting's possession and to the stock assessment people (the relevant RAGs). Each RAG is then to decide if the data and samples are required to be transferred to Fish Ageing Services to be archived and potentially processed if to be used in future stock assessments.	Ian Knuckey	As soon as practicable	Complete -Dr Knuckey has completed an inventory of otoliths in Fishwell Consulting's possession and the list was made available to the RAG during the meeting.
9	4.3 2018 Chairs meeting	AFMA to coordinate via the RAGs to produce a description of the blue eye trevalla fishery history, including recreational catch, black market etc.	AFMA	As soon as practicable	Underway – further information to be included from additional sources; including NSW, and Victoria and Dr Malcolm Haddon.
2	1.4 SESSF RAG Data 2018	Mr Krusic-Golub to locate methods paper for running a simulation to develop ageing targets and discuss with CSIRO including the general method and the requirements for a single species (initially alfonsino).	Kyne Krusic-Golub (Fish Ageing Services) to the South East Resource Assessment Group (SERAG)	SERAG 2 2018	Complete - work to be undertaken as part of the data services contract between AFMA and CSIRO.

Prev No.	Agenda Item / Meeting Date	Action Item	Agency / Person	Timeframe	Progress as of SESSF RAG Meeting February 2019
3	1.4 SESSF RAG Data 2018	SERAG to consider the priority given to the SESSF species catch history project when it prepared the 2020-21 annual research statement. This priority would be considered by SESSFRAG when it reviewed the 2020-21 annual research statement at its February / March 2019 meeting.	SERAG	SERAG 2 2018	Complete – a scoping project with a high priority was proposed during the consideration of the SESSF annual research statement.
4	1.4 SESSF RAG Data 2018	AFMA to circulate the previously agreed process (see 2013) for introducing new assessments to the TAC setting process. Dr Dichmont to work with CSIRO and AFMA to develop a protocol for how RAGs should assess proposals for new stock assessment methods in future.	AFMA / Cathy Dichmont / CSIRO	As soon as practical	Complete – incorporated into the technical working group and discussed at Agenda itm 9. Action Item 7 from the Chairs' meeting is for AFMA and CSIRO to develop the process for consideration by SESSFRAG
5	1.4 SESSF RAG Data 2018	Dr Tuck to present on 'Incorporating the effects of marine spatial closures in risk assessments and fisheries stock assessments' (Tuck <i>et al</i> 2018 FRDC 2011-032) at SESSFRAG's next meeting.	CSIRO, Dr Geoff Tuck	SESSFRAG Feb/Mar 2019	Redundant – whilst this was not addressed at the meeting, the action item is superseded by action item 19.
11	2.3 SESSF RAG Data 2018	AFMA to examine data from any period where there is an overlap between observers and electronic monitoring (EM) to allow verification of logbooks by comparing data provided by skippers with that provided by observers (e.g. weights, species ID).	AFMA / Brodie	As soon as practical	Redundant – superseded by action item 2 from 2019 Chairs' meeting
17	2.4 SESSF RAG Data 2018	AFMA to work with the data team to correct units in the AFMA database for length measurements. If cannot be corrected in database, AFMA to work with CSIRO to correct.	AFMA	As soon as possible	Underway – AFMA is in the process of making the corrections within the database.
27	4.1 SESSF RAG Data 2018	SERAG to consider an exploration of alternative methods to estimate <i>M</i> , taking into consideration life history parameters the following matters at its next meeting for the purposes of TAC setting for the second and third year of a three year MYTAC in 2019-20 and 2020-21	SERAG	SERAG 1 2018	Redundant - Superseded by Action Item 28 as part of a general discussion regarding treatment of natural mortality in Tier 1 assessment

Table 2 Action Items from SERAG relevant to the SESSFRAG for considerations

Prev No.	Agenda Item / Meeting Date	Action Item	Agency / Person	Timeframe	Progress as of SESSF RAG Meeting August 2018
1	2017.09 1.4	Dr Jemery Day to prepare a discussion paper regarding the inclusion of winter/ summer length data from FIS surveys in future tiger flathead assessments.	AFMA and CSIRO	SESSFRAG Data Meeting 2018. To be raised at SESSFRAG Chairs meeting 2018	Redundant: SERAG to be provided with the responsibility for the carriage of this action item.
15	2018.09 Agenda item: 12	Ensure agenda item for ERA triggers is added to SESSFRAG Chair's meeting, 2019.			Redundant – Superseded by Action Item 33 for the ERA Triggers to be added to the SESSFRAG data meeting

Table 1 Action Items from SHARKRAG relevant to the SESSFRAG for considerations

Prev No.	Agenda Item / Meeting Date	Action Item	Agency / Person	Timeframe	Progress as of SESSF RAG Meeting February 2019
2	GHAT Data Working Group March 2017	Robin Thomson to investigate the statistical implications of conducting biennial collection of biological data for the GHAT (subject to funding).	Robin Thomson	TBC	Redundant: superseded by Action Item 27 2019 Chairs' meeting – MSE testing will be undertaken by CSIRO during the next gummy shark assessment
3	SharkR AG 3 2018 3.1	SESSFRAG to review the appropriateness of how and where data such as State, recreational, ageing and FIS data are collated and stored, and provide recommendations on the future collection and storage of these data.	AFMA	2019	Complete –AFMA is the most appropriate place to store the data. Additionally much data, including state data, is in the CSIRO report

New Action Items as of end of meeting

Table 2 Actions arising from SESSFRAG Chairs' meeting 2019

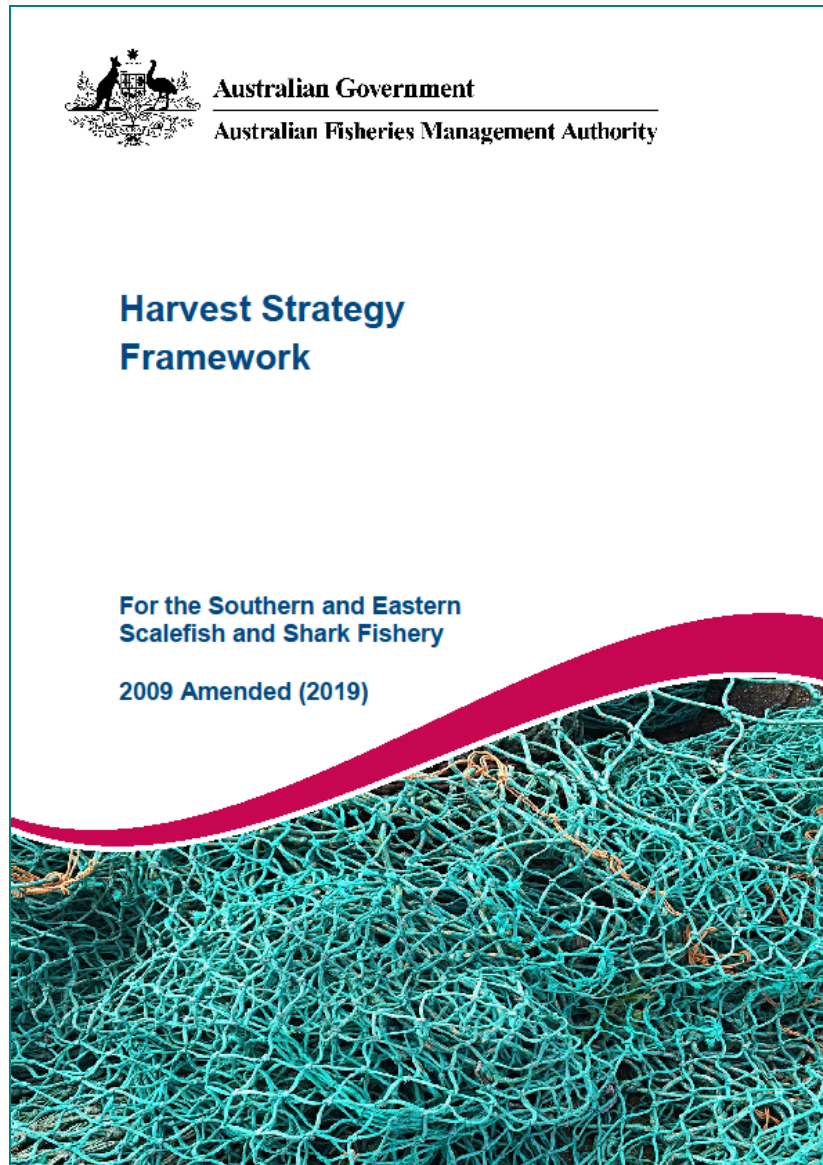
#	Agenda Item / Meeting Date	Action Item	Agency / Person	Timeframe
1	4 SESSFRAG Chairs' 2019	AFMA to consider adding data from NSW, Dr Haddon and Victoria and provide a revised blue-eye trevalla history report to SESSFRAG in August 2019.	AFMA	SESSFRAG Data meeting 2019
2	4 SESSFRAG Chairs' 2019	AFMA to ensure existing footage where there is overlap between observers and electronic monitoring is retained and advise the SESSFRAG about how many additional shots this constitutes.	AFMA (Ryan Keightley)	As soon as practicable
3	4 SESSFRAG Chairs' 2019	CSIRO to provide a copy of the school shark close kin project summary to SESSFRAG.	CSIRO	As soon as practicable
4	4 SESSFRAG Chairs' 2019	AFMA to obtain and include in its database the following data sets: <ul style="list-style-type: none"> • Great Australian Bight (GAB) and South East Trawl Fishery Independent Surveys • crew collected data (incl. GABT and the GHAT) • historic blue warehou industry collected data 	AFMA	As soon as practicable
5	6 SESSFRAG Chairs' 2019	AFMA to inform the RAG of the outcome of the Commission on the TAC setting	AFMA	Immediately after the decision is made
6	6 SESSFRAG Chairs' 2019	Paul Burch to upload to GovDex the final discard report that explains the change in process for scaling up the discards of blue warehou.	Paul Burch	As soon as practicable
7	9 SESSFRAG Chairs' 2019	AFMA and CSIRO to update the document <i>TAC setting process: Guidelines for provision of data and stock assessment processes</i> : <ul style="list-style-type: none"> • Section 1.3 (Presentation of base case and final assessments) and • Include the summary flowcharts 'SESSFRAG review of data adequacy' and 'assessment review and TAC setting' prior to SESSFRAG consideration at the Data meeting in August 2019. Real-life examples to be included for the meeting, possibly gummy shark, to explain the flowcharts to enable participants to work through the process.	AFMA/CSIRO	SESSF RAG data meeting 2019

#	Agenda Item / Meeting Date	Action Item	Agency / Person	Timeframe
8	9 SESSFRAG Chairs' 2019	AFMA to contact CSIRO regarding undertaking SAFE assessments for species that were unable to be assessed using Tier 4 assessments	AFMA	As soon as practicable
9	9 SESSFRAG Chairs' 2019	AFMA to check whether it is possible to undertake ageing for all species annually within the existing budget, rather than when the assessment is due, noting that there may be efficiencies to batching them	AFMA	Data working group meeting
10	9 SESSFRAG Chairs' 2019	Include the Fishery Management Strategy as an agenda item at the next SESSFRAG meeting	AFMA	SESSFRAG data meeting 2019
11	10 SESSFRAG Chairs' 2019	NSW DPI to provide their Multi-criteria Decision Matrix for prioritising research and monitoring needs to AFMA. AFMA and NSW DPI to discuss further and provide an update to the SESSFRAG 2020 Chairs' Meeting.	Dr Hall – NSW DPI / Mr Day - AFMA	SESSFRAG data meeting 2019
12	10 SESSFRAG Chairs' 2019	SESSFRAG to discuss at the SESSFRAG 2019 Data meeting whether a redesign of the FIS is worthwhile undertaking.	SESSFRAG	SESSFRAG data meeting 2019
13	10 SESSFRAG Chairs' 2019	Dr Sporcic to consider whether there are any learnings from the FIS optimisation work that can be applied to improve CPUE standardisation and provide an update to the SESSFRAG 2019 Data Meeting.	CSIRO	SESSFRAG data meeting 2019
14	10 SESSFRAG Chairs' 2019	AFMA to consider how the outcomes of the discard weight estimate project may be implemented and report to the SESSFRAG 2019 Data Meeting.	AFMA	SESSFRAG data meeting 2019
15	10 SESSFRAG Chairs' 2019	AFMA to ensure there is sufficient overlap of observer coverage and electronic monitoring data collection to enable comparison from the trawl electronic monitoring trial.	AFMA	Immediately
16	10 SESSFRAG Chairs' 2019	AFMA to establish a working group to consider data collection scenarios to allow for a FIS, including: <ul style="list-style-type: none"> reducing biological collection targets potential to postpone assessments and rationalising the ISMP program. The outcomes of the working group, including a design framework, to be provided for information out-of-session to SESSFRAG prior to June 2019.	AFMA	June 2019
17	11 SESSFRAG Chairs' 2019	The Economic Working Group to assess the potential value of the dollars per unit of effort metric as an index. If there is potential, ensure it is considered as part of the FRDC considering metrics for measuring economic efficiency and productivity in fisheries.	Economic Working Group / AFMA management	Economic working group meeting 15-16 April 2019

#	Agenda Item / Meeting Date	Action Item	Agency / Person	Timeframe
18	12 SESSFRAG Chairs' 2019	Observers to update the 2018 report to include the missing data, including jackass morwong west, gemfish, grenadier, warehou, pink ling and trevalla.	AFMA observers	As soon as practicable
19	14 SESSFRAG Chairs' 2019	Circulate the marine spatial closures in risk assessments presentation to SESSFRAG and present at either SESSFRAG 2019 Data meeting or SERAG in September.	Dr Tuck CSIRO	SESSFRAG data meeting 2019 or SERAG September meeting
20	15 SESSFRAG Chairs' 2019	CSIRO to determine whether there are enough resources to undertake the bight redfish and deepwater flathead assessments for the GABTF in 2019.	CSIRO	immediately
21	15 SESSFRAG Chairs' 2019	AFMA and CSIRO to develop a detailed project proposal for a comparison of overlapping GHAT EM and observer data for submission to the ARC / ABARES.	AFMA	September 2019
22	15 SESSFRAG Chairs' 2019	Review the project description for <i>market barriers, demand and consumption of GAB products</i> and further define the project for inclusion in the GABT Research Plan.	GABIA	September 2019
23	15 SESSFRAG Chairs' 2019	Obtain further clarity from Professor Tisdell regarding the project ' <i>cost/benefit analysis of the bycatch research and development plan</i> ' for inclusion on the GABT research plan.	GABRAG	As soon as practicable
24	15 SESSFRAG Chairs' 2019	Review, and include, the costs of the stock assessments in the SESSF Research Plan, to allow for an estimate of annual cost in the scheduling table.	AFMA and CSIRO	Data working group meeting
25	15 SESSFRAG Chairs' 2019	Mr Morison to provide AFMA with the 2004 <i>South East Fishery: Fishery Assessment Report</i> for conversion into a datasheet.	Mr Morison	As soon as practicable
26	15 SESSFRAG Chairs' 2019	Data exclusion to investigate the effect of biennial sampling to be undertaken during the next gummy shark assessment to determine the impact of biennial data collection by removing every second year of length and age data.	CSIRO – Dr Thomson	During the gummy shark assessment in 2020
27	15 SESSFRAG Chairs' 2019	SESSFRAG to discuss how estimates of natural mortality should be addressed across all Tier 1 assessments at its 2019 Data meeting.	SESSF RAG	SESSFRAG data meeting 2019
28	15 SESSFRAG Chairs' 2019	Circulate the SESSF Annual Research Statement 2020-21 for comment for items that were not covered in the meeting.	AFMA	immediately
29	15a SESSFRAG Chairs' 2019	Dr Thomson to consider the feedback from the RAG and determine whether to expand the scope of the blue-eye trevalla close kin project proposal.	CSIRO	As soon as practicable

#	Agenda Item / Meeting Date	Action Item	Agency / Person	Timeframe
30	16a SESSFRAG Chairs' 2019	Include results of the update ERAs for otter board trawl, Danish seine and gillnet the 2019 SESSFRAG data meeting.	AFMA	SESSFRAG data meeting 2019
31	16b SESSFRAG Chairs' 2019	Include the identification of ERA triggers as an early item on the agenda for the 2019 SESSFRAG data meeting.	AFMA	SESSFRAG data meeting 2019

Harvest Strategy Framework





Australian Government

Australian Fisheries Management Authority

Harvest Strategy Framework

**For the Southern and Eastern
Scalefish and Shark Fishery**

2009 Amended (2019)



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Version	Updates	Author	Date
Version 1.1 to 1.2	Drafting the Harvest Strategy Framework into template	Sharon Koh, Steve Auld	22 September 2009
Version 1.3	Redraft following outcomes of SESSFRAG meeting February 2011	Sharon Koh	July 2011
Version 2	<p>Updates to web links and accessibility changes.</p> <p>Integration of GAB section, multi-year TACs, consistent application of discards and discount factor guidance. Removal of CPUE multiplier. Research needs, now included in the strategic research plan and the annual research plan, have been removed.</p>	George Day	February 2014
Version 3	<p>Providing for alternative TACs to those produced by the Tier 1 harvest control rule in defined circumstances.</p> <p>Removal of the small change limiting rule.</p> <p>Clarification of how to apply the discount factor.</p> <p>Documenting the limit placed on the Tier 3 harvest control rule multiplier as recommended by</p>	George Day	February 2015

Version	Updates	Author	Date
	<p>SESSFRAG in March 2013.</p> <p>Specifying the approach for setting TACs when the Recommended Biological Catch is 0.</p> <p>To provide guidance on 'step down' and 'step up' TACs.</p>		
Version 4	<p>Providing for alternative assessment methods in defined circumstances.</p> <p>Adopting a weighted average of state catch rather than a simple average for the purposes of TAC calculation.</p>	George Day	March 2017
Version 5	<p>Apply a weighted average of state catches to gummy shark as is the case for other SESSF species.</p> <p>Clarification of treatment of discards and state catch in Tier 4 assessments and RBC calculations.</p> <p>Review of GABT triggers at Appendix A.</p>	George Day	March 2019

Table 1: Harvest Strategy Summary Table

Tier level (Species vary)	Reference Point/ Trigger Point	Reference Point function*	Information requirements to monitor Reference Point	Control Rule	Research priorities
Tier 1	B ₂₀	Limit	Catch, effort, discards, age, length, relative abundance, biomass information from: <ul style="list-style-type: none"> - Logbook and catch landing records - ISMP - FIS 	<B ₂₀ : No targeted fishing; rebuilding strategy will be developed	ISMP FIS
	B ₃₅	HCR inflection	Same as above	<B ₃₅ : TACs are set at levels that allow stocks to rebuild to target levels	Same as above
	B ₄₈	Target	Same as above	<B ₄₈ : Rebuild stocks towards B ₄₈ >B ₄₈ : At or above target, fish at F ₄₈ .	Same as above
Tier 3	F ₂₀	Limit	Catch, discards, age, length information from:	<F ₂₀ : No targeted fishing, rebuilding	ISMP

Tier level (Species vary)	Reference Point/ Trigger Point	Reference Point function*	Information requirements to monitor Reference Point	Control Rule	Research priorities
			<ul style="list-style-type: none"> - Logbook and catch landing records - ISMP 	strategy will be developed	
	F ₄₀	MSY proxy	Same as above	<F ₄₀ : TACs are set at levels that allow stocks to rebuild to target levels	Same as above
	F ₄₈	Target	Same as above	<F ₄₈ : Rebuild stocks towards F ₄₈ >F ₄₈ : At or above target, fish at F ₄₈ .	Same as above
Tier 4	CPUE ₂₀	Limit	Catch, effort, discards information from: <ul style="list-style-type: none"> - Logbook and catch landing records - ISMP 	<CPUE ₂₀ : No targeted fishing, rebuilding strategy will be developed	ISMP

Tier level (Species vary)	Reference Point/ Trigger Point	Reference Point function*	Information requirements to monitor Reference Point	Control Rule	Research priorities
	CPUE ₄₀	MSY proxy	Same as above	<CPUE ₄₀ : TACs are set at levels that allow stocks to rebuild to target levels	Same as above
	CPUE ₄₈	Target	Same as above	<CPUE ₄₈ : Rebuild stocks towards CPUE ₄₈ >CPUE ₄₈ : At or above target, fish at F ₄₈ .	Same as above
Tier 3	5%	Discount Factor (metarule)	Same as for Tier 3 – applies for assessments which are more uncertain	Reduces the TAC derived from the RBC – applied on an individual species basis ¹	

¹ SESSFRAG 4-5 March 2014 recommended guidance for the Commission for when the Tier 3 and Tier 4 discount factors are not applied - see below at section 6.4.1.

Tier level (Species vary)	Reference Point/ Trigger Point	Reference Point function*	Information requirements to monitor Reference Point	Control Rule	Research priorities
Tier 4	15%	Discount Factor (metarule)	Same as for Tier 4 – applies for assessments which are more uncertain	Reduces the TAC derived from the RBC applied on an individual species basis.	
All Tier levels	50%	Large Change Limiting rule (metarule)	Same as above	TACs between fishing seasons to change by no more than 50% where this will not pose a significant risk to stock status.	

N.B. The Harvest Strategy Policy allows alternative reference points to the recommended defaults - B_{MEY} , B_{MSY} , B_{LIM} - to be used where they better pursue the objectives of the Policy.

Glossary

Types of reference points

Reference Point	Description
Metarule	a rule that describes how the RBCs obtained from an assessment should be adjusted in calculating a recommended TAC
Target	relates to a target reference point as per the Harvest Strategy Policy. May be expressed in terms of biomass, fishing mortality or CPUE
Limit	relates to a limit reference point as per the Harvest Strategy Policy. Fishing stops at this reference point. May be expressed in terms of biomass, fishing mortality or CPUE
MSY	maximum sustainable yield
MEY	maximum economic yield
Override	under exceptional circumstances, enables adjustment to a recommended TAC where certain conditions are met; e.g. to take advantage of a “boom” period of highly variable species, or to impose additional restrictions when stocks are thought to under threat.
Inflection point	the reference point below which TACs are adjusted to allow stocks to rebuild to target levels. Also known as a breakpoint

Notation

Notation	Description
B	spawning biomass level
B _{CUR}	the current spawning biomass level
B ₀	the unfished spawning biomass (determined from an appropriate reference point)

Notation	Description
B_x	the biomass level representing x% of the unfished spawning biomass B_0
F	fishing mortality rate
F_{CUR}	the current fishing mortality rate
F_x	the fishing mortality rate which would achieve a spawning biomass level of B_x
M	the natural stock mortality rate
$CPUE_x$	catch per unit effort which would achieve a spawning biomass level of B_x

Other acronyms

Acronym	Description
ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
CDR	Catch Disposal Record
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CPUE	Catch per unit of effort
ERA	Ecological Risk Assessment
FIS	Fishery Independent Survey
GAB	Great Australian Bight
GABMAC	Great Australian Bight Management Advisory Committee
GABTS	Great Australian Bight Trawl Sector
GHAT	Gillnet, Hook and Trap
HSP	Commonwealth Fisheries Harvest Strategy Policy 2007

Acronym	Description
HSF	Harvest Strategy Framework
HCR	Harvest Control Rule
ISMP	Independent Scientific Monitoring Program
MAC	Management Advisory Committee
MSE	Management Strategy Evaluation
RAG	Resource Assessment Group
RBC	Recommended Biological Catch
SEMAC	South East Management Advisory Committee
SESSF	Southern and Eastern Scalefish and Shark Fishery
TAC	Total Allowable Catch
TEP	Threatened, Endangered and Protected

1 Overview of the SESSF harvest strategy

1.1 The Harvest Strategy Policy

The objective of the Commonwealth Fisheries Harvest Strategy Policy 2007 (HSP) is the sustainable and profitable use of Australia's Commonwealth fisheries in perpetuity through the implementation of harvest strategies that maintain key commercial stocks at ecologically sustainable levels, and within this context, maximise the economic returns to the Australian community.

To meet this objective, harvest strategies are designed to pursue an exploitation rate that keeps fish stocks at a level required to produce maximum economic yield (MEY) and ensure stocks remain above a limit biomass level (B_{LIM}) at least 90% of the time. Alternative reference points may be adopted for some stocks to better pursue the objective of maximising economic returns across the fishery as a whole.

The HSP provides for the use of proxy settings for reference points to cater for different levels of information available and unique fishery circumstances. This balance between prescription and flexibility will encourage the development of innovative and cost effective strategies to meet key policy objectives. Proxies must ensure stock conservation and economic performance as envisaged by the HSP. Such proxies, including those that exceed these minimum standards, must be clearly justified.

With a harvest strategy in place, fishery managers and industry are able to operate with greater confidence, management decisions are more transparent, and there are fewer unanticipated outcomes necessitating hasty management responses.

Further detail on how to use harvest strategies is provided in the Guidelines to the Harvest Strategy Policy (Commonwealth Fisheries Harvest Strategy Policy Guidelines 2007).

1.2 The SESSF Harvest Strategy Framework

The SESSF Harvest Strategy Framework (HSF) sets out the management actions necessary to achieve defined biological and economic objectives, and describes the indicators used for monitoring the condition of stocks, the types of assessments conducted and the rules applied to determine the recommended total allowable catches.

The HSF was developed in 2005. Since that time it has been reviewed in line with the HSP which was developed to help give effect to the requirements of the Ministerial Direction (2005).

The HSF uses a three tier approach designed to apply different types of assessments and cater for different amount of data available for different stocks. The HSF adopts increased levels of precaution that correspond to increasing levels of uncertainty about stock status, in order to reduce the level of risk associated with uncertainty. In this approach, each stock

is assessed using one of three types of assessment depending on the amount and type of information available to assess stock status, where Tier 1 represents the highest quality of information available (i.e. a robust integrated quantitative stock assessment). The previous Tier 2 analysis, which applied to species and/or stocks which have a less robust quantitative assessment, is no longer being used.

Each Tier has its own harvest control rule (HCR) that is used to determine a recommended biological catch (RBC). The RBCs provide the best scientific advice on what the total fishing mortality (landings from all sectors plus discards) should be for each species/stock. For all Tier levels, once the RBC is determined from the results of the assessment and the application of the relevant HCR, a recommended total allowable catch (TAC) is calculated based on the TAC setting rules described in section 6.4.

The HCRs for the three tier levels differ depending on the types of indicators used. For Tier 1, the HCR is based on the following reference points:

- *The limit biomass* B_{LIM} – represents the spawning biomass level below which the risk to the stock is unacceptably high and the stock is defined as “overfished”. The default B_{LIM} proxy is B_{20} = 20% of the unfished spawning biomass.
- *The B_{MSY}* – represents the spawning biomass level which would result in a maximum sustainable yield (MSY), which is the point at which additional fishing effort is most likely to decrease the total catch and any profit. The default B_{MSY} proxy is B_{40} = 40% of the unfished spawning biomass.
- *The target biomass* B_{TARG} – represents the spawning biomass level which would result in a maximum economic yield (MEY), which is the point at which the sustainable catch or effort level for the fishery maximises profits. B_{TARG} is generally equal to B_{MEY} , for which the default proxy is approximated by $1.2 \times B_{MSY}$. If the default B_{MSY} proxy is used, this results in B_{48} = 48% of the unfished spawning biomass.

Tier 3 and Tier 4 assessments use other indicators (relating to fishing mortality and catch rates respectively) and reference points which are taken as proxies for the biomass reference points for Tier 1. The HCRs for each tier level are outlined below.

1.2.1 Tier 1

A Tier 1 stock assessment uses an integrated biological and statistical approach that combines a wide variety of data inputs, generally including CPUE, other abundance indices and size and age composition. The Tier 1 harvest control rule applies to species and/or stocks where there is a robust quantitative assessment that provides estimates of current biomass levels, and where estimates or appropriate proxies are available for B_{LIM} , B_{TARG} and B_{MSY} . The default targets and limits are set to comply with the HSP. The RBC is calculated by applying target fishing levels determined from the harvest control rule to the current biomass, to calculate the total catch (including discards) in the next year, using the agreed base case assessment model.

In some circumstances, a different TAC to that produced by the Tier 1 HCR may be set - refer to section 6.4.7.

1.2.2 Tier 3

A Tier 3 stock assessment uses information available on the age structure of annual catches and annual total catch weight, as well as knowledge of basic biological parameters, e.g. natural mortality, length at age, weight at length, fecundity at age and selectivity at age. The estimation of current fishing mortality is made using all this information. The catch control rule uses the ratio of the target exploitation rate to the actual exploitation rate as a multiplier on the current average catch to determine the RBC.

Limit and target reference points, which may be estimated using a yield-per-recruit analysis, are applied to the fishing mortality and are comparable to the limit and target reference points used in the Tier 1 harvest control rule. The period over which average current catch is estimated is chosen to match the period to which the estimated fishing mortality applies. The estimate of fishing mortality is limited to not less than 0.1 of natural mortality.

1.2.3 Tier 4

The Tier 4 assessment is based entirely on catch and CPUE.

The Tier 4 analysis determines an RBC by selecting CPUE reference points that are taken as proxies for the estimated B_{LIM} and B_{TARG} . This is done by assuming that the CPUE is proportional to stock abundance, an assumption that is made in most SESSF assessments. If the stock was at unexploited equilibrium at the start of fishing, then the initial CPUE level at the start of the time series would correspond to the unexploited biomass or B_0 , and the other reference points are the appropriate fractions of this (e.g. 20% for B_{20}). For most SESSF stocks there is not a full CPUE time series back to the start of fishing, so it is necessary to choose a reference period from the data series that we do have where we think we can make a reasonable estimate of the level of depletion of the stock. Most SESSF species are considered to be fully exploited by 1986, so a reference period against which current rates are compared is chosen around this time when CPUE levels and catches were relatively stable. The default period is 1986-1995, but other periods are used for some species and fisheries which were not fully developed in 1986.

It is then assumed that during the reference period the stock was at the level that will provide maximum economic yield, i.e. the CPUE corresponds to B_{MEY} (which as a default is assumed to be B_{48}). This is why, for these stocks, the Tier 4 rule uses the average CPUE in the reference period as a CPUE target, and the average catch in that period as a catch target.

1.2.4 Alternative assessment methods

Alternative assessment methods may be adopted in certain circumstances as outlined in paragraph 6.3.4 below.

1.3 Alignment of the HSF with the HSP

The HSF meets the requirements of the HSP by applying a precautionary approach, standards for reference points, and measures to be implemented in accordance with the reference points as specified in the HSP. These are reflected in the use of a tiered approach to control rules, and decreases in exploitation rates as the stock size decreases below a target reference point or as uncertainty about stock status increases. The HSF involves the use of maximum economic yield (MEY) as a target, a biomass limit reference point to trigger no further targeted fishing, and the proxies $B_{LIM} = 20\%$ of B_0 , $B_{MSY} = 40\%$ of B_0 , and $B_{MEY} = 1.2B_{MSY}$. The HSF also requires rebuilding strategies for stocks below B_{LIM} , and TACs are set at an appropriate level to rebuild stocks to B_{MSY} or B_{MEY} in line with the HSP.

For multi-species fisheries, the HSP requires MEY to be applied to the fishery as a whole and optimized across all species in the fishery, so that some secondary species may be fished at levels that will result in their biomass remaining below B_{MEY} . The SESSF will continue to move towards applying MEY at a whole-fishery level, but the way that this can be best achieved may develop over time.

1.4 Governance

The status of fish stocks in the SESSF, and how they are tracking against the HSF, is reported to the RAGs, MACs and AFMA Commission as part of the yearly TAC Setting process (see section 6.1). Stock assessments for each quota species, produced by the RAGs each year, include consideration of the catch rates for each quota species in the current and previous fishing years, how catches compare to the TAC, where the stock status indicators sit in relation to the reference points, and a recommended biological catch (RBC) for the upcoming fishing year. The TACs are determined by the AFMA Commission on the basis of the RBCs and advice from the RAGs, MACs, and AFMA Management.

2 Background to the SESSF

An overview of the fishery can be found in the latest SESSF Management Arrangements booklet, which is available on the AFMA website at: <https://www.afma.gov.au/fisheries-services/fisheries-management-plans>

The booklet includes:

- the geographical distribution of the fishery, closures and fishing seasons
- value of the fishery and management arrangements
- historical and current trends in catch and effort.

3 Key commercial species or stocks and ERA priority

Harvest Strategies are in place for all 34 species subject to quota (including target and non-target species) in the SESSF. An Ecological Risk Assessment at the SAFE level was first conducted for the SESSF in 2007. This assessment was updated in 2012 to include distribution and effort data from 2007-2010 in the fishery.

4 Objectives of the SESSF Harvest Strategy

4.1 Biological

- To maintain stocks at (on average), or return to, a target biomass point B_{TARG} or equivalent proxy (e.g. F_{TARG} or $CPUE_{TARG}$) equal to the stock size that aims to maximise net economic returns for the fishery as a whole.
- To maintain stocks above the limit biomass level, or an appropriate proxy, at least 90% of the time.
- A reduced level of fishing if a stock is below B_{TARG} but above B_{LIM} (or an appropriate proxy).
- To implement rebuilding strategies, no-targeting and incidental bycatch TACs if a stock moves below B_{LIM} (or an appropriate proxy).
- To ensure the sustainability of fisheries resources, including consideration of the individual fishery circumstances and individual species or stock characteristics, when developing a management approach.

4.2 Socio-economic

- To maintain stocks at (on average), or return to, a target biomass point B_{TARG} equal to the stock size that aims to maximise net economic returns for the fishery as a whole.
- To maximise the profitability of the fishing industry and the net economic returns to the Australian community.
- To minimise costs to the fishing industry, including consideration of the impacts on the industry of large or small changes in TACs and the appropriateness of multi-year TACs.

4.3 Ecosystem

- To be consistent with the principles of ecologically sustainable development, including the conservation of biological diversity, and the adoption of a precautionary risk approach.

5 Monitoring

The biological and economic conditions in the fishery are monitored by the following three methods:

5.1 Logbooks and catch records

AFMA requires fishers to record catch and effort information in logbooks at sea, and in catch disposal records (CDRs) which record the actual landed catch at port. CDRs are considered more accurate than logbook records.

The following data is recorded for each fishing operation: the port and date of departure and return; gear type and fishing method; number of fish kept and discarded; and resultant catch including what is included in the weight (e.g. trunked, gutted, filleted, whole). Further information on logbooks and CDRs is available at: <https://www.afma.gov.au/fisheries-services/logbooks-and-catch-disposal>

5.2 The Integrated Scientific Monitoring Program (ISMP)

A key component of the ISMP is the sampling and recording of catches at ports and on board fishing vessels using fishery-independent observers. The purpose of the ISMP is to provide reliable, verified and accurate information on the fishing catch, effort and practice of a wide range of vessels operating inside and, periodically, outside the Australian Fishing Zone.

Biological and environmental data are collected on: catch composition including size and weight; amount and type of incidental catch; number of fish kept and discarded; fate of target and non-target species; interactions with TEP species; and fishing effort. Further information on the Observer program is available at: <https://www.afma.gov.au/fisheries-services/observer-services>

5.3 Fishery Independent Surveys (FIS)

The FIS is an industry-based fishery-independent resource survey which provides a time-series of relative abundance indices for key target species. A FIS has been conducted for Deepwater Flathead and Bight Redfish in the GABTS since 2005, and for key target species in the SESSF since 2008.

Biological and environmental data are collected such as: target species; catch rate (kg/shot); fishing method; and fishing depth. Information which provides a relative abundance index of other main byproduct and incidental catch species is also obtained.

5.4 Data Availability

The ability to meet the objectives of the HSF relies on obtaining the required data in time for stock assessments to be carried out.

Future information and ongoing monitoring requirements are identified through regular reporting from the above monitoring programs, and regular meetings of RAGs which are responsible for overseeing and managing the stock assessment process under the HSF.

6 Reference points and decision rules

6.1 TAC setting process

The data used for input into the stock assessment process are collected by the ISMP, AFMA logbooks and CDRs and FISs. Otoliths from the biological sampling are provided to a private contractor for ageing. All sampling and age data are provided to stock assessment scientists for analysis or reporting. The analyses are then discussed by RAGs, which produce final stock assessment reports for quota species in the SESSF during October and November each year.

The stock assessment reports provide recommended biological catch (RBC) amounts for each quota species. Each stock is assessed under the appropriate Tier level as advised by the RAGs and SESSF RAG.

In mid-December, AFMA produces a position paper with recommended TACs for quota species for the upcoming fishing season, based on the stock assessments and RAG advice. The paper is distributed to interested parties and undergoes a public comment period. For some GAB species, TAC recommendations are conducted according to a pre-agreed set of decision rules, which are associated with the FIS or CPUE and incorporated into the TAC-setting cycle.

In early February, a South East Management Advisory Committee (SEMAC) TAC Setting meeting is held where TAC recommendations are made. The Great Australian Bight Management Advisory Committee (GABMAC) also provides advice on TAC recommendations.

The outcomes of RAGs, SEMAC and GABMAC, together with the AFMA position paper and any public comments received, are then sent to the AFMA Commission to determine TACs for the upcoming fishing season in mid-February. In determining the TACs, the AFMA Commission may provide AFMA with direction in instances where there is concern that current management strategies for depleted or at risk stocks may not meet the objectives of the HSP in a timely manner. The TACs for Bight Redfish and Deepwater flathead are set using the decision rules outlined in section 6.5 under co-management arrangements with the Great Australian Bight Fishing Industry Association.

6.2 Overfishing and reference points

A stock is defined as subject to overfishing if the current fishing mortality rate (also known as exploitation rate) exceeds the limit reference point F_{LIM} for a particular biomass value (see Figure 1). F_{LIM} is the fishing mortality rate that would result in a spawning biomass of B_{LIM} (the default proxy for which is B_{20}). The stock is defined as overfished if stock levels are below B_{LIM} . B_{LIM} is the point below which there will be no further targeted fishing for that species, and a stock rebuilding strategy will be developed. Refer to section 6.4.8 regarding the setting of incidental bycatch TACs.

The recommended maximum fishing mortality rate for Tiers 3 and 4 is F_{MSY} (the default proxy for which is F_{40}). This represents the fishing mortality rate that would cause the spawning biomass to decline to its maximum sustainable biomass B_{MSY} (the default proxy for which is B_{40}). The breakpoint, or HCR inflection point, in the overfishing line in Figure 1 occurs at a biomass corresponding to B_{MSY} . If $B < B_{\text{MSY}}$ or $F > F_{\text{MSY}}$, the TACs should be reduced to limit fishing effort and the fishing mortality rate. For Tier 1, the recommended maximum fishing mortality rate and HCR inflection point occurs at a proxy of F_{35} (see Table 1 and section 6.3).

The target fishing mortality rate F_{TARG} represents the fishing mortality rate that would result in a spawning biomass of B_{TARG} (equal to B_{MEY}). The default value for F_{TARG} is F_{48} , the value of F corresponding to a B_{TARG} of B_{48} . Alternative reference points may be adopted for some stocks to better pursue the objective of maximising economic returns across the fishery as a whole.

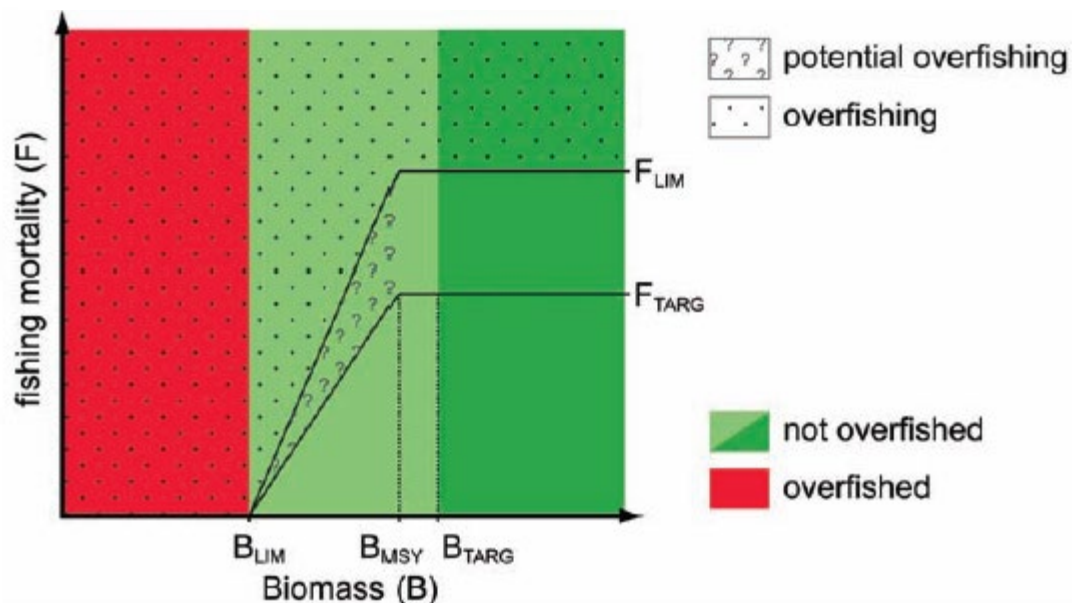
The guidelines to the HSP provide that in multi-species fisheries 'MEY applies to the fishery as a whole and is optimized across all species in the fishery. As a result some secondary species (e.g. lower value species) may be fished at levels that will result in their biomass remaining below their target biomass reference point (i.e. B_{MEY}). In such circumstances, the estimated biomass of these secondary species must be maintained above their limit reference point, B_{LIM} . Consideration should also be given to:

- demonstrating that economic modelling and other advice clearly supports such action
- no cost-effective, alternative management options (eg gear modification or spatial management are available)
- the associated ecosystem risks have been considered in full.'

Consideration should also be given to whether the quota species is targeted, its contribution to the value of the fishery, any sustainability concerns and the level of quota latency for that species.

For computational purposes, the target and limit reference points are calculated via a "spawning biomass per recruit" analysis (Reference plus Appendix to be provided). While F_{LIM} is fixed, F_{TARG} will decrease as uncertainty about the assessment increases.

Figure 1. Schematic representation of a harvest control rule; showing key reference points
(Source: ABARES Fishery Status Report 2007).



6.3 Determining RBCs using harvest control rules (HCRs)

6.3.1 Tier 1

The Tier 1 HCR applies to species and/or stocks where there is a robust quantitative assessment that provides estimates of current biomass levels (B_{CUR}) and where estimates are available for B_{35} , B_{20} and F_{48} . The formula for calculating F_{TARG} is as follows:

F_{TARG}	Biomass level
$F_{TARG} = F_{48}$	where $B_{CUR} > B_{35}$
$F_{TARG} = F_{48} * (B_{CUR}/B_{20} - 1)$	where $B_{35} > B_{CUR} > B_{20}$
$F_{TARG} = 0$	where $B_{CUR} < B_{20}$

The RBC is calculated by applying F_{TARG} to the current biomass B_{CUR} to calculate the total catch (including discards) in the next year, using the agreed base case assessment model:

$$RBC = \text{Catch}[F_{TARG} \rightarrow B_{CUR}]$$

At Tier 1, $B_{LIM} = B_{20}$, the maximum value for $F_{TARG} = F_{48}$ and the breakpoint in the HCR occurs at B_{35} . Alternative reference points may be adopted for some stocks to better pursue the objective of maximising economic returns across the fishery as a whole.

6.3.2 Tier 3

The Tier 3 HCR applies to species and/or stocks that do not have a quantitative stock assessment, but where estimates of fishing mortality and other biological information are available.

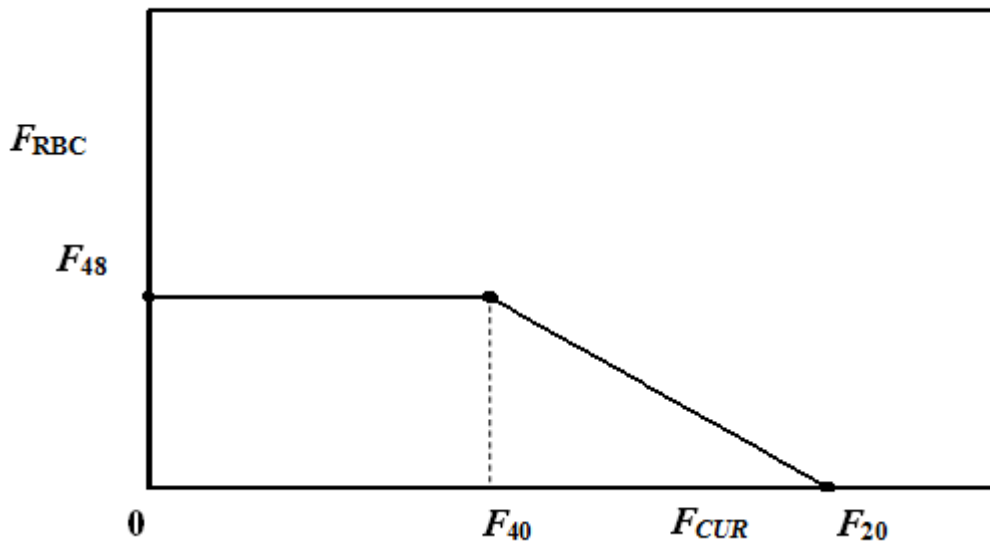
Yield per recruit calculations are used to calculate F values that will reduce the spawning biomass to 20% (F_{20}), 40% (F_{40}) and 48% (F_{48}) of the unexploited level. The relationship given in Figure 2 is then used to assign a value for F_{RBC} using F_{CUR} . This relationship has properties similar to the Tier 1 harvest control rule, with the default proxies of F_{20} as the limit and F_{48} as the target fishing mortality rate.

The following formula, which adjusts the current catch C_{CUR} according to the ratio of the intended and current exploitation rates, is then used to calculate the recommended biological catch C_{RBC} :

$$C_{RBC} = \frac{(1 - e^{-F_{RBC}})}{(1 - e^{-F_{CUR}})} C_{CUR}$$

where F_{CUR} is the estimated current fishing mortality, and F_{RBC} is the selected F for the recommended biological catch from the control rule. The estimate of fishing mortality is limited to be no less than 0.1 of natural mortality.

Figure 2. Method for selecting F_{RBC} based on F_{48} target and estimated F_{CUR}



6.3.3 Tier 4

The Tier 4 HCR applies to species and/or stocks where there is no reliable information available on either the current biomass or current exploitation rate. It is assumed that there is information available on current catch levels and trends in catch rates.

The Tier 4 control rule is of the form:

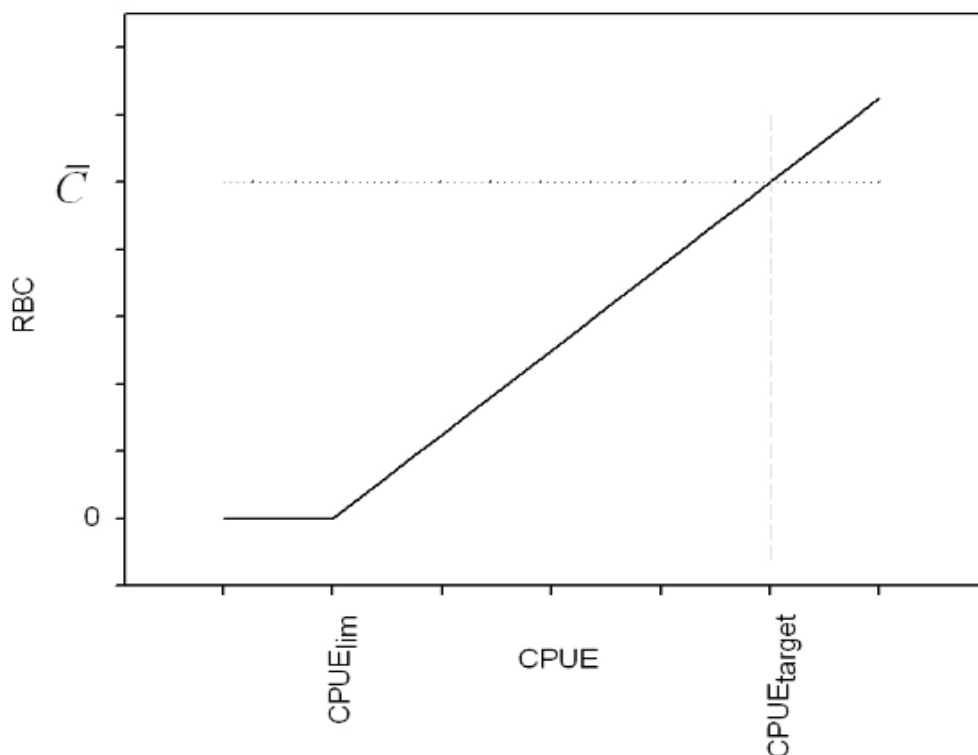
$$RBC = C^* \max \left(0, \frac{\overline{CPUE} - CPUE_{lim}}{CPUE_{target} - CPUE_{lim}} \right)$$

where:

$CPUE_{target}$	is the target catch per unit effort (CPUE) for the species
$CPUE_{lim}$	is the limit CPUE for the species
\overline{CPUE}	is the average CPUE over the most recent m years
C^*	is a catch target derived from a historical period that has been identified as a desirable target in terms of CPUE, catches and status of the fishery

The form of the rule is shown in Figure 3. Because this linear form can result in large catches at high CPUE levels which could deplete the stock very quickly, a maximum catch level C_{max} is imposed when the CPUE is above the target level, and the multiplier is set to zero when the CPUE is below the limit.

Figure 3. Graphical representation of the Tier 4 harvest control rule. \overline{C} is the average catch over the most recent m years.



6.3.4 Alternative assessment methods

The RAG may make RBC recommendations based on alternative assessment methods where it considers the method:

- is more appropriate for a quota species than the assessment method outlined for Tier 1, Tier 3 or Tier 4
- meets the intent of the HSP.

In such circumstances, the RAG should provide advice on any discount factor to be applied and the expected reliability of any associated harvest control rule.

A variety of 'Tier 5' approaches have been used to inform TAC setting in different circumstances, these include catch-msy and age-structured stock reduction analysis approaches.

6.4 Determining TACs from RBCs

The following metarules are applied to the RBCs that are derived from the application of the Harvest Control Rules. The metarules for discount factors, state catch, discards, research catch allowance and the large change limiting rule are applied in the order below. The other metarules may be applied in the circumstances described. On the basis of the RBCs, TACs may be reduced to support stock recovery and prevent stocks from becoming overfished in the future. Note that the TACs for Bight Redfish and Deepwater flathead are set using the decision rules outlined in section **Error! Reference source not found.** under co-management arrangements with the Great Australian Bight Fishing Industry Association.

6.4.1 Discount Factor

Consistent with the HSP, which establishes a more precautionary approach to harvest control rules for species for which assessments are more uncertain, it is considered appropriate to apply a discount factor to the RBCs derived from Tier 3 and 4 assessments. The discount factors to be applied are 5% for Tier 3 and 15% for Tier 4. These values take account of the relative uncertainties in the assessments and reference points at each of these Tier levels.

The application of the rule can be shown as follows:

$$\text{Tier 3:} \quad RBC_{DISC} = RBC \left(1 - \frac{5}{100} \right)$$

$$\text{Tier 4:} \quad RBC_{DISC} = RBC \left(1 - \frac{15}{100} \right)$$

- The application of the discount factor is to be determined on an individual species basis but will be applied unless RAGs advise that alternative equivalent precautionary measures are in place. At its meeting on 4-5 March 2014, SESSFRAG

recommended to the AFMA Commission that a discount factor should apply unless: equivalent or additional precaution is provided by other measures, such as but not limited to:

- spatial closures
- market controls.

6.4.2 State catch, discards and research catch allowance

When other sources of mortality arising from discarded catch, or catch taken by other jurisdictions (e.g. state and recreational sectors) or research catch allowance are included in assessments, they are subtracted from the RBC to produce a Commonwealth TAC.

The quantity of discards to be deducted should be based on the best available data whether this is derived from observers, logbooks verified by electronic monitoring or other sources.

The discarded catch and state catch are generally estimated for the following fishing season using a four year weighted average. Estimates are weighted in the ratio of 8:4:2:1 for the most recent four years, with most weight given to the most recent year.

For Tier 4 assessments, if discards or state catches are included in the reference period catches, C^* , they should be deducted from the RBC to calculate the TAC (see section 6.3.3. above).

When estimating state catch, the impact of management changes in state fisheries (e.g. new spatial closures) are to be considered to forecast the state catch in the following year.

Where appropriate, the methods used to estimate future discards and state catches may be varied if an alternative method is expected to provide a more reliable estimate. This may be appropriate if there are management changes in state fisheries.

To ensure consistency between the RBCs derived through stock assessment models and the resultant TAC, where a stock assessment model is used to estimate a future discard rate, this estimate should be used in determining the TAC.

Research catch allowance is deducted from the RBC as determined by the Commission in accordance with AFMA's *Research Catch and Effort Allowance Policy 2007*.

6.4.3 Latest CPUE Multiplier Rule

This rule is no longer applied.

6.4.4 Large Change Limiting Rule

This rule is designed to limit large changes (up or down) in the TACs from year to year. It is applied last in the sequence of rules and compares the recommended TAC derived after applying the first three rules, with the actual TAC for the previous fishing year.

To limit excessive changes from season to season in the TACs, an override may be applied for some species in setting TACs for the next fishing season, such that the TACs will not change up or down by more than 50% from the previous fishing season where this will not pose a significant risk to stock status. For multi-year TACs, the large change limiting rule may be applied for each year of the period until the RBC is achieved.

6.4.5 Multi-year TACs

Multi-year TACs are to be applied for all Tier 1, Tier 3 and Tier 4 species where suitable. In determining whether a multi-year TAC applies, the following criteria should be considered:

- if the current biomass (B_{CUR}) is higher than the maximum sustainable yield (B_{MSY}) OR if B_{CUR} is below B_{MSY} but higher than the biomass limit (B_{LIM}) and B_{CUR} does not show a decreasing trend over a time period relevant for that species
- if fishable biomass (Tier 1) or a proxy (Tier 3 and Tier 4) can be predicted at an acceptable precision for the multiyear TAC period
- if the fishery is expected to be stable in terms of the level, method and spatial distribution of effort for the multi-year TAC period.

For Tier 1 species, multi-year TACs should be set using Tier 1 assessment projections and probability estimates after considering break out rules.

Multi-year TACs for Tier 3 and Tier 4 species are to be determined on a per species basis by the individual RAGs. Breakout rules for multi-year TACs are to be applied as appropriate to identify fundamental changes from the understanding of the stock at the time of the assessment. Break out rules are to be set having regard to any one or more of the following:

- changes in CPUE (from logbooks and FISs). The CPUE method should be the same as used in the last assessment, either standardized or unstandardised and, if standardised, using the same standardisation parameters as used in the assessment
- changes to economic factors
- changes in total fishing mortality (from total catches, discards, catches in other fisheries or jurisdictions)
- changes in size and age compositions
- interactions with TEP species, for example where a quota species is listed as conservation dependent under the *Environment Protection and Biodiversity Conservation Act 1999* or where catches of a quota species impact TEP species (eg companion species)
- changes to companion species TACs
- changes to abundance indexes derived from FISs.

In setting a multi-year TAC, the multi-year RBC is applied for each year in the period, with updated state catches, discards and research catch allowance to be deducted annually for the purposes of determining the TAC.

6.4.6 Step up or step down TACs

A different TAC to that produced by applying the HCR and the metarules above may be adopted in limited circumstances. This may occur where there is a step up or step down in the TAC to achieve the RBC over a number of years. A step up or step down TAC may be set to reduce the economic impact of a significant change in RBC and allow fishers time to adjust their operations where the:

- TAC best pursues AFMA's objectives and the objectives of the HSP
- RAG provides advice on the biological risk to the stock of adopting a step up or step down TAC.

6.4.7 Setting a TAC outside the Tier 1 Harvest Control Rule

In some circumstances it may be appropriate to set a TAC different to that produced by the Tier 1 HCR, for example, where the Tier 1 HCR produces a TAC below the incidental bycatch of the species. A TAC different to that produced by the Tier 1 HCR may be set where the:

- stock is estimated to be above B_{LIM} but below B_{TARG}
- probability of the stock being below B_{LIM} , both at the date of the assessment and in future years, is assessed to meet the HSP objective of ensuring that the stock stays above B_{LIM} at least 90% of the time (i.e. less than a 1 in 10 year risk that stocks will fall below B_{LIM})
- relevant RAG considers that the time that the stock is estimated to take to rebuild to B_{TARG} under the proposed TAC is appropriate given the HSP and biology of the stock.

6.4.8 Incidental bycatch TACs where the RBC is zero

Where the RBC is zero, an incidental bycatch TAC may be set after considering:

- the impact of incidental catches on rebuilding of the stock
- non-targeted catch based on:
 - landed catch
 - logbook discards
 - ISMP estimates of discards
- RAG or MAC advice on whether the incidental bycatch TAC should be adjusted to account for any inefficiency in the quota market for that stock
- RAG or MAC advice on their understanding of the level of targeting and the ability of operators to avoid catching the stock
- whether other management arrangements (including those in the relevant Rebuilding Strategy) have been, or are proposed to be, implemented to prevent targeting.

6.4.9 Other provisions

Other provisions in addition to those above may be considered, including:

- agreed transition rules for TAC setting in the next fishing year, where harvest strategy rules have been revised
- companion species TACs (rules still to be determined).

Table 6 shows the current or suggested Tier levels for species/stocks in the SESSF.

Table 6. Suggested Tier Levels for SESSF species and stocks (2011)

Species/stocks	Tier level	Comments
Alfonsino	3	Was assessed as Tier 4 in 2007, then as Tier 3 in 2008 with the availability of ageing data
Blue Eye Trevalla	4	
Blue Grenadier	1	
Blue Warehou	4	
Tiger Flathead	1	For the 2013 assessment, Shelf RAG agreed that the default RBC for tiger flathead is calculated under the 20:35:40 strategy
Eastern Gemfish	1	
Western Gemfish	1	
Jackass Morwong	1	The 20:35:48 harvest control rule was applied in the 2008 assessment
John Dory	3	The first formal assessment was undertaken in 2008
Mirror Dory	3	
Ocean Perch	4	Potentially 3, if additional information on growth and age composition is available
Pink Ling	1	
Redfish	3	Formal quantitative assessments have been conducted in the past, however, have too many uncertainties.
Royal Red Prawn	4	Potentially 3, if size information is available to reflect different growth rates of male and female
School Whiting	1	
Silver Trevally	4	
Spotted (Silver) Warehou	1	
Orange Roughy east	1	
Orange Roughy south	1	
Orange Roughy west	1	

Species/stocks	Tier level	Comments
Orange Roughy Cascade	1	
Bight Redfish	1	
Deepwater Flathead	1	
School Shark	1	
Gummy Shark	1	
Elephant Fish	4	
Saw Shark	4	
Ribaldo	4	
Smooth Oreo	4	
Other Oreo	4	
Deepwater sharks	4	

6.5 GABTS Decision Rules

The GABTS operates under a different set of decision rules to the other sectors of the SESSF. These separate arrangements have been agreed to under co-management arrangements. The FIS and the collection of age and frequency data as well as the monitoring of catch and effort information obtained will be analysed and presented to the RAG each year prior to the date at which a decision on the TAC for the next year is made.

- When the FIS has been conducted in two consecutive years, the catch rates from the first leg of the survey will be the indicator of abundance used to make any adjustment to the default TAC.
- In a year when the FIS has not been conducted in two consecutive years, the standardised commercial catch rate for the period July to February inclusive is the indicator of abundance used to make any adjustment to the default TAC.
- If there is a change of $\geq 20\%$ to the indicator of abundance, a 10% (increase or decrease) to the default TAC will occur.
- If the RAG is concerned with any indicators over the period between stock assessments (length frequency distributions, standardised commercial catch rates, age distributions etc.), then it can decide to undertake a full assessment in that year.
- Multi-year TACs have been agreed to using the same rules outlined in section 6.4.5.

The GABTS has a development strategy for species not currently under a TAC, with actions occurring at specified catch triggers (**Appendix 1**). This strategy is designed to improve the data collected and the knowledge of these species as catch increases.

- The initial catch triggers (set at 400 t for blue grenadier and gemfish, and 100 t for pink ling, blue-eye trevalla, ribaldo and hapuku) require data collection and analysis, and the development of an assessment plan.

- Exceeding the second trigger level requires that fishing for that species cease.
- The third trigger level applies to total catches across the three most recent years and requires a formal stock assessment.

6.6 Evaluation of reference points and decision rules

The HSF expresses the objectives of the Harvest Strategy in the form of quantifiable reference points based on the HSP. These reference points are used to guide management decisions, which are pre-agreed actions linked directly to the status of the fishery relative to those reference points.

The reference points and harvest control rules have been tested and refined through a management strategy evaluation (MSE) project conducted by CSIRO during 2006 and 2007. The MSE evaluated the choice of targets and thresholds for all Tier levels of the HSF. A key result of the project was improvements to the Tier 3 and Tier 4 rules, which now have well defined target harvest levels analogous to those used in the Tier 1 assessments for the major commercial species, recognising that Tier 3 and Tier 4 assessments are based on less information than Tier 1.

A copy of the final report “Evaluation of new harvest strategies for SESSF species” is available at:

<http://www.afma.gov.au/wp-content/uploads/2010/06/HSE-AFMA-Report-June20091.pdf>.

Currently, climate change is not explicitly considered in the HS. However, changes in the status, composition and population dynamics of the stock is reflected in the data collected – for example, age and length frequencies, catch and effort, stock recruitment, mortality and biomass data and trends.

Both biological and economic targets have been explicitly considered in developing the reference points and decision rules. However, while biological indicators and parameters have been included, economic indicators and parameters are still under development.

Evidence that the decision rules will maintain or move the stock to the biomass targets (or equivalent proxy) within a reasonable timeframe, and that the HSF will ensure that the stocks stay above the limit biomass level (or equivalent proxy) at least 90% of the time, have been provided by MSE testing.

For stocks below B_{LIM} , rebuilding strategies have been implemented in accordance with the HS. The strategies outline measures for rebuilding the stocks to above B_{LIM} (or equivalent proxy), and then additional measures to rebuild the stocks to B_{TARG} (or equivalent proxy) and monitor and maintain the stocks at the target level. The rebuilding strategies include an objective to ensure that the stocks stay above the limit biomass level (or equivalent proxy) at least 90% of the time.

7 Review

Under certain circumstances, it may be necessary to amend harvest strategies between reviews. These circumstances may arise if:

- there is new information that substantially changes the status of a fishery, leading to improved estimates of indicators relative to reference points; or
- drivers external to management of the fishery increase the risk to fish stock/s; or
- it is clear the strategy is not working effectively and the intent of the HSP is not being met.

Further explanation can be found in section 15 of the HSP Guidelines. The consultative and technical processes for amending harvest strategies are set out in the HSP Guidelines in section 2.5.

The SESSF Harvest Strategy Framework underwent a management strategy evaluation (MSE) by CSIRO in 2006-2007. The project identified problems with the initial implementation of the HSF, developed improvements to the TAC setting procedures, and then tested these using the MSE approach. A MSE procedure was developed and used to test each Tier rule of the HSF.

A final report on the outcomes of the MSE was produced in 2009, entitled “Evaluation of new harvest strategies for SESSF species”. Key outcomes of the project were:

- a discussion paper with nine recommendations for modifications to the HSF
- demonstration that the HSF is consistent with, and meets the requirements of, the Commonwealth Harvest Strategy Policy
- demonstration that the Tier 1 rule achieves its aims for a range of species with differing life histories
- improvements to the Tier 3 and Tier 4 harvest control rules. The revised rules were presented to and approved by the RAGs during 2008, and applied (where appropriate) to setting the RBCs for 2009
- an evaluation of proposed rules for changing the TAC in response to the most recent year’s catch per unit effort (CPUE).

The MSE testing framework developed in the project is available for further testing of any future proposed revisions to elements of the HSF.

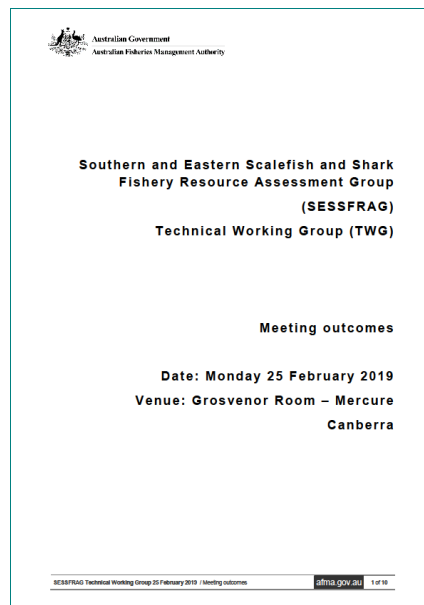
8 Appendix

Table 8.1 GABTS Trigger limits

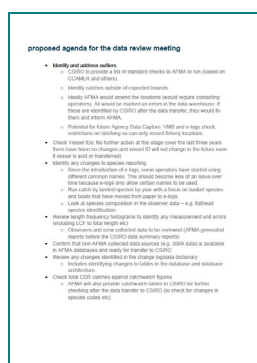
SPECIES	TRIGGER TO COLLECT BIOLOGICAL DATA	TRIGGER FOR ANALYSIS OF BIOLOGICAL DATA (INC. AGEING OF OTOLITHS)	CEASE FISHING FOR THAT SPECIES	COMMENCE STOCK ASSESSMENT
Gemfish	Currently collected	400t	500t/year	1000t/3 years
Blue Grenadier	Currently collected	400t	500t/year cease fishing. If a spawning aggregation is found, trigger an acoustic survey (500t) and operator collects 100 whole fish.	1000t/3 years
Ling	Currently collected	100t	250t	250t
Blue-eye Trevalla	Currently collected	100t	250t	—
Ribaldo	Currently collected	100t	250t	—
Hapuka	Currently collected	100t	250t	—
Gulper sharks		—	Code of practice by industry to not target these species in addition to area closure.	—
Deepwater sharks (Black/Brier)		—	Code of practice by industry to not target these species in addition to area closure.	—
Chinamen Leatherjacket		—	Management measures on Bight Redfish and Deepwater Flathead influence catch.	—
Angel Shark		—	Management measures on Bight Redfish and Deepwater Flathead influence catch.	—
Jackass Morwong		—	Management measures on Bight Redfish and Deepwater Flathead influence catch.	—

Technical Working Group meeting outcomes

Meeting outcomes (Includes Attachment 1 of the outcomes –declared conflicts of interest)



Attachment 2 of the outcomes – agenda for the AFMA annual data review meeting



Attachment 3 of the outcomes – Monitoring MYTAC species in the SESSF:



Attachment 4 of the outcomes – DRAFT Total allowable catch setting process: Guidelines for the provision of data and stock assessment processes:



Note: the guidelines will be finalised prior to the SESSFRAG Data meeting



**Southern and Eastern Scalefish and Shark
Fishery Resource Assessment Group
(SESSFRAG)
Technical Working Group (TWG)**

Meeting outcomes

**Date: Monday 25 February 2019
Venue: Grosvenor Room – Mercure
Canberra**

Attendees

Attendees	
<i>Dr Cathy Dichmont</i>	<i>Chair</i>
<i>Dr Paul Burch</i>	<i>CSIRO</i>
<i>Ms Cate Coddington</i>	<i>AFMA</i>
<i>Mr Daniel Corrie</i>	<i>South East Trawl and Great Australian Bight Trawl Manager, AFMA</i>
<i>Mr George Day</i>	<i>AFMA Member</i>
<i>Dr Jemery Day</i>	<i>CSIRO</i>
<i>Dr Karina Hall</i>	<i>NSW Department of Primary Industries</i>
<i>Dr Malcolm Haddon</i>	<i>Fisheries consultant</i>
<i>Mr Ryan Keightley</i>	<i>A/g Gillnet, Hook and Trap Manager, AFMA</i>
<i>Dr Ian Knuckey</i>	<i>Fishwell Consulting</i>
<i>Dr Rich Little</i>	<i>CSIRO</i>
<i>Mr Sandy Morison</i>	<i>SERAG and SharkRAG Chair</i>
<i>Dr Veronica Silberschneider</i>	<i>NSW Department of Primary Industries</i>
<i>Dr Miriana Sporcic</i>	<i>CSIRO (dial in)</i>
<i>Dr Robin Thomson</i>	<i>CSIRO</i>
<i>Dr Geoff Tuck</i>	<i>CSIRO</i>
<i>Mr James Woodhams</i>	<i>ABARES</i>

Declarations of interest

1. The Technical Working Group (TWG) noted attendees' declarations of conflicts of interest at [Attachment 1](#).

Procedure for pre-processing data

2. Dr Burch presented outcomes from the recent AFMA and CSIRO data meeting including:
 - the intent that AFMA would look to create existing CSIRO data tables within AFMA databases
 - combine information and develop processes for outlier detection (including latitude / longitude and positional data). Outlier detection should be checked both at the point where the data is entered and where the data is used
 - a description of planned changes to AFMA databases
 - incorporating new data sources, including electronic monitoring and industry data collection.
3. **The TWG recommended that Fishwell, CSIRO and AFMA develop, and AFMA maintain and make available, a 'data process and change' document for each database, including: metadata, process applied to the data, source (e-logs etc), checks, rules and filters and a log of changes over time.**
 - The TWG noted that in addition, AFMA will maintain a specific, more detailed, change log for each database. May be worth exploring heterogeneity amongst vessels to identify where gear types and skippers have changed.
 - The TWG noted there is a change log within e-log software that provides background information where operators have been contacted to make corrections, although AFMA is not currently accessing these data
 - A correction log (e.g. corrections made to kilograms, locations etc) is maintained within the database.
4. The TWG noted that some identified data inconsistency issues could be resolved through AFMA's ICT and Agency Data Collection projects. In the interim, the **TWG recommended that SESSFRAG adopt the agenda for the AFMA data review meeting for quota species (to be held at least annually before the SESSFRAG Data meeting), as follows:**
 - Identify and address outliers
 - CSIRO to provide a list of standard checks to AFMA to run (based on CCAMLR and others).
 - Identify catches outside of expected bounds.
 - Ideally AFMA would amend the locations (would require contacting operators). All would be marked as errors in the data warehouse. If

these are identified by CSIRO after the data transfer, they would fix them and inform AFMA.

- Potential for future Agency Data Capture: VMS and e-logs check; restrictions on lats/long so can only record fishery locations.
- Check Vessel IDs: No further action at this stage (over the last three years there have been no changes and vessel ID will not change in the future even if vessel is sold or transferred)
- Identify any changes to species reporting
 - Since the introduction of e-logs, some operators have started using different common names. This should become less of an issue over time because e-logs only allow certain names to be used.
 - Run catch by landed species by year with a focus on basket species and boats that have moved from paper to e-logs.
 - Look at species composition in the observer data – e.g. flathead species identification.
- Review length frequency histograms to identify any measurement unit errors (including LCF to total length etc)
 - Observers and crew collected data to be reviewed (AFMA generated reports before the CSIRO data summary reports)
- Confirm that non-AFMA collected data sources (e.g. SSIA data) is available in AFMA databases and ready for transfer to CSIRO
- Review any changes identified in the change log/data dictionary
 - Includes identifying changes to tables in the database and database architecture.
- Check total CDR catches against catchwatch figures
 - AFMA will also provide catchwatch tables to CSIRO for further checking after the data transfer to CSIRO (to check for changes in species codes etc)

‘Break outs’: which fishery indicators to review

5. The TWG recommended SESSFRAG adopt the guide *Monitoring MYTAC species in the SESSF* at Attachment 3.

Process for considering new assessment methods

6. The TWG recommended SESSFRAG adopt the guide *Total Allowable Catch (TAC) setting process: Guidelines for provision of data and stock assessment processes* at Attachment 4.

Species that are difficult to assess

Tier 4 species with high discards

7. The TWG noted:
 - these species (e.g. elephant fish and inshore ocean perch) would now be considered byproduct species
 - for Tier 4s, even if discard estimates become more certain, or discarding ceased, discard estimates are not available for the reference period. As such, Tier 4s would not be able to be run for at least 13 years
 - independent surveys (e.g. trawl surveys and close kin) could be undertaken and would not rely on discard estimates. However, similarly they would not provide an index during the reference period
8. **The TWG recommended an interim approach, pending the outcomes of the multi-species harvest strategy:**
 - setting a TAC based on the existing TAC, subject to sustainability concerns of the RAG and consideration of whether the TAC is restricting catches of that species or any other species
 - annual monitoring of available fishery indicators on a weight of evidence basis, including SAFE assessments, where available
 - if fishing mortality needs to be constrained, management measures other than output controls should be considered by SEMAC and AFMA.

Action Item: AFMA to contact CSIRO regarding undertaking SAFE assessments for species that were unable to be assessed using Tier 4 assessments.

9. For the multi-species harvest strategy project, a risk assessment (e.g. SAFE) every five years at the lowest tier of the harvest strategy could be considered, which could then be MSE tested.

Stock assessment data is internally conflicted to a high degree

10. For Tier 1 species, it would be more informative to keep running the Tier 1, considering data conflicts and determining what data to use in the assessment. Then data collection should be revisited to reduce uncertainty in the assessment.
11. For non-Tier 1 species, generally catch rate assessments are more conservative, so in most cases a Tier 4 assessment will be more conservative and should be adopted. This is subject to the RAG's view on the data and the appropriateness of the assessment.
12. Alternative indexes of abundance should be considered where available.

Inadequate data

13. The TWG noted that the issue was a broad one, incorporating data gaps across ISMP, crew collected data and indices of abundance.
14. **The TWG recommended collecting more representative data where possible and reviewing data collection targets and methods to achieve this.** The TWG noted this will be considered as part of the data strategy meeting and the multi-species harvest strategy project.
15. **In addition to data collection, the TWG recommended investigating:**

- Using an objective measure of uncertainty to set the RBC (e.g. buffer applied to account for uncertainty in Tier 1s based on the distribution of model outputs).
 - This approach to setting the RBC should be developed, including percentile to be chosen for setting the RBC, and MSE tested as part of the MSHS project.
 - If the uncertainty can not be calculated, an alternative assessment (e.g. surplus production – which would fall into Tier 2) could be considered.

Productivity and regime shift

16. **The TWG recommended the RAGs revisit SESSF guidance on when a regime shift has occurred, noting that rather than using the term ‘regime shift’, it would be more appropriate to use the language adopted for guidelines to the new *Commonwealth Fisheries Harvest Strategy Policy*. This would be broader than ‘shifts’ and include directional change.**
17. **To address changes in productivity, the TWG recommended that dynamic reference points be considered for the revised SESSF harvest strategy, noting that a research project was being proposed (separate to the multi-species harvest strategy project) to investigate the use of dynamic reference points.**
18. **In the interim, unless a regime shift has been identified (see paragraph 16 above), if there is evidence of a productivity change, continue to adopt recent recruitment scenarios for setting TACs as recommended by the RAGs as appropriate.**

General recommendations

19. Generally, the TWG noted the importance of appropriate data collection, including fishery independent methods.
20. **For each assessment, the TWG recommended the RAG should provide an explanation of why a Tier has been adopted.**
21. **The TWG recommended that ‘Tier 2’ could be activated for non-integrated assessments, subject to meeting the requirements for adopting new assessment methodologies identified in *Total Allowable Catch (TAC) setting process: Guidelines for provision of data and stock assessment processes***
22. **The TWG recommended not using the current Tier 3 method, as supported by simulation testing.**
23. For species for which Tier 5 assessments are applied, the RAG should also include description of the data needs and collection approaches based on risk-catch-cost.
24. MSE testing should include Tier 5 assessments if they continue to be used under the new harvest strategy.
25. Assessment diagnostics should be considered by RAGs, including what is currently presented and what is used in other forums, such as CCAMLR.

When to reject an assessment and setting TACs for species without accepted assessments

When to reject an assessment ?

Before the assessment is commenced

26. **The TWG recommended that:**

- Before the assessments are started (i.e. the year before the assessment is undertaken), the SESSFRAG Data meeting should review available data and discuss and provide advice on whether to run the assessment.
- To inform this advice, ageing for the relevant Tier 1 species should be done in time for SESSFRAG consideration.

Action item: AFMA to check whether it is possible to move to undertake ageing for all species annually.

After the assessment has been prepared

27. **The TWG recommended that standard diagnostics be developed to better inform the decision whether to accept or reject an assessment.**

28. **The TWG recommended that RAG's consider rejecting assessments where there is:**

- obvious mis-specification (assessment cannot fit the index of abundance, cannot reconcile index and composition data for the same fleet; two indices showing very different trends; extreme sensitivity to 'small' changes in assumptions)
- major changes in assessment outcomes that cannot be explained (primarily) by new data / information.

Setting a TAC for a species without an accepted assessment

29. **The TWG recommended that, for species without an accepted assessment, the TAC be set based on:**

- in the short term, use the existing TAC, subject to sustainability concerns of the RAG using weight of evidence approach
- for future assessments, the assessor to present RBCs for three years, and then longer term projected RBCs to be used if the assessment is not run at the end of the MYTAC period (applied retrospectively to assessments if possible)
- consider alternative assessment approaches that could be used in future, using the process for considering new assessment methodologies as outlined in the *Total Allowable Catch (TAC) setting process: Guidelines for provision of data and stock assessment processes*.

- long term, look at changing harvest rates based on the uncertainty around the assessment (including uncertainty because of the time since the last assessment).
30. **The TWG recommended that SESSFRAG consider adopting a summary flowchart describing:**
- **when to run an assessment**
 - **when to accept or reject an assessment**
 - **how to set a TAC for species without an accepted assessment.**

Next steps

31. The outcomes from the TWG, along with a summary flow chart of when assessments are rejected, be provided to the SESSFRAG meeting for adoption.

Attachments

- 1) List of declared conflicts of interest
- 2) agenda for the AFMA annual data review meeting
- 3) *Monitoring MYTAC species in the SESSF*
- 4) *Total Allowable Catch (TAC) setting process: Guidelines for provision of data and stock assessment processes*

Declared Conflicts of Interest

Attendee	Declared interest
Dr Cathy Dichmont	<p>Proprietor of Cathy Dichmont Consulting.</p> <p>Chair of TT RAG.</p> <p>Contracted by various State and Commonwealth agencies to undertake various reviews and consultancies not related to SESSF.</p> <p>No pecuniary interest in the SESSF.</p>
Dr Paul Burch	<p>Employed by CSIRO, assessment scientist. Acquiring funding for research purposes.</p>
Ms Cate Coddington	<p>AFMA, Executive Officer of SESSF RAG. No interest, pecuniary or otherwise.</p>
Mr Dan Corrie	<p>AFMA, South East Trawl and Coral Sea Manager. No interest, pecuniary or otherwise.</p>
Mr George Day	<p>Employed by AFMA; Senior Manager of Demersal and Midwater Fisheries.</p> <p>No interest, pecuniary or otherwise.</p>
Dr Jemery Day	<p>CSIRO, assessment scientist. Acquiring funding for research purposes.</p> <p>Interests in promoting good science.</p>
Dr Karina Hall	<p>Cross-jurisdictional research and management interests for DPI NSW.</p>
Dr Malcolm Haddon	<p>Stock assessment scientist.</p> <p>CSIRO Honorary Fellow. No longer a member of any RAG or MAC.</p> <p>Research interest in fisheries assessment, management. Occasionally interested in research funding for fisheries research modelling.</p>
Mr Ryan Keightley	<p>Employed by AFMA, A/g Gillnet, Hook and Trap, High Seas and Norfolk Is Manager. No interest, pecuniary or otherwise</p>
Dr Ian Knuckey	<p>Director Fishwell Consulting Pty Ltd</p> <p>Involved in –Fishery Independent Survey (FIS) SESSF and GAB</p> <p>Range of research interests in relation to South East fisheries including the GABTF, SESSF and auto-longline sector. Agent for Olfish Electronic Logbooks</p> <p>NPF RAG Chair, Scientific member on NORMAC</p>

Attendee	Declared interest
	Provides research advice to various industry associations: SETFIA, GABIA and SSIA
Dr Rich Little	Employed by CSIRO, assessment scientist. Acquiring funding for research purposes.
Mr Sandy Morison	<p>Director of Morison Aquatic Sciences.</p> <p>Chair of SharkRAG, SERAG and the Tropical Rock Lobster Working Group.</p> <p>Scientific member on SEMAC.</p> <p>Contracted by government departments, non-government agencies and companies for a range of fishery related matters including research and (by SCS Global Services) for MSC assessments of AFMA managed and other Australian and international fisheries.</p> <p>No pecuniary or other interest in the SESSF.</p>
Dr Veronica Silberschneider	Cross-jurisdictional research and management interests for DPI NSW, no pecuniary interests.
Dr Miriana Sporcic	CSIRO, assessment scientist. Acquiring funding for research purposes
Dr Robin Thomson	<p>Employed by CSIRO, Assessment scientist. Acquiring funding for research purposes</p> <p>PI on data services contract and close kin project for school shark.</p>
Dr Geoff Tuck	<p>Employed by CSIRO.</p> <p>Involved in Stock assessments. Interest in obtaining funding for future research.</p>
Mr James Woodhams	Employed by ABARES. Potential interest in funding for research. No interests, pecuniary or otherwise

proposed agenda for the data review meeting

- Identify and address outliers
 - CSIRO to provide a list of standard checks to AFMA to run (based on CCAMLR and others).
 - Identify catches outside of expected bounds.
 - Ideally AFMA would amend the locations (would require contacting operators). All would be marked as errors in the data warehouse. If these are identified by CSIRO after the data transfer, they would fix them and inform AFMA.
 - Potential for future Agency Data Capture: VMS and e-logs check; restrictions on lats/long so can only record fishery locations.
- Check Vessel IDs: No further action at this stage (over the last three years there have been no changes and vessel ID will not change in the future even if vessel is sold or transferred)
- Identify any changes to species reporting
 - Since the introduction of e-logs, some operators have started using different common names. This should become less of an issue over time because e-logs only allow certain names to be used.
 - Run catch by landed species by year with a focus on basket species and boats that have moved from paper to e-logs.
 - Look at species composition in the observer data – e.g. flathead species identification.
- Review length frequency histograms to identify any measurement unit errors (including LCF to total length etc)
 - Observers and crew collected data to be reviewed (AFMA generated reports before the CSIRO data summary reports)
- Confirm that non-AFMA collected data sources (e.g. SSIA data) is available in AFMA databases and ready for transfer to CSIRO
- Review any changes identified in the change log/data dictionary
 - Includes identifying changes to tables in the database and database architecture.
- Check total CDR catches against catchwatch figures
 - AFMA will also provide catchwatch tables to CSIRO for further checking after the data transfer to CSIRO (to check for changes in species codes etc)



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Monitoring MYTAC species in the SESSF

A guide to monitoring species managed under a multi-year total allowable catch in the Southern and Eastern Scalefish and Shark Fishery.



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1 Purpose

This framework provides direction on how to monitor any changes to a species or stock that is managed under a multi-year total allowable catch (MYTAC) within the Southern and Eastern Scalefish and Shark Fishery (SESSF). This is an interim framework, until such time as MYTACs are Management Strategy Evaluation tested.

2 Background

In 2010, the AFMA Commission agreed to the use of certain criteria and principles to set a total allowable catch (TAC) across multiple years, as outlined within the *Harvest Strategy Framework for the Southern and Eastern Scalefish and Shark Fishery* (the Harvest Strategy).

The Harvest Strategy stipulates that ‘breakout rules’ are to be applied as appropriate to MYTAC species as trigger points to identify fundamental changes from the understanding of the stock at the time of assessment.

Previously, breakout rules were applied to all MYTAC species as determined by the relevant RAG for that species.

At the 2017 Southern and Eastern Scalefish and Shark Fishery Resource Assessment Group (SESSFRAG) Chair’s meeting, the RAG reviewed the process for applying breakout rules and developed a decision tree support tool (Appendix A) to assist RAGs to monitor MYTACs by evaluating relevant fishery indicators akin to that of breakout rules.

3 When should species under a MYTAC be evaluated?

The decision tree support tool at Appendix A has a series of questions designed to highlight species which might require further scrutiny by the RAG between scheduled assessments. Specifically, the decision tree considers whether:

- 1) the stock assessment is being conducted in that year
- 2) the stock is managed under a rebuilding strategy
- 3) the species or stock is within its initial MYTAC period
- 4) the stock is above the biomass (or proxy) target reference point
- 5) less than 50 per cent of the TAC was caught in the previous season due to non-operational reasons.

Depending on the answer to the questions above, one of the following scenarios occur:

- a) The risk to the stock is considered to be low and no further analysis is required
- b) There is some indication that the stock is at risk, and a series of fisheries indicators should be reviewed to ensure there have been no changes to the underlying assumptions of the stock assessment.

Prior to the SESSFRAG Data meeting each year, AFMA is responsible for assessing each MYTAC species using the decision tree support tool and identifying which species will require an evaluation of relevant fishery indicators. AFMA (with assistance from CSIRO) is to then collate the fishery indicator data. The RAG is then responsible for reviewing the fishery indicators based on the guidance under section 5.

The RAG may override AFMA's application of the decision tree on a species specific basis with appropriate rationale. The RAG may also review fishery indicators and provide advice on any other species.

4 What is a fishery indicator?

Fishery indicators are variables used to identify fundamental changes to trends in a species or stock that is managed under a MYTAC during non-assessment years.

Fishery indicators may include:

- catch per unit effort (CPUE);
- total fishing mortality (from total catches, discards, catches in other fisheries or jurisdictions);
- size and age structure; or
- economic factors (for species under calculated economic target reference points)

5 Reviewing fishery indicators

The following review of relevant fishery indicators, using a weight of evidence approach, should be undertaken for a species highlighted as potentially at risk after consideration of the criteria in the decision tree support tool. Representativeness of the data should be considered in reviewing indicators and potential responses.

For all species

- Relevant operational and management changes
- Data outside historical ranges

Tier 1 species

- Standardized CPUE
- FIS data if available
- Age and length composition (recruitment)
- Discard estimates (to look for recruitment events, failure of recruitment events to eventuate)
- Conflicting data (e.g. age composition between observers, crew collected and FIS)

Tier 3 species

- Discards
- Age and/or length composition

Tier 4

- Standardized CPUE
- Discards

Tier 5 species

- Catch versus TAC
- Discard estimate

6 Review outcomes

After reviewing fishery indicators, if the RAG is satisfied that a significant change has occurred or that the underlying assumptions of the stock assessment are no longer valid, the RAG should recommend an appropriate management response. The response should be proportionate to the risk identified and might include:

- bringing a scheduled assessment forward for re-assessment and subsequent setting of a revised MYTAC
- reducing the TAC for the remainder of the MYTAC period
- implementing a single year TAC, or
- other actions as determined.

Resource capacity must be considered alongside other priorities when deciding what an appropriate response is.

Appendix A: Decision tree support tool for evaluating fishery indicators

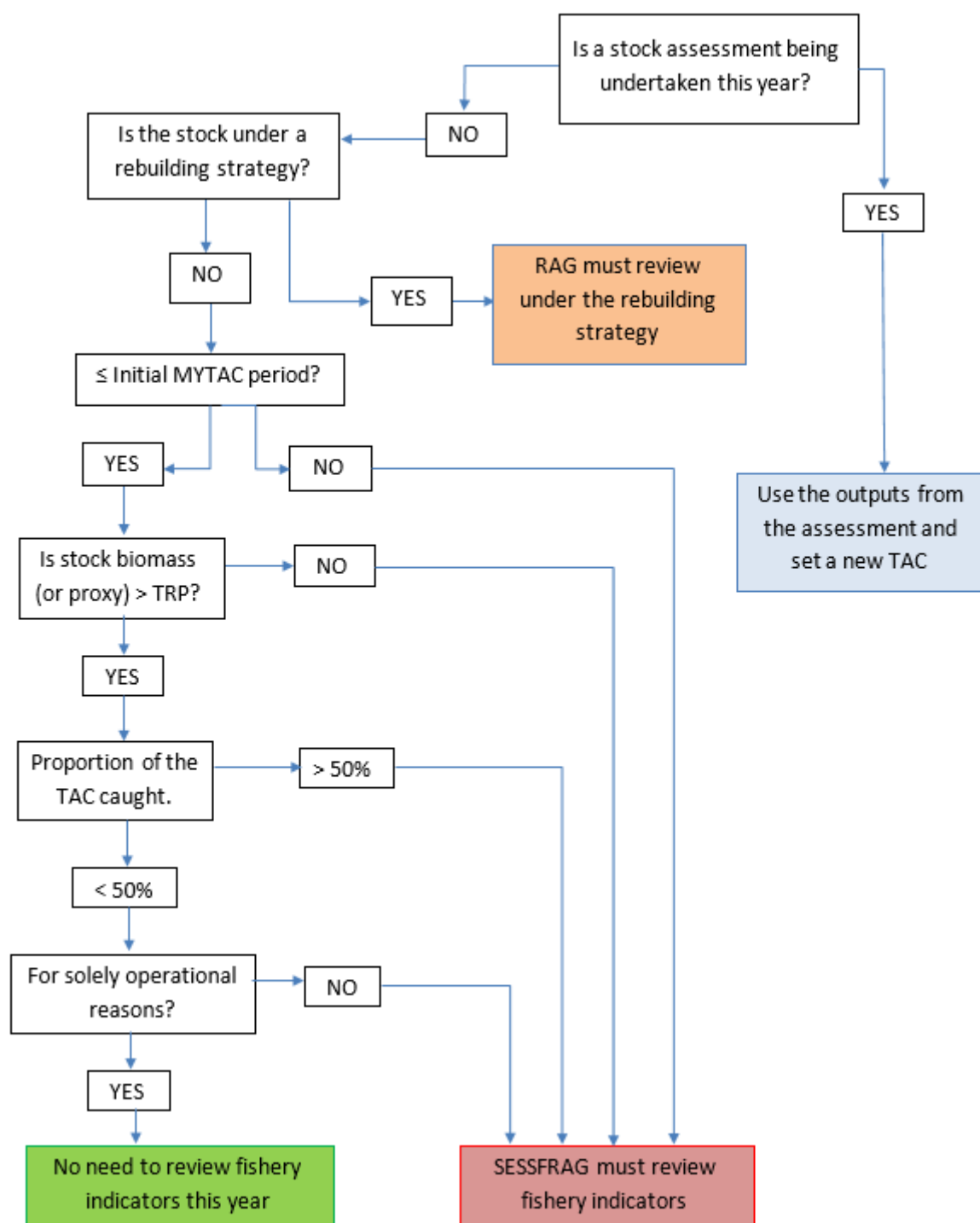


Diagram 1 Decision tree support tool (source: SESSFRAG TWG 2019 papers)



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DRAFT

Total Allowable Catch (TAC) setting
process

Guidelines for provision of data and
stock assessment processes

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Total Allowable Catch setting process

The following process has been developed and approved by the Southern and Eastern Scalefish and Shark Fishery Resource Assessment Group (SESSF RAG) to provide direction to resource assessment groups (RAGs), to ensure that the TAC setting process is conducted in the most efficient and cost effective way each year.

1.1 Preparing for Resource Assessment Group meetings

To ensure that members have seats at the table and access to power etc. at RAG meetings, AFMA executive officers (EOs) are to send a list of potential observers to the Chair to approve before the meeting. EOs and Chairs to ensure that only approved observers are in the room.

Assessments are to be provided to the AFMA EO at least one week before the meeting for sending out, unless otherwise agreed by AFMA and RAG members. There is a risk that changes may be identified after the assessment is submitted but it is important that RAG members have sufficient time to consider the documents before the meeting.

Unless there are exceptional circumstances, assessment scientists should be available to discuss the assessment at RAG meetings (either in person or by phone/video link).

1.2 AFMA Provision of data to CSIRO

AFMA to ensure catch and effort data, catch disposal record data, observer data and SSIA crew collected data is available to allow processing before the SESSF data meeting by providing the data to CSIRO by no later than 30 April each year. In addition, for inclusion in stock assessments the following data must be provided:

NSW observer data – 30 April

Aging data – 30 June

State catch data – 30 June

Additional GABT logbook data – 30 June

GABT crew-collected data - 30 June

GABFIS, SETFIS – 30 June.

1.3 Presentation of basecase and final assessments

For tier 1 assessments sensitivities and likelihood profiles (unless circumstances do not allow for it) to be presented at the first meeting. Base cases and sensitivities to be agreed by the RAG at the first meeting before presentation of the final assessment. Any significant changes to base cases or sensitivities to be agreed by the RAG. In the instance where a significant change to the base case or sensitivities arises, the stock assessment scientist should notify AFMA and the Chair and the decision may be made to consider the change in an additional telephone meeting prior to the final meeting.

Projections for alternative constant catch scenarios of average and low recruitment for rebuilding species should be run each time they are assessed, to the extent possible.

1.4 Publication of final assessments

Access to data used in assessments and assessment code should be made available for public release after the assessment, subject to AFMA's data confidentiality policy. AFMA will hold the groomed dataset and control file and will review on a case by case basis whether the data should be released, in consultation with the original author where appropriate.

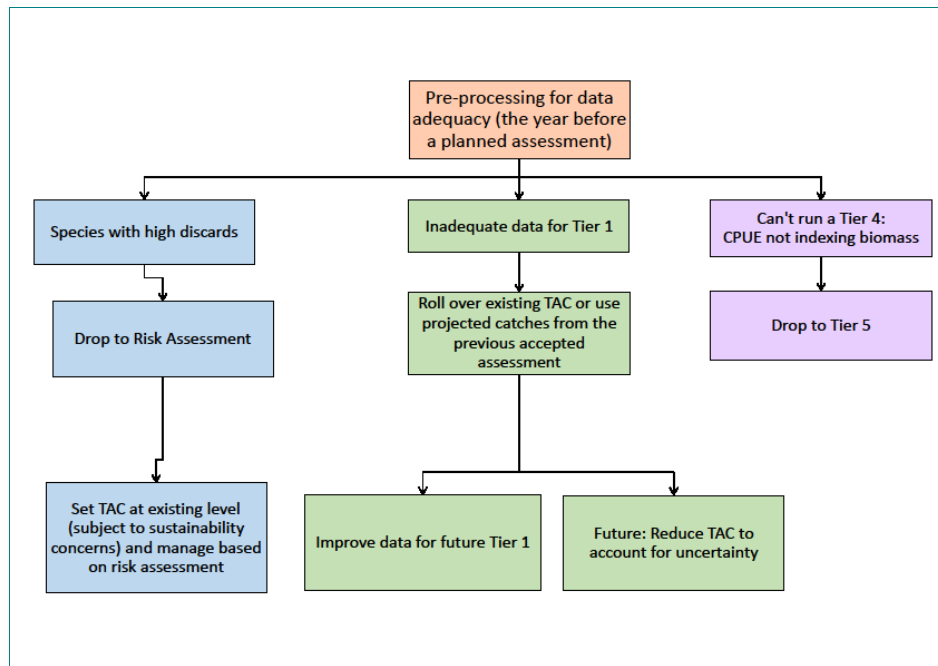
Assessment reports should be approved by AFMA and made available online.

1.5 Process for considering new assessment approaches

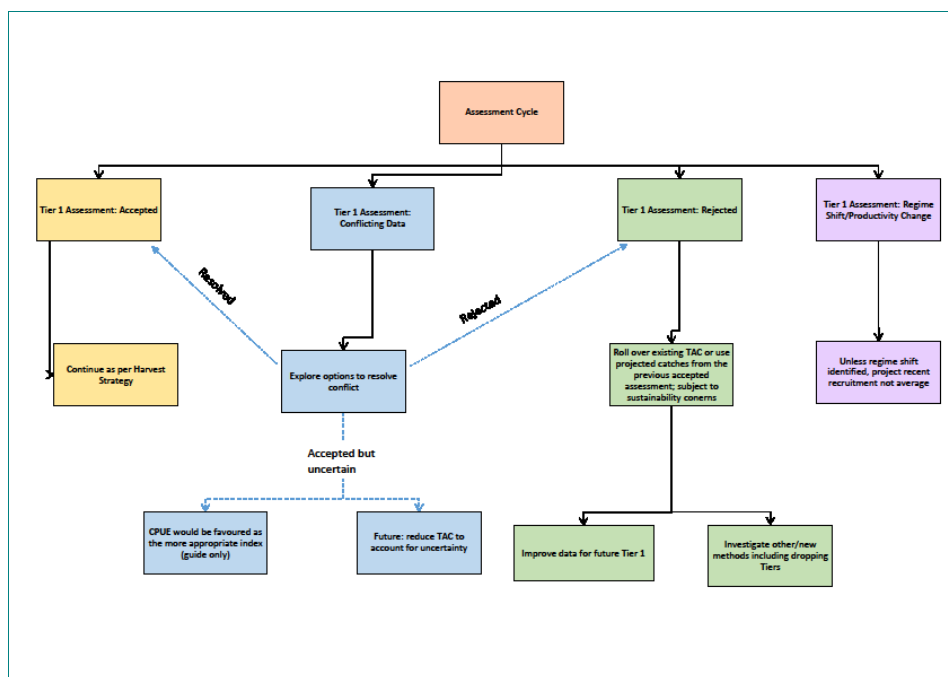
The RAG is open to considering new assessment methodologies, not currently in the assessment toolbox. Unless there are exceptional circumstances, a new methodology should not be introduced for consideration in the year of an assessment. The following provides a general guide for considering new assessment methods.

- A set of standard data and a statement of required outputs should be made available by the RAG for the assessor to test a new assessment methodology (e.g. one data set from a data rich species (e.g. deepwater flathead) and one data set from a data poor species).
- The test assessment should be documented and made available, along with any published scientific reviews, to the RAG.
 - The proposer should also document the benefits of new methodology.
- Based on these results, the RAG would provide advice whether this assessment should proceed to simulation testing by the proposer (if not already done). This should be based on technical advice as well as the cost of the new assessment.
- Following consideration of simulation testing, ideally this new assessment (if recommended to continue) would be undertaken in parallel with the existing assessment methodology. This means that the full impact of the different assessments can be rigorously reviewed and the RAG would decide which assessment to adopt for the purposes of TAC recommendations.
- The RAG would need to decide whether a base case version would be undertaken (i.e. pick an accepted assessment and scenario) or whether ensemble methods applying multiple model outputs would apply. [Discount factors should also be considered during this process].


Flowchart of the 'SESSFRAG review of data adequacy' and 'assessment review and TAC setting' flowcharts



Assessment review TAC setting flowchart



Data Strategy meeting outcomes



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**Southern and Eastern Scalefish and Shark
Fishery Resource Assessment Group
(SESSFRAG)
Data Strategy Meeting**

Meeting outcomes

Date: 27-28 February 2019
**Venue: Grosvenor Room – Mercure
Canberra**

SESSFRAG Technical Working Group 25 February 2019 / Meeting outcomes

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**Southern and Eastern Scalefish and Shark
Fishery Resource Assessment Group
(SESSFRAG)
Data Strategy Meeting**

Meeting outcomes

Date: 27-28 February 2019

**Venue: Grosvenor Room – Mercure
Canberra**

Attendees

Participants	
<i>Dr Cathy Dichmont</i>	<i>Chair</i>
<i>Dr Paul Burch</i>	<i>CSIRO</i>
<i>Ms Cate Coddington</i>	<i>AFMA</i>
<i>Mr Daniel Corrie</i>	<i>South East Trawl and Great Australian Bight Trawl Manager, AFMA</i>
<i>Mr George Day</i>	<i>AFMA Member</i>
<i>Dr Sarah Jennings</i>	<i>Economic member</i>
<i>Dr Jemery Day</i>	<i>CSIRO</i>
<i>Dr Lance Lloyd</i>	<i>Lloyd Environmental</i>
<i>Mr Ryan Keightley</i>	<i>Alg Gillnet, Hook and Trap Manager, AFMA (outcomes)</i>
<i>Dr Ian Knuckey</i>	<i>Fishwell Consulting</i>
<i>Dr Rich Little</i>	<i>CSIRO</i>
<i>Mr Sandy Morison</i>	<i>SERAG and SharkRAG Chair</i>
<i>Mr Andrew Penney</i>	<i>Pisces Australis</i>
<i>Dr Kyne Krusic-Golub</i>	<i>Fish Ageing Services (dial in)</i>
<i>Dr Veronica Silberschneider</i>	<i>NSW Department of Primary Industries</i>
<i>Dr Karina Hall</i>	<i>NSW Department of Primary Industries</i>
<i>Dr Miriana Sporcic</i>	<i>CSIRO (dial in)</i>
<i>Mr Neil McDonald</i>	<i>GABIA</i>
<i>Mr David Stone</i>	<i>SSFassn.</i>
<i>Mr Simon Boag</i>	<i>SETFIA</i>
<i>Dr Robin Thomson</i>	<i>CSIRO</i>
<i>Dr Geoff Tuck</i>	<i>CSIRO</i>
<i>Mr James Woodhams</i>	<i>ABARES</i>
Observers	
<i>Mr Russell Conway</i>	<i>Recreational representative</i>
<i>Dr Kevin Stokes</i>	<i>Stokes.Net.NZ limited</i>

1 Welcomes and Introductions

Declarations of interest

1. The Data Strategy Working Group (DSWG) noted attendees' declarations of conflicts of interest at [Attachment 1](#).

2 FMS data plan: short, medium and long term data strategy and Implications of the Commonwealth Fisheries Harvest Strategy Policy and Bycatch Policy

2. The DSWG noted that:
 - a) the SESSF Data Plan, dealing primarily with quota species, was last reviewed by SESSFRAG at its 8-10 August 2018 meeting;
 - b) AFMA is now developing a Data Strategy to be included in the SESSF Fisheries Management Strategy (FMS). This will incorporate the existing data plan along with broader data needs around byproduct, bycatch and protected species as well as other environmental and economic data as applicable;
 - c) data needs have been impacted by the Commonwealth Fisheries Harvest Strategy Policy 2018 (Harvest Strategy Policy) and Commonwealth Fisheries Bycatch Policy 2018 (Bycatch Policy), including data requirements around a broader range of species;
 - d) the SESSF multi-species harvest strategy research project may lead to different harvest strategy approaches with different data needs; and
 - e) accordingly, while the data plan will be expanded and incorporated into the SESSF FMS Data Strategy, it will remain a living document to respond to changing data needs and ways of achieving them.

Defining Data Needs

3 Declining indicators and multi-species harvest strategy implementation workshop outcomes

3. The DSWG, acknowledging most members of this group were in attendance at the workshop, noted the outcomes of the Declining Indicators Implementation and Multi-species Harvest Strategy workshop as outlined by Dr Knuckey and Dr Little.
4. The DSWG **recommended** that AFMA should consider the data needs arising from the workshop in developing the SESSF Data Strategy.

4 Review, confirm and prioritise data needs

5. The DSWG group was asked to:
 - i. review and confirm current data requirements

- ii. identify additional data requirements; and
- iii. prioritise collection of data

for each of the species categories identified below to meet the requirements of the *Commonwealth Fisheries Harvest Strategy Policy 2018* (Harvest Strategy Policy) and *Commonwealth Fisheries Bycatch Policy 2018* (Bycatch Policy).

6. The DSWG **recommended** waiting for the Economics Working Group's consideration of the economic data that should be collected in the SESSF.
7. The DSWG **recommended** that SESSFRAG consider the SESSF data collection summary as identified at [Attachment 2](#) in developing the SESSF Data Plan.
8. The DSWG further **recommended** that SESSFRAG consider, through a working group if appropriate, further changes to the SESSF Data Plan under the new Harvest Strategy and Bycatch Policies and AFMA's protected species strategies:
 - a) species classification to determine if important byproduct species (e.g. leatherjackets, frostfish, latchet, squid) should be classified as key commercial fish stocks. Under the Harvest Strategy Policy, these key commercial species should be maintained at target biomass to produce maximum economic yield from the fishery, which may require the collection of a range of new information (biological, distribution ect).
 - b) Environmental data – working out what data should be collected, with a focus on productivity and climate change impacts as identified by the Declining Indicators Implementation workshop.
 - c) Protected species – determining a reliable annual estimate of protected species interactions.
 - d) Overall discards – advising on what information is required and how this may be achieved.
 - e) Review species specific targets (including biological data needs) in the SESSF data plan.

Mechanisms to achieve data needs

5 CSIRO: FIS optimisation research

9. Dr Sporcic and Dr Day presented the draft results of the FRDC project 'A re-examination of underlying model assumptions and resulting abundance indices of the Fishery Independent Survey (FIS) in Australia's SESSF', noting the following objectives:
 - i. re-examine some of the underlying assumptions of the survey;
 - ii. update data that conditions the model (FIS2) and find efficiencies in sampling design; and,
 - iii. use data simulation (using FIS2) to examine the utility of the estimates given the process and sampling errors that have been observed.

Two additional objectives (outside the scope of this project) were also examined:

- iv. Reconditioned model accounting for within year variability to estimate FIS abundance indices (FIS3)
 - v. Stock assessment scenario exploration: incorporate updated FIS abundance indices in seven Tier 1 stock assessments
10. The DSWG noted the outcomes of the project, and agreed there are several ways of remodelling the current FIS which would reduce CV's for a range of species, and these should be explored if continuation of the FIS is recommended.

6 Fishwell: FIS inter-annual variation

11. Dr Knuckey presented an analysis of the FIS, particularly investigating occurrences of inter-annual variation seen for tiger flathead, pink ling, blue grenadier and silver warehou. Dr Knuckey summarised that his analysis could not find any operational or environmental issues that would allow for, or account for, the large inter-annual variations in these four species (flathead, ling, grenadier, silver warehou). It was noted that there are some large shots associated with the variations, but further work needs to be undertaken to investigate the influence of each data point.
12. The DSWG **recommended** that a costed, timelined, proposal be developed for a redesign of the FIS, optimised for the following key economic species in the fishery:
- tiger flathead
 - pink ling
 - blue grenadier
 - jackass morwon
13. The DSWG noted that the FIS, optimised for these species, may also provide useful data for other species too, and further consideration should be given to optimisation for other species such as mirror dory, john dory and gummy shark.
14. The DSWG **recommended** this proposal go to SESSFRAG as a research priority.

7 Data collection in the GHAT

Fishwell project determining discard estimates and length frequency from EM

15. The DSWG noted a presentation from Dr Knuckey on a Fishwell Consulting project which had the following objectives:
- i. Establish a process for obtaining discard weight estimates from piece-counts using electronic monitoring;
 - ii. and trial the use of EM cameras as a method for collecting length frequency data on retained (and discarded) shark species and make recommendations for practical implementation by AFMA and industry.
16. The DSWG noted that SharkRAG recommended the methodology developed to produce discard weight estimates from electronic monitoring piece-counts be incorporated into discard estimates for use in future GHAT assessments.
17. The DSWG noted that EM can be used as a method for collecting length frequency, and highlighted potential overlap with the Industry data collection program.

Shark Industry Data Collection (SIDaC) program update

18. The DSWG noted an update from Mr Boag on the Shark Industry Data Collection (SIDaC) program, which was implemented in place of AFMA Observers to collect biological data in the GHAT for gummy and school shark, blue eye trevalla, pink ling and ribaldo. Mr Boag stated that the program is tracking well, and is being continually refined.

8 Update on electronic monitoring trial in the SET

19. The DSWG noted a presentation by Mr Corrie on the progress of the south east trawl electronic monitoring trial.
20. The DSWG **recommended** that, if EM is adopted in the SET, there should be sufficient overlap between onboard observers and EM to allow comparisons between the two methods of data collection and verification.

Achieving the data plan

9 Advice to SESSFRAG: the SESSF data plan: consider data collection scenarios and costings: crew, e-logs, electronic monitoring, FIS (Including direct HCR), ISMP.

21. The DSWG noted a presentation and spreadsheet from Mr Penney. Mr Penney explained that during the SMARP project, a comparison of the cost implications of alternative assessments for different species categories, frequency of fisheries independent surveys (FIS) and frequency of data analysis and stock assessment under multi-year TACs was facilitated by development of a spreadsheet allowing all of these options to be varied in real time. The SMARP project recommended optimum scenarios, but those have changed over time with the implementation of EM, close kin mark recapture, industry data collection programs ect. AFMA tasked Mr Penney to update this spreadsheet to provide to the DSWG.
22. As such, Mr Penney noted enhancements made to the spreadsheet and presented some example scenarios to illustrate how the tool may be used to explore the cost implications of alternative data collection scenarios. It was noted that the costs in the spreadsheet are best estimates to be used as an indication only.
23. The DSWG agreed the spreadsheet is a useful tool, however noted a number of costs are incorrect, and suggested it may not be worthwhile running through this in the meeting.
24. As such, the DSWG **recommended** that SESSFRAG appoint a working group, consisting of AFMA, CSIRO, Dr Knuckey, Mr Penney, Dr Jennings and Industry representatives to refine the options spreadsheet and work through various scenarios, in order to determine an appropriate future data collection scenario for the SESSF. It was noted that any future data collection plan would need to be accepted by the appropriate RAGs and MACs.

25. The DSWG discussed the available data collection methods, including EM, FIS and ISMP, and noted they all have value and could not discount any. It was agreed that it is likely we will need a combination of data collection sources, and the solution may be around refining, scheduling and optimising each data collection source (e.g. refining ISMP collection targets, EM or ISMP coverage, staggering data collection, reducing frequency of, or postponing assessments).

26. The DSWG discussed the continuation of the FIS, noting:

- There are concerns with the reliability of standardized CPUE alone (due to effort creep ect), and an alternative index is required (e.g FIS)
- FIS's are designed as long term surveys, and full value will not be realised until more data points are achieved (5-10 points)
- EM and FIS primarily collect different data (EM is more similar to ISMP)
- There are improvements in methodology (FIS3) which will improve CVs
- The reanalysis and current design is performing well for the three key species (pink ling, tiger flathead and blue grenadier). As such, optimisation for these species may not be required before the next FIS survey is run.
- undertaking the FIS has a higher priority than undertaking a FIS optimisation at this stage, improvements are only likely to have marginal benefits to the value of the FIS at this stage

Noting these points, the DSWG **recommended** that the FIS continue in 2019, noting it currently produces good CVs for the key target species. While a redesign and optimisation is worthwhile, particularly for other (non key target) species, it would not necessarily need to be undertaken before the next survey.

Attachments

- 1) List of declared conflicts of interest
- 2) SESSF data plan

Declared Conflicts of Interest

Attendee	Declared interest
Dr Cathy Dichmont	<p>Proprietor of Cathy Dichmont Consulting.</p> <p>Chair of TT RAG.</p> <p>Contracted by various State and Commonwealth agencies to undertake various reviews and consultancies not related to SESSF.</p> <p>No pecuniary interest in the SESSF.</p>
Dr Paul Burch	<p>Employed by CSIRO, assessment scientist. Acquiring funding for research purposes. PI on data services contract.</p>
Dr Sarah Jennings	<p>Economics member on SERAG.</p> <p>Invited economics participant on SEMAC.</p> <p>Economics coordinator, FRDC Human Dimensions Research</p> <p>Member of AFMA Economics Working Group.</p> <p>Adjunct Senior Researcher, TSBE, University of Tasmania.</p> <p>Independent economics consultant.</p> <p>No pecuniary or other interest.</p>
Ms Cate Coddington	<p>AFMA, Executive Officer of SESSF RAG. No interest, pecuniary or otherwise.</p>
Mr Dan Corrie	<p>AFMA, South East Trawl and Coral Sea Manager. No interest, pecuniary or otherwise.</p>
Mr George Day	<p>Employed by AFMA; Senior Manager of Demersal and Midwater Fisheries.</p> <p>No interest, pecuniary or otherwise.</p>
Dr Jemery Day	<p>CSIRO, assessment scientist. Acquiring funding for research purposes.</p> <p>Interests in promoting good science.</p>
Dr Karina Hall	<p>Cross-jurisdictional research and management interests for DPI NSW.</p>
Mr Ryan Keightley	<p>Employed by AFMA, A/g Gillnet, Hook and Trap, High Seas and Norfolk Is Manager. No interest, pecuniary or otherwise</p>
Dr Ian Knuckey	<p>Positions:</p> <p>Director – Fishwell Consulting Pty Ltd</p> <p>Director – Olrac Australia (Electronic logbooks)</p> <p>Deputy Chair – Victorian Marine and Coastal Council</p> <p>Chair / Director – Australian Seafood Co-products & ASCo</p>

Attendee	Declared interest
	<p>Fertilisers (seafood waste)</p> <p>Chair – Northern Prawn Fishery Resource Assessment Group</p> <p>Chair – Tropical Rock Lobster Resource Assessment Group</p> <p>Chair – Victorian Rock Lobster and Giant Crab Assessment Group</p> <p>Scientific Member – Northern Prawn Management Advisory Committee</p> <p>Scientific Member – SESSF Shark Resource Assessment Group</p> <p>Scientific Member – Great Australian Bight Resource Assessment Group</p> <p>Scientific Member – Gulf of St Vincents Prawn Fishery Management Advisory Committee</p> <p>Scientific participant – SEMAC, SERAG</p> <p>Current projects:</p> <p>AFMA 2018/08 Bass Strait Scallop Fishery Survey – 2018 and 2019</p> <p>FRDC 2017/069 Indigenous Capacity Building</p> <p>FRDC 2016/116 5-year RD&E Plan for NT fisheries and aquaculture</p> <p>AFMA 2017/0807 Great Australian Bight Trawl Survey – 2018</p> <p>Traffic Project Shark Product Traceability</p> <p>FRDC 2018/021 Development and evaluation of SESSF multi-species harvest strategies</p>
Dr Rich Little	Employed by CSIRO, assessment scientist. Acquiring funding for research purposes.
Mr Sandy Morison	<p>Director of Morison Aquatic Sciences.</p> <p>Chair of SharkRAG, SERAG and the Tropical Rock Lobster Working Group.</p> <p>Scientific member on SEMAC.</p> <p>Contracted by government departments, non-government agencies and companies for a range of fishery related matters including research and (by SCS Global Services) for MSC assessments of AFMA managed and other Australian and international fisheries.</p> <p>No pecuniary or other interest in the SESSF.</p>
Dr Veronica Silberschneider	Cross-jurisdictional research and management interests for DPI NSW, no pecuniary interests.

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Dr Miriana Sporcic	CSIRO, assessment scientist. Acquiring funding for research purposes
Dr Robin Thomson	Employed by CSIRO, Assessment scientist. Acquiring funding for research purposes PI on close kin project for school shark.
Dr Geoff Tuck	Employed by CSIRO. Involved in Stock assessments. Interest in obtaining funding for future research. Principle investigator on the SESSF stock assessment project.
Mr Lance Lloyd	GABRAG Chair. Member of GABMAC and SESSFAG. Director; Lloyd Environmental Pty Ltd. Research Fellow; Federation University Australia No pecuniary interest.
Dr Andrew Penney	Director of Pisces Australis Pty Ltd, an Australian registered marine and coastal research and management consultancy based in Canberra. As such, I have an interest in any opportunities in this regard. Principal Investigator on FRDC Project No 2017-180: Design and implementation of an Australian National Bycatch Report: Phase 1 - Scoping Scientific Member of AFMA Tropical Rock Lobster RAG and Small Pelagic Fishery Scientific Panel Member of the AFMA ERA Technical Working Group. No shareholding and hold no positions relating to any other companies, including any fishing companies or industry associations
Dr James Woodhams	Employed by ABARES. Potential interest in funding for research. No interests, pecuniary or otherwise
Mr David Stone	Executive Officer for Sustainable Shark Fishing Industry Inc. Declared interests in representing hook and gillnet industry member interests. Declared interest in RBCs
Mr Simon Boag	Executive Officer South East Trawl Fishing Industry Association (SETFIA) Non-beneficiary Director of two fishing companies in the SESSF one of which is a significant quota owner. Industry member on both SERAG and SEMAC. SETFIA receives funding from various bodies to complete projects. Engaged by AFMA to collect shark industry biological data PI on the fishery independent survey SETFIA is the PI on the orange roughy east AOS EO on SSIA EO on SPFIA

Attendee	Declared interest
Mr Neil MacDonald	<p>Executive officer of the Great Australian Bight Industry Association</p> <p>Executive officer of Surveyed Charter Boat Owners and Operators Association South Australia</p> <p>Executive officer of Southern Fishermen's Association</p> <p>Executive officer of Saint Vincent Gulf Prawn Boat Owner's Association</p> <p>Executive officer of South Australian Blue Crab Pot Fishers Association</p> <p>Executive officer of Marine Scale Net Fishers Association</p> <p>Committee support South Australian Rock Lobster Advisory Council</p> <p>Director NMAC(SA) P/L</p> <p>Chair CGG SAC Gippsland MSS</p>
Dr Kyne Krusic-Golub	Director at Fish Ageing Services.

SESSF data collection summary

		Target				Byproduct				Bycatch				TEPS				Conserve Program		
Source	Data Type	GABT	CTS	GN	Hook	GABT	CTS	GN	Hook	GABT	CTS	GN	Hook	GABT	CTS	GN	Hook	TRWL	Hook	SHRK
Logbooks	Catch*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓
	discards					✓	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓
	effort / location	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Gear details	✓	✓	✓	✓	✓	✓	✓	✓											
	Baiting Ratio				✓															
	Depth	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Interactions													✓	✓	✓	✓			
	Life Status													✓	✓	✓	✓			
	Depredation																			
	CTD	✓	✓	✓	✓	✓	✓	✓	✓									✓	✓	✓
Electronic Monitoring	Catch																			
	Effort																			
	Discards			✓	✓															
	Length			✓	✓															
	Spp Comp																			
	Landed Catch																			
	TEP interactions																			
ISMP (Observers) - Onboard	Catch*									✓	✓	✓	✓					✓	✓	✓
	Discards	✓	✓			✓	✓			✓	✓							✓	✓	✓
	Gear																			
	Interactions													✓	✓					
	Spp Pres													✓	✓					
	Length	✓	✓			✓	✓													
	Age	✓	✓			✓	✓													
	Mitigation deployment													✓	✓					
	Tissue samples	✓	✓																	
	Biologicals	✓	✓																	

		Target				Byproduct				Bycatch				TEPS				Conserve Program		
Source	Data Type	GABT	CTS	GN	Hook	GABT	CTS	GN	Hook	GABT	CTS	GN	Hook	GABT	CTS	GN	Hook	TRWL	Hook	SHRK
ISMP - Port	Length	✓	✓			✓	✓													
	Age	✓	✓			✓	✓											✓		
	Tissue samples	✓	✓																	
	Biologicals	✓	✓																	
Fishery Independent Survey	Catch	✓	✓			✓	✓			✓	✓									
	Effort/location	✓	✓			✓	✓			✓	✓									
	Depth	✓	✓			✓	✓			✓	✓									
	TEP interactions													✓	✓					
	Length	✓	✓																	
	Age	✓	✓																	
	Tissue Sample	✓	✓																	
	Environment	✓	✓																	
Industry sampling	Lengths	✓	✓	✓	✓	✓	✓													
	Age	✓	✓	✓	✓															
	Tissue Samples	✓	✓	✓	✓															
	Biologicals	✓	✓	✓	✓															

* Used for catch composition

Key:

✓	Data is currently collected from this data source.
✓	It is possible to collect this data from this data source, but is not currently being utilised or requires further work to do so.

Glossary:

Biologicals	Includes maturity stage, sex, and stomach contents
CTD	Conductivity Temperature Depth
Spp Comp	Species composition
Spp Pres	Species presence/absence
TEP	Threatened, Endangered and Protected species

Updated GAB annual research statement





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Annual Research Statement 2020-21

Great Australian Bight Trawl Sector

Great Australian Bight Trawl Sector Annual Research Statement for 2020-21

The Great Australian Bight Trawl Sector (GABTS) Annual Research Plan is developed by AFMA, in consultation with the Great Australian Bight Resource Assessment Group (GABRAG) and the Great Australian Bight Management Advisory Committee (GABMAC). In developing the Plan consideration is given to the broader Southern and Eastern Scalefish and Shark Five Year Strategic Research Plan (SESSF Research Plan 2015-2020).

AFMA funding in 2020-21 (AFMA Research Committee; ARC)

Title	Objectives and component tasks	Evaluation		
		Total cost (\$) (approx. only)	Priority/ rank	Feasibility
CURRENT				
	‘Current’ items will be added if any long-term projects are approved in the 2019-20 plan by the ARC.			
NEW IDENTIFIED RESEARCH FOR 2020-21				
Stock assessment for species identified in Appendix A. (included in SESSF research statement)	Bight Redfish 2020 Tier 1 stock assessment (subject to GABRAG advice to move to 2019)	Low	Essential	High
ISMP data services contract (included in SESSF research statement)	Conduct analysis and reporting of ISMP data and industry based sampling data for 2020-21	Low GABT proportion approx. \$16k	Essential	High
Fish ageing for SESSF quota species	Undertake fish ageing for the SESSF to support stock assessments for the period 2020/21 to 2022/23.	Low	Essential	High

Title	Objectives and component tasks	Evaluation		
		Total cost (\$) (approx. only)	Priority/rank	Feasibility
(included in SESSF research statement)		Total cost approx \$262k p/a for SESSF. GABT proportion based on 2 speices		
GABT Fishery Independent Survey	GABRAG proposed to postpone April 2020 survey to April 2021. Conduct a winter survey which will provide further points in the times-series of fishery independent survey (FIS) indices of abundance. The resulting FIS data series will be included in stock assessments of target species and time series analysis of major by-product and by-catch species. The FIS also provides time series information on the spatial and temporal distribution of a large number of non-commercial fish species and a platform from which biological information (length, sex, maturity, age etc) can be collected in a systematic way from these species.	Medium Cost subject to review of vessel charter costs.	Essential	High

FRDC funding in 2020-21 (Commonwealth Research Advisory Committee; ComRAC)

Title	Objectives and component tasks	Evaluation		
		Total cost (approx. only)	Priority/rank	Feasibility
RESEARCH UNDERWAY				
Under-caught TACs and lack of stock recovery	Determine why some TACs in the SESSF are under caught and propose options to resolve this where possible	Funded 2016/17 ComRAC	High – Top priority	High

Title	Objectives and component tasks	Evaluation		
		Total cost (approx. only)	Priority/rank	Feasibility
	Investigate the decline or lack of recovery of low biomass stocks given periods of low catches and expected recovery (eg environmental shift, problems with assessment, loss of biomass signal in obtainable data, violation of assumption of stability in biological characteristics of stocks Project should consider incorporation of Atlantis modelling.	funding (\$250k set aside)		
RESEARCH APPROVED BY FRDC				

Title	Objectives and component tasks	Evaluation		
		Total cost (approx. only)	Priority/rank	Feasibility
Multi-species fisheries: harvest strategy implications of maximising economic yield and implementation options for Commonwealth fisheries, with a focus on the Southern and Eastern Scalefish and Shark Fishery (SESSF)	<p>Undertake research with the objectives:</p> <p>1) Consolidation of background information and experience on (i) application of MEY in multispecies fisheries, (ii) the identified SESSF multispecies sub-fisheries and the biological and technical interactions within them, and (iii) the preferred future monitoring and assessment option(s) that have been identified by SESSF Monitoring and Assessment Review Project (SMARP).</p> <p>2) Develop and quantitatively test options for a fishery-wide harvest strategy, including reference points and decision rules that can applied to the appropriate sub-fisheries and achieve MEY outcomes for the fishery as a whole.</p> <p>3) Integrate the outputs from 2 and 1 (iii) above to produce a complete tested draft revision of the SESSF Harvest Strategy</p> <p>4) Conduct a cost-benefit analysis for implementation of a new draft SESSF Harvest Strategy, drawing on SMARP project analyses and recommendations.</p>	<p>High</p> <p>Costs to be determined.</p>	<p>High</p> <p>Included in November 2018 call for research</p>	<p>High</p>
Quantifying discards and bycatch	Quantify the performance of discard and bycatch reduction strategies in the GABT Sector and SET Sector.	TBC	<p>High</p> <p>Included in November 2018 call for research</p>	<p>High</p>

Title	Objectives and component tasks	Evaluation		
		Total cost (approx. only)	Priority/rank	Feasibility
reduction strategies GABTF and SET	Recommendations for reducing discards and increasing NER and boat level profits in the trawl fisheries.			
NEW IDENTIFIED RESEARCH FOR 2020-21				
Cost/benefit analysis of the Bycatch Research and Development Plan	AFMA is currently awaiting comment from the GABRAG Economic member.	Low	High	High
Market barriers to increased demand and consumption of GAB products	Identify market barriers to increased demand and consumption of GAB products and the potential to increase value. The project will undertake market analysis and product evaluation to identify operational practices that can increase the value and demand for the product in established and potentially new markets.	Low	High	High

Cost

- High: >\$200,000
- Medium: \$100,000 - \$200,000
- Low: <\$100,000

Management priority categories

- Essential
- High
- Medium
- Low

Feasibility categories

- High
- Medium
- Low

APPENDIX A: GABTS - monitoring, research and assessment schedule (updated January 2019)

[illegible]

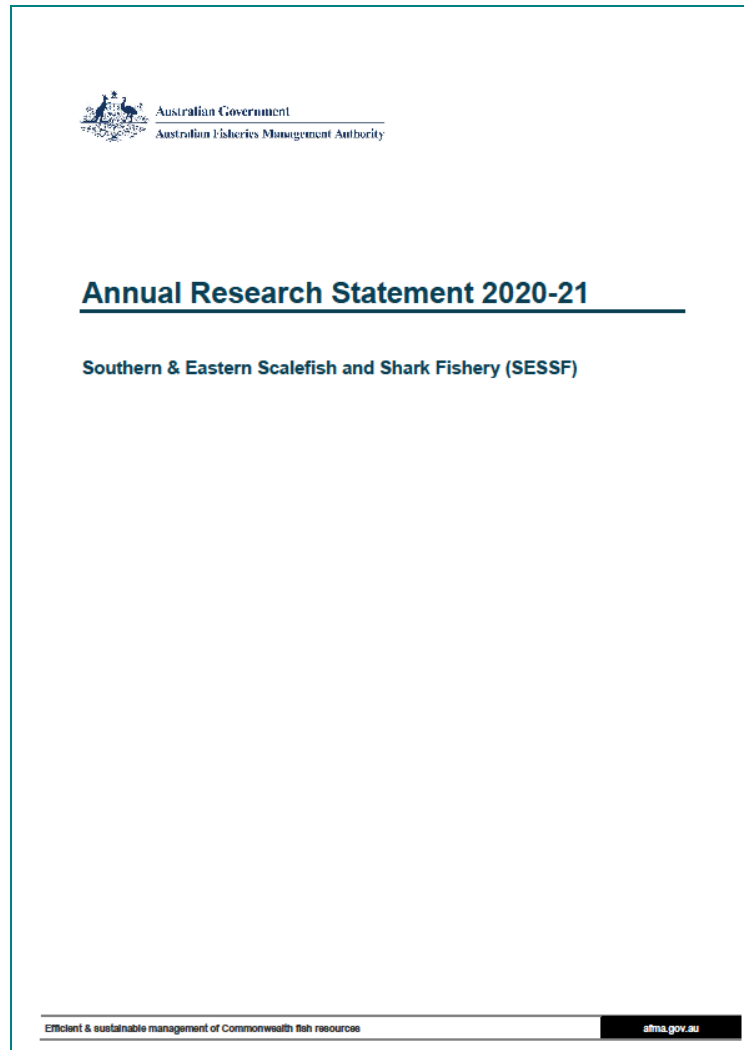
* - Calendar year not financial year

Appendix B – SESSF planned stock assessment schedule – as at January 2019

Species	MYTAC in 2019-20 season	Last assessed	2018	2019	2020	2021	2022	2023	AFMA management comment
Alfonsino	5th year of 3-year MYTAC	2013		3			3		SESSFRAG advice to push back because of low catches
Bight redfish	4th year of 5-year MYTAC	2015		1	←				GABRAG recommended bringing forward to 2019 based on FIS outcomes
Blue eye trevalla	1st year of 3-year MYTAC	2018	4/5			4/5		4/5	Tier 4 for slope, Tier 5 for seamounts. Trigger to be implemented for the seamounts with no more than 54 t to be taken in any fishing year
Blue grenadier	1st year of 3-year MYTAC	2018	1			1			Under-caught and above target
Blue warehou	N/A	2013							Rebuilding species, reviewed by SERAG (2018)
Deepwater flathead	3rd year of 3-year MYTAC	2016		1			1		
Deepwater shark east	1st year of 3-year MYTAC	2018	4			4			SERAG recommended a MYTAC subject to SESSFRAG review of assessment approaches in Feb 2019. SESSFRAG recommended a revised C _{TARG} not including catch from inside the closures.
Deepwater shark west	1st year of 3-year MYTAC	2018	4			4			SERAG recommended a MYTAC subject to SESSFRAG review of assessment approaches in Feb 2019. SESSFRAG recommended a revised C _{TARG} not including catch from inside the closures
Elephant fish	Single year TAC	2017 (not accepted)		?					SESSFRAG recommended postponing this assessment pending further advice on assessment approach
Flathead	3rd year of 3-year MYTAC	2016		1			1		
Gemfish - east	N/A	2009			1			1	Subject to data availability and outcomes of SESSFRAG workshops
Gemfish - west	3rd year of 3-year MYTAC	2016		4			4		Advice from GABRAG is to move to a Tier 4 for the CTS component of the stock. Move assessment to SERAG
Gummy shark	3rd year of 3-year MYTAC	2016		1 →			1		SharkRAG recommended delaying the assessment by one year as to incorporate a full year of Industry data collection, the new CPUE standardization work and revised discard estimates from electronic monitoring. Note comments from SharkRAG 2 2016 that are of relevance if the assessment is delayed: <i>The RAG agreed that the (proposed MYRBC scenario's presented) were acceptable from a biological perspective (in that all three sub-stocks were projected to remain above target levels through to 2019) provided that only a 3 year MYTAC was applied, and would be</i>

									preferable to Industry from a stability perspective. The RAG emphasised that under these cases there would be short term stability for Industry, however a new assessment in 2019 would likely to result in a lower RBC following fishing down to the target reference point.
Jackass morwong	1st year of 3-year MYTAC	2018	1						
John dory	2nd year of 3-year MYTAC	2017			3				SESSFRAG advice needed to consider how to assess this and other species with conflicting data
Mirror dory	Single year TAC	2018	4	4	4	4	4	4	Annual assessment given the cyclical nature of stock abundance
Ocean perch	2nd year of 3-year MYTAC	2017			4			4	
Orange roughy - south	N/A	2000							
Orange roughy - east	1st year of a ? year MYTAC	2017			1			1	
Orange roughy - west	N/A	2002							Limited effort, bycatch TAC
Orange roughy - cascade plateau	N/A	2009							Limited data
Orange roughy - alban & esp	N/A	N/A							Limited effort, bycatch TAC
Oreo smooth - cascade	Long term TAC (catch dependent)	2010							Limited data
Oreo smooth - other	3rd year of a 3 year MYTAC	2015		5?					Consider approach to assessment at SESSFRAG 2019
Oreo basket	1st year of a 3 year MYTAC	2017			4				
Pink ling	3rd year of a 3 year MYTAC	2018	1			1			
Redfish	N/A, bycatch TAC	2017			1			1	
Ribaldo	1st year of a 3 year MYTAC	2017			4			4	
Royal red prawn	1st year of a 3 year MYTAC	2017			4			4	
Saw shark	1st year of a 3 year MYTAC	2017			4			4	
School shark	N/A (Index of Abundance start 14/15)	2012	1			1			Apply close kin genetics index of abundance
School whiting	1 st of a 3 year MYTAC	2017			1			1	Stock structure work prior to 2020 assessment
Silver trevally	1st year of a 3 year MYTAC	2017			4			4	
Silver warehou	3rd year of 3 year MYTAC	2018	1			1			
			2018	2019	2020	2021	2022	2023	

Updated SESSF annual research statement





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Annual Research Statement 2020-21

Southern & Eastern Scalefish and Shark Fishery (SESSF)

Southern and Eastern Scalefish and Shark Fishery Annual Research Statement for 2020-21

This Southern and Eastern Scalefish and Shark Fishery (SESSF) Annual Research Statement was developed by AFMA, in consultation with the SESSF Resource Assessment Group (SESSFRAG), South East Resource Assessment Group (SERAG) and the South East Management Advisory Committee (SEMAC). It identifies areas of high priority research for both AFMA and potential FRDC funding in 2020-21 and will be presented to the AFMA Research Committee (ARC) for consideration at their October 2019 meeting as part of the 2020-21 funding round.

AFMA funding in 2020-21 - AFMA Research Committee (ARC)

Title	Objectives and component tasks	Evaluation		
		Total cost (\$) (approx. only)	Priority/ ranking	Feasibility
RESEARCH UNDERWAY				
Integrated Scientific Monitoring Program (ISMP)	AFMA observer program, logbooks	\$600k (funded by the Fishery, not ARC)	Essential	High
Fish Ageing for SESSF quota species	Undertake fish ageing for the SESSF to support stock assessments	\$262k approx (total project cost over three years 2017-18 to 2019-20 is \$786k approx)	Essential	High
Analysis of Electronic Monitoring Data	A comparison of weights recorded by operators (logbook) and weights estimated by AFMA observers against piece counts recorded by electronic monitoring in order to establish discard weight estimates from piece counts using electronic monitoring. Investigating obtaining length data from electronic monitoring.	\$70k	High	High

Title	Objectives and component tasks	Evaluation		
		Total cost (\$) (approx. only)	Priority/ ranking	Feasibility
GHAT CPUE calculation methodology	Currently CPUE for gillnet-caught species is calculated on a kilogram per shot basis. Given the change to net length restrictions, the RAG has identified a strong need to change gillnet CPUE calculations: from catch by shot to catch by metres of net set to better account for zero shots.	\$30k	Essential	High
SESS Fishery Independent Survey	To conduct a winter survey which will provide further points in the times-series of fishery independent survey (FIS) indices of abundance. The resulting FIS data series will be included in stock assessments of target species and time series analysis of major by-product and by-catch species. The FIS also provides time series information on the spatial and temporal distribution of a large number of non-commercial fish species and a platform from which biological information (length, sex, maturity, age etc) can be collected in a systematic way from these species.	Did not proceed in 2018	Essential (2019)	High

NEW IDENTIFIED RESEARCH FOR 2020-21

Fish ageing for SESSF quota species	Undertake fish ageing for the SESSF to support stock assessments for the period 2020/21 to 2022/23.	Approx \$262k p/a (subject to review of age requirements and budgeting needs) (Approx \$786k over three years subject to revised contract)	Essential	High
Stock assessments for identified species in Table 1 below (subject to changes identified by the relevant resource assessment group and agreed by AFMA) in the SESSF in 2021 (using data to 2020) and 2022 (using data to 2021)	The annual assessment presents fishery statistics and catch at size/age data and synthesises existing stock assessment information for the key target species of the SESSF. This is a requirement of the SESSF Harvest Strategy.	\$200k approx. (total project cost over three years - \$900k approx.)	Essential	High
Review SESSF catch history	There is a need to finalise documentation of historical SESSF catch histories started by M Koopman and continued by N Klaer. <i>Initial Scope</i> The first step will be to establish the difference between catch data generated by Neil Klaer and those in the Fishery Assessment Reports (Smith & Wayte) to establish the extent of the issue with a focus on Tier 1 species with other species done in a serendipitous manner. Noting some species such as school whiting and redfish	\$5k	Medium	Medium

NEW IDENTIFIED RESEARCH FOR 2020-21

	may have other databases that may be more relevant than the FAR. Following this, a proposal for further work would be prepared.			
Examination of data acquired through electronic monitoring, logbooks and on board observers (gillnet)	<p>Since the introduction of electronic monitoring (EM) in the Gillnet, Hook and Trap Sector, and more recently as part of the trial of EM in the Commonwealth Trawl Sector there has been overlap of data collected by onboard observers, EM coverage and logbooks. At its 2018 Data Meeting, SESSFRAG prioritised the need to review and compare the data acquired through the various sources, with a particular focus on discard estimates and catch composition</p> <p>A comparison of effort (net length) might also be feasible by comparing logbook data to EM footage (using net rotations to estimate length)</p>	Medium	High	High
Examination of data acquired through electronic monitoring, logbooks and on board observers (CTS)	<p>Since the introduction of electronic monitoring (EM) in the Gillnet, Hook and Trap Sector, and more recently as part of the trial of EM in the Commonwealth Trawl Sector there has been overlap of data collected by onboard observers, EM coverage and logbooks. At its 2018 Data Meeting, SESSFRAG prioritised the need to review and compare the data acquired through the various sources, with a particular focus on discard estimates and catch composition.</p>	Medium	Low Pending outcomes of CTS trial	High

NEW IDENTIFIED RESEARCH FOR 2020-21

Blue-eye Close-Kin	A scoping study to assess close-kin as a risk assessment approach for blue-eye trevalla. A scoping document, was provided to SESSFRAG Chair's meeting Feb 2019 and will be submitted to the ARC with this research plan.	Low (\$48k)	High	High
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FRDC funding in 2019-20 - Commonwealth Research Advisory Committee (ComRAC)

Title	Objectives and component tasks	Evaluation		
		Total cost (approx. only)	Priority/rank	Feasibility
RESEARCH UNDERWAY				
Under-caught TACs and lack of stock recovery	Determine why some TACs in the SESSF are under caught and propose options to resolve this where possible Investigate the decline or lack of recovery of low biomass stocks given periods of low catches and expected recovery (eg environmental shift, problems with assessment, loss of biomass signal in obtainable data, violation of assumption of stability in biological characteristics of stocks Project should consider incorporation of Atlantis modelling.	Funded 2016/17 ComRAC funding (\$250k set aside)	High – Top priority	High
Re-examination of underlying model assumptions and resulting abundance errors in the SESS FIS	1) Re-examine some of the underlying assumptions of the survey 2) Use new techniques to potentially create efficiencies in sampling, and 3) Examine the utility of the estimates given the process and sampling errors that have been observed.	\$92k approx. Accepted by ComRAC (Nov 2016 meeting) for inclusion in FRDC's Dec 2016 call for applications for funding in 2017/18	High	High
Empirical investigation of demand conditions and dynamics in the South East fishery.	Improved policy, management and industry performance through better understanding of key market relationships, demand conditions and price formation. Estimated completion mid-2019.This project is funded by the Human Dimensions Research subprogram of the FRDC (2018-017).			

RESEARCH PRIORITIES BEING CONSIDERED BY FRDC

Multi-species fisheries: harvest strategy implications of maximising economic yield and implementation options for Commonwealth fisheries, with a focus on the Southern and Eastern Scalefish and Shark Fishery (SESSF)	<p>Undertake research with the objectives:</p> <ol style="list-style-type: none"> 1) Consolidation of background information and experience on (i) application of MEY in multispecies fisheries, (ii) the identified SESSF multispecies sub-fisheries and the biological and technical interactions within them, and (iii) the preferred future monitoring and assessment option(s) that have been identified by SESSF Monitoring and Assessment Review Project (SMARP). 2) Develop and quantitatively test options for a fishery-wide harvest strategy, including reference points and decision rules that can applied to the appropriate sub-fisheries and achieve MEY outcomes for the fishery as a whole. 3) Integrate the outputs from 2 and 1 (iii) above to produce a complete tested draft revision of the SESSF Harvest Strategy 4) Conduct a cost-benefit analysis for implementation of a new draft SESSF Harvest Strategy, drawing on SMARP project analyses and recommendations. 	High Costs to be determined.	High Included in November 2018 call for research	High
School whiting stock structure and catch composition	<p>Determining the stock structure of eastern school whiting stock and better understanding the species composition mix between eastern school whiting and stout whiting.</p> <p>Recommendations for approaching assessment(s) based on the outcomes of stock structure work.</p>	TBC	High Included in November 2018 call for research	High

Quantifying discards and bycatch reduction strategies GABTF and SET	<p>Quantify the performance of discard and bycatch reduction strategies in the GABT Sector and SET Sector.</p> <p>Recommendations for reducing discards and increasing NER and boat level profits in the trawl fisheries.</p>	TBC	High Included in November 2018 call for research	High
NEW IDENTIFIED RESEARCH FOR 2020-21				
Investigate options for use of dynamic reference points for SESSF species	Investigate options for assessments and status reporting against dynamic reference points for SESSF stocks that appear to demonstrate long term productivity changes, including implications for harvest strategies.	Low	High	High
Application of Close-Kin assessments for key and rebuilding species in the SESSF	<p>A feasibility study to determine whether close-kin assessments are an option for key commercial and rebuilding species in the SESSF, including what a sampling design would look like and how much it would cost.</p> <p>Include blue-eye trevalla pending ARC support for blue-eye trevalla close-kin project.</p>	Medium/ High	Medium	High

Research projects identified for inclusion in future research plans

Title	Objectives and component tasks	Evaluation		
		Total cost (approx. only)	Priority/rank	Feasibility
Updating knowledge of key species biology	Update species biology information for selected key SESSF species for use in assessments. See APPENDIX A for brief scoping document. Note: await outcomes of existing FRDC project: (http://www.frdc.com.au/Archived-Reports/FRDC%20Projects/2016-139-DLD.PDF) to see if this item can be removed or updated.	Medium	High (not FRDC)	High
Obtaining fish lengths using electronic monitoring	Investigate implementation issues, cost and solutions to adopt electronic monitoring to collect length frequency information for key commercial species on hook and gillnet vessels to support Tier 1 assessments.	Low	Medium Subject to data plan and implementation of EM	High
Changes to CPUE standardisations	Develop general approaches for SESSF CPUE standardisations that deal with such issues as structural adjustment and targeting.	Low	Medium	High
Better understanding of protected species interactions and potential impacts	<ul style="list-style-type: none"> Quantitative measure of TEP interactions in the SESSF Assessment of population size for relevant species 	High	Low	Med
Changes in fishing power	Literature review/meta-analysis of changes to fishing power over time. Relates to under-caught TAC project. Commence with desktop study looking at available information. Note work already done on mesh sizes on the Danish seine fleet.	Low	Low Being considered at implementation workshop	High

Maximising economic returns for the Australian community	<ul style="list-style-type: none"> Identify factors which impact on the profitability of individual operators and the fishery. Improve market dynamics. Increase efficiency of vessels. 	Medium	Medium Await outcomes of under-caught TACs and multi-species harvest strategy project. If gaps remain priority might be revised.	
School shark and gummy shark post release survival	Investigation of the post-release survival rates of gummy shark (focus on tertiary stress response) and school shark (focus on immediate and post-release mortality), and the application of survivability to discard estimates for these species.	Medium Note: School shark not supported by ARC in March 2017)	Medium Subject to clarification of rationale from the RAG and application to management.	Medium / High
Identification of school shark nursery areas in South Australia	Identify nursery areas for school shark in South Australia for potential future conservation areas. Current work: PhD student (Matt McMillan).	Low	Medium	High
Options for data poor assessments	Develop improved assessment methods for low catch and data poor species in the SESSF.	Low	Medium	High
Continued Close Kin Mark Recapture sampling and analysis for school shark	Continue close kin sampling and analysis for school shark as the primary indicator of abundance for this species.	Low/Medium	Essential	High
Close kin sampling of school shark pupping grounds.	Including locations, connectivity to get better understanding of stock structure.	Medium	Low	Medium
Close Kin Mark Recapture (CKMR) for gummy shark	Noting the successful application of CKMR to school shark, consider whether the approach can be applied to gummy shark cost effectively, noting	High	Medium	High

	some concerns with CPUE as an index for gummy shark with ongoing avoidance of school shark.			
Standardizing CPUE for skipper effect using logbook skipper ID and experience in the SESSF.	To improve CPUE standardizations in the SESSF.	Low	High	High

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Species	MYTAC in 2019-20 season	Last assessed	2018	2019	2020	2021	2022	2023	AFMA management comment
Alfonsino	5th year of 3-year MYTAC	2013							SESSFRAG Advice to stop using Tier 3 Future assessment subject to periodic review
Bight redfish	4th year of 5-year MYTAC	2015		1	←				GABRAG recommended bringing forward to 2019 based on FIS outcomes
Blue eye trevalla	1st year of 3-year MYTAC	2018	4/5			4/5		4/5	Tier 4 for slope, Tier 5 for seamounts. Trigger to be implemented for the seamounts with no more than 54 t to be taken in any fishing year
Blue grenadier	1st year of 3-year MYTAC	2018	1			1			Under-caught and above target
Blue warehou	N/A	2013							Schedule subject to annual review of fishery indicators
Deepwater flathead	3rd year of 3-year MYTAC	2016		1			1		
Deepwater shark east	1st year of 3-year MYTAC	2018	4			5			SERAG recommended a MYTAC subject to SESSFRAG review of assessment approaches in Feb 2019. SESSFRAG recommended a revised CTARG not including catch from inside the closures.
Deepwater shark west	1st year of 3-year MYTAC	2018	4			5			SERAG recommended a MYTAC subject to SESSFRAG review of assessment approaches in Feb 2019. SESSFRAG recommended a revised CTARG not including catch from inside the closures
Elephant fish	Single year TAC	2017 (not accepted)	bSAFE					SAFE	Assessed using SAFE in 2018.
Flathead	3rd year of 3-year MYTAC	2016		1			1		
Gemfish - east	N/A	2009			1			1	Schedule subject to annual review of fishery indicators SESSFRAG – tier 1 level was retained, but it wil be reviewed at the data meeting in August
Gemfish - west	3rd year of 3-year MYTAC	2016		4			SAFE		Advice from GABRAG is to move to a Tier 4 for the CTS component of the stock. Move assessment to SERAG
Gummy shark	3rd year of 3-year MYTAC	2016		1 →			1		SharkRAG recommended delaying the assessment by one year as to incorporate a full year of Industry data collection, the new CPUE standardization work and revised discard estimates from electronic monitoring. Note comments from SharkRAG 2 2016 that are of relevance if the assessment is delayed:

									<p>The RAG agreed that the (proposed MYRBC scenario's presented) were acceptable from a biological perspective (in that all three sub-stocks were projected to remain above target levels through to 2019) provided that only a 3 year MYTAC was applied, and would be preferable to Industry from a stability perspective. The RAG emphasised that under these cases there would be short term stability for Industry, however a new assessment in 2019 would likely to result in a lower RBC following fishing down to the target reference point.</p> <p>SESSF RAG - delay until the outcomes of the GHAT CPUE calculation methodology project can be incorporated and have the appropriate data for net length and biologicals</p>
Jackass morwong	1st year of 3-year MYTAC	2018	1			1			
John dory	2nd year of 3-year MYTAC	2017			4				
Mirror dory	Single year TAC	2018	4	4	4	4	4	4	Annual assessment given the cyclical nature of stock abundance
Ocean perch	2nd year of 3-year MYTAC	2017			4			4	
Orange roughy - south	N/A	2000							
Orange roughy - east	1st year of a ? year MYTAC	2017			1			1	
Orange roughy - west	N/A	2002							Limited effort, bycatch TAC
Orange roughy - cascade plateau	N/A	2009							Limited data
Orange roughy - alban & esp	N/A	N/A							Limited effort, bycatch TAC
Oreo smooth - cascade	Long term TAC (catch dependent)	2010							Limited data
Oreo smooth - other	3rd year of a 3 year MYTAC	2015		5					
Oreo basket	1st year of a 3 year MYTAC	2017			4				
Pink ling	3rd year of a 3 year MYTAC	2018	1			1			
Redfish	N/A, bycatch TAC	2017			1			1	
Ribaldo	1st year of a 3 year MYTAC	2017			4			4	
Royal red prawn	1st year of a 3 year MYTAC	2017			4			4	
Saw shark	1st year of a 3 year MYTAC	2017			4			4	

School shark	N/A (Index of Abundance start 14/15)	2012	1			1		Apply close kin genetics index of abundance
School whiting	1 st of a 3 year MYTAC	2017				1	1	Subject to NSW catches Stock structure work prior to 2020 assessment
Silver trevally	1st year of a 3 year MYTAC	2017			4		4	
Silver warehou	3rd year of 3 year MYTAC	2018	1			1		
			2018	2019	2020	2021	2022	2023

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Updating knowledge of key species biology

Many of the current SESSF stock assessments use species-specific biology information derived over twenty years ago. These underlying assumptions are critical inputs to assessments and are likely to have changed over time for some species.

At its November 2016 meeting, SERAG included a project in the SESSF research plan to update species biology information for selected key SESSF species which would be available for use in assessments.

A key consideration for the RAG is to identify which species are more likely to have undergone changes in biological parameters, e.g. short-lived shelf species.

Candidate species may include:

- Tier 1 species
- Key/secondary species without quantitative assessments. Under a revised SESSF Harvest Strategy there may be the need to assess these species.
- SESSF species currently nominated as 'non-assessable' being considered by the SESSF working group.
- High risk ERA species with missing productivity information. Depending on the outcomes of revised ERA assessments, there may be a need to collect biological information to revise risk scores.