PZJA Torres Strait Finfish Fishery Resource Assessment Group

FFRAG Meeting 15

29-30 November 2023

Novotel Oasis Hotel - Cairns

Meeting Record

Note all meeting papers and records are available on the PZJA webpage:
https://www.pzja.gov.au/torres-strait-finfish-groups

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Agenda Item 1 – Preliminaries

1.1 Acknowledgement of Traditional Owners, Welcome and Apologies

1 The 15th meeting of the Protected Zone Joint Authority (PZJA) Torres Strait Finfish Fishery Resource Assessment Group (FFRAG) commenced at 0845 hrs. FFRAG Chair, David Brewer, welcomed participants and acknowledged the Traditional Owners of the various lands of which members were participating from, and paid respect to the Elders of these communities past, present and emerging.

2 All members were present at the commencement of the meeting, and the FFRAG took the time run through introductions with the meeting observers.

3 The FFRAG noted an apology from the representative for Malu Lamar (permanent observer).

4 The Chair sought consent from the RAG to record the meeting for the purpose of ensuring an accurate record. The Chair advised that the recording is kept secure and is deleted once the final meeting record is published. There were no objections to the meeting being recorded.

1.2 Adoption of agenda

5 The FFRAG noted and agreed to amendments to the draft agenda, namely the addition of a *Climate and Ecosystem* and *Non-commercial catch project* updates. The adopted agenda can be found at **Attachment A**.

1.3 Declarations of interests

6 Consistent with the PZJA Fisheries Management Paper No. 1 (FMP 1), which guides the operation and administration of PZJA consultative forums, the RAG noted the requirement to declare all interests, perceived or real. Each member declared their interest in the fishery as documented in **Table 1**. In line with the AFMA standard for declaring potential conflicts of interest in Commonwealth MACs and RAGs to best protect the integrity of advice, members with grouped interests (government, research and industry) were sequentially asked to leave the room to allow the remaining RAG members to:

- freely comment on the declared interests
- agree if the interests precluded the members from participating in any discussions and
- agree to any methods to treat the declared interest (e.g. the member provides preliminary input but leaves the room when any advice is formed).

7 The RAG noted that, in addition to the process under this item, it remained the obligation of all members to update their declarations throughout the meeting as required.

Government agencies interests

8 Members and observers who are employed by government agencies (AFMA, TSRA, QDAF, ABARES) left the meeting (Chris Boon, Rosemary Millward, Damian Miley (online), Adam White, Yen Loban, Brooke D'Alberto, and Chad Lunow (online)). It was discussed that the government agency representatives generally don't have fishing licences or participate in the science supporting the fishery and that their main interest is in managing the fishery sustainably. It was discussed that the TSRA had declared their holdings of Sunset licences and revenue generated from leasing these entitlements for the benefit of Traditional Inhabitants.

9 Noting this declared interest, the remaining members agreed that information from the government agencies is required for each agenda item being discussed. Therefore, the remaining members

recommended that the AFMA, TSRA, QDAF and ABARES members and observers be present for all FFRAG advice being formed.

10 Government members re-joined the meeting and were advised of the remaining members' consideration of their declared interests.

Research interests

11 Members with declared research interests left the meeting to enable free discussion of these interests (David Brewer, Andrew Penney, Michael O'Neill, Ashley Williams, Andrew Trappett and Rik Buckworth). The remaining members noted that scientific members are required for their expertise when discussing scientific/research topics. However, it was agreed that scientific members should be asked to leave the meeting when making final recommendations for scientific research projects which have a perceived conflict of interest.

12 The remaining members agreed the scientific members should participate in all other agenda items and stock assessment advice being formed.

13 Members with research interests re-joined the meeting and were advised of the remaining members' consideration of their declared interests.

Industry members' interests

14 Members and observers with declared industry interests in the fishery left the room (Rocky Stephen, Gavin Mosby, Harry Nona, Terrence Whap, Benny Dau and Yen Loban).

15 The remaining members agreed that industry members could be perceived to have a conflict of interest when recommending RBCs.

16 The members noted that the industry members' experience and knowledge is essential to the RAG discussion, as well as the members' role to provide expertise and knowledge of the industry within their cluster nations.

17 The remaining members advised that the industry members should participate in all agenda items and advice being formed at this meeting.

18 The industry members re-joined the meeting and were advised of the RAG consideration of their interests.

Table 1. Attendance and declarations of interest – Finfish Fishery RAG 15 meeting

Name	Position	Declaration of interest
Members		
David Brewer	Chair	• Director – Upwelling P/L (David Brewer Consulting). • Honorary Fellow - CSIRO • Chair - Torres Strait Finfish RAG • Scientific member – Torres Strait Finfish Working Group • Scientific member – Northern Prawn Fishery RAG • Current consultancies with Quandamooka Yoolooburrabee Aboriginal Corporation, Newcrest Mining Ltd. • Ex co-investigator on the completed Torres Strait 'Non-commercial catch'

Name	Position	Declaration of interest
		project. • As a fisheries consultant, may apply for funds for Torres Strait fishery research projects in the future where consistent with his role as Chair.
Rocky Stephen	TIB industry member	• Councillor for Ugar. • Chairperson of Kos and Abob Fisheries Ugar. • Works with brother in a commercial fishing business on Ugar (Brother Bear Fisheries). • Eastern cluster representative on the PZJA Finfish RAG & Working Group. • Traditional Inhabitant member - Torres Strait Scientific Advisory Committee. • TSRA Board member for Ugar • TSRA Finfish Quota Management Committee. • TSRA Board Fisheries Advisory Committee member. • Member of Zenadth Kes Fisheries company.
Gavin Mosby	TIB industry member	• Yorke Island Central Island representative • Member to Finfish Working Group, Prawn MAC
Harry Nona	TIB industry member	• TIB licence holder – fulltime cray fishermen • Member for Kaiwalagal
Terrence Whap	TIB industry member	• President of the local fisherman's association in Maluialgal • PBC Director • TSRA Board Member and Ranger
Benny Dau	TIB industry member	• TIB Licence holder • Member of Zenadth Kes Fisheries company.
Michael O'Neill	Scientific member	• Principal fisheries scientist working with the Queensland Government (Department of Agriculture and Fisheries, Fisheries Queensland) in the stock assessment program. • Principal scientist for TSSAC three-year project for Spanish mackerel stock assessment work. • Member of PZJA Finfish RAG and Working Group. • Working on and supporting work on coral trout CPUE standardisation presented at previous meetings
Ashley Williams	Scientific member	• CSIRO Scientist • Scientific member of Tropical Tuna RAG and MAC • Project leader for Torres Strait Spanish mackerel Close-kin mark-recapture (CKMR) design project
Andrew Penny	Scientific member	• Researcher and management scientist. • Is a consultant (Pisces Australia) with a general interest in tropical fisheries. • Serves on six AFMA/PZJA advisory groups. • Conducted research previously with the Torres Strait Prawn fishery and Tropical Rock Lobster fishery. No current Torres Strait projects. • Researcher on current projects involving climate change/stock assessments.

Name	Position	Declaration of interest
Chris Boon	Executive Officer	• Employed by AFMA • No pecuniary interests or otherwise
Rosemary Millward	AFMA Member	• Employed by AFMA • Past industry participation in TS prawn fishery, currently commercially involved with QLD East Coast prawn fishery. • No pecuniary interests or otherwise in Torres Strait fisheries
Damian Miley	Torres Strait Regional Authority (TSRA) Member - Online	• Employed by TSRA – Program Manager (Fisheries & Infrastructure). • No pecuniary or vested interests in Torres Strait fisheries as an individual. • Notes that TSRA holds finfish fishing licences on behalf of Traditional Inhabitants.
Chad Lunow	QDAF Member - Online	• Fishery manager for Queensland East coast for Spanish Mackerel, Reef line, Rocky reef and charter fishing. Avid spear fisher and recreational fisher and have no pecuniary interests in either the Queensland fisheries or the Torres Strait.
Permanent Observers		
Aisi Anas	PNG NFA Observer	• Employed by NFA, oversees fisheries management matters dealing with catch quotas, catch sharing. • Research data – stock biology and related (if/when PNG is involved in specific research work) • AFMA/NFA corporation matters (e.g. staff training, and associated capacity building support)
Egon Stewart	Industry Observer	• Sunset sector operator who participates in both the TS Spanish mackerel and Reef Line fisheries.
Casual Observers		
Yen Loban	TSRA observer	• TSRA member for Ngurapai and Muralag • Holds TSRA portfolio for fisheries • TIB licence • Traditional Owner • Zenadth Kes Fishing Company
Trevor Hutton	CSIRO	• Sits on Finfish Working Group as permanent observer • Interest in finfish projects
Adam White	TSRA observer	• Employed by TSRA – Project Manager (Fisheries)
Brooke D'Alberto	ABARES observer	• Employed by ABARES (DAFF) • Works on Torres Strait Fisheries for Fisheries Status Reports, including Finfish and Tropical Rock Lobster
Rik Buckworth	Spanish mackerel stock assessment project investigator	• Independent fisheries scientist • Member of assessment team in Torres Strait • Member of research project team working on Spanish mackerel on East Coast working with QDAF • Works with Northern Territory and Queensland fisheries, as well as AFMA • NPRAG member

Name	Position	Declaration of interest
		• Works with fishing industry on a number of projects • CSIRO honorary position • Charles Darwin University honorary position • Background of substantial amount of research in Spanish mackerel
Andrew Trappett	Investigator for Biological Sampling Project	• Fisheries biologist at QDAF • Works on Torres Strait biological sampling program, Torres Strait Spanish mackerel assessment. • Assisting with Torres Strait coral trout stock assessment and close-kin-mark-recapture work

1.4 Actions arising from previous meetings

19 The RAG noted the progress against the actions arising from previous FFRAG meetings, as detailed in Table 1 of the meeting papers.

20 The RAG agreed to retain current action items which are still ongoing, and to remove items which have been actioned or are to be actioned at the current meeting.

21 When discussing 'FFRAG 12 – Action 1' (development of an all-in-one CPUE reporting form), the FFRAG recommended to add this to the agenda for future community consultation so that TIB daily fishing logbook options can be workshopped. AFMA agreed to collaborate with the TSRA to support this process.

22 TIB members reiterated the importance of taking the next steps in developing TIB CPUE reporting methods. The FFRAG noted past discussions which identified this as a key data-need for the fishery, especially in the context of aspirations to increase the quantum of effort from the TIB sector. It was also suggested to provide space to report community feedback on the reporting form, such as environmental observations.

23 The AFMA EO provided information about the current TDB02 CDR form, summarising that this current form can be used by TIB operators conducting daytrips (non-primary/tender operations) as an 'all-in-one' CPUE form; if reported daily upon landing of their catch (utilising the voluntary 'part B – Effort' section). It was recalled that in previous RAG discussions stockpiling of catch before being landed to a licenced fish receiver was identified as a possible cause to explain the reduction in TIB effort data. Potential stockpiling, as well as a reduction in fishers utilising the voluntary effort section, are barriers to collecting high-quality TIB CPUE data. The FFRAG agreed that this factor needs to be addressed through ongoing education in conjunction with the development of a future TIB CPUE reporting form.

1.5 Out of session correspondence

24 The RAG noted the out-of-session correspondence as provided in the FFRAG 15 papers. It was noted that seven new emails have been added since the previous meeting.

Agenda Item 2 – UPDATES FROM MEMBERS

2.1 Industry and Scientific Members

Sunset Sector

25 The FFRAG noted reports from the Sunset sector, hearing that the current season was rough, but yielded very good catch rates for Spanish mackerel; one of the best seasons in recent memory. The method of choice has been eb-tide fishing, as this helps in the wind.

26 The flow of water currents was reported to be changing from long term patterns. These unusual currents flowing from various directions can result in either an increase or decrease in catch rates.

27 Sharks were present during Egon's operations, but overall depredation rates were much lower than last season. Second-hand reports from other sunset operators also indicate that shark sightings/interactions have reduced compared to past seasons.

28 The size of Spanish mackerel was reported to be higher than average, with industry viewing this as a sign of a healthy fishery. Male mackerel were typically caught in the morning on the floodtides, with female mackerel being caught primarily in the afternoon.

29 The catch composition while targeting coral trout has depended on fishing location and methods used. Some crew targeted passionfruit in shallow water, as it is easier to pull anchor and less likely to get 'sharked'. Shallow water fishing is sight fishing and produces preferable sized fish. However, some crew prefer to fish deeper water and target common trout using the depth sounder.

30 Passionfruit trout have been observed in higher proportions in the northern extent of the fishery area, (Cumberlands). It was noted that it is harder to fish in the southern fishery area due to exposed anchorages.

31 In recent months, warming waters have not been observed, with temperatures remaining notably cold. Water currents have been moving in unusual ways, and it was noted that this could drive unexpected changes in Torres Strait fisheries. The FFRAG discussed that a known oceanic current reaches the TS around November from the south via east coast on a yearly basis, with multiple anecdotal reports suggesting that this year has been cooler than usual. Fishers reported that fish often go off the bite in response to this cold water.

32 TIB members acknowledged Egon (Sunset sector) for his knowledgeable participation in the discussions and for his continued contribution to the biological sampling program.

<u>TIB / Subsistence Sector</u>

33 TIB fishers reported that passionfruit trout remain in shallow waters, and that he observed increasing proportion of passionfruit trout in Central waters has continued. The mix of the four CT species used to be far more even, whereas over recent years the majority are now passionfruit trout. It is unclear whether this observation indicates and increase in passionfruit trout, or a decrease in the other trout species.

34 Other TIB members reported that coral trout numbers are increasing on the reefs, observed when diving at the end of TRL season. These reports were in line with further reports from Mululigal which indicate that subsistence fishers for coral trout observed that coral trout are increasing, especially in the eastern portion of this Cluster Nation.

35 The group noted that commercial TIB fishing remains low this season and discussed potential pathways to increase participation rates. Coxswains certification requirements was identified as a potential barrier for future TIB fishers. The FFRAG noted that the TSRA are investigating whether recognising prior knowledge through Recreational Marine Boat Licence experience could streamline the coxswain's certification process.

36 It was reported that lack of infrastructure and high fuel and freight cost also remained major barriers to participation from this sector. However, subsistence catch remains high.

37 TIB members emphasised the importance of collecting data on this non-commercial catch to ensure this knowledge can be utilised by future generations and so the effects of climate change can be detected and mitigated. The TIB members sought the support of the TSRA to pursue community consultation on the importance of reporting non-commercial catch.

38 The FFRAG noted that an update on the current non-commercial catch project would be provided later in the meeting. The AFMA member and Andrew Penney provided information about the Maori customary fisheries docket system which is used to collect non-commercial fisheries data. This system requires applicable community members to reports their customary catch to the authorised representative of the area's 'Iwi' (tribe/Nation). The FFRAG considered the potential application of a similar systems in the Torres Strait.

39 It was also discussed whether the current TDB02 CDR reporting system could be utilised by community members to report non-commercial catch that is otherwise collected in line with commercial methodology. This process could see fishers, who have harvested a dinghy load of fish for an event or extended family, report this catch for use in future CPUE analysis. This could be a way of utilising the CPUE data of fishers who have reduced/ceased commercial fishing due to logistical barriers, but otherwise continue to operate in the same manner for the purpose of providing food resources directly to the community.

40 TIB members reiterated that future consultation and reporting systems (both commercial and non-commercial) would need to account for concerns community members may have about providing this data, noting the personal and cultural significance it would hold. TIB members says the way forward to spread the word through the community, including all family members including children, to show this data will be important for the future of Torres Strait fisheries.

Environmental observations

41 TIB members reported that in central TS, the amount of green seagrass has reduced. This has now been replaced by black algal growth in the lagoons now. It was asked whether his could be due to cooler water temperatures. Historically, green growth/seagrass is observed leading up to Christmas time in combination with clear water. This has been replaced with black algal growth and higher turbidity. It was suggested that turbidity in certain areas could be causing localised warming which also could explain the black algal growth. It was reported that NW winds historically 'clear out' the black algae, however, these winds have not arrived as expected in recent months, offering a further potential explanation for the increase in its growth.

42 TIB members also reported that shark sighting/interactions have reduced this year. A potential explanation was considered, proposing that sharks could be more active during periods of higher water temperatures.

2.2 Government Agencies

AFMA Update

43 The FFRAG noted an update provided by the AFMA Executive Officer, including recent information on TACs, leasing, licencing and catch data. It was raised that TIB licence numbers are significantly down compared to recent seasons, in line with reduced catch rates.

44 The FFRAG noted the conditions of the current Wildlife Trade Operation for the TSFF which was approved in November 2023. A key condition of this WTO approval was the requirement to introduce mandatory catch reporting of all bycatch species. There were some concerns raised about the feasibility of collecting fishery dependant data on all discard's species. However, it was noted that AFMA intends to introduce this requirement in the updated TSF01 logbook for the 2024-25 season.

45 The FFRAG then discussed the potential to run an observer program in the TSFF to both verify catch reporting and collect other data such as those required for the biological sampling program. Scientific members recommended up to 30% observer coverage across total fishing days, to capture rare events. However, it was noted that common practice is to aim for 10% observer coverage as a minimum due to resource constraints.

46 It was recommended to stratify any future observer coverage over the full distribution of the utilised fishery area. The FFRAG agreed that, if that observer coverage is approved for 2024-25, then a planning session should be organised to design the proposed observer program / data sheets.

TSRA Update

47 The TSRA member provided an update on the current Torres Strait Climate Change and Fisheries project. Funded by TSRA and lead by CSIRO, this project will model the impacts of climate change on key fisheries in the TS. A steering committee to help guide this project is currently being planned, and will include representatives from the TIB industry, Government, and the researchers. Updates will be provided to as new information comes available.

QDAF Update

48 The FFRAG noted a verbal update provided by the QDAF member regarding relevant management proceedings occurring in the QLD jurisdiction/Department. Current items include the establishment of an internal Climate Change governance committee, and the structural readjustment for gillnet fisheries. QDAF are currently assessing the risks and mitigations relating to the potential effort shift from gillnet fishers moving into other fisheries.

49 QDAF are also investigating independent data validation, noting similar WTO conditions across a number of fisheries. This is being actioned in the trawl and net fisheries first, however current camera technology remains a challenge. This independent data validation project work will focus on key target and discards species first, before progressing onto other bycatch species. Data collected on target species will be utilising in future stock assessments. It was suggested that PZJA fisheries could work with QDAF to develop methodologies to collect such data in Torres Strait fisheries. A discussion paper on this topic is due to be released in December 2023.

2.3 NFA Update

NFA Update

50 The FFRAG noted a verbal update from the NFA observer. Key updates included that the PNG TRL, BDM, and South Fly artisanal fisheries now have active management plans. The prawn trawl fishery also has a management plan, but the fishery is inactive. While the fishery remains inactive, the current stock status of the prawn fishery is uncertain.

51 The FFRAG briefly discussed the recent finfish trawl effort in the PNG ‘Dogleg’ waters and considered potential implications for Torres Strait fisheries. It was noted that these vessels do not report to a species level, it will be listed as ‘mixed finfish’. For this reason, impacts to specific species were not able to be considered.

52 The FFRAG noted that there are reforms currently in development to progress finer-scale reporting requirements, research, and stock assessments.

53 The fish-maw trade was also discussed, reported to include multi-species effort, comprising 4 or 5 species including barramundi in the Gulf of Papua. At the end of December 2023, PNG NFA intends to introduce a management plan for this fish-maw trade; - a key uncertainty which needs to be addressed is identifying from which fisheries these products are being harvested.

54 The 2023 Fisheries Bilateral Meeting was discussed, noting that NFA and AMFA held a technical meeting where it was agreed to develop an MOU between the two agencies. This MOU would foster greater collaboration on research and information sharing. This proposed collaboration was considered to be particularly important for developing fisheries in future years where there are shared stocks between the two jurisdictions.

55 TIB members acknowledged the implementation of fisheries management plans in PNG, with the FFRAG considering this a very positive development. A willingness was expressed to keep the lines of communication open between NFA and TIB stakeholders regarding ongoing developments.

2.4 Native Title update

56 Noting the apology received from the representative from Malu Lamar, no update was provided under this agenda item.

2.5 Climate and Ecosystem Update

57 The FFRAG noted that a new standing agenda item has been added to the FFRAG workplan. This item was added after the PZJA, at its meeting on 19 July 2023, agreed that a standing agenda item "Climate and Ecosystem update" be introduced to all RAG and Working Group agendas where total allowable catch (TAC) and/or effort limits are to be considered.

58 Under this agenda item the FFRAG noted the work being undertaken to incorporate climate change information into fisheries management advice and decisions in other Commonwealth managed fisheries. The meeting papers also provided an overview of recent work undertaken in Torres Strait fisheries related to climate change.

59 The FFRAG then considered the draft Climate and Ecosystem Status report for the Torres Strait Finfish Fishery, which is intended to be a document to summarise latest environmental data / forecast indicators that the group can utilise to track the potential risks for Torres Strait fisheries.

60 The intent of the Climate and Ecosystem Status report will be refined over time based on FFRAG, Finfish Working Group (FFWG) and expert feedback. The FFRAG provided the following advice against three questions provided in the meeting papers:

a. What key indicators would the FFRAG like included in the report?
    - The El Niño-Southern Oscillation (ENSO) information should be updated yearly.
    - The FFRAG needs to identify environmental indicators for coral trout. There is currently one identified already for Spanish mackerel.
    - Should monitor dynamic B_0 zero outputs from Stock Synthesis model.
    - AFMA to follow up with scientific members for additional resources.

b. Is it useful and appropriate to capture fishers' observations in the report?
    - Yes, the FFRAG agreed that cataloguing contemporaneous environmental observations from fishers would be beneficial for monitoring for the effects of climate change.

c. What would be the preferred timing for production of this report?
    - The FFRAG recommended to review the report annual at the stock assessment 'data meeting'. This will ensure the report is current before considering RBCs.

61 The FFRAG highlighted the importance of the ongoing TRL survey. In addition to its main function of monitoring the TRL stock, the survey acts as a valuable climate change monitoring tool.

Agenda Item 3 – STOCK ASSESMENTS AND RECOMMENDED BIOLOGICAL CATCH (RBC) ADVICE

3.1 Spanish Mackerel

62 The RAG noted a presentation from Dr Michael O'Neill on the 2023 Torres Strait Spanish mackerel stock assessment. The assessment was a stock synthesis model, which has been developed through the current project "*Torres Strait Spanish mackerel stock assessment*" (project number 200815). The assessment used all available harvest and catch rate data and fish age-length frequency data. The update to the model included an additional year of harvest and age-length frequency data from the 2022-23 fishing year. The stock synthesis model has been guided by RAG advice, including through a technical meeting held on 6-7 June 2023.

63 All data inputs into the 2023 assessment were applied in line with recommendations from FFRAG 13 (8 June 2023) and FFRAG 14 (30 August 2023). Twelve specific model analyses were performed to build agreed variables into the assessment and account for uncertainties.

64 The presentation summarised the following actions for this agenda item:

1. Answers to questions raised at FFRAG 14
2. Review of the stock synthesis (ss) analyses
3. Discussion of RBC results for 2024-25 season.

Answers to previous FFRAG questions

65 The FFRAG first considered the questions raised at FFRAG 14, summarised on slide 5. The RAG noted that the stock assessment team had provided written responses. The FFRAG noted these responses and agreed they had been adequately addressed for the final assessment.

66 The relationship between small catches of Spanish mackerel and coral trout was discussed, whereby the group considered how to account for these in the assessment. Egon advised that occasionally, he will catch a couple of Spanish mackerel while fishing for coral trout. These are the fishing days that could be removed from the data set when calculating Spanish mackerel catch rates or require extra standardisation.

67 Options were discussed on how to remove these records in future assessments, if they can be identified that they don't contain any useful information for CPUE calculations. The RAG recommended to continue developing standardised catch rates (co-variate for Proportion(Coral trout)) targeting in GLM (catchability effect).

68 It was agreed to including both standardised catch rates (with and without coral trout adjustment) in the 2023 assessment to account for uncertainties. Future assessments could include an audit of hard copies to gain additional information about the target species of effort.

Review of the SS model

69 The FFRAG were then asked to discuss and provide advice on the 2023 stock synthesis analyses, and the core analyses applied for RBC calculations. Slide 9 summarised analyses (12 core, 5 exploratory analyses, and an exploratory grid approach).

70 Noting caution regarding uncertainties, the RAG agreed that the model is starting to estimate a higher level of steepness with the increased standard deviation on data inputs, particularly on catch rates (diagnostics were provided in the r4ss output files of the assessment; analyses 2 was considered the 'starting point case' (used to be called the 'base case')).

71 Growth estimates were also considered to be reasonable. It was suggested it would be interesting to overlay this with observed length/age data (in the r4ss output files of the assessment – analysis 2). The key message was that the model is demonstrating a good fit to the observed mean-age data throughout the timeseries; it is predicting older fish in later years, as observed in the bio sampling data. This highlights the importance of the biological sampling data to guide the model.

72 The SS model demonstrated a satisfactory fit, but less compared to previous assessments, to the catch rate data. This was due to down weighting the fit through increased extra standard deviation.

73 The RAG noted the sigma R value of 0.33 for annual recruitment deviations and advice from the project team that higher values of sigma R did not influence the results. The value was suggested by model diagnostics.

74 The FFRAG also discussed diagnostics (summarised on slide 10) and were asked provide advice on these points before reviewing the RBC values. Scientific members supported the diagnostics but raised that the only point to review further would be if any of the parameters behaved erratically. Dr O'Neill confirmed that nothing unusual in the parameters were observed.

75 Dr O'Neill then highlighted that when full IUU input is applied, the estimates of steepness are quite stable, with standard errors remaining small. However, IUU input does influence the model, which highlights the value of including a range of IUU figures (full or half) to account for uncertainties. The FFRAG agreed that all estimates of steepness are within the feasible range of steepness to be expected for Spanish mackerel.

76 Regarding the spawning biomass ratio, the FFRAG considered the 'coral trout effect' (small catches) as a catch rate input. Including this input had a significant impact on estimated catch rates 2021–2023; it estimated a higher stock recovery. Including the coral trout effect produced a higher spawning biomass ratio when used.

77 Since the preliminary analysis presented at FFRAG 14, the median spawning biomass 95% confidence levels (mean of all 12 core analyses) are now looking far more feasible, back to a similar level estimated by the custom model. Median spawning biomass 95% confidence levels produced by the 'grided' models (fixed steepness) also displayed similar biomass ratios as to the core analyses.

78 The RAG endorsed using the mean of the 12 core analyses for the purposes of considering RBC options. This included including both 'no CT' and 'CT'. Therefore, the RAG progressed to the third action for this agenda item: to review the 2024-25 RBC options produced by the 2023 assessment.

<u>RBC calculation</u>

79 Based on the twelve agreed model runs, the results of the updated 2023 stock assessment showed the estimated median spawning biomass of Torres Strait Spanish mackerel across all model scenarios for 2022-23 was 41% (B_{41}) of unfished biomass in 1941 (B_0), which was a 10% increase to the estimated level of 31% (B_{31}) in 2021-22; which did not consider half IUU or the coral trout effect. This followed an upward trend since an estimated biomass of 23% in 2019. Notably, Sunset standardised catch rates remained above the 20-year low in 2019.

80 The FFRAG agreed to apply the same methodology from 2022 which guided advice on an RBC for the 2023-24 fishing season. The RBC calculations were projected over a 12-year period using a 'constant catch' rule. This approach was agreed to under the harvest strategy framework to supply the model with a range of decision rules.

81 The RAG agreed that the current method was a conservative approach in line with past harvest strategy workshop advice to "bank fish". This methodology aimed to achieve the established objective to 'not

significantly raise the TAC while the stock recovers' to ensure the population recovers to the target reference point as soon as practicable.

82 In providing advice on an RBC for the 2024–25 season the RAG considered the calculated risk-levels of a range of RBC options. Presented as a 'matrix of scenarios', the potential RBC figures were based on different target reference points**.**

83 The RAG:

a) agreed to forecast the stock biomass to the 2024-25 fishing season based on an assumed level of total harvest in 2023-24 of 81 tonnes (including an unchanged estimate of non-commercial catch).

b) From 2024–25 to 2034–35 considered four[1] different constant harvests to apply to the results of the twelve key model runs. Each level of harvest per year (labelled and defined according to fishing mortality reference points F_{40} through to F_{60}) related to building the stock to different target reference points (B_{40} – B_{60}).

c) reviewed harvest projections to evaluate risk to the spawning stock. Consistent with the approach followed since 2019, it was agreed to consider the chance model projections of the spawning stock would drop below the limit reference point (B_{20} or 20% of the unfished spawning biomass level in 1940) during a 12 year-time period (three times the age of full sexual maturity), assuming average recruitment and the constant catch (RBC) related to building the stock to the different target reference points.

The RAG agreed to be guided by the '90% risk criterion' of the *Commonwealth Harvest Strategy Policy*, that if more than 10% of model runs (based on 1000 simulations) dropped the stock below B_{LIM}, this would represent unacceptable risk to the stock.

d) agreed B_{60} continued to be a sensible long term target reference point, noting that B_{48} is the interim target reference point; and

e) reviewed the fish population projections to evaluate the likelihood of the biomass reaching the interim reference point of B_{48} 12 years.

2024-25 RBC advice

84 Noting the 90% risk criterion, the RAG elected to rule out the RBC options which were assessed to exceed this acceptable risk level. This left the RAG with three options: F_{48} - 141 tonnes, F_{50} – 133 tonnes, or F_{60} - 97 tonnes. The RAG noted that the F_{48} harvest level of 141 tonnes did not rebuild the stock to the interim target reference point B_{48} in all forecasts. Options between F_{50} – 133 tonnes and F_{60} - 97 tonnes remained.

85 **The RAG recommended an RBC for Spanish Mackerel of 97 tonnes for the 2024/25 season.**

86 This RBC falls within the acceptable risk-level and considers the objectives of the *Torres Strait Fisheries Act 1984.* The RBC also fulfills the requirements of both the interim (B_{48}) and long-term (B_{60}) target reference points.

87 In making its recommendation, the FFRAG considered the potential impacts of climate change. It was agreed that there was no evidence in the recent data (either positive or negative) to suggest a climate effect. Therefore, climate change was considered, but no amendment was required for the purposes of RBC advice. The RAG noted that the identified RBC is the most conservative RBC option based on the established TAC-setting / rebuilding strategy.

[1] Previously five harvest reference points were used ≤ 2022. At FFRAG 13 meeting (June 8, 2023), noting the advice from the RAG technical subgroup, the RAG agreed to remove F_{MSY} from future matrices of RBC options.

88 The non-commercial catch estimate, to assist the FFWG in formulating its TAC advice, remains unchanged at 20 tonnes total for the 2024-25 season.

89 Noting the increase in estimated biomass over recent years, TIB members requested that this be added to the agenda for future community consultation. It is important to communicate progress made in the current re-building phase of the stock. It was added by the AFMA EO that this presents a timely opportunity to further develop the harvest strategy with community members to plan for a target end date for rebuilding with agreed timeline. This developed harvest strategy could involve annual or multi-year RBC setting.

3.2 Coral Trout

90 The FFRAG noted a presentation from Trevor Hutton regarding the TS coral trout stock assessment workshop which was held on 28 November 2023. The purpose of this meeting was to evaluate the available information, including a review of the 2019 preliminary stock assessment, to identify and address uncertainties in the current understanding of the stock's status. A key point from the workshops discussions was the confirmation that the assumed coral trout densities inputted into the 2019 assessment are consistent with the observed densities established in the Great Barrier Reef marine park. This conclusion was supported by available survey data.

91 However, the major uncertainty which cannot be addressed with available data is information on the species split between the four main coral trout species found in the Torres Strait. This factor was considered a major uncertainty due to the observed species spilt in the available biological sampling data.

92 The coral trout workshop concluded that, while the 2019 assessment provides valid evidence that the coral trout 'basket' is being managed to a sustainable level, there are fundamental uncertainties about the stock status at an individual species level. A key conclusion of the 2019 assessment was that the stock biomass has not been reduced by a significant amount by recent catches.

93 To summarise, based on the outcomes of the coral trout workshop, the RAG concluded that there was sufficient evidence to suggest the following:

- The coral trout fishery has not been subjected to overfishing.
- There is no evidence to suggest amendment to the current RBC.
- A statistically significant stock assessment on the coral trout basket could be conducted in future based on the identified improvements to the preliminary assessment. Such a future assessment would have to split historic catch proportions and downscale the fishery zones/areas to assess catch rates on a refined scale.

94 For long term stock assessment of individual coral trout species, it was suggested that data on individual species must be collected and analysed on an individual reef basis. To minimise uncertainties, assessors must know where the trout have been caught. This was noted as an important amendment to the TSF01 logbook.

95 Planning for future assessments, the FFRAG noted that in approximately three years, the new data collected from the TSF01 logbook can be used to assess the species composition / split by reef.

96 The FFRAG considered the feasibility of collecting information on species split by individual reef in the TSF01 logbook. Advice from the sunset industry sector suggested that a typical operation will see the primary vessel anchor on a single reef for the day, and that the tenders will not travel too far. Based on this advice, the reported lat/long for the primary vessel could be utilised for CPUE considerations. However, the ideal scenario would be spatial data collected for individual tenders. This was added as a recommended input for the updated TSF01 logbook.

97 The FFRAG considered a workplan to collect sufficient data for a future coral trout assessment which was developed during the workshop:

- Individual coral trout species must be reported by reef in the logbook
- Effort by reef for individual coral trout species must be reported in the logbook
- Recommended to evaluate spatial species split using old data (Milton and Long, 1997; Williams *et al*., 2007) compared to new data (Trappett *et al*., 2023).
- With the above data, in three seasons it may be feasible to recommended TACs for each individual coral trout species
- FFRAG recommended to revisit the coral trout assessment workplan under the future research agenda item.

98 In its consideration of providing RBC advice, the FFRAG discussed the potential impacts of climate change. It was noted that temperature has a known influence on coral trout behaviour, with warm water incursions potentially effecting CPUE or the average depth and diet coral trout may prefer. It is unknown whether water temperature is a significant influence on recruitment on the Torres Strait.

99 While the FFRAG acknowledged that there is a level of risk and uncertainty regarding potential climate change impacts, they agreed that the current CPUE trigger limits are appropriate to monitor for potential negative impacts. With contemporary evidence from the neighbouring GBR fishery that suggests that coral trout are not inherently susceptible to short-term climate change effects[2], further literature was cited by the FFRAG to support a further review if triggers limits are reached in future seasons.[3]

100 The FFRAG noted that current standardised CPUE trigger limits have not been reached (90.6 kg per boat-day).

101 The FFRAG also considered anecdotal reports from both TIB and sunset industry members that the stock is healthy. The sunset sector has not noticed a discernible shift in species split or distribution in the fishery area utilised by this sector.

102 However, it was noted that due to current spatial closures for the sunset sector, the risk of localised depletion is heightened. Sunset fishers reportedly return to previously fished ground during the season as there are no remaining open reefs available to fish within areas which are both open and protected from the prevailing weather conditions. The FFRAG acknowledged the risks associated with the reduced fishing area for the sunset sector, however members were comfortable with the current triggers levels established to monitor for signs of localised depletion.

2024-25 coral trout RBC advice

[2] Pratchett, M. S., Clark, T. D., Scott, M., Hoey, A. S., Leigh, G. M., & Emslie, M. J. 2022, Effects of climate change and habitat degradation on Coral Trout (Plectropomus spp.), Townsville, July. CC BY 3.0

[3] Pratchett, M.S.; Caballes, C.F.; Hobbs, J.-P.A.; DiBattista, J.D.; Bergseth, B.; Waldie, P.; Champion, C.; Mc Cormack, S.P.; Hoey, A.S. Variation in the Physiological Condition of Common Coral Trout (*Plectropomus leopardus*) Unrelated to Coral Cover on the Great Barrier Reef, Australia. *Fishes* **2023**, *8*, 497. https://doi.org/10.3390/fishes8100497

Johansen, J., Pratchett, M., Messmer, V. *et al.* Large predatory coral trout species unlikely to meet increasing energetic demands in a warming ocean. *Sci Rep* **5**, 13830 (2015).

Pratchett, M.S., Messmer, V., Reynolds, A., Martin, J,. Clark, T.D., Munday, P.L., Tobin, A.J., and Hoey, A.S. , Effects of climate change on reproduction, larval development, and adult health of coral trout (Plectropomus spp.)

103 The FFRAG recalled that a coral trout RBC/TACC of 135 tonnes has been in place since 2008-09. This TACC was based on the average catch between 2001 and 2005 and included historic high catches reported in the fishery.

104 It was also noted from the meeting papers that, at its meeting on 3-4 November 2022 (FFRAG 12), the RAG considered an additional source of information on coral trout: an updated Catch per Unit Effort (CPUE) data series (standardised).[4] The RAG noted that catch rates remained above 130 kg per boat day.

105 The RAG agreed that the updated CPUE time series did not provide a cause for concern in the status of the stock. The current trend is following an up-cycle which succeeds a cyclical, but marginally upward trend since the early 1990's.

106 At the current meeting, having considered recent catch data, previous assessments, and the 2022 CPUE timeseries, the RAG concluded that there is no evidence to suggest amending the substantive RBC of 135 tonnes; the available data does not suggest a decline in the coral trout population, and there were no justifications identified to increase the RBC.

107 The FFRAG agreed that, based on all lines of evidence, it is highly unlikely that the stock is at risk from fishing:

a) Fishing levels remain low in the Fishery. The total reported catch for 2022-23 fishing season is 28 t. This low catch is attributed to low input effort. Therefore, the risk of this level of catch being unsustainable was considered low.

b) Outcomes of the 2006 Management Strategy Evaluation (MSE) analysis and the 2019 preliminary stock assessment both predict the current biomass to be high relative to virgin biomass:

- *MSE:* Four constant catch scenarios of 80, 110, 140 and 170 tonnes were tested which all achieved a biomass for the fishery of at least 60% of virgin total biomass by 2025 (B_{60}). The biomass in 2004 was estimated to be more than 60% of unfished levels (Williams *et al*., 2011, 2007). Commercial catch in recent years has been below historical catch levels and well below the lowest catch level simulated in the MSE (80 tonnes per year).
- *Preliminary stock assessment:* This assessment found the coral trout stock to be around 80% of virgin biomass (B_{80}). All of the model estimates of current spawning biomass were above 65% estimated virgin biomass (B_{65}). The results were also consistent with the current 135 tonnes TAC.

c) The standardised time series does not reveal a decline to the stock assessment trigger level of 90.6 kg per boat-day considered under the harvest strategy work completed to date for the fishery.

108 **The RAG recommended an RBC for coral trout of 135 tonnes for the 2024-25 season.**

109 To date, the Total Allowable Commercial Catch (TACC) for coral trout has not been calculated with an explicit deduction to account for non-commercial catch (e.g. traditional, recreational or charter fishing). This is because it had not been a high priority to undertake work to determine catch estimates whilst catches remain very low compared with the TACC.

110 However, the RAG at the FFRAG 12 meeting agreed to reconsider an estimate of non-commercial catch in 2023, noting the aspirations of the TIB sector to increase the quantum of effort in the reef-line fishery.

[4] Clayton, C. E., O'Neill, M. F., Trappett, A. G. and Leigh, G. M. (2023) *Torres Strait Reef Line Fishery: Coral trout (Plectropomus spp.) catch rate analysis, with data to June 2022.* Technical Report. State of Queensland.

111 Noting the above, the FFRAG provided a first estimate of non-commercial catch for coral trout to support TACC setting for the 2024-25 season (*10 tonnes):

Traditional/Subsistence Catch

- 1 tonne (Maluligal Nation)
- 1 tonne (Gudamaluligal Nation)
- 1 tonne (Kaiwalagal Kaureg Nation)
- 2 tonnes (Kulkalgal Nation)
- 0 tonnes* (Kemer Kemer Meriam Nation) *To be confirmed at the FFWG meeting when a relevant representative is available.

Recreational Catch

- 5 tonnes

Agenda Item 4 – MANAGEMENT

4.1 Update to the TSF01 Daily Fishing Logbook

112 Noting time constraints, the FFRAG agreed that the logbook update would be considered out-of-session.

Agenda Item 5 – RESEARCH

5.1 Climate Change Research

113 The FFRAG noted a presentation from Dr Laura Blamey on 'Climate Change in the Torres Strait'. This presentation summarised key environmental data useful to monitoring the effects of climate change, and detailed relevant past and current research which focusses on the Torres Strait.

114 The outline of the presentation was as follows:

1. Climate change in Northern Australia
2. Marine climate change scoping study done in 2020-2021
3. Marine climate change modelling project 2023-2026

115 The FFRAG noted that a key metric of concern was mean sea surface temperatures in recent years, with 2023 being the highest on record (Figure 1). Based on this trend, higher water temperatures at the end of each summer season can be expected in Northern Australia. Predictions indicating this increasing sea surface temperatures are becoming less uncertain, with the greatest impacts forecast to occur post 2050.

116 Periods of heavy rainfall are expected to increase (highly uncertain), and cyclones are expected to become more intense but less frequent. Marine heatwaves are also expected to increase in their frequency; the number of hot days could triple in the region by the end of the century.

117 The FFRAG reviewed a figure from the CSIRO Climate Adaptation Handbook, which summarised the relationships between physical ocean properties and the potential effects of climate change on marine life (Figure 2).

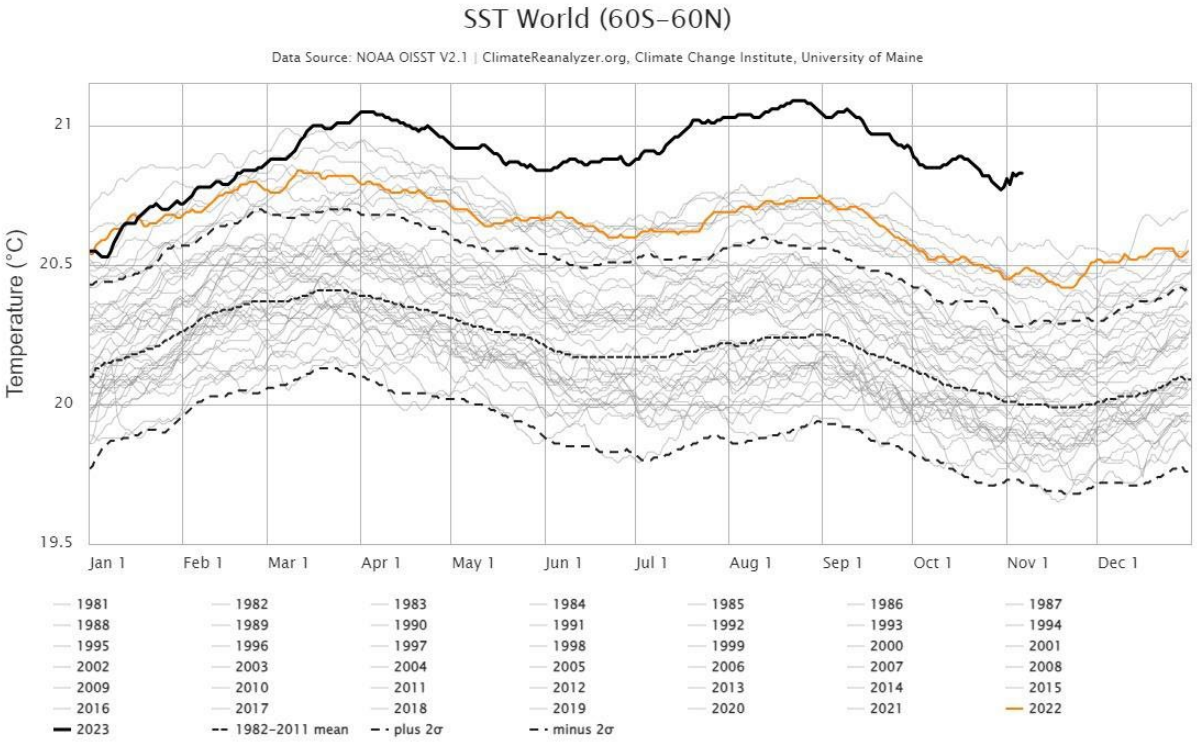

Figure 1: Yealy global mean sea surface temperature (60S – 60N) since 1981. 2023 is highlighted in bold.

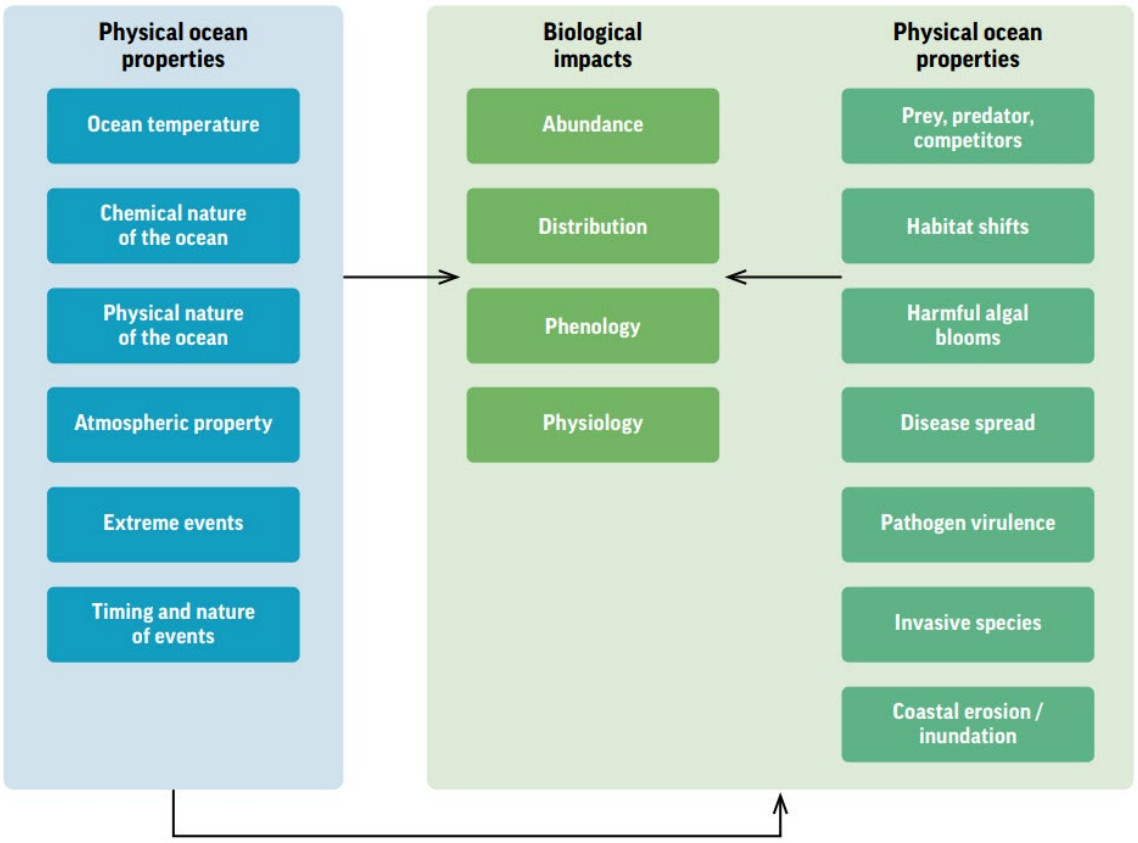

Figure 2: How will climate change affect marine life? CSIRO Climate Adaptation Handbook

118 Regarding the potential impacts to Torres Strait finfish fisheries, the literature cited in the presentation listed the following:

Spanish mackerel

- Vulnerable to climate change
- Increases in water temperature could result in a net southward movement of the stock - implications for fishers who cannot travel to other areas/fisheries.
- Spawning could be influenced by water temperature.
- Potential impacts of environmental variables e.g. rainfall, may have flow on effects on Spanish mackerel catch rates.

Coral Trout

- Temperature could affect activity, feeding rates or escape responses (➔ catchability)
- Indirect impacts through changes to food and habitat from increased temperatures and cyclones
- Heat waves on GBR: decrease biomass & increase catch rates
- Ocean acidification: increase in metabolic demand? Negative impacts on habitat or prey.

119 The FFRAG recalled the climate change 'scoping study' completed in 2020 (*Scoping a future project to address impacts from climate variability and change on key Torres Strait Fisheries*). This project identified a need for a dedicated oceanographic model for the Torres Strait. An oceanographic model would better capture the complex ocean dynamics across the Torres Strait. The oceanographic model could then be run under different climate change scenarios and applied to the ecosystem model to look at impacts to fisheries and important species.

120 The current 'marine climate change modelling' project (2023-2026) aims to use the latest models to provide scientific information to fishers and managers about current and future risks to key fisheries in the Torres Strait. The project team will investigate how different climate change scenarios will impact species in the short term, medium term, and longer term. The results of scientific modelling will be presented to stakeholders and adaptation strategies can then be co-developed.

121 The FFRAG agreed that opportunities should be sought to collaborate with PNG authorities to collect environmental data which could contribute to climate change research.

5.2 Coral trout and Spanish mackerel biological sampling project update

122 The RAG noted a presentation from Andrew Trappett on the current project *Torres Strait Finfish Fishery Coral Trout and Biological Sampling 2021-2024* (project number 2020/0814). Key statistics for the program were included in the meeting paper.

123 A key update was the successful collection of over 1100 genetic samples for use in the proposed close-kin mark-recapture project. This initially was not looking likely due to the slow start to the fishing season. The FRRAG raised the importance of commencing the contamination analysis for future CKMR project for planning purposes (separate to the biological sampling program).

5.3 Coral trout and Spanish mackerel biological sampling project update

124 The RAG noted a presentation from Mr David Brewer on 'Phase 2' of the non-commercial catch project *Measuring non-commercial fishing catches (traditional subsistence fishing) in the Torres Strait in order to improve fisheries management and promote sustainable livelihoods.*

125 The project team plans to conduct community consultation in 2024 to action the next phase of the project to identify the most appropriate methodology/program to enable the collection of non-commercial catch data.

126 The RAG discussed a potential option to develop a Torres Strait 'hybrid' model similar to the Moari customary fisheries program in New Zealand, whereby the success of a data-collection program (e.g. mobile phone application) could be strengthened by oversight from elders. Community leaders could act as 'champions' of the data collection, provided guidance to young people and the broader community to encourage data reporting through the app. It was suggested that this be added to the agenda for community consultation.

5.4 Research Priorities

Close-Kin Mark-Recapture research proposal

127 The FFRAG discussed and provided advice on a research proposal for a close-kin mark-recapture (CKMR) project. This proposal is scheduled to be considered by the Torres Strait Scientific Advisory Committee for funding in 2024-25. The approach detailed in the proposal was supported, with relevant risks identified and accounted for. However, the FFRAG noted that funding for years 2/3 (2025-26 / 2026-27) of the project may rely on the outcomes of contamination analysis proposed for 2024-25, which currently are not expected to be available before a funding decision is made for 2025-26 financial year.

Biological sampling research proposal

128 The FFRAG discussed and provided advice on a research proposal for a biological sampling project. This proposal is also to be considered by the Torres Strait Scientific Advisory Committee for funding in 2024-25. The group noted that the proposal is for a one-year project which would act as an extension of the current biological sampling program.

129 The RAG highlighted the importance of the biological sampling program as the highest priority for 2024-25, noting the collection of biological data supports future key research projects such as stock assessments and CKMR. The proposed budget was considered good value for money.

QDAF's involvement in TS research beyond 2024-25

130 The RAG then noted an update from Sue Helmke regarding Fisheries Queensland's involvement in Torres Strait research beyond 2024-25. Fisheries Queensland are currently reviewing future service delivery options for fisheries assessment and monitoring, noting the scope to provide services for both QLD and PZJA fisheries.

131 It is being investigated whether ongoing projects such as the Spanish mackerel stock assessment and biological sampling could become a component of QDAF's core work plan as a PZJA agency. The establishment of a long-term monitoring/assessment program could be developed as an agreement between PZJA partner agencies. The RAG agreed that such an arrangement would action several key research requirements for the fishery, noting that future arrangements would require consideration in line with current TSSAC research processes.

Spanish mackerel stock assessment research proposal

132 The RAG noted that no research proposals have been received for a Spanish mackerel stock assessment for the 2024-25 financial year.

133 Noting that no proposals were received, the RAG recommended to not pursue additional avenues/research providers through the TSSAC process for 2024-25. Due to timing and budgets constraints, it was recommended to action this research/management priority through other means.

134 The group discussed options for the monitoring/assessment for this fishery in 2024-25, noting that the 2023 assessment could be re-run out-of-session with an additional years' data in a cost-effective action if no further refinements are required.

135 It was also suggested that available funding could be utilised to complete a CPUE assessment as an index of abundance in lieu of a full stock assessment.

136 It was agreed that multi-year TAC setting should be discussed at a June 2024 'research' meeting to account for the potential absence of a stock assessment. The first requirement will be to plan for RBC advice for 2025-26 which the RAG will be asked to provide advice on in late 2024.

137 The RAG noted advice from scientific members that the available data/assessment resources make it feasible to set multi-year TACs without the need for a yearly stock assessment. This will need to be built into a refined harvest strategy for the fishery.

Update to the 5-year rolling research plan.

138 The RAG agreed to defer discussions on research priorities (updating the 5-year rolling research plan) until June 2024, when the group will advise on Spanish mackerel stock assessment options for 2024-25, and the order of other research priorities.

FFRAG's response to TSSAC's questions

139 The RAG provided advice regarding the following questions which were raised by TSACC when considering research funding for 2024-25 at its meeting on 22-23 August 2023:

a. Is it reasonable to expect the stock assessment budget to step down through the years, given it should become easier to run?

140 Yes, if the stock assessment was re-run in its current configuration, with just the addition of new data, then the cost would step down. However, the RAG advised that in practice this is often not always/fully the case due to the ongoing pursuit of refinements/development and the availability of new information. For example, this has often occurred in the SESSF and TSTRLF.

141 Regarding the TSSMF assessment, the RAG is satisfied that the grid of model runs in the 2023 SS assessment represent our best understanding of the uncertainties. So, it is feasible to re-run the same model grid used in the 2023 assessment in future years (at least in the short-medium term), utilising new catch and effort data, but without further development of the assessment model or exploration of additional uncertainties.

142 The RAG is scheduled to meet in the first half of 2024 to provided final advice on future research priorities, including a proposed stock assessment schedule, noting pending advice from AFMA and Fisheries Queensland meetings regarding an ongoing stock assessment and monitoring schedule. Advice here will also influence decisions on a multi-year TACC; see TSSAC question b) below.

143 To summarise, there is an option to further streamline future stock assessments. However, the RAG noted that it may seek ongoing development to the relatively new stock synthesis (SS) model. Therefore, the format of future assessments will be guided by an evaluation of the cost/benefit of further refinements.

b. Should the TSSMF stock assessment be run less frequently, noting there are only a few data points added each iteration, and we have a very limited budget to fund all Torres Strait research?

144 The RAG has annually reviewed increases in the spawning stock from 23% to 41% between 2019–2023. This rebuilding period has just reached the point for potential new increases in the RBC, against balancing stakeholder principles to "bank fish" and a possible longer term B60% spawning biomass

target. Moving forward, fewer stock assessments might lessen the frequency of harvest advice and evaluations of performance indicators.

145 However, based on the TSSAC question, the RAG commenced discussions regarding multi-year TACC setting. If actioned, in the medium term, this will require an amendment to the current RBC advisory system for the fishery.

146 A harvest strategy workshop with stakeholders is now proposed to be held in early 2025 to identify the specific aspirations for rebuilding/monitoring the stock. In the short term, in the absence of a yearly stock assessment, the RAG would need to consider RBC and TACC recommendations every year based on other available information (such as trends in annual harvest, standardised catch rate, age frequency and reports from industry).

147 Noting that the stock is estimated to be rebuilding (estimated 41% of virgin biomass in 2023, increasing from 23% in 2019), the sustainability risk to the stock is decreasing to the point where the RAG can consider multi-year TACC setting in the absence of a yearly stock assessment. The RAG, however, considers a yearly stock assessment to be desirable in the short term, noting that this work is a key component of the current harvest strategy (to recommend RBCs based on a yearly stock assessment that provides a range of RBC options which are projected over 12 years of simulations to identify risk to the stock).

148 In the short term, an option to action the stock assessment priority could be to conduct re-runs/minor refinements to the 2023 assessment, until such a time where the RAG recommends major enhancements to the assessment as a high priority. The RAG will be able to provide further advice in 2024 once all options to action an ongoing stock assessment have been considered.

c. Provide information on how the three projects, finfish biologicals, close kin mark recapture, and the stock synthesis stock assessment fit together as long-term projects. For example, will every project be required very year? Should the biological sampling project merge with the CKMR project, particularly if epigenetic aging replaces otolith aging? What does the FFRAG see as the timeline for these collaborations / changes to each project to ensure we are maximising cost benefits of projects and not duplicating work.

149 Biological sampling will remain the highest priority as an ongoing annual need. The key reason is that the fish sampling directly supports stock assessments and CKMR; collecting annual data is critical for these future projects and to assess annual patterns in fish recruitment effecting stock status and RBC. The priority is to maintain an unbroken annual dataset of Spanish mackerel and coral trout age-length data and Spanish mackerel genetic samples. Such work might be actioned through ongoing collaboration with Fisheries Queensland, noting AFMA and FQ are to discuss potential arrangements, which might offer a cost-effective long-term strategy.

150 Stock assessments might not be required every year. Pending advice, they would be completed on an as-needed basis, determined by RAG instructions regarding the risks to the stock, achieving target reference points and RBCs.

151 Initially, the CKMR can be completed as a standalone project as currently scoped/proposed (3-year project, subject to the outcomes of contamination analysis in 2024-2025). The standalone approach would provide an important estimate of Spanish mackerel abundance to scale a future stock assessment, which could then be utilized for RBC setting and to build into a refined harvest strategy. If successful, future CKMR analyses on annual monitoring samples could provide valuable yearly estimates of abundance.

152 A reduced approach would see the stock being managed through multi-year RBC and TACC setting, with established empirical indicators and triggers (such as standardised CPUE index). The success of

such an approach would depend on mitigating the error in the indicators, which is better handled in SS. Results here can also guide future research priorities to action emerging uncertainties and needs.

153 With the ongoing support of an uninterrupted annual biological sampling program, CKMR could be conducted annually, or at future intervals, as required, to provide a fishery-independent time series of abundance. At this stage, otoliths are considered to provide the most precise estimates of age, and the collection of a subsample (~400) of otoliths each year supports the assessment to track annual changes in recruitment, and changes in cohort strength and growth. However, epigenetic ageing is currently the best approach to provide age information for CKMR, which requires age information from a larger sample (at least 1000) of fish each year, as it can use the same tissue sample collected for CKMR; and the precision estimates from CKMR were shown to be robust to the estimated error in epigenetic ageing. However, if the error in epigenetic ageing can be reduced in future, it might be possible to replace the otolith ageing with epigenetic ageing.

154 The annual biological sampling program would still be required, noting its utility for collecting data on coral trout, as well as additional data from fish length sheets to derive representative samples.

155 Routine stock assessments could also be utilised to monitor the stock as required. The RAG advised that some assessments from other jurisdictions are every 3–5 years. This could be a minimal management approach, but the RAG said they would ideally not like more than 2–3 years between assessments.

156 In summary, there are multiple options to action these three priorities in the medium/long-term. Their utility will be assessed based on risk to the stock and in achieving harvest strategy goals and reference points. Stock assessments and CKMR are not reliant on each other and could be conducted simultaneously (with CKMR providing an additional input into stock assessment), or, either one could be utilised as the sole routine monitoring tool for the fishery.

157 An identified cost-effective research approach would see CKMR conducted initially as a standalone project to provide a first 'absolute' estimate of abundance, with routine multi-year stock assessments conducted to support RBC and TACC setting. Future CKMR analyses can then be conducted as required, utilising available funding and the stockpiling of annual genetic samples through monitoring.

Agenda Item 6 – PRIORITIES FOR THE RAG / DATE AND VENUE FOR NEXT MEETING

158 Noting the recommendation to add the following two items to the list of FFRAG priorities: the development of multi-year TAC setting, and data preparation work for a future coral trout stock assessment, the FFRAG deferred further discussions on this agenda item to the proposed June 2024 meeting.

159 Regarding dates for next meetings following June 2024, the FFRAG noted that the annual stock assessment 'data meeting' will be contingent on the to-be-identified format of the 2024 index of abundance for Spanish mackerel.

160 The annual 'RBC meeting' was proposed to be held in November 2024 in line with previous years.

Agenda Item 7 – OTHER BUSINESS

161 The FFRAG noted that the development of a bait net fishery is still being considered by stakeholders through the TSRA. As this would be a developmental fishery, the FFRAG referred any discussion on this item to the FFWG as the appropriate advisory group to consider management matters.

Attachments

Attachment A: FFRAG 15 agenda as adopted.

15th MEETING OF THE PZJA TORRES STRAIT
FINFISH FISHERY RESOURCE ASSESSMENT GROUP (FFRAG 15)

Wednesday 29th - Thursday 30th November 2023 - (8:30am-5pm)

Novotel Oasis Hotel - Cairns

DRAFT AGENDA

1 PRELIMINARIES

1.1 Acknowledgement of Traditional Owners, Welcome and Apologies

The Chair will welcome members and observers to the 15th meeting of the FFRAG.

1.2 Adoption of Agenda

The FFRAG will be invited to adopt the draft agenda.

1.3 Declaration of Interests

Members and observers will be invited to declare any real or potential conflicts of interests and determine whether a member may or may not be present during discussion of or decisions made on the matter which is the subject of the conflict.

1.4 Action Items from Previous Meetings

The FFRAG will be invited to note the status of action items arising from previous meetings.

1.5 Out-of-Session Correspondence

The FFRAG will be invited to note out of session correspondence on FFRAG matters since the previous meeting.

2 UPDATES FROM MEMBERS

2.1 Industry & Scientific Members

Industry and scientific members will be invited to provide a verbal update on matters concerning the Torres Strait Finfish Fishery, in particular, providing comment on fishing patterns, behaviours, prices, and market trends this season.

2.2 Government Agencies

The FFRAG will be invited to note updates from AFMA, TSRA and QDAF on matters concerning the Torres Strait Finfish Fishery.

2.3 PNG National Fisheries Authority

The FFRAG will be invited to note a verbal update from the PNG National Fisheries Authority if a representative is in attendance.

2.4 Native Title

The FFRAG will be invited to note a verbal update from Malu Lamar (Torres Strait Islander) Corporation RNTBC if a representative is in attendance.

2.5 Climate and Ecosystem Update

The FFRAG is invited to note an update on climate and ecosystem changes and discuss their impacts on Torres Strait finfish fisheries.

3 STOCK ASSESMENTS AND RBC ADVICE

3.1 Spanish Mackerel

The FFRAG will be invited to review the 2023 stock assessment outcomes and provide advice on a Recommended Biological Catch for Spanish mackerel for the 2024-25 fishing season.

3.2 Coral Trout

Having regard for new catch data, and previous assessments, the FFRAG will be invited to provide advice on a Recommended Biological Catch for coral trout for the 2024-25 fishing season. The FFRAG will consider the outcomes of a scientific sub-group review of the 2019 stock assessment scheduled for 28 November 2023.

4 MANAGEMENT

4.1 Update to the TSF01 Daily Fishing Logbook

The FFRAG will be invited to review the draft amendments to the TSF01 logbook. Subject to endorsement from the FFRAG, these amendments will be finalised before the commencement of the 2024-25 fishing season.

5 RESEARCH

5.1 Climate Change Research

The FFRAG will be invited to note a presentation from Dr Laura Blamey regarding past and current research investigating climate change modelling and impacts in the Torres Strait.

5.2 Biological Sampling Project

The FFRAG will be invited to note an update from the QDAF project team on the current project *Torres Strait Finfish Fishery Coral Trout and Biological Sampling 2021-2024* (project number 2020/0814).

5.3 Non-Commercial Catch Project

The FFRAG will be invited to note an update from Mr David Brewer on 'phase 2' of the non-commercial catch project: *Measuring non-commercial fishing catches (traditional subsistence fishing) in the Torres Strait in order to improve fisheries management and promote sustainable livelihoods,* which was approved for co-funding between AFMA and the FRDC in the 2022/23 - 2023/24 financial years.

5.4 Research Priorities

The FFRAG will be invited to discuss and provide advice on any proposals received regarding research scopes recently endorsed by the Torres Strait Scientific Advisory Committee for the 2024-25 funding year.

FFRAG members will also be invited to review the research priorities for the Finfish Fishery. This discussion will lead on from FFRAG 13 and will form preliminary advice for the 2025-26 funding year.

6 PRIORITIES FOR THE RAG / DATE AND VENUE FOR NEXT MEETING

FFRAG members will be invited to discuss other future priorities for management of the Finfish Fishery.

The FFRAG will discuss arrangements for FFRAG 16 and 17, tentatively scheduled for September and November 2024, and be advised of upcoming meetings of the FFWG (5 - 6 December 2023) and the PZJA meeting to decide next season's sustainable catch limits (January 2024).

7 OTHER BUSINESS

FFRAG members will be invited to discuss other business for consideration.

The Chair must approve the attendance of all observers at the meeting. Individuals wishing to join the meeting as an observer must contact the Executive Officer – Chris Boon (chris.boon@afma.gov.au)