Shark Resource Assessment Group (SharkRAG)

Meeting 2 2024

Meeting minutes

Melbourne

Microsoft teams

28-29 November 2024

Agenda item 1. Preliminaries

1.1 Welcome and apologies

1. The Chair opened the meeting at 12:38 hrs with an Acknowledgement of Country and welcomed members, invited participants and observers.

2. Attendees noted that the meeting was being recorded for the purposes of taking minutes.

Attendees	Membership
Mr. Sandy Morison	Chair
Dr. Lianos Triantafillos	AFMA member
Dr. Andrew Penney	Scientific member
Dr. Robin Thomson	Scientific member
Mr. Craig Harris	Industry member
Mr. Kyriakos Toumazos	Industry member
Mr. Jamie Papas	Industry member
Mr. Leigh Castle	Industry member
Ms. Anissa Lawrence	Conservation member
Dr. Caleb Gardener	Economic member
Ms. Michelle Henriksen	Executive Officer
Invited Participants	**Organisation**
Mr. Ross Bromley	SSIA[1]
Dr. Miriana Sporcic	CSIRO[2]
Dr. Paul Burch	CSIRO
Dr. Pia Bessell-Browne	CSIRO
Mr. Keith Sainsbury	Sain Solutions
Observers	**Organisation**
Mr. Kurt Davis	ABARES[3]
Ms. Sally Weekes	AFMA[4]
Ms. Anna Willock	AFMA
Mr. Anthony Coggan	AFMA
Apologies	**Organisation**
Dr. Charlie Huveneers	Scientific member

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[1] Southern Shark Industry Association
[2] Commonwealth Scientific and Industrial Research Organisation
[3] Australian Bureau of Agriculture and Economics Research
[4] Australian Fisheries Management Authority

1.2 Declarations of interest

3. The Chair invited SharkRAG members and attendees to discuss any declarations of interest.

4. SharkRAG members and attendees noted there was a quorum for the meeting and followed the declarations of interest procedure as outlined in [Fisheries Administration Paper 12](#), and updated the register of interest ([Attachment A)](#).

5. Industry participants were deemed to have a potential conflict of interest with *Agenda Item 7.0 RBC advice for all shark species* and Members agreed that industry participants were welcome to participate in discussions, but not for final recommendations or decisions.

6. CSIRO attendees were deemed to have a conflict of interest with 9.0 *Research priorities* and Members agreed that attendees affiliated with CSIRO were welcome to participate in discussions, but not for final recommendations for research to be put forward for funding in 2026-27.

1.3 Adoption of agenda

7. SharkRAG adopted the agenda outlined at [Attachment B](#).

1.4 Minutes of previous meeting

8. SharkRAG endorsed the minutes of the SharkRAG meeting of July 2024 as a true and accurate record of the meeting and noted that they are available on the [AFMA website](#).

1.5 Actions arising from previous meetings

9. SharkRAG noted the status of action items from previous meetings and the updates provided by the AFMA member at [Attachment C](#).

10. A list of action items established at this meeting are listed in [Attachment D](#).

Agenda item 2. Developing a harvest control rule without an estimate of B_0

11. Dr. Pia Bessell-Browne (CSIRO) provided an update on the project titled "Developing a harvest control rule to use in situations where depletion can no longer be calculated relative to unfished levels", noting work is underway and the project is due to be completed in 2025.

12. SharkRAG noted:

    a. that Close-Kin Mark-Recapture (CKMR) assessments provide an accurate estimate of absolute abundance during years in which sampled offspring were born, but do not directly provide estimates of the unfished biomass (B_0). The latter is required when implementing

the standard SESSF Tier 1 20:35:48 harvest control rule (HCR). Therefore, a HCR is required to be developed for species assessed based on CKMR analysis, where B_0 is not estimated.

b. spawning potential ratio (SPR) was identified as one measure that could be useful for the development of a HCR without an estimate of B_0. SPR evaluates the yield-per-recruit that is expected to be produced over the lifetime of a fished cohort compared with that for a no fishing scenario.

c. The SPR based HCRs being tested include four main inputs, namely:

    i. SPR;

    ii. Recommended Biological Catch (RBC);

    iii. Target Reference Point (TRP); and

    iv. Probability that SPR will exceed the TRP.

d. the project will develop HCR parameters tuned for school shark and an example teleost species to assess the performance of HCRs under alternative RBC scenarios.

13. SharkRAG discussed the project's preliminary findings and noted that:

a. the project will adopt the standard 20% Limit Reference Point (LRP) from the Commonwealth Fisheries Harvest Strategy Policy (CFHSP) as part of a comprehensive simulation phase that will be completed while testing the HCRs.

b. the candidate HCRs for application to the school shark assessment are expected to be provided to SharkRAG in 2025 and will be considered by the South-East Management Advisory Committee (SEMAC) and the Southern and Eastern Scalefish and Shark Fishery Resource Assessment Group (SESSFRAG).

c. CSIRO are working to provide a submission to the Department of Agriculture, Fisheries and Forestry (DAFF) for the results of this project to be considered in their harvest strategy review.

d. the project will consider the use of data such as conditional age-at-length and assumptions regarding the selectivity of gear types.

e. HCR rules do not directly account for spatial impacts to a stock (i.e. management through closures etc); however, the CKMR assessment has helped in understanding the stock structure of school shark.

f. investigations into the inclusion of stock recruitment relationships within SPR calculations will be undertaken as part of this project. This will likely have more relevance for the generic teleost rule rather than that for school shark.

g. while the project presented here will develop a HCR that is suitable for use with the school shark assessment, further work is required to determine how catches of school shark and gummy shark interact and the decision rules needed to ensure that the multi-species nature of the fishery are considered and the requirements of the CFHSP are met.

h. AFMA will be submitting a proposal for phase 2 of the multi-species harvest strategy project, which includes determining harvest strategy rules for the SESSF. This presents an opportunity to include the work discussed for the Gillnet, Hook and Trap (GHAT) sector.

i. in the interim, SharkRAG will use the existing CKMR assessment process to set the school shark bycatch TAC whereby a recent average exploitation rate is projected into the future.

j. time is needed to provide sufficient information to RAG members on the HCR outputs and the process of incorporating the HCR once the updated CKMR assessment is available.

Action item 1: AFMA to develop a plan on the process required for a Harvest Control Rule (HCR) to be applied to the school shark CKMR assessment in 2025. The process of adopting the project outputs and the expected candidate HCR relevant to the school shark fishery will be considered at the SESSFRAG chairs meeting in 2025.

Agenda item 3. School shark metier analysis

14. Dr. Paul Burch (CSIRO) presented the proposed metier-based companion species analysis to determine the bycatch and discard of school shark in the SESSF.

15. SharkRAG noted that:

a. a bycatch analysis is based on a metier of fishing operations that target a specific assemblage of species using specific gear during a precise time of year and/or within a specific area.

b. the analysis assumes logbooks are an accurate representation of catch (including discarding), the abundance of target and rebuilding species does not change, and that target species are caught in approximately the same proportions as the previous two years.

c. a metier bycatch analysis for school shark was due in 2024, however the analysis was postponed due to capacity constraints. CSIRO are looking to prioritise delivery to RAGs in 2025-26 and seek advice on whether SharkRAG would like the school shark bycatch analysis completed in 2025 or be deferred until 2026 when it can be undertaken along with the analysis for the SESSF trawl sector, leading to cost savings.

16. SharkRAG discussed that:

a. a spatial bycatch analysis would identify the proportion of school shark caught per tonne of gummy shark in each metier and estimates the current bycatch of school shark and the projected unavoidable catch going forward accounting for the gummy shark TAC.

b. although a bycatch analysis is informative, SharkRAG agreed a simpler ratio analysis would be beneficial for consideration in 2025, given the uncertainty around targeting of school shark occurring in the shark fishery.

c. the inclusion of temporal information would be useful as the proportion of fishing effort may vary between seasons.

d. a separate targeting analysis, previously completed by Malcom Haddon (CSIRO), identifies vessels that may require additional investigation by AFMA. This analysis can be repeated to identify where a vessel is shooting back within an area when school shark is caught, indicating targeting.

e. SharkRAG agreed that a targeting analysis is informative for AFMA (with a monthly breakdown) and would be helpful when the rebuilding strategy review is completed, noting that current rebuilding strategies require RAGs and MACs to assess whether there is any targeting occurring in the fishery on an annual basis.

f. the ability for the metier analysis to include a dollar metric would help provide information on the opportunity costs between the RBC and TACs set for school shark and gummy shark.

Action item 2: SharkRAG agreed that a metier-based companion species was not required for school shark and a spatial analysis of the gummy shark: school shark catch ratio would be more beneficial to better understand if fishing patterns are changing and help determine the potential targeting of school shark by the gummy shark fishery. CSIRO to provide the catch ratio analysis for SharkRAG consideration at SharkRAG in 2025.

Agenda item 4. Climate change adaptation

17. Dan Corrie (AFMA) presented an update on the AFMA Climate Risk Framework (CRF) and the trial application for selected SESSF species.

18. SharkRAG noted:

    a. the CRF has been trialled for select species in the SESSF and is designed to integrate with existing measures to manage climate risks in decision making processes such as setting TACs.

    b. the CRF Working Group met with industry representatives, management, and scientific stakeholders in October 2024 to consider trial application of the CRF for gummy shark and elephantfish.

    c. the CRF involves a 4-step process:

        i. assess risk to the species/stock posed by climate change and stock status using best available science;

        ii. assess whether current or planned management measures are sufficient to manage risk;

        iii. resolve the residual risk; and

      iv.   provide advice on any additional measure required.

d. Gummy shark were identified with an overall risk as 'none', noting the following considerations:

      i.   climate risk is considered 'neutral', and all three stocks are at or above the target reference point;

      ii. accordingly, there were no measures identified at Step 2 required to mitigate climate risk; and

      iii. notwithstanding the existing management in place under the harvest strategy, the residual risk remains 'none' and no additional measures are required.

e. Elephantfish were identified with an overall risk of 'low', noting the following considerations:

      i.   climate risk was assessed as 'medium' and the stock is considered 'near target';

      ii. accordingly, there were no measures identified at Step 2 required to mitigate climate risk; and

      iii. the residual risk remains 'low' noting stock status and climate risk should continue to be monitored.

19. SharkRAG discussed the CRF and noted that:

a. while the framework recognises potential positive impacts of climate change, the language is skewed towards negative impacts. More neutral words should be considered to replace 'risk' and 'mitigation'.

b. uncertainty associated with stock assessments and climate models should be accounted for – if not in the Step 1 risk profile, at least when options for management responses are considered at Step 2.

c. the Southeast Australian Marine Ecosystem Survey (SEA-MES) results available on the public website have not been standardised and are not a reliable indicator of relative abundance and are therefore not suitable to be used for management purposes in their current form.

d. measures of biomass relative to targets at Step 1 are not appropriate for species where biomass estimates are not available, even if referring to a proxy. High/Medium/Low would be a better risk measure for all species, including those with biomass estimates.

e. application of the framework to non-quota species assessed using Ecological Risk Assessments (ERA) is not necessary, provided the ERA affectively accounts for climate impacts.

f. accounting for climate-driven changes in biological attributes should be considered during the next SESSF ERA updates.

Agenda Item 5. 2024 standardised CPUE for sharks

20. Dr. Miriana Sporcic (CSIRO) provided an update on the 2024 Catch Per Unit Effort (CPUE) standardisation report for SESSF shark species, using data to 2023.

21. SharkRAG noted the following:

    a. CPUE for gummy shark by the gillnet sector:

        i. the recent catch in 2023 in South Australia increased by 56%;

        ii. catch from the Bass Strait were predominantly taken in the east, with the CPUE presenting a constant cyclical pattern since 2000; and

        iii. Tasmanian standardized CPUE has slightly decreased in the most recent year relative to previous years but remains on average accounting uncertainty.

    b. CPUE for gummy shark by the trawl sector:

        i. there has been a recent decrease in the number of vessels compared to previous year;

        ii. catch has reduced in 2023 compared to previous year, predominately from central and western South Australia; and

        iii. the CPUE has remained above average since approximately 2013, noting a recent decrease.

    c. CPUE for gummy shark by the manual longline sector:

        i. there has been an overall decrease in the number of vessels since 2019;

        ii. catch has decreased since 2019, despite an increase in 2023; and

        iii. the CPUE is noisy when taking uncertainty into consideration.

    d. CPUE for gummy shark by the Danish seine sector:

        i. the number of vessels has decreased since 2020; and

        ii. the CPUE has remained above average since 2015.

    e. CPUE for school shark by the trawl sector:

        i. there has been a decrease in the most recent year catch despite no change in the number of vessels;

        ii. the CPUE is increasing, despite the most recent decrease relative to the previous year, and has exceeded the long-term average since 2016

    f. CPUE for sawshark:

        i. gillnet catch in 2023 remains similar to the previous year. The 2022 gillnet catch is the lowest in the time series. Catch is predominately from eastern Bass Strait;

        ii. the CPUE series is below the long-term average; and

        iii. trawl catch is predominately from South Australia and eastern Bass Strait. The CPUE series for both trawl and Danish seine is around the long-term average, accounting for uncertainty.

g. CPUE for elephantfish by the gillnet sector:

   i. there has been an increase in the number of vessels catching elephant fish compared to the previous year (i.e., 27 *vs* 20);

   ii. catch is predominately from the Bass Strait; and

   iii. CPUE has remained below the long-term average since 2014, with a slight increase in 2018 (relative to 2017) followed by a decrease in 2019 and minimal changes to 2022. The most recent estimate increased to just on average relative to the previous year, accounting for uncertainty.

22. SharkRAG discussed these results and noted that:

   a. the gummy shark catch in South Australia by gillnet may be a possible mislabelling of gear type in the logbook records, due to hook vessels mostly operating in the area.

   b. the current CPUE series does not account for discards, however discards can be incorporated when they become available to CSIRO.

   c. the rate of CPUE increase for school shark in the trawl series is greater than the rate of population increase indicated by the CKMR data, which was evident through the sensitivity analysis where incorporating the trawl CPUE into the CKMR assessment reduced the model fit.

   d. the decrease in gummy shark catch by the gillnet sector in the Bass Strait is thought to be linked to unfavourable windy conditions.

   e. SharkRAG recommended Dr. Miriana Sporcic to combine the manually baited and automatic baited hooks to construct an additional CPUE series for consideration in the next update

   f. to account for changing dynamics of the GHAT sector, Industry agreed to provide skipper experience information for consideration in future catch rate standardisations. This will help account for differences in fishing behaviour between vessels and new skippers/boats entering the fishery.

Action item 3: Dr. Miriana Sporcic to check the gummy shark catch by gillnet in South Australia of 115.4 tonnes used for the standardised CPUE report, following comments by industry that catches of that size are unlikely given that most school shark caught off South Australia are taken primarily by hooks.

Action item 4: Dr. Miriana Sporcic to combine manual and automatic baited hooks as an addition to the next standardised shark CPUE series update, and if possible incorporate skipper experience information provided by industry.

Agenda item 6. School shark CKMR

23. Dr. Robin Thomson presented a progress update on the school shark CKMR assessment project.

24. SharkRAG noted that:

   a. the tissue sampling, genetic sequencing, and kin pair identification has been completed. A new genetic analysis method is able to clearly distinguish parent offspring pairs from full sibling pairs.

   b. a new process for genetic sequencing of mitochondrial DNA is to be implemented by Diversity Arrays Technology (DArT).

   c. DArT have also developed a new process for investigating epigenetic methylation that can be used to find age-associated loci that is expected to produce better epigenetic ageing results for school shark.

   d. the CKMR assessment model will be updated in 2025 to incorporate both new and old samples.

25. SharkRAG discussed this and noted that:

   a. a response to industry questions regarding CKMR's applicability to school shark assessments will be provided out of session by Dr. Robin Thomson, including providing further clarity on the stock structure linkages between Australia and New Zealand.

   b. the CKMR results are indicating kin pairs are widely distributed, as kin pairs span all sampled zones.

   c. a recent capture of a school shark off western South Australia that was originally tagged in New Zealand.

Agenda item 7. RBC 2025-26 season

26. Dr. Lianos Triantafillos (AFMA) presented a summary on the process used to set the Total Allowable Catch (TAC) for the 2024-25 fishing season.

27. SharkRAG noted that:

   a. the Commission at its 92nd meeting in March 2024 considered advice from SharkRAG and SEMAC on the RBC for school shark. The Commission settled on the RBC approach from SEMAC to determine the school shark by-catch TAC at 197 tonnes for the 2024-25 fishing season. To constrain school shark bycatch by the gummy shark fishery and maintain school shark catch to the CKMR mortality threshold, the Commission reduced the gummy shark TAC by 8% to 1,558 tonnes.

   b. at its July 2024 meeting, SharkRAG made the following recommendations when setting the school shark bycatch TAC and gummy shark RBC for the 2025-26 SESSF fishing season:

      i.   to ensure school shark catches are constrained to the unavoidable by-catch of the gummy shark fishery and that the total mortality threshold that supports the agreed rebuilding rate is not exceeded, the school shark by-catch TAC will be calculated using the logbook method that:

1. uses logbook recorded catches and discards as the best estimate of the total mortality for recent years;

2. allows for the projected population increase in school shark, and its impact on catches and discards (currently estimated to be 3% annually, but to be updated in 2025);

3. uses a 4-year weighted average to predict state catches in the next year (including Western Australia), noting that SharkRAG may choose an alternative method if that was thought to produce a more justifiable amount; and

4. caps total mortality at whichever is lower of either the Close-Kin Mark-Recapture (CKMR) projected catch using an average total mortality threshold or the unavoidable by-catch of the Commonwealth fishery.

    ii.   the best estimate of survivability of released live school shark should be used when setting the school shark by-catch TAC. This was assumed to be 11.5% [5].

   iii.   any adjustments to the gummy shark TAC would be made on the basis of reducing the incidental by-catch of school shark and not due to sustainability concerns.

c. elephantfish and sawshark are categorised as 'trigger species' under the SESSF Harvest Strategy Framework and for such species, the TAC is maintained unless it is has been more than six years since it was last assessed or the criteria under the trigger species classification have been breached.

d. given none of these criteria were triggered for elephantfish or sawshark this fishing season, AFMA sought advice on maintaining the current TACs for the 2025-26 fishing season, noting an updated assessment at the 6-year time buffer is due in 2026 for both species.

2. When CSIRO went through the spreadsheet to calculate the incidental by-catch TAC for school shark, several of the metrics used in the calculation were discussed.

a. the first of these was the suitability of assuming a 11.5% survival rate for discards, an issue raised prior to the meeting. In the absence of a better estimate, SharkRAG agreed to continue to use this estimated survival rate in the calculation of the TAC.

b. the second metric discussed was the estimated projected population increase of 3% and whether this could be an underestimate, given that there is anecdotal evidence from

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[5] Braccini M., Van Rijn J. and Frick L (2012). High Post-Capture Survival for Sharks, Rays and Chimaeras Discarded in the Main Shark Fishery of Australia? PLoS ONE 7(2): e32547. https://doi.org/10.1371/journal.pone.0032547

industry that the abundance of school shark has notably increased over the last few years across the fishery. Adding weight to this argument was the steady increase in trawl CPUE (a metric that has been previously used as an indicator of relative abundance for school shark) over the last decade. A significant increase in abundance could also partially explain why the discard rates (+50 tonnes) and proportion of TAC caught of school shark (49% vs 30% for gummy shark TAC) by late November were much higher than previous seasons. During this discussion, the question was asked if trawl CPUE could be used to infer the rate of population increase. When CSIRO explained that the rate of increase in the trawl CPUE is greater than the CKMR model was able to achieve, without compromising the fit to the kin pair data, SharkRAG decided to stick with a projected population increase of 3% in the calculation of the TAC and agreed that the CKMR estimate remains as the best estimate of the whole school shark populations. SharkRAG agreed it would wait for the results of the next CKMR assessment before changing its position.

   c. the final metric discussed was the state catch of South Australia. SharkRAG noted that South Australia implemented several management measures to constrain the catch of school shark (including a daily cap of two school sharks per day and an annual catch limit of 13 tonnes) in late 2023 and that the annual catch for 2024 would remain below 13 tonnes. Given this, SharkRAG decided that an annual estimate of 13 tonnes represents the best prediction for South Australia's catch in the next year and it should be used in the calculation of the TAC, instead of the 4-year weighted average used to predict the catch of the other states.

3. When these agreed metrics were entered into the spreadsheet, and total mortality was capped at the CKMR total mortality threshold, as per SharkRAG 1 2024 recommendations (i.e. due to it being lower than the unavoidable by-catch of the Commonwealth fishery), the incidental by-catch TAC for school shark was calculated at 207,092 kg. This was ~5% higher than the 197 tonnes set in the previous fishing season.

4. When determining a TAC for gummy shark, SharkRAG recommended either the annual RBC or the 3-year average RBC be used, noting that both would be conservative as the gummy shark TAC was constrained in the previous fishing season to reduce the by-catch of school shark bycatch during the 2024-25 season.

5. SharkRAG also recommended that should an adjustment to the gummy shark TAC be required in response to the current high level of school shark discards (noting only six months of data are available and could change by the end of the fishing season), that the approach used for the 2024-25 fishing season is reasonable. The 2024-25 approach estimates the proportional reduction and applies a reduction to the three-year average RBC of 1,733 tonnes. The committee responsible for providing management advice to the AFMA Commission on the gummy shark TAC for the 2025-26 fishing season is SEMAC, and this committee is next scheduled to meet in February 2025.

6. As none of these criteria were triggered for either elephantfish or sawshark, and an updated assessment for both species was next due in 2026, SharkRAG recommended maintaining the current TACs for the 2025-26 fishing season of 114 tonnes for elephantfish and 525 tonnes for sawshark.

7. SharkRAG also discussed other related matters and noted that:

    a. following high school shark catches in recent seasons, Western Australia is introducing management measures such as catch and effort limits, electronic monitoring, and digital reporting for implementation by late 2025. Furthermore, a harvest strategy is being developed for the Western Australia elasmobranch fishery that is scheduled to be finalised in early 2025. In addition, a proposal is currently out for public consultation for the introduction of 20% marine park closures, however the implementation date for this marine park is not known.

    b. Commonwealth operators continue to face catch reductions due to higher school shark catch by the states. This is acknowledged by SharkRAG and has been recommended to be put forward to SEMAC as a consideration when setting the TACs. AFMA is collaborating with state jurisdictions more regularly to improve cross jurisdictional management of the gummy shark and school shark fisheries. Recent high catches of school shark by New South Wales are also a concern and will be monitored.

Recommendations

28. SharkRAG recommended the following RBC's and TACs for the four quota species relevant to the shark fishery:

    a. a school shark bycatch TAC of 207 tonnes;

    b. a gummy shark RBC either using the annual or 3-year average from the outcome of the 2023 stock assessment, noting that:

        i. where an adjustment to the gummy shark TAC is required, applying it to the three-year average RBC of 1,733 tonnes is reasonable.

    c. an elephantfish TAC of 114 tonnes; and

    d. a sawshark TAC of 525 tonnes.

Agenda item 8. Bycatch and discard workplan update

29. SharkRAG noted the updated SESSF gillnet and manual line bycatch and discard workplans, and the action items recommended from the July 2024 SharkRAG meeting.

30. SharkRAG endorsed the action items to be included in a final version of the updated workplans including:

a. for the gillnet bycatch and discard workplan:

  i. develop a broader and more relevant shark and ray species ID guide;

  ii. distribute best practice fact sheets for minimising bird interactions and species ID guides for gillnets;

  iii. investigate mitigation measures to minimise seabird interactions with gillnets;

  iv. retain the dolphin management strategy and undertake a desktop review of the strategy; and

  v. review the Australian Sea Lion management strategy.

b. for the manual line (shark hook) bycatch and discard workplan:

  i. develop a broader and more relevant shark and ray species ID guide;

  ii. undertake a desktop analysis of electronic monitoring data;

  iii. review the operational guidelines for seabird bycatch;

  iv. consider spatial management if needed; and

  v. develop and distribute relevant handling guide for skates and rays.

Agenda item 9. Research priorities

31. SharkRAG noted the research proposals submitted in response to AFMA's call for research for the 2025-26 financial year. The research priorities currently funded for 2025-26 relevant to SharkRAG include:

a. *development of guidelines for Harvest Control Rules when using low recruitment.* This was discussed in detail in Agenda item 3.

32. Ongoing research priorities currently funded for the 2024-25 financial year relevant to SharkRAG include:

a. monitoring program data services in the SESSF;

b. improving CPUE standardisations for sharks (delayed to 2025);

c. continued CKMR sampling and analysis for school shark;

d. application of CKMR assessments for key rebuilding species in the SESSF; and

e. stock assessments for SESSF quota species for the 2025-26 and 2025-26 financial years (including Integrated Scientific Monitoring Program, data services in the SESSF).

33. SharkRAG discussed the following projects for funding in the 2026-27 financial year:

a. Management Strategy Evaluation (MSE) testing of the harvest control rules being developed by CSIRO, when stock status relative to unfished biomass can no longer be determined (if unable to be part of the multi-species harvest strategy MSE testing process).

b. an analysis of school shark stock structure, noting proceeding with this priority is subject to the outcome of the CKMR stock assessment results in 2025. A previous project scope can be used and provided to SharkRAG for its consideration.

Agenda item 10. SESSF data plan

34. SharkRAG noted the SESSF data plan was developed based on advice received from SESSFRAG in 2024, relating to bycatch reporting in the trawl sector and sampling targets in the GHAT sector.

35. SharkRAG discussed:

   a. the SIDaC sampling plan is currently being revised to better reflect fishing activity temporally, for implementation by the 2025-26 fishing season.

   b. AFMA have implemented a new observer portal to improve how shots and trip IDs are linked together for data analysis.

Action item 5: SIDaC and CSIRO to finalise the SIDaC sampling plan proposal for implementation by the 2025-26 fishing season. The sampling plan will be provided to SharkRAG out of session when available.

Agenda item 11. Other business

36. SharkRAG agreed the next meeting will be held in late 2025, following the data meeting in August.

37. A review of the school shark rebuilding strategy will be undertaken once the CKMR stock assessment has been finalised.

Close of meeting

38. The Chair thanked participants for their contributions and closed the meeting at 11:52.

November 2024

Attachment A – Register of interest

Member	Position	Interest declared
Alexander (Sandy) Morison	Chair	Director of Morison Aquatic Sciences. Chair of SharkRAG. Contracted by government departments, non-government agencies and companies for a range of fishery related matters including research and for MSC assessments of AFMA managed and other Australian and international fisheries. No pecuniary or other interest in the SESSF shark fishery.
Robin Thomson	Scientific Member	CSIRO, Assessment scientist. Acquiring funding for research purposes. PI of AFMA-CSIRO co-funded project 'Ongoing monitoring of school shark abundance and rebuilding in the SESSF using close kin mark recapture'. PI of the AFMA-funded project 2022/0806: "CKMR assessment design for selected key and rebuilding species in the SESSF and development of a CKMR tool for bycatch stocks". Co-investigator on FRDC project to develop harvest strategies for CKMR assessments for school shark and scalefish.
Andrew Penney	Scientific Member	Scientific member on SERAG, GABRAG, SharkRAG, SPFRAG, TRLRAG and Finfish RAG. Fisheries research and management consultant and has provided services to AFMA on a number of topics, including evaluating gear efficiency in the shark gillnet fishery. PI on FRDC project investigating use of dynamic reference point and harvest strategies for management of Commonwealth fisheries.
Charlie Huveneers	Scientific Member	Associate Professor and research scientist. Potential interest in funding for research. No pecuniary interest or otherwise.
Caleb Gardner	Economic member	Institute for Marine and Antarctic Studies. Organisation is known to submit research funding applications for consideration by AFMA Committees
Kyriakos Toumazos	Industry Member	Chief Executive Officer (South Australian Northern Zone Rock Lobster Fishermen's Association Inc.); Director of Southern Sea Eagles Pty Ltd; Director of Southern Fisheries Pty Ltd; Director Health Balance Pharmacies Pty Ltd; Member South Australian Boating Facility Board; Member of Shark Resource Assessment Group (AFMA); Member of South East Management Advisory Committee; Member of AMSA Regional Safety Committee; Director Southern Shark Industry Alliance; Director PACK Investments Pty Ltd; Director Cruickshank's Corner Developments Pty Ltd;

Member	Position	Interest declared
		Director Cruickshank's Corner Commercial Pty Ltd; Director Seafood Industry Australia;
Leigh Castle	Industry Member	Tasmanian shark hook, scalefish hook and tuna minor line fisher. Owns SESSF quota and vessel statutory fishing rights. Has a declared interest in shark hook items and RBC recommendations
Craig Harris	Industry Member	Gillnet fisher and SFR holder.
Jamie Papas	Industry Member	Gillnet fisher and SFR holder. Board Director San Remo Fishermen's Co/Op
Anissa Lawrence	Conservation Member	Director of TierraMar Ltd, registered charity. Independent consultant TierraMar Consulting Pty Ltd Undertakes contracts for a number of Conservation Non-Government Organisations, government departments, non-government agencies and the private sector on a range of fishery related matters. No pecuniary interest. Conservation member on SPFRAG. Conservation member on SEMAC Conservation member on South Australia Rock Lobster MAC and RSC. Conservation member on Spencer Gulf Prawn RSC Director and Chair of Ocean Future Fund Inc
Lianos Triantafillos	AFMA Member	AFMA member, Manager of the Gillnet, Hook and Trap fishery. No interest pecuniary or otherwise.
Michelle Henriksen	Executive Officer	AFMA EO. No interest pecuniary or otherwise.
Ross Bromley	Invited participant	Principle of Girella Fisheries Services. Engaged by SSIA as SIDaC manager. Engaged by SETFIA as western orange roughy project manager. Member of Victorian Rock Lobster RAG. EO of Eastrock (Eastern Zone Rock Lobster Industry Association Inc.). Client representative of various MSC Certificates (none are shark sp.). No interest, pecuniary or otherwise.
Miriana Sporcic	Invited Participant	Employed by CSIRO. No interest, pecuniary or otherwise.
Dan Corrie	Invited Participant	Employed by AFMA. No interest pecuniary or otherwise.
Steph Brodie	Invited Participant	Employed by CSIRO. No interest, pecuniary or otherwise.
Paul Burch	Invited Participant	Employed by CSIRO. No interest, pecuniary or otherwise.
Kurt Davis	Observer	Employed by ABARES. No interest, pecuniary or otherwise.
Keith Sainsbury	Observer	Sain Solution

Member	Position	Interest declared
		Member of the AFMA Climate Risk Framework Working Group
Anthony Coggan	Observer	Employed by AFMA. No interest pecuniary or otherwise.
Sally Weekes	Observer	Employed by AFMA. No interest pecuniary or otherwise.
Anna Willock	Observer	Employed by AFMA. No interest pecuniary or otherwise.

Attachment B – Final meeting agenda

Location: Melbourne/Virtual

Chair: Sandy Morison

Day 1: 28.11.2024 12:30 to 16:45

Time	Item	Purpose	Presenter
12:30	**1. Preliminaries** 1.1 Acknowledgement of Country 1.2 Declarations of interest 1.3 Adoption of Agenda 1.4 Minutes from previous meetings 1.5 Actions arising from previous meeting	For noting	Chair/Michelle Henriksen (15 min)
12:45	**2. Developing a harvest control rule without an estimate of B0**	For noting	Pia Bessell-Browne (30 min)
13:15	**3. Metier analysis**	For advice	Paul Burch (45 min)
14:00	**4. Climate Change adaptation** 4.1. Climate and ecosystem status report **4.2.** Climate risk framework	For noting	Steph Brodie & Dan Corrie (60 min)
15:00	*Afternoon Tea – 15 min*		
15:15	**5. 2024 standardised CPUE for sharks**	For noting	Mirana Sporcic (30 min)
15:45	**6. School shark CKMR** **6.1.** Information session about CKMR process	For noting	Robin Thomson (60 min)
16:45	*End of Day*		

Day 2

29.11.2024 9:00 to 12:15

Time	Item	Purpose	Presenter
09:00	**7. RBC 2025-26 season** 7.1. School shark bycatch TAC 7.2. Gummy shark	For advice	AFMA/CSIRO (90 min)
10:30	*Morning Tea – 15 min*		
10:45	**8. Bycatch and discard work plan update** **8.1.** GHAT shark hook sector **8.2.** GHAT gillnet sector	For noting	AFMA (15 min)
11:00	**9. Research priorities**	For advice	AFMA (30 min)
11:30	**10. SESSF Data plan**	For advice	AFMA (30 min)

12:00	11. Other businesses	For advice	Chair/members (15 min)
12:15	***End of Day***		

Attachment C – Progress of actions from previous meetings

Complete/Redundant	Underway	Need further advice	Not yet started

No.	Meeting	Agenda item	Action	Agency/Person Responsible	Timeframe	Progress
1A	SharkRAG 2 2023	3	CSIRO to further investigate the under-representation by the model of gummy shark female age-at-length growth curves.	CSIRO	SharkRAG 2 2025	**Underway**: Further work will be completed on the gummy shark model to allow it to estimate growth within the model. This work will be completed ahead of the next model update in 2025 and will be part of Geoff Tuck's stock assessment project.
1B	SharkRAG 2 2023	3	AFMA and CSIRO to investigate improving the collection of samples across a range of female shark sizes (with particular focus on larger sizes).	AFMA and CSIRO	As soon as practicable	**Underway** SSIA are undertaking actions to improve the collection of lengths and other information required under SIDaC arrangements.
2	SharkRAG 2 2023	3	CSIRO to investigate why the 3-year gummy shark RBC is lower than the long-term RBC when the stock status remains above target.	CSIRO	SharkRAG 2 2024	**Underway**: This work will be completed ahead of the next model update in 2025. CSIRO to confirm how this work will be done.
4	SharkRAG 2 2023	5	SEMAC to discuss if a targeting analysis is required for school shark (behaviours or management) as suggested by ABARES. CSIRO and ABARES to ensure this project does not overlap and aligns with the school shark metier analysis scheduled for 2024.	SEMAC	SharkRAG 2 2024	**Underway**: While not discussed by SEMAC, this is being discussed by AFMA, CSIRO and ABARES. Targeting analysis is already part of the metier analysis. AFMA in discussion with ABARES and CSIRO regarding the project and will be discussed at agenda item 4.0 at SharkRAG 2 2024.
5	SharkRAG 2 2023	5	AFMA to update discard values for inclusion in the next school shark rebuilding strategy review.		December 2025	**Not yet started**
9	SharkRAG 2 2023	10	AFMA to amend wording in the SESSF data plan referring to the reporting of bycatch and discard species to the RAGs	AFMA	SESSFRAG data meeting 2024	**Ongoing**: AFMA in process of editing the data plan for consideration by SESSFRAG

			and MACs to better reflect how this is being done currently.			
1	SharkRAG 1 2023	2.1	AFMA to consider how to improve discard data reporting and the potential options industry can undertake to improve better discard reporting.	AFMA	As soon as practicable	**Not yet started**
2	SharkRAG 1 2023	2.2	AFMA to seek further advice from CSIRO (for example Dr. Beth Fulton) to provide insight on the relationship between octopus and gummy shark populations, to better understand the potential impact of an incoming octopus fishery through VIC (along with established octopus fisheries in SA and TAS) on the GHAT.	AFMA/CSIRO	SharkRAG 2 2024	**Completed:** Beth Fulton and researchers from the University of Tasmania have been contacted however no insight could be provided. This has been flagged as an interest to AFMA and will provide an update to SharkRAG if this information becomes available.
9	SharkRAG 1 2023	5	Industry, AFMA and CSIRO to work on expanding sample collection from SA and TAS shallow line fleets in the data plan, such as increased length samples and tag recapture data.	AFMA/CSIRO/Industry	SharkRAG 2 2024	**Ongoing:** currently being considered by AFMA, the observer program, CSIRO and industry.
1	SharkRAG 2 2022	4	Sensitivity analyses and base case scenarios incorporating gillnet efficiency to be presented to SharkRAG for the gummy shark stock.	CSIRO	SharkRAG 2 2024	**Underway**: Gillnet efficiency is included in the research project *Improving CPUE Standardisation for Sharks*. To be presented at SharkRAG 2 2024.
2	SharkRAG 2 2021	5	AFMA to liaise with CSIRO (Dr Burch) to include a summary of previous SharkRAG advice regarding historical catches be included into a paper they are working on that capture's historical decisions.	AFMA	SESSFRAG data meeting 2024	**Ongoing**: The draft catch histories project, which includes school and gummy shark, is to be circulated by Paul Burch before the SESSFRAG data meeting in August 2024.
1	SharkRAG 1 2024	1	AFMA, CSIRO and SSIA to explore alternative methods for collecting data on species composition for both retained and discarded components of catch, and the possibility of collecting ancillary data such as life history information.	AMFA/CSIRO/SSIA	SharkRAG 2 2024	**Ongoing**: SIDaC and CSIRO will provide an updated sampling plan and will be discussed in agenda item 10.0 at SharkRAG 2 2024.

2	SharkRAG 1 2024	2	AFMA to contact ABARES to enquire if their economic index project, which is being undertaken for other fisheries, could include the GHAT shark fishery, and whether it would involve additional costs.	AFMA	SharkRAG 2 2024	**Completed:** ABARES are working towards anon-survey approach to monitor the economic performance of Commonwealth fisheries, including the GHAT sector in the SESSF. The economic index project proposed for the GHAT could be included as part of this package, however it wont be known until 2025 whether this is the best economic indicator to pursue.
3	SharkRAG 1 2024	2	AFMA to enquire with PIRSA whether monitoring processes have been implemented for gummy shark and school shark discards, and if not, if the collection of such data is intended.	AFMA	SharkRAG 2 2024	**Completed:** Discards are uncertain for state fisheries and there has been no indication of discard monitoring processes due to be implemented.
4	SharkRAG 1 2024	3	AFMA, CSIRO, and SSIA to investigate sampling school shark from deeper waters in the west to feed into the CKMR model and provide spatial representation.	AFMA/CSIRO/SSIA	SharkRAG 2 2024	**Completed:** School shark sampling by trawl boats will be included in the next co-management contract with SETFIA beginning 1 July 2025. Observers have also been instructed to sample school shark when onboard NZ freezer boats in west Tasmania in 2025.
5	SharkRAG 1 2024	4	AFMA to consult with state jurisdictions as to whether they have information on the extent of discarding (e.g. due to lice damage) of school shark and gummy shark in state fisheries.	AFMA	SharkRAG 2 2024	**Completed:** SA currently do not have coverage of the discards in the school shark and gummy shark fisheries. Due to the timing of state based recreational fishing (short time periods set during the day), lice damage is not of a concern
6	SharkRAG 1 2024	6	AFMA to provide SERAG the relevant species from the Daley and Hyde (2023) report (*Fishery and spatial management solutions to inform the protection and recovery of Australia's threatened*	AFMA	SERAG 2 2024	**Underway:** The report is due to be discussed at SERAG 2 2024.

| | | | *endemic elasmobrancs*) for consideration, including:

• Whitefin swell shark
• Longnose skate
• Greeneye spurdog
• Eastern angel shark
• Grey skate
• Coastal stingaree
• Yellowback stingaree
• Greenback stingaree
• Sydney skate | | | |

Attachment D – Actions and recommendations arising from the meeting

Agenda item	Responsibility	Action/recommendation
2.0 Harvest control rule without an estimate of B0	AFMA	**Action item 1** AFMA to develop a plan on the process required for a Harvest Control Rule (HCR) to be applied to the school shark CKMR assessment in 2025. The process of adopting the project outputs and the expected candidate HCR relevant to the school shark fishery will be considered at the SESSFRAG chairs meeting in 2025.
3.0 School shark metier analysis	CSIRO	**Action item 2** SharkRAG agreed that a metier-based companion species was not required for school shark and a spatial analysis of the gummy shark: school shark catch ratio would be more beneficial to better understand if fishing patterns are changing and help determine the potential targeting of school shark by the gummy shark fishery. CSIRO to provide the catch ratio analysis for SharkRAG consideration at SharkRAG in 2025.
5.0 Standardised CPUE	CSIRO/Industry	**Action item 3** Dr. Miriana Sporcic to check the gummy shark catch by gillnet in South Australia of 115.4 tonnes used for the standardised CPUE report, following comments by industry that catches of that size are unlikely given that most school shark caught off South Australia are taken primarily by hooks. **Action item 4** Dr. Miriana Sporcic to combine manual and automatic baited hooks as an addition to the next standardised shark CPUE series update, and if possible incorporate skipper experience information provided by industry.
7.0 RBC advice for all shark species	AFMA	**Recommendation:** SharkRAG recommended the following RBCs and TACs for the four quota species relevant to the shark fishery: ***School shark bycatch TAC*** SharkRAG recommended an incidental bycatch TAC of 207 tonnes be set for school shark that was determined s using the logbook method recommended by SharkRAG 1 that: • was based on the logbook recorded catches and discards as the best estimate of the total mortality for the recent years; • assumed an 11.5% survival rate for discards and a projected population increase of 3%; • used a 4-year weighted average to predict state catches in the next year, except for SA, where 13 t was used because it was considered a much more reliable estimate of next year's catch following the implementation of significant management changes in SA at the end of 2023 to constrain the catch of school shark in this state combined with evidence that these changes were effective; and • used the close-kin mark-recapture (CKMR) total mortality threshold of 306 tonnes to cap mortality because it was lower than the ~343 tonnes estimated by adding together the unavoidable by-catch of the Commonwealth fishery with state catches. ***Gummy shark*** SharkRAG recommended that either the Annual or the 3-year average RBC from the 2023 stock assessment be used to determine a TAC, noting that both would be conservative given the TAC was constrained in the previous fishing year to reduce school shark bycatch in the 2024-25 season. SharkRAG also recommended that should an adjustment to the gummy shark TAC be required in response to the currently high level of school shark discards (noting only six months of data are available and could change by the end of the season), that the approach used for the 2024-25 fishing season to estimate the proportional reduction and applying it to the three-year average RBC of 1,733 tonnes, is reasonable.

		Elephantfish and sawshark SharkRAG noted that elephantfish and sawshark are both categorised as 'trigger species' under the SESSF Harvest Strategy Framework and none of the triggers were exceeded in the previous season so recommended that the TACs of 114 tonnes and 525 tonnes be maintained, respectively, for the 2025-26 fishing season.
9.0 Research priorities	CSIRO	**SharkRAG discussed the consideration of the following projects for funding in the 2026-27 financial year:** 1. MSC testing of the harvest control rule being developed by CSIRO, when stock status relative to unfished biomass can no longer be determined (if unable to be part of the multi-species harvest strategy MSE testing process); and 2. An analysis of school shark stock structure, subject to the outcome of CKMR assessment results in 2025. A previous project scope to be used and provided to SharkRAG for its consideration following the CKMR results.
10.0 SESSF Data plan	AFMA/CSIRO/SIDaC	**Action item 4** SIDaC and CSIRO to finalise the SIDaC sampling plan proposal for implementation by the 2025-26 fishing season. The sampling plan will be provided to SharkRAG out of session when available.
Next meeting	AFMA	SharkRAG 1 meeting 2025: September/October following the release of the CKMR assessment results and the SESSF data meeting.