Australian Government
Australian Fisheries Management Authority

Shark Resource Assessment Group (SharkRAG)

Meeting 1 2024

Meeting minutes

25 July 2024

Agenda item 1. Preliminaries

1.1 Welcome and apologies

1. The Chair opened the meeting at 09:03 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
Ms. Cate Coddington	AFMA member
Dr. Andrew Penney	Scientific member
Dr. Charlie Huveneers	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]
Mr. Ross Daley	Horizon Consultancy
Observers	**Organisation**
Mr. Kurt Davis	ABARES[2]
Ms. Sally Weekes	AFMA[3]
Apologies	**Organisation**
Dr. Miriana Sporcic	CSIRO[4]
Dr. Paul Burch	CSIRO

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 is 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).

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

5. Industry participants were deemed to have a potential conflict of interest with *Agenda Item 4.3 Total Allowable Catch (TAC) setting decision*. Industry participants left the meeting, the remaining members agreed that Industry participants were welcome to participate in discussions but not for final recommendations or decisions.

1.3 Adoption of agenda

6. SharkRAG adopted the agenda outlined at Attachment B.

1.4 Minutes of previous meeting

7. SharkRAG endorsed the minutes of the SharkRAG meeting of December 2023 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

8. SharkRAG noted the status of action items from previous meetings and the updates provided by the AFMA member at Attachment C.
9. SharkRAG agreed:
    a. action item 3 from SharkRAG 2 2016 *(*The school shark rebuilding strategy to be updated to reflect research showing there is some genetic connectivity between Australian and New Zealand school shark stocks) be marked as redundant, noting that the school shark rebuilding strategy is due for a full review in 2026 after the CKMR assessment is delivered and the updated information about genetic connectivity will be included as appropriate given conflicting information in recent studies.
    b. action items 8 and 9 from SharkRAG1 2021 be marked redundant and replaced with a new action that encompasses current needs relating to data collection for retained and discarded components of catch (including sawshark); refer to Action Item 1.
    c. action item 7 SharkRAG 2 2023 (Dr Julian Morison to provide further clarity on how the outcomes of the economic index project can be used if it is developed as a research priority for the 2025-26 call for research, including how the index is useful for SharkRAG based on its use in the ETBF) be marked redundant noting that ABARES is already collecting economic information already for the ETBF and could be asked to undertake the same process for the GHAT fishery.

Action item 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.

Action item 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.

10. A list of action items established at this meeting are listed in Attachment D.

Agenda item 2. Fisheries Update

11. SharkRAG noted the updates provided by AFMA and SharkRAG members in particular:
    a. the AFMA Commission determined a 197 t Total Allowable Catch (TAC) for school shark and 1,588 t gummy shark TAC for the 2024-25 SESSF fishing season.
    b. AFMA have been in consultation with WA and SA on their school shark and gummy shark catches.
        i. SA Primary Industries and Regions (PIRSA) have implemented catch caps and trip limits
        ii. WA Department of Primary Industries and Regional Development (WA DPIRD) agreed to the development of a complementary harvest strategy and catch sharing arrangements during 2024.
    c. SSIA are developing a scope to investigate the potential implications of amending the shark longline conditions to allow automatic baiting in the Bass Strait.
    d. Mr Toumazos outlined that:
        i. shark catches throughout the fishery have been extremely productive and well above average
        ii. the increase in school shark abundance causing difficulties to avoid when targeting gummy shark
        iii. catches of gummy shark in eastern Bass Strait catches have been positive
        iv. the economics of the fishery has been negatively impacted: the prices for leasing quota has increased with the reduction in quota availability and fuel prices have increased.
    e. a recent FRDC call for research was noted related to *Impacts of electromagnetic fields (EMFs) associated with offshore wind infrastructure on commercially and recreationally*

important marine species, and a published research article titled *Age is not just a number: how incorrect ageing impacts close-kin mark-recapture estimates of population size*.

f. AFMA's Economic Working Group met in June 2024 to discuss how the group can improve fishery economics risks advice to the AFMA Commission. It is anticipated that an economics conditions paper will be provided to AFMA's consultative committees every six months.

12. SharkRAG discussed the management arrangements being implemented by WA DPIRD and PIRSA:
    a. the impact that WA's management will have is unclear as it is yet to be implemented.
    b. whether the catch caps and trip limits implemented by PIRSA could lead to a possible increase in discards.
        i. Mr Toumazos explained that the new arrangements should represent a true limit as the SA snapper fishery is closed where gummy shark and school shark are taken as bycatch.
        ii. it is important to understand discard practices in South Australia given the new management arrangements.

Action item 3. AFMA to enquire with the South Australian Department of Primary Industries and Regions (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.

Agenda item 3. School shark CKMR

13. SharkRAG noted the update provided by Dr. Robin Thomson (CSIRO) on the school shark close-kin mark-recapture (CKMR) assessment project.
    a. the review from the last CKMR assessment recommended that the following be undertaken to improve the assessment: improving ageing techniques, model skip breeding and investigate school shark stock structure.
    b. due to concerns regarding school shark vertebral ageing, bomb radiocarbon ageing was explored as a means of providing the calibration set but was not found to provide successful results. A new approach has therefore been investigated for Full-Sibling Pairs (FSPs) to provide epigenetic readings with results so far indicating a likely method.
    c. tissue sampling, genetic sequencing, and identification of kin pairs for school shark have been completed. However, ongoing technological development and delays in commercialising the epigenetic essay has resulted in a one-year delay of the school shark CKMR model update and therefore a school shark assessment to be considered by SharkRAG.
    d. results indicate a clear separation between parent offspring pairs and full sibling pairs.
14. SharkRAG discussed:

a. that three sources of information that indicates school shark have a three-year breeding cycle is used to inform the CKMR model, which also includes the possibility of individuals breeding outside of the three-year cycle, these are:
    i. work undertaken by Walker (2005)[5] suggests a three-year breeding periodicity
    ii. results from the CKMR assessment itself with the predominant model showing a three-year age separation between half-siblings.
b. that the understanding of breeding periodicity will improve as ageing improves and further results from the assessment are gained.
c. that climate change could affect school shark behaviour, including breeding periodicity
d. whether enough areas of the species range are being sampled, as there are areas where samples are not being collected. Close kin pairs and tag recapture data both indicate that school shark are moving between shark zones and therefore territoriality is unlikely.
e. that additional samples from deeper water in the west of the fishery would enable better spatial representation in the model.
f. that for epigenetic ageing it is important that the tissue samples are collected from the same area of the animal (from the neck near the vertebrae) as the different tissues undergo methylation differently

Recommendations

15. SharkRAG recommended that school shark vertebrae continue to be collected until the epigenetic technique proves successful.

Action item 4: AFMA, SSIA and CSIRO to investigate sampling school shark from deeper waters in the west to feed into the CKMR model and provide spatial representation.

Agenda item 4. TAC setting process 2025-26 season

16. SharkRAG noted:
    a. the process undertaken to set both the school shark bycatch TAC and gummy shark TAC for the 2024-25 season. There were differences between the SharkRAG advice and the SEMAC advice and the ensuing AFMA Commission decision in March 2024.
        i. SharkRAG recommended in December 2023 (meeting and out-of-session):

[5] Walker, T.I. 2005. Chapter 4 Reproduction in fisheries science. In: W. C. Hamlett (ed.), Reproductive biology and phylogeny of Chondrichthyes: sharks, batoids, and chimaeras, pp. 81–127. Science Publishers, Inc., Enfield, New Hampshire 03478, USA.

1. a school shark bycatch TAC should be based on the amount of school shark expected as unavoidable bycatch in pursuit of gummy shark based on the logbook method used previously.
2. a gummy shark TAC be based on outputs from the 2023 gummy shark stock assessment of either the three-year average recommended biological catch (RBC) or the annual RBCs for 2024, 2025 and 2026.

ii. SEMAC recommended in February 2024 (based on AFMA advice):
1. setting the school shark bycatch TAC based on the projections of the estimated fishing mortality rates[6] from the 2018 CKMR stock assessment as a proxy RBC and deducting all known sources of mortality
2. that the gummy shark TAC be reduced by 8 per cent to reduce the incidental bycatch of school shark.

iii. the AFMA Commission considered both methods and determined that the RBC approach was both more precautionary and more aligned with the Commonwealth fisheries harvest strategy policy. To ensure the school shark mortality threshold was not exceeded, the Commission agreed to reduce the gummy shark TAC. In making the decision, the Commission too multiple factors into account, including the perceived unfairness of reducing catch on a sustainable species based on increased catch of a companion species by other fishery sectors (most-notably state-managed fisheries in SA and WA) balancing this and the status of school shark under the ABARES fishery status report, the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *Convention on Migratory Species*.

b. the logbook method parameters used by SharkRAG for recommending a school shark unavoidable bycatch TAC for the 2024-25 season:
i. a 3% annual increase in school shark population based on CKMR assessment results
ii. a 4-year weighted average of landings and discards (accounting for an 11.5% survival rate) from Commonwealth fisheries
iii. state landings, which includes a 4% discard allowance due to lice damage).
iv. while not used, the method can also account for an adjusted change in gummy shark TAC to account for school shark bycatch and cap total removals at the CKMR model sustainable mortality threshold.

17. SharkRAG discussed:

[6] the projected fishing mortality rates were based on an average fishing mortality for the years 2013-17, these were projected for the years 2018 to 2037. SharkRAG agreed to the use of these at their meeting in December 2018 for setting total fishing mortality estimates in 2019-20, 2020-21 and 2021-22. While SharkRAG accepted the close kin assessment model, noting high confidence in the absolute estimate of abundance, there was lower confidence in the estimates of trend.

School shark

a. the determined lice damage for state discards may not be an accurate reflection based on the level of lice-damaged catch being landed by Commonwealth operators.
b. the commensurate reduction of 8% implemented by SA on their gummy shark allocation under the *Memorandum of Understanding between the Commonwealth of Australia, The Australian Fisheries Management Authority, and the states of south Australia and Tasmania and Victoria with respect to the school shark and gummy shark fishery in waters relevant to the states of south Australia, Tasmania and Victoria* to align with the Commonwealth reduction to constrain school shark bycatch.
c. the management arrangements for state jurisdictions include:
    i. PIRSA have implemented:
        1. commercial catch caps of 13 t for school shark and 48.9 t for gummy shark
        2. daily take and possession limits (5 gummy shark or school shark, of which there can be no more than 2 school shark), with a maximum of two daily limits on any multi-day trip
        3. prevention of the use of more than one licence on each registered boat for determining limits
    ii. WA DPIRD:
        1. intend to develop a harvest strategy for implementation by January 2025
        2. have completed consultation for southern marine park networks.
d. there is no evidence of a separate school shark stock residing in WA waters, noting the original school shark stock assessment included western SA and WA.

Gummy shark

e. the gummy shark TAC determined by the Commission for the 2024-25 season was based on a reduction on the annual RBC from the stock assessment. This resulted in the ensuing TAC being close to what could have been the TAC calculated from the average RBC. As such the modelled average RBC remains relevant whereas the modelled annual RBCs do not.

Recommendations

18. despite the wide confidence interval from the 2019 CKMR assessment on projected population estimates, indicators support that the school shark population is rebuilding, potentially at a rate greater than 3%. These indicators include on-the-water observations by industry, the increasing trawl catch-per-unit-effort (CPUE), and that it was necessary to reduce the gummy shark TAC to minimise school shark bycatch.
19. due to conflicts of interest, industry members were asked to leave the meeting while the RAG deliberated the TAC process recommendations. Non conflicting members agreed following the TAC

setting process relating to school shark and gummy shark, in the absence of an updated school shark CKMR stock assessment:

Incidental school shark bycatch TAC:

a. to ensure the catches of school shark are constrained to the unavoidable bycatch of the gummy shark fishery and that the total mortality threshold that supports the agreed rebuilding rate is not exceeded, the school shark bycatch TAC will be calculated using the logbook method that:
    i. uses the logbook recorded catches and discards as the best estimate of the total mortality for the recent years
    ii. 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)
    iii. takes account of state catches (including WA) using a 4-year weighted average as the default approach to predict the state catches in the next year (noting that SharkRAG may choose an alternative method if that was thought to produce a more justifiable amount)
    iv. caps total mortality at whichever is lower of either the CKMR total mortality threshold or the unavoidable bycatch of the Commonwealth fishery.
b. SharkRAG noted the AFMA Commission decision from the 87th meeting in March 2023 that the best estimate of survivability of released live school shark should be used. For the 2024-25 season this was 11.5% as per Braccini et al. 2012[7].
c. for state school shark catches for the 2025-26 SESSF season:
    i. South Australia – projected catches of 13 t should be used as management arrangements have been introduced that should be a true limit and not increase the level of discarding
    ii. Western Australia – projected catches of 15 t should not be used. While it is expected that management arrangements could limit take to 15 t, it is unclear what impacts these arrangements will have at this stage.

Gummy shark TAC:

a. if required, to reduce the incidental bycatch of school shark, adjustments to the gummy shark TAC should be made on the three-year average RBC noting industry concerns regarding the economic impact:

[7] Braccini M, Van Rijn J, 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. doi:10.1371/journal.pone.0032547

i. the adjustment to the gummy shark TAC for the 2024-25 SESSF season was made on the basis of reducing the incidental bycatch of school shark and was not due to sustainability concerns for gummy shark

ii. given the change in gummy shark TAC the modelled annual RBCs are no longer relevant, and estimation of new annual RBCs would require that the gummy shark stock projections be re-run.

20. industry members were invited back into the room and were informed of the outcome. Mr Toumazos raised dissent on the need to adjust the gummy shark TAC to reduce the school shark incidental bycatch, outlining concerns about the impact on the fishing industry.

Action item 5: 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.

Agenda Item 5. Endemic elasmobranch report

21. SharkRAG noted the presentation provided by Dr. Ross Daley on the report *Fishery and spatial management solutions to inform the protection and recovery of Australia's threatened endemic elasmobranchs*[8]:
    a. several species in the report were nominated for listing under the EPBC Act. Of these whitefin swell shark, longnose skate, greeneye spurdog and grey skate are currently being considered[9] for listing under the by the Minister responsible for the EPBC Act.
    b. existing Commonwealth management in place already, including handling practices and fishery closures, providing extended protection for the elasmobranchs.
    c. No species highlighted in the report were identified as potentially at high risk under the GHAT ecological risk assessments (ERAs)[10]
    d. of the ten species outlined in the report, the relevant species to the shark fishery include longnose skate, greeneye spurdog and grey skate, and potentially whitefin swell shark. The other five species were considered to be out of the range of the fishery: greeneye spurdog and grey skate occur in deeper waters, and eastern angelshark, yellowback stingaree and Sydney skate are all outside the geographic area.
    e. species highlighted in the report are data poor and are largely unknown. Species such as eastern angel shark, longnose skate and grey skate have not been recorded in logbooks at the species level by operators.
22. SharkRAG discussed:

[8] Daley RK, and Hyde CA (2023) *Fishery and spatial management solutions to inform the protection and recovery of Australia's threatened endemic elasmobranchs*. Australian Marine Conservation Society & Humane Society International - Australia. Australia. 2023.
[9] Finalised priority assessment lists - DCCEEW

a. the nine recommendations made in the report for both Commonwealth and state jurisdictions. Existing Commonwealth management in place already, including handling practices, data collection and monitoring and fishery closures providing extended protection for the elasmobranchs.
b. the recorded depth range habitat of whitefin swell shark, which is generally deeper than125m and deeper than the area of the gillnet fishery.
c. that as several species overlap with SESSF trawl sectors and are susceptible to trawl gear, these species will be referred to SERAG for consideration.
d. there are potential issues on the scientific basis of the report, including the CPUE series used and the timeframe over which it is based.
e. Some species were found to have a high post-capture survival by Braccini et al (2012). Survival rates under this study were inferred by the damages to the animal and as such survivability may not be a true representation. Additionally, operators need to comply with bycatch handling practices to maximise survivability.

Agenda item 6. Bycatch and discarding workplans

23. SharkRAG noted:
    a. the gillnet bycatch and discarding workplan 2018 is due for a review.
    b. there has not been a manual line (shark hook) sector workplan developed previously.
    a. In accordance with the guiding principles of AFMA's *Bycatch Strategy: Mitigating protected species interactions and general bycatch 2017-2022*, fishery workplans should focus on 'high risk' bycatch and threatened, endangered and protected species identified through ERA processes.
    b. updated ERAs have been undertaken for both the shark gillnet[11] and the shark hook[12] sectors, these were finalised in 2021.
    c. the gillnet ERA identified as potentially at high-risk, common bottlenose and Indian Ocean bottlenose dolphins, three species of albatross and 2 petrels; due to the low to medium productivity of the species and their high susceptibility to the gear.
    d. no species were identified as potentially at high-risk in the shark hook ERA.
    e. several management measures exist that reduce bycatch in both the gillnet and shark hook sectors, these include gear modifications, area closures, and protected species management strategies.

[11] Sporcic, M., Bulman, C.M., Fuller, M. (2021). Ecological Risk Assessment for the Effects of Fishing. Report for the Southern and Eastern Scalefish and Shark Fishery (Gillnet Hook and Trap Sector): Shark gillnet sub-fishery 2012-2016. Report for the Australian Fisheries Management Authority. 218 p.
[12] Sporcic, M., Bulman, C.M., Fuller, M. (2021). Ecological Risk Assessment for the Effects of Fishing. Report for Southern and Eastern Scalefish and Shark Fishery (Gillnet Hook and Trap Sector): Manual Longline Sub-Fishery 2015- 2019. Report for the Australian Fisheries Management Authority. 148 p.

24. SharkRAG considered the relevant species in the Daley & Hyde (2023) report (longnose skate, greeneye spurdog, grey skate and whitefin swell shark), which were not identified as potentially at high-risk under the ERAs in these fishing sectors, and agreed that:
    a. whitefin swell shark records were probable misidentifications within the gillnet fishery, and that these were likely to be draughtboard shark based on the depth of catches, species spatial distribution and electronic monitoring footage data.
    b. additional ID guides and data collection could be a focus for inclusion in the updated bycatch and discard workplans
25. SharkRAG reviewed the action items from the current gillnet workplan and noted that the following action items have been completed:
    a. develop and implement a dolphin mitigation strategy,
    b. develop and distribute best practice guidelines for minimising marine mammal interactions,
    c. regulate the drop in gillnets in 20 meshes, and
    d. develop and distribute of handling guides for sharks and rays.

Recommendations

26. SharkRAG recommended that new workplans be developed for the next five years for both the gillnet and shark hook sectors, that species recognised as potentially at high-risk under ERAs and/or species listed under the EPBC Act should be prioritised and that the following actions should be considered for inclusion in the workplans:
    a. gillnet bycatch and discarding work plan:
        i. develop broader and more relevant species identification guides
        ii. develop and distribute best practice fact sheet for minimising bird interactions
        iii. retain the gillnet dolphin mitigation strategy, due to its effectiveness, and undertake a desktop review of the strategy
        iv. review the Australian Sea Lion (ASL) management strategy, noting that an external review by Goldsworthy et al (2020) found the strategy to be fairly effective
    b. shark hook bycatch and discarding work plan:
        i. develop a broader and more relevant species identification guide
        ii. undertake a desktop analysis of electronic monitoring (EM) data, to investigate the interactions with threatened and endangered species within the shark hook sector
        iii. review the operational guidelines for seabird bycatch
        iv. consider spatial management if needed

Action item 6: AFMA to provide to SERAG the relevant species from the Daley & Hyde (2023) report *Fishery and spatial management solutions to inform the protection and recovery of Australia's threatened endemic elasmobranchs,* including:

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

Agenda item 7. Other business

27. SharkRAG agreed out of session the next meeting will be held in Melbourne on 28-29 November 2024.

Close of meeting

28. The Chair thanked participants for their contributions and closed the meeting at 16:35.

July 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.
Andrey 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
Kyri 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 interests 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
Cate Coddington	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. 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.
Ross Daley	Invited Participant	Former employee of CSIRO 1993-2014 Member IUCN Shark Specialist Committee. Director of Horizon Consultancy Member of Marine Stewardship Council Peer Reviewer group. Receives funding from non-government Conservation organisations for Shark Research. Received funding from FRDC.

Member	Position	Interest declared
		Provided paid fisheries advice to WA Fisheries. Provided paid advice on fisheries matters to Caribbean Fisheries Council, Ministry of Fisheries in Peru, Kuwait Institute of Scientific Research
Kurt Davis	Observer	Employed by ABARES. No interest, pecuniary or otherwise.

Attachment B – Final meeting agenda

Location: Virtual, Microsoft Teams

Chair: Sandy Morison

25.07.2024 09:00 to 16:45

Time	Item	Purpose	Presenter
09:00	**1. Preliminaries** 1.1 Acknowledgement of Country, welcome and apologies 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)
09:15	**2. Fishery updates** 2.1. AFMA 2.2. Industry 2.3. Scientific 2.4. Economic 2.5. Conservation	For noting	Members of each group (30 min)
09:45	**3. School shark CKMR**	For noting	CSIRO (30 min)
10:15	***Morning Tea – 15 min***		
10:30	**4. TAC setting 2025-26 season** 4.1. School shark – process for setting bycatch TACs 4.2. Gummy shark – TAC setting process and adjustments (if required) 4.3. TAC methodology decision	For advice	AFMA/CSIRO (90 min)
12:00	***Lunch – 45 min***		
12:45	**5. Endemic elasmobranch report**	For advice	Ross Daley (30 min)
13:15	**6. Bycatch and discard work plan** **6.1.** GHAT shark hook sector **6.2.** GHAT gillnet sector	For advice	AFMA (90 min)
14:45	***Afternoon tea – 15 min***		
15:00	**6. Bycatch and discard workplan contd.**	For advice	AFMA (90 min)
16:30	**7. Other businesses** 7.1. Next meeting	For advice	Chair/members (15 min)
16:45	***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 2025	**Underway**: This work will be completed ahead of the next model update in 2025. CSIRO to confirm how this work will be done.
3	SharkRAG 2 2023	4	SharkRAG members, that are not considered to have a conflict of interest, to provide advice on an incidental bycatch TAC for school shark out-of-session.	AFMA	December 2023	**Completed**: Outcomes of the out-of-session item available at: afma.gov.au/sites/default/files/2024-02/Out-of-session-outcome-school-shark-bycatch-TAC.pdf
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

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**
6	SharkRAG 2 2023	6	CSIRO to confirm a timeframe for when the CKMR outputs will be known by March 2024. An external researcher is currently being approached to see if the work is able to be completed for methylation reading.	CSIRO	SharkRAG 1 2024	**Completed**: CSIRO confirmed the ageing work was not able to be completed in time for the CKMR assessment to be provided during 2024 as scheduled. The assessment will now be completed in 2025.
7	SharkRAG 2 2023	7	Dr. Julian Morison to provide further clarity on how the outcomes of the economic index project can be used if it is developed as a research priority for the 2025-26 call for research, including how the index is useful for SharkRAG based on its use in the ETBF.	Dr Morison	August 2024	**Redundant**: Replaced by Action item 2 from SharkRAG 1 2024, AFMA to approach ABARES.
8	SharkRAG 2 2023	9	CSIRO to confirm out of session whether development of the gummy shark assessment model to enable estimated sex specific natural mortality and growth curves in the current model would be progressed independently of, or combined with, the current stock assessment project	CSIRO	SharkRAG 1 2024	**Completed**: This project will be included under the CSIRO stock assessment project
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 and MACs to better reflect how this is being done currently.	AFMA	SESSFRAG data meeting 2024	**Ongoing**: AFMA in process of editing the data plan for consideration by SESSFRAG
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	**Ongoing** Dr Beth Fulton and researchers from the University of Tasmania were contacted and will provide AFMA with the information
4	SharkRAG 1 2023	4	AFMA to seek advice from GABRAG/MAC to provide insight into Trawl gummy SA shift in depth distribution extending deeper.	AFMA	December 2023	**Completed**: The GABMAC industry member (GABIA) outlined that industry has not found a shift in shark depth distribution. Sharks recently caught by trawl at 145/150m are during the night. Depth also varies by season; they tend to be shallower during summer months (100/130m).
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	**Not yet started**
10	SharkRAG 1 2023	5	AFMA to attempt to project where the catch of gummy shark would be at the end of the 2023-24 SESSF season.	AFMA	Before the end of 2023-24 season	**Redundant**
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*.
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.

8	SharkRAG 1 2021	3	SIDaC to look at feasibility of including saw shark species composition in their data program.	AFMA and SIDaC	N/A	**Redundant** SharkRAG 2 2023 agreed that this action item be updated to involve exploring alternative methods for saw shark species data composition. Refer to Action Item 1 SharkRAG 1 2024
9	SharkRAG 1 2021	3	AFMA to consider observer data including trawl data in the saw shark summary table for SharkRAG	AFMA	N/A	**Redundant** SharkRAG 2 2023 agreed that this action item has been longstanding, and that the intent of this items should be updated to involve exploring alternative methods for saw shark species data composition. Refer to Action Item 1 SharkRAG 2 2024
3	SharkRAG 2 2016	2.2	The School Shark Rebuilding Strategy to be updated to reflect research showing there is some genetic connectivity between Australian and New Zealand school shark stocks.	AFMA	N/A	**Redundant** A review of the School Shark (*Galeorhinus galeus*) Stock Rebuilding Strategy was undertaken and considered by SharkRAG 2 in November in 2021. SharkRAG agreed that there was no evidence to suggest that the Strategy was not working and therefore no significant change to management was justified at that point. Additionally, updated information about genetic connectivity between Australia and New Zealand populations will be included as appropriate given conflicting information in recent studies. The Strategy is due for a full review again in 2026.

Attachment D – Actions and recommendations arising from the meeting

Agenda item	Responsibility	Action/recommendation
1.0 Preliminaries	AFMA	**Recommendation**: Actions 8 and 9 SharkRAG 1 2012 to be marked redundant and replaced with a new action that encompasses current needs relating to data collection for sawshark.
1.0 Preliminaries	AFMA/CSIRO/SSIA	**Action item 1:** AFMA, Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Southern Shark Industry Alliance (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.
2.0 Fishery updates	AFMA	**Action item 2:** AFMA to contact Australian Bureau of Agriculture Resource Economics (ABARES) to enquire if their economic index project, which is being undertaken for other fisheries, could include the Gillnet, Hook and Trap (GHAT) shark fishery, and whether it would involve additional costs.
2.0 Fishery updates	AFMA	**Action item 3:** AFMA to enquire with the South Australia Department of Primary Industries and Regions (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.
3.0 School shark CKMR	AFMA/CSIRO/SSIA	**Action item 4:** AFMA, SSIA and CSIRO to investigate sampling school shark from deeper waters in the west to feed into the CKMR model and provide better spatial representation.
4.0 TAC setting process	AFMA	**Action item 5:** 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.
4.0 TAC setting process	AFMA/CSIRO	**Recommendation:** SharkRAG recommended the following Total Allowable Catch (TAC) setting process relating to school shark and gummy shark ***School shark incidental bycatch TAC*** To ensure that catches of school shark are constrained to the unavoidable bycatch of the gummy shark fishery and that the total mortality threshold that supports the agreed rebuilding rate is not exceeded: • the school shark bycatch TAC will be calculated using the logbook method that: ○ uses the logbook recorded catches and discards as the best estimate of the total mortality for the recent years ○ allows for the projected population increase in school shark, and its impact on catches and discards (currently estimated to be 3% pa but to be updated in 2025) ○ takes account of states catches (including Western Australia) using a 4-year weighted average as the default approach to predict the state catches in the next year, (noting that the RAG may choose an alternative method if that was thought to produce a more justifiable amount)

		○ caps total mortality at whichever is lower of either the close-kin mark-recapture (CKMR) total mortality threshold or the unavoidable bycatch of the Commonwealth fishery [SharkRAG noted: live release survivability of 11.5% to be applied to discards as per Commission decision from 87th meeting] • for state catches for the 2025-26 season, management arrangements have been (or are anticipated to be) implemented for: ○ South Australia – projected catches of 13 tonnes should be used, as management arrangements have been introduced that should be a true limit and not increase the level of discarding ○ Western Australia – projected catches of 15 tonnes should not be used, while it is expected that management arrangements could limit take to 15 tonnes, it is unclear what impact these arrangements will have at this stage ***Gummy shark TAC*** SharkRAG recommended that if required, to reduce incidental bycatch of school shark, adjustments to the gummy shark TAC should be made on the three- year average recommended biological catch (RBC) noting Industry concerns regarding the economic impact, noting: • the adjustment to the gummy shark TAC for the 2024-25 season was made on the basis of reducing the incidental bycatch of school shark and was not due to sustainability concerns for gummy shark • given the change to gummy shark TAC the modelled annual RBCs are no longer relevant, and estimation of new annual RBCs would require that the gummy shark stock projections be re-run
4.0 TAC setting process	N/A	**Recommendation:** Despite the wide confidence interval from the CKMR assessment on projected populations, SharkRAG agreed that indicators support that the school shark population is rebuilding, potentially at a rate greater than 3%. These indicators include the on-the-water observations by industry and the increasing trawl Catch Per Unit Effort (CPUE).
6.0 bycatch and discard workplans	AFMA	**Action item 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 endemic elasmobranchs*) for consideration, including: • Whitefin swell shark • Longnose skate • Greeneye spurdog • Eastern angel shark • Grey skate • Coastal stingaree • Yellowback stingaree • Greenback stingaree • Sydney skate

		While these species are not currently listed under the Environmental Protection and Biodiversity Act (EPBC Act), some of these species are being considered for listing by the Threatened Scientific Species Committee (TSSC). SharkRAG considered only the relevant species to the shark fishery including whitefin swell shark, longnose skate, greeneye spurdog and grey skate and noted there were no species identified as potentially at high risk under the ecological risk assessment (ERA) in these fishing sectors. Additional ID guides and data collection were highlighted as a focus for inclusion in the updated bycatch and discard workplans. Whitefin swell shark records were noted as being a probable misidentification, likely to be draughtboard shark, within the gillnet fishery due to the disparity between depth of catches, species spatial distribution and data from electronic monitoring footage review.
6.0 bycatch and discard workplan		**Recommendation:** SharkRAG reviewed the actions from the existing gillnet bycatch and discard workplan and recommended that new workplans be developed for the next five years for the gillnet and shark hook sectors. The following actions should be considered in the development of the workplans for species recognised as potentially at high-risk under ERAs and/or species listed under the EPBC Act. ***Gillnet bycatch and discarding work plan:*** • develop a broader and more relevant species identification guide • develop and distribute best practice fact sheet for minimising bird interactions • retain the dolphin management strategy due to its effectiveness and undertake a desktop review of the strategy • review the Australian sea lion management strategy, noting that a review found the strategy to be fairly effective ***Shark hook (manual line) bycatch and discarding work plan:*** • develop a broader and more relevant species identification guide • undertake a desktop analysis of electronic monitoring data • review the operational guidelines for seabird bycatch • consider spatial management if needed
Next meeting	AFMA	SharkRAG 2 meeting – 28/29 November 2024