PZJA Torres Strait Finfish Resource Assessment Group	Meeting 7 8 October 2020
PRELIMINARIES **Meeting preliminaries**	**Agenda Item No. 1.1** **FOR NOTING**

RECOMMENDATIONS

That the Finfish RAG **NOTE**:

1. the Chairperson's acknowledgement of traditional owners and welcome address; and

2. apologies received from any members unable to attend.

PZJA Torres Strait Finfish Resource Assessment Group	Meeting 7 8 October 2020
PRELIMINARIES Adoption of agenda	Agenda Item No. 1.2 FOR NOTING

RECOMMENDATIONS

That the FFRAG **NOTE** and **ADOPT** the draft agenda.

BACKGROUND

1. Key items for a draft agenda for FFRAG 7 were circulated to members and other participants via email on 5 July 2020 date. No comments were received from members on the key items for discussion.

2. A full draft agenda (**Attachment A**) was circulated together with papers, to members on 17 September 2020.

7th MEETING OF THE PZJA TORRES STRAIT FINFISH RESOURCE ASSESSMENT GROUP

8 October 2020 (9:00 am – 3:00 pm)

Videoconference

DRAFT AGENDA

The meeting will open at 9:00am on Thursday 8 October 2020 and will be a video conference meeting convened through Microsoft Teams. A link to access the meeting will be within an email from FFRAG Executive Officer, Andrew Trappett.

AGENDA ITEM 1 PRELIMINARIES

1.1 Acknowledgement of Traditional Owners, welcome and apologies

The Chair will welcome FFRAG members and any observers to the FFRAG 7 meeting.

1.2 Adoption of agenda

The FFRAG is to consider and adopt the draft agenda.

1.3 Declarations of interest

FFRAG members must declare any real or potential conflicts of interests to the group 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.

AGENDA ITEM 2 STOCK ASSESSMENTS

2.1 Review of data inputs to support the 2020 Spanish mackerel stock assessment

FFRAG are asked to provide advice to support members of the Spanish mackerel stock assessment team by discussing, selecting and endorsing a range of key data that will become inputs to be used in the 2020 stock assessment updated to be presented to the FFRAG on 4-5 November 2020.

AGENDA ITEM 3 RESEARCH

3.1 Finfish Fishery research priorities

FFRAG are asked to discuss and provide advice on research priorities for the next funding cycle and to provide input to a strategic research plan for a five year research plan. This advice will support the PZJA Torres Strait Scientific Advisory Group meeting in October 2020.

AGENDA ITEM 4 OTHER BUSINESS

4.1 Other Business

The FFRAG is invited to nominate any other business for discussion.

4.2 Date and venue for next meeting

The FFRAG will review dates and venues for FFRAG 8 (4-5 November 2020) and be advised of upcoming meetings of the FFWG (25-26 November 2020) and PZJA meeting to decide next season sustainable catch limits (January 2021). It is likely that all PZJA advisory group meetings will be video conference meetings in 2020 due to COVID protocols.

CLOSE OF MEETING

PZJA Torres Strait Finfish Resource Assessment Group	Meeting 7 8 October 2020
PRELIMINARIES Declarations of interests	Agenda Item No. 1.3 FOR ACTION

RECOMMENDATIONS

That the Finfish RAG:

1. **DECLARE** all real or potential conflicts of interest in Torres Strait Finfish Fisheries at the commencement of the meeting;
2. **DETERMINE** whether the member may or may not be present during discussion of or decisions made on the matter which is the subject of the conflict;
3. **ABIDE** by decisions of the RAG regarding the management of conflicts of interest; and
4. **NOTE** that the record of the meeting must record the fact of any disclosure, and the determination of the RAG as to whether the member may or may not be present during discussion of or decisions made on the matter which is the subject of the conflict.

BACKGROUND

1. Consistent with the *Protected Zone Joint Authority (PZJA) Fisheries Management Paper No. 1 (FMP1)*, which guides the operation and administration of PZJA consultative forums, members are asked to declare any real or potential conflicts of interest.
2. RAG members are asked to provide the executive officer with a list of declared interests.
3. FMP1 recognises that members are appointed to provide input based on their knowledge and expertise and as a consequence, may face potential or direct conflicts of interest. Where a member has a material personal interest in a matter being considered, including a direct or indirect financial or economic interest; the interest could conflict with the proper performance of the member's duties. Of greater concern is the specific conflict created where a member is in a position to derive direct benefit from a recommendation if it is implemented.
4. When a member recognises that a real or potential conflict of interest exists, the conflict must be disclosed as soon as possible. Where this relates to an issue on the agenda of a meeting this can normally wait until that meeting, but where the conflict relates to decisions already made, members must be informed immediately. Conflicts of interest should be dealt with at the start of each meeting. If members become aware of a potential conflict of interest during the meeting, they must immediately disclose the conflict of interest.
5. Where it is determined that a direct conflict of interest exists, the forum may allow the member to continue to participate in the discussions relating to the matter but not in any decision making process. They may also determine that, having made their contribution to the discussions, the member should retire from the meeting for the remainder of discussions on that issue. Declarations of interest, and subsequent decisions by the forum, must be recorded accurately in the meeting minutes.
6. Interests declared at the last FFRAG meeting (FFRAG 6) are provided at **ATTACHMENT A**.

FFRAG Standing Register of Declared Interests as Declared at FFRAG 6

Name	Organisation	Declaration of interest
David Brewer – RAG Independent Chairperson	Independent chair	Director – Upwelling P/L (David Brewer Consulting) which has no current Torres Strait projects or pecuniary interests. 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, Redlands City Council. Co-investigator on non-commercial take fishery project.
Selina Stoute – AFMA member	AFMA	No interests declared.
Tom Roberts – QDAF member	QDAF	No interests declared.
Allison Runck - TSRA member	TSRA	No pecuniary interests declared noting TSRA holds access rights to the Finfish Fishery and generates revenue on behalf of Traditional Inhabitants through seasonally leasing access.
Rocky Stephen – industry member	Kos and Abob Fisheries, Ugar Brother Bear Fisheries, Ugar. Torres Strait Island Regional Council.	Councillor for Ugar, TSRA Member for Ugar, Chairperson of Kos and Abob Fisheries Ugar, Works with his brother in a commercial fishing business on Ugar, Eastern cluster member on the PZJA Finfish Working Group. Sits on PZJA Prawn MAC and TS Scientific Advisory Committee. Does not hold a TIB licence.
Kenny Bedford – industry member	Debe Mekik Le Consultancy	Runs a consultancy business which has recently delivered the infrastructure audit to TSRA.
John Tabo – industry member	Industry, TSRA	Commercial coral trout fisher. Holds a Torres Strait Traditional Inhabitant Boat Licence. Member of the Torres Strait Regional Authority Finfish Quota Management Committee.
Tenny Elisala –	Industry, TSRA	TSRA Ranger Dauan, TIB licence holder.

Name	Organisation	Declaration of interest
industry member		
Paul Lowatta – industry member	Industry.	Full time commercial fisher. Holds a Torres Strait Traditional Inhabitant Boat Licence.
Tony Vass – industry member	Industry.	No financial interests in the Torres Strait. Does not own or operate a licence in Torres Strait. Former mackerel fisher in Torres from 1990 to 2008.
Michael O'Neill – scientific member	QDAF	Principal scientist for TSSAC recommended project to develop a harvest strategy for the Torres Strait Finfish Fishery. Co-investigator on TSSAC recommended Spanish mackerel assessment project. Scientific member of PZJA Finfish Working Group.
Ashley Williams – scientific member	Australian Bureau of Agricultural and Resource Economics James Cook University	ABARES fishery scientist under Department of Agriculture and Water Resources. Involved in previous TS research, is an author on the ABARES Fishery Status Reports.
Rik Buckworth – scientific member	Sea Sense Consultancy	Independent Fisheries Scientist with Sea Sense Consultancy, adjunct at Charles Darwin University, CSIRO Fellow, ex NT Fisheries, AFMA Northern Prawn RAG, AFMA South East RAG. Principal investigator on TSSAC approved TS Spanish mackerel assessment project. Chair of NT Research Advisory Committee for FRDC. Chair of Northern Territory Aquaculture Management Advisory Committee.
Andrew Trappett	AFMA, Finfish RAG Executive Officer	Involved as co-investigator on TSSAC approved projects for mackerel assessment and ageing - stakeholder liaison, communication and data services roles.

TORRES STRAIT FINFISH FISHERY RESOURCE ASSESSMENT GROUP	Meeting 7 8 October 2020
STOCK ASSESSMENT Review of data inputs to support the 2020 Spanish mackerel stock assessment	Agenda Item 2.1 For DISCUSSION & ADVICE

RECOMMENDATIONS

That the Finfish Fishery RAG:

a) **NOTE** a presentation from Spanish mackerel stock assessment project team members Dr Michael O'Neill and Dr Rik Buckworth summarising data inputs, including newly available catch and biological data, that will be used for the scheduled November 2020 stock assessment update; and

b) **DISCUSS, SELECT** and **ENDORSE** these key data inputs to be used in the 2020 stock assessment.

KEY ISSUES

1. Two stock assessments (2019 and 2020) have been funded for Torres Strait Spanish mackerel. These assessments enable communities, managers, scientists and other stakeholders to understand the status of the mackerel stock.
2. The outputs of the 2019 stock assessment were delivered to the RAG and Working Group and advice from these committees was used by the PZJA at their 20 January 2020 meeting to decide a sustainable catch limit (Total Allowable Catch or TAC) for the present 2019-20 season (1 July 2020 to 30 June 2021).
3. The project is funded to provide a 2020 stock assessment (using data up to 30 June 2020) which will included newly available data (Table 1 below) and will be reviewed by the RAG, Working Group and used by the PZJA at their planned January 2021 meeting to review the TAC for the next fishing season (2021-22 season starting 1 July 2021). Should further time be required by the FFRAG, e.g. if additional meetings are required by the committee, the PZJA TAC decision can potentially be deferred to a later out of session meeting in the first quarter of 2021.
4. Best practice in the process of developing a fishery stock assessment is to consider available data sources and inputs and review how they are to be used in the model. The outputs of a stock assessment model of a fish stock (such as abundance of fish) are dependent on the agreed treatments and quality of data that are put into the model (blue and orange cells in the **Figure 1** overview below).
5. As per the usual process in developing a stock assessment, the project team have identified a number of issues with data to be addressed. The three themes under which these issues are found, and some example issues for exploration by the RAG are:
    a. harvest data **(Figure 2** below) e.g. assumptions of levels of historic harvest prior to logbooks in 1989, assumed catch level from Taiwanese illegal fishers, using an assumed average weight of fish for years where no sampling data is available to calculate total harvest.
    b. Catch-rate data such as fish per boat-day, and

c. age-length data inputs

6. The project team are seeking RAG views on confirming how to treat these data as inputs into the model ahead of the 2020 stock assessment update which will be presented at the FFRAG 8 meeting on 4-5 November 2020.
7. The project team are seeking RAG views on reviewing and defining the number of model runs performed in the 2020 assessment (recall that a range of 40 model runs with a range of treatments/factors were presented in 2019 with the median value of 35 of these analyses used to support setting a Recommended Biological Catch).
8. The RAG are asked to provide their views on potentially reducing the number of these runs analysed with a view to forming an agreed 'base case' model run for future assessments.

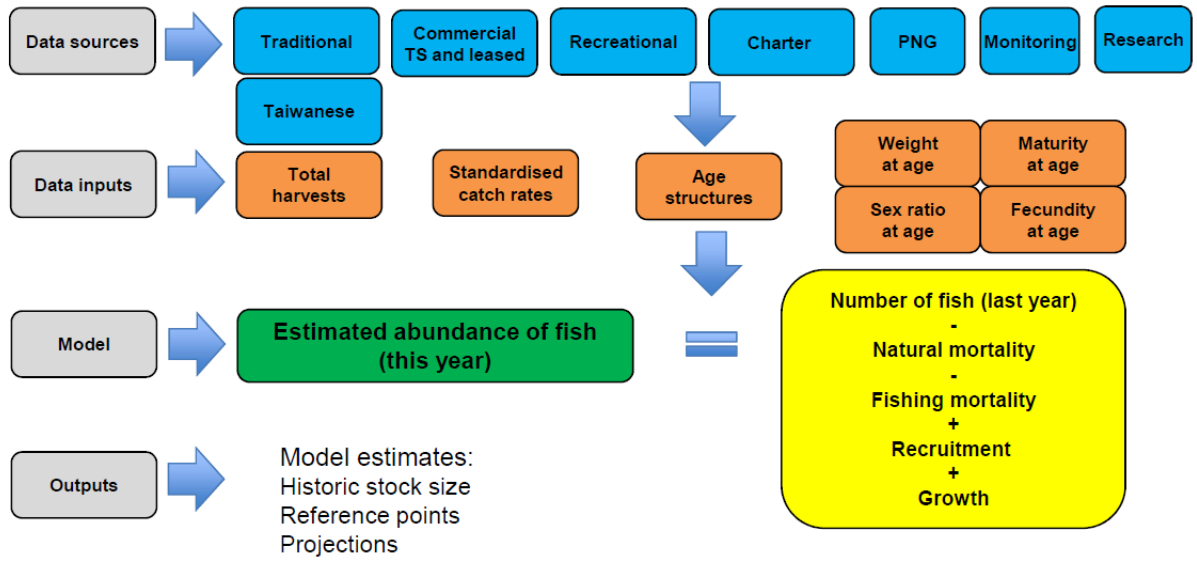

Figure 1. Overview of components of the 2019 Spanish mackerel stock assessment. *Source: Michael O'Neill QDAF presentation to FFRAG 6, 2019.*

BACKGROUND

9. Inputs into the 2019 stock assessment included:
    a. Catch and effort data from Sunset sector fishers Daily Fishing Logbooks (TSF01) from 1989 to June 2018.
    b. Catch data, and some limited effort data, from the Fish Receiver System (Catch Disposal Records (CDRs) – TDB02).
    c. Biological sampling data from the QDAF Long Term Monitoring Program 2000 to 2003 including length, sex and ageing data.
    d. Meteorological data including wind strength, wind direction and lunar phase.
10. Newly available data for the 2020 stock assessment include:
    a. 2019-20 season length, sex and ageing data from the funded project "*Torres Strait Finfish Fishery: Coral Trout and Spanish Mackerel Biological Sampling*". This project has provided 1592 length frequency measurements and ageing data from 255 fish.

b. 2005 length measurements and ageing data from an older JCU sampling project.

c. 2019-20 season catch and effort data from TSF01 Daily Fishing Logbooks (Sunset sector only)

d. 2019-20 Fish Receiver System catch data from TBD02 Catch Disposal Records (Traditional Inhabitant Boat sector and Sunset sector)

e. Older biological sampling data as summarised in **Table 1** below.

Table 1. History of Torres Strait Spanish mackerel biological sampling programs. Green shaded cells represent newly available data to be included in the 2020 stock assessment. *Source: Michael O'Neill QDAF.*

Fishing year	Data source	Description
1974-75	DAF, Qld.	Survey of Fisheries Resources - Torres Strait, 1974. Length data only from the commercial Sunset sector.
1978-79	DAF, Qld.	The Fisheries Research Branch undertook biological age-length sampling of Spanish mackerel, from the commercial Sunset sector. Fork length (FL, in cm), total weight (to the nearest 0.1 kg) and sex were recorded and otoliths sampled at sea from catches by commercial troll-fishing vessels from northern-stock fish at Bramble Cay in Torres Strait (McPherson 1992).
1983-84	DAF, Qld.	A FIRTA-funded pilot tagging program was conducted by the Fisheries Research Branch in Torres Strait. Only five tag returns were reported after 10 years. Length data only.
1998-99, and 1999-00	DAF, Qld.	Sampling conducted via a stock definition study conducted in Torres Strait in 1998 and 1999. Length data only from the commercial Sunset sector. A current FRDC study investigating the stock integrity of Spanish mackerel in northern Australian waters using otolith microchemistry, genetic and parasite techniques has indicated that there are possibilities of distinct assemblages of fish between Torres Strait and Western Australia. Sampling for this stock definition study was conducted in Torres Strait in 1998 and 1999.
2000-01 2001-02 2002-03	DAF, Qld.	Collected biological information of fish age, length and sex data. Monitoring of the Torres Strait Spanish mackerel fishery was conducted from 2000 to 2002 and involved commercial catch sampling from Bramble Cay (DPI&F 2005). Sampling was conducted each year for 14 days in October to coincide with the timing of peak catches and spawning activity (DPI&F 2005). Monitoring ceased in 2003 when recent studies suggested that Spanish mackerel in the Torres Strait formed a discrete stock from those in the Gulf of Carpentaria and along the east coast of Queensland (Lester et al. 2001, Moore et al. 2003, Ovenden 2004, Buckworth et al. 2005). Begg et al. 2006
2004-05	AFMA	In 2004, AFMA trialled a voluntary fisher logbook designed to record lengths of Spanish mackerel caught by the Sunset commercial sector (Begg et al. 2006).
2005-06	JCU	The 2005-06 Spanish mackerel age-length data was from James Cook University (JCU) research – the Effects of Line Fishing (ELF) and Fishing and Fisheries (F&F) projects. The JCU projects provided individual fish age and length data on Spanish mackerel sampled from Torres Strait waters. Torres Strait sampling includes waters north of 11 degrees south, including waters in the key mackerel fishing-ground of Bramble Cay in the northeast Torres Strait. The sampling was from SUNSET fishing vessels between 25 October 2005 and 3 November 2005. Dr Bruce Mapstone supplied the JCU data to DAF on 18/03/2020 under a Deed of Confidentiality.
2019-20	DAF, Qld.	Final report for Torres Strait Spanish mackerel AFMA-2019/0832. Langstreth et al. 2020. TIB and Sunset commercial sampling. Age and length.

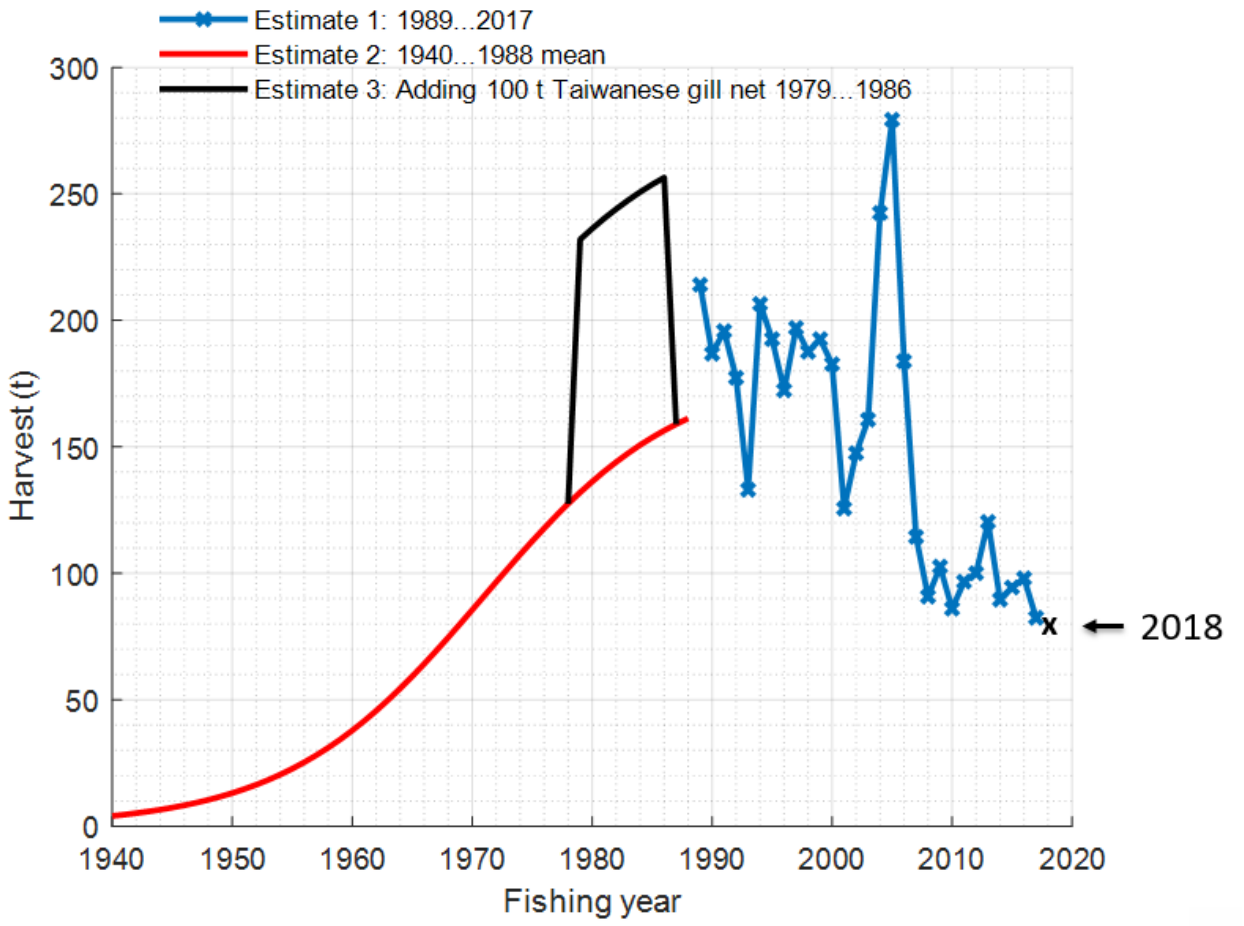

Table 2. Example summary harvest rate data from the 2019 stock assessment. Source: Michael O'Neill, QDAF, FFRAG 5, Oct 2019 presentation.

TORRES STRAIT FINFISH FISHERY RESOURCE ASSESSMENT GROUP	Meeting 7 8 October 2020
RESEARCH Fishery Research Priorities	Agenda Item 3.1 For DISCUSSION & ADVICE

RECOMMENDATIONS

Finfish RAG are to:

a) **NOTE** that a rolling five-year research plan for the Torres Strait Finfish Fishery is used to inform the Torres Strait Scientific Advisory Committee's (TSSAC) annual call for research funding proposals;

b) **NOTE** that three research projects are funded for the 2020/21 funding year:

   a. Torres Strait Spanish mackerel stock assessment with appraisal of environmental drivers;

   b. Enhancing biological data inputs to Torres Strait Spanish mackerel stock assessment; and

   c. Developing an approach for measuring the non-commercial fishing in Torres Strait in order to improve fisheries management and promote sustainable livelihoods.

c) **NOTE** that assuming AFMA's Torres Strait Research budget for the 2021/22 financial year remains unchanged compared to previous years, AFMA would have approximately $120 000 of uncommitted funding for new research commitments. TSSAC promotes funding from other sources to assist the PZJA meet research priorities across fisheries. .

d) **NOTE** previous 2019 RAG advice to research priorities **Attachment A** and **Table 1** below.

e) **DISCUSS** and **PROVIDE ADVICE** on research priorities for research funding available in the next 2021/22 financial year funding round; and

f) **DISCUSS** and **PROVIDE ADVICE** on strategic research priorities for a rolling five-year research plan for 2021 to 2025 The RAG is asked to rank identified priorities in order and to assign an essential/desirable status to each item.

KEY ISSUES

Research funding and process

1. Each PZJA advisory committee is responsible for providing advice to AFMA and the PZJA TSSAC on research priorities and suggested projects to address these priories for the next available funding round.
2. In addition to providing advice on priority research for the 2021/22 funding round, the FFRAG is asked to provide advice to support formation of a draft five year research plan (2019 five year research plan for 2020 to 2025 is at **Attachment A**). RAG are asked to amend and update this plan where necessary according to any new research needs or management priorities projected for the next five years. For reference, the key outcomes

of the last FFRAG consideration of research priorities is at **Table 1** below (FFRAG 5, 31 October - 1 November 2019).

3. Assuming no change to AFMA's Torres Strait research budget, there is $120,000 available in AFMA research funding for the Torres Strait for 2021/22 financial year, $290,000 of the 2021/22 AFMA research budget is already committed to multi-year research funding for the Tropical Rock Lobster Fishery abundance surveys (**Attachment B** below).

4. Other opportunities for additional funding may be possible, for example, TSRA have provided funding for projects beyond the AFMA allocated budget, which may be possible again in 2021/22. There are also other research funding providers that could be engaged if additional funding provided the funding applications aligned with the organisations funding priorities.

5. Projects funded in the present 2020/21 year are: a Spanish mackerel stock assessment and a biological sampling project (sex, length & age) for Spanish mackerel and coral trout along with a desktop study considering approaches to measure non-commercial catches. From next financial year (2021/22) there are no research funds yet committed for any research in the Torres Strait Finfish Fishery.

6. Can we insert a line on TSSAC process – TSSAC will meet Nov then make call in Dec?

Priorities for the fishery

7. Key management and research considerations discussed by the RAG at recent meetings (FFRAG 5, FFRAG 6) are outlined along with a status update in **Table 1** below and have included:

    a. stock assessment for Spanish mackerel, particularly in relation to the evident decline in CPUE, and therefore our signal of abundance, over recent seasons;

    b. understanding environmental drivers that may be affecting the assessment catch rates and potentially impacting recruitment of Spanish mackerel;

    c. progressing the preliminary stock assessment for coral trout;

    d. harvest strategy development including establishing reference points & building rates for the Spanish mackerel stock and consideration of management strategy evaluation testing work to examine if potential strategies would likely be effective;

    e. biological sampling to support the Spanish mackerel stock assessment - particularly understanding whether recruitment is changing ;

    f. expansion of biological sampling to include coral trout, noting that with high suggested biomass, research effort is well placed on improving information streams and inputs to the assessment until it is further developed;

    g. an alternative index of abundance for mackerel other than the relative abundance provided from fishery dependent logbook catch rate data noting the relatively data-poor state of the fishery with few vessels providing data to build a signal of stock trends (Spanish mackerel but also noted as a likely issue for coral trout); and

    h. stock structure of mackerel – connectivity between the targeted fishing grounds and other areas of the fishery – along with basic biological information to support understanding of early life history such as where fish recruiting to the fishery have spent their initial years.

8. Additional research needs suggested at FFRAG 5 were:
    a. Examination of shark depredation effects (bite offs) on catch rates noting fisher reports that this might be affecting catch rate series for the stock assessment in

years with a strong depredation.

b. Otolith morphology – potentially developing an index of mackerel ages based on the shapes and sizes of otoliths recorded.

c. Optimum ratio of B MSY to B MEY to determine the optimum ratio between B MSY and B MEY and the appropriate proxy economic target for the fishery

Table 1 Overview of recent research needs identified or discussed at FFRAG 5, FFRAG 6 with update on present status.

Need	Detail of identified need	FFRAG Prioritisation	Status (as of September 2020)
Stock assessment – Spanish mackerel	Evident decline of Spanish mackerel abundance based on CPUE series has been the scientific and management focus of the fishery.	**ESSENTIAL**	Project funded for 2020, but nothing planned or funded for 2021 or beyond.
Stock assessment – coral trout	RAG has noted work required to further develop the preliminary stock assessment	CPUE series update put forward as a small essential project to fill available funding.	No research planned or funded. Small tactical project to update CPUE in 2020 but was not supported by TSSAC.
Biological sampling – Spanish mackerel	RAG has noted an essential need for mackerel biological sampling noting the gap since last available information (2019 sampling is the first since 2005).	**ESSENTIAL**. RAG has recommended a five year time series of sampling data be progressed as a priority.	Project funded for 2020 but nothing planned or funded for 2021 or beyond.
Biological sampling – coral trout	RAG noted the data poor nature of the trout fishery and suggested broadening the information available through sampling to support future development of the stock assessment once complete.	**ESSENTIAL**, put forward 2019.	Project funded to begin trout sampling for 2020 season but nothing planned or funded for 2021 or beyond.
Harvest strategy development	Need a HS framework with agreed reference points (target, limit) and harvest control rules. Though not formally adopted, certain elements of a strategy have been adopted by management as interim reference points with the focus on keeping mackerel stock above the default B LIM of 20 per cent of virgin biomass and building the stock in a positive direction.	No prioritisation given, when last considered the RAG was expecting a successful outcome from this project.	No research planned or funded. Project competed in 2019 but has not provided a complete framework that provides HCRs to set TACs and respond to harvest levels. RAG might consider a tactical project to revisit project outcomes and further progress towards adoption.
Management Strategy Evaluation	MSE testing is best practice ahead of implementing a harvest strategy to test to see if the proposed strategy and control rules will achieve the fishery objectives.	No prioritisation given but likely low given the need to finalise a HS first.	No research planned or funded. RAG have advised a project could be formed but would be reliant on the outcomes of the harvest strategy development process (see above).

Alternative index of stock abundance	RAG has suggested that an alternative index of abundance for mackerel could be developed (other than the relative abundance provided from fishery dependent logbook catch rate data) noting the relatively data-poor state of the fishery with few vessels providing data to build a signal of stock trends (for Spanish mackerel but also noted as relevant for coral trout which is also data poor)	RAG have discussed but not prioritised this research need.	No research planned or funded. OOS discussions with RAG technical members have indicated that progressing a Close Kin Mark Recapture study could be feasible given SM biology and would likely help address abundance and reliance on the stock assessment as well as address genetic connectivity and hyper-stability issues in the longer term.
Stock structure and broader ecological understanding of Spanish mackerel.	With most available catch data coming from the Bramble Cay breeding aggregation RAG has identified a need to where recruits to the fishery are coming from, the structure within Torres Strait stock as well as level of connectedness with adjacent stocks in other fisheries. It is also important to understand the related ecological factors - what is driving recruitment (spawning success), feeding patterns, where spawning aggregations occur and to use this info to manage the Torres Strait stock e.g. predict where good fishery catch rates might occur, where/when protection may be required.	Noted as scientifically important but not recommended as a priority for the fishery at this stage.	No research planned or funded.
Fishery independent survey information	In line with developing an alternative index of abundance the RAG has identified a need for additional information channels for the mackerel and trout stocks independent of daily fishing logbooks (fishery dependent data). Suggestion has been made that research fishing or underwater visual surveys could augment	**DESIRABLE** - not recommended as a priority for the fishery at this stage.	Noted as scientifically important but not recommended as a priority for the fishery at this stage noting associated costs.
Shark depredation	Study to investigate increased shark interaction with fishery operations and depredation impacts on Finfish Fishery catch rates (how to capture and track over time or investigate potential mitigation options).	**DESIRABLE** - not recommended as a priority for the fishery at this stage.	No research planned or funded. RAG suggested that a broader scale project across northern Australia could be formed to investigate a number of fisheries that lose catch to sharks and could be funded by FRDC for example.

Otolith morphology	Developing an index of mackerel ages based on the shapes and sizes of otoliths recorded	**DESIRABLE**, not recommended for immediate funding.	No research planned or funded.
Optimum ratio of B MSY (max. sustainable yield) to B MEY (max. economic yield)	While stakeholders may select a higher future target reference point (e.g. B60) to support good catch rates and stock sharing, noted this will mean a trade-off for a lower RBC as less harvest will occur to keep more fish in the water and less boats will be active in the fishery. A project could attempt to determine the optimum ratio between B MSY and B MEY and the appropriate proxy economic target for the fishery.	**DESIRABLE**, not recommended for immediate funding.	No research planned or funded. RAG supported a desktop study (e.g. applying Pascoe et al. work to the Torres Strait Spanish mackerel stock c.f. QDAF east coast work) to determine the optimum ratio between B MSY and B MEY and the appropriate proxy economic target for the fishery.

BACKGROUND

9. At its 31 Oct-1 Nov 2019 meeting FFRAG 5 discussed priority and longer term research priorities (excerpt of meeting record at **Attachment B** below). The RAG recommended two projects for priority, tactical funding in 2020/21:

    a. Further biological sampling (ageing and length frequency) for Spanish mackerel. The RAG recommended this data collection ideally occurs for an additional three to four years; and

    b. Updating the Standardised CPUE series for coral trout with additional catch and effort data to track how the stock is tracking

10. FFRAG 5 noted good progress on the higher priority Spanish mackerel stock assessment, progress on developing a preliminary coral trout stock assessment, progress towards considering take outside of the commercial fishery (with a project funded) and some progress towards development of a harvest strategy. FFRAG noted gaps in research planning included no projects to consider the identified research needs of Management Strategy Evaluation testing and Spanish mackerel stock structure and life history.

11. For the present 2020/21 cycle The AFMA research budget was set at $411,000 for the 2020-21 financial year, however $365,268 was already been committed to multi-year projects (**Attachment C**), which were supported for funding by the TSSAC previously. This left **$45,732** for spending on priority, tactical research projects in 2020/21.

12. The TSSAC called for research applications to address three tactical research needs that could be addressed by projects for funding in the 2020/21 financial year on 9 December 2019, with applications due on 3 February 2020. Three projects were included in the call for research for 2020-21:
    a. Determining weight conversion ratios for curryfish species *Stichopus herrmani* and *S. vastus*.
    b. Torres Strait Finfish Fishery Coral Trout Catch Per Unit Effort Standardisation.
    c. Torres Strait Finfish Fishery Biological Sampling.

13. One pre-proposal application was received for each project, and the TSSAC reviewed the three pre-proposals at its teleconference on 11 March 2020. The TSSAC decided not to support the coral trout catch per unit effort standardization project at this time, noting the budget was higher than anticipated and with the available budget, funding other projects were considered a higher priority in the finfish fishery such as expanding the sampling program to include coral trout. The TSSAC invited full proposals for the other two projects.

Biological sampling – status as of September 2020

14. At FFRAG 5 (date) the RAG supported extending the biological sampling program for Spanish mackerel for ideally another three cycles in addition to the first and second rounds that have been funded (five cycles total). If this were to be funded it would mean sampling would be conducted in 2019, 2020, 2021, 2022 and 2023 fishing seasons to support the stock assessments and would assist stakeholders in understanding the structure of the stock over time, especially changes in recruitment.

15. The biological sampling project "*Torres Strait Finfish Fishery: Coral Trout and Spanish Mackerel Biological Sampling"*. The final project proposal for 2020-21 will have a total budget of $121,700 (with $46,000 from the TSSAC budget and a contribution of $75,700 from TSRA). The project will continue Spanish mackerel sampling and expand the

program to begin sampling catches of coral trout species, conducting species identification, measuring lengths and ageing and sexing common coral trout. Otoliths will be extracted from other coral trout species and stored but ageing these species is out of scope for the project. Should the project be recommended by the RAG and TSSAC for funding beyond 2020-21 it is anticipated that the proposed budget would remain around $120k per year.

Harvest strategy and MSE testing – status as of September 2020

16. The previously funded project "*Developing Harvest Strategies for the Torres Strait Finfish Fishery"* concluded in 2019 and, though it aided the fishery in progressing mackerel and trout stock assessments, was not able to deliver a complete harvest strategy framework. It is likely that this project will require further work to complete the components of the Spanish mackerel sub-fishery Strategy and to develop a Strategy to support management of coral trout. **Attachment D** (below) outlines a summary of status of harvest strategy components developed through the project (as reported at FFRAG 5). The RAG may wish to provide advice on a tactical project to complete development of the Fishery harvest strategy and potentially included MSE testing of different scenarios.

Torres Strait Spanish mackerel stock assessment with appraisal of environmental drivers – status as of September 2020

17. The Spanish mackerel stock assessment project has been funded by TSSAC ($89k provided) to update the assessment in 2019 (complete) and 2020 (in progress) along with an appraisal of environmental drivers that could be influencing harvests, the catch rate series and recruitment in the fishery. The TSSAC budget allocated for each of these two assessment updates was approximately $45k per year. It is anticipated that the required budget for future iterations of this assessment may be lower without the requirement for additional work on environmental driver analysis.

ATTACHMENTS

Attachment A: Draft 2019 Five year research plan 2019-2023, Torres Strait Finfish Fishery,

Attachment B: Excerpt of FFRAG 5 meeting record on research planning and Five Year Fishery Research Plan

Attachment C: TSSAC funds committed to multi-year projects 2020-21 and beyond.

Attachment D: Summary table and status of components developed through the Harvest Strategy project as reported at FFRAG 5 (October 2019).

Attachment E: Overview of TSSAC general process, research themes, and background to rolling five year research plans.

Attachment A. 2019 Torres Strait Finfish Fishery five year research plan (2018 to 2023) put to TSSAC ahead of 2019-20 funding round.

Proposed Project	Objectives and component tasks	Year project to be carried out and indicative cost*					Notes on project timings	Other funding bodies[1]	Evaluation		
		2018/19	2019/20	2020/21	2021/22	2022/23			Priority essential /desirable	Priority ranking (1-5)	Theme
Finalisation of Harvest Strategy	Finfish Harvest Strategy (Project No. 2016/0824) currently funded. Final HS draft expected by EOFY 2018/19.	$44,719 (for final Harvest Strategy)					HS Project established in 2016/17.		Essential	1	1a
Management Strategy Evaluation (MSE) of draft harvest strategy	Requirements of Cwth HS Policy and Guidelines to undertake MSE prior to implementation.	MSE – requires funding.	MSE work - requires funding. Advice pending.						Essential	1	1a
Stock assessments	Need for ongoing assessment of key commercial species.	Advice pending and HS will inform frequency. Maximum is yearly. Funding is required.							Desirable	2	
Age and length data sampling program	Develop costed options for the collection of age and length data for Spanish mackerel to support present and future stock assessments.	Not costed – advice pending.							Desirable	2	1a
Stock structure of Spanish mackerel.	Define the spatial scale of management and connectivity of Torres Strait populations of SM with adjacent areas (Gulf, Qld, Coral Sea, PNG) potentially through collection of samples for genetic relatedness.	Not costed – advice pending.							Desirable	2	1a, 1b
Ecological Risk Assessment (ERA)	All Torres Strait fisheries to be put through Ecological Risk Management framework over the next three financial years.		ERA due 2019/20. $20,400 allocated.					AFMA	Desirable	3	1a
Estimating catches outside the commercial fishery.	Current project: Monitoring the traditional take of finfish in the TSPZ (RR2015/0823) Project is under review. May require a revised project plan and or/tender.	~$140k budget remaining.	Future work on this project is pending advice.				Project established 2015.	TSRA total funding $199,802 (not from Torres Strait research budget)	Desirable.	3	1a

Attachment B - Excerpt of FFRAG 5 meeting record RE research planning

Five Year Fishery Research Plan

The PZJA Torres Strait Finfish Resource Assessment group **RECOMMEND** that the priority tactical research needs for funding in 2020-21 were:

1. Further biological sampling (ageing and length frequency) for Spanish mackerel. The RAG recommended this data collection ideally occurs for an additional three to four years; and
2. Updating the Standardised CPUE series for coral trout with additional catch and effort data to track how the stock is tracking

In forming their 2019 Fishery Five Year Research Plan, the RAG reviewed their input to the 2018 plan and what identified research priorities were at that time. The RAG noted good progress with funding secured to support development of the Fishery harvest strategy, stock assessments for Spanish mackerel and coral trout, as well as biological sampling and environmental risk assessment for Spanish mackerel. The main gaps identified that had not been progressed since 2018 were Management Strategy Evaluation Testing for the Harvest Strategy (noting AFMA advice that this would be considered based on the outputs from the funded project) and understanding stock structure for Spanish mackerel. The FFRAG noted that a number of points have previously been raised in relation to the Spanish mackerel data and stock assessment (paper fish, hyperstability - Bramble Cay centric data) which were being investigated through the two-year funded project.

Beyond tactical projects for potential funding in the 2020-21 financial year, the RAG has previously considered a range of research needs for the fishery as detailed in **Table 1** below. AFMA advised that these research needs would be translated to the five year research plan and circulated out of session for RAG comment and that the identified tactical research needs (Spanish mackerel biological sampling and coral trout standardised CPUE analysis) would be presented to TSSAC at their late November 2019 meeting to be considered as scopes for 2020-21 research funding.

Table 1: Summary of FFRAG 5 considerations on Finfish Fishery research priorities.

Research	RAG Comments	Priority / How to action
Biological sampling for Spanish mackerel	RAG confirmed the need for biological data collection to support the Spanish mackerel stock assessments, build a time series and aid demonstrating that the stock is building towards the target reference point. RAG recommends three to four additional years of sampling to build a time series to attempt to understand changes in the stock age structure over time i.e. recruitment variation.	High priority data need to address the need to understand the declining catch rate trend (and noting the age of available data) Immediate priority for tactical research funding through TSSAC. **ESSENTIAL**
Biological sampling for coral trout.	Suggested that a future project could expand existing Spanish mackerel collection protocols to collect coral trout frames for ageing, sexing and length frequency analysis and that this would help address the species basket issue by providing firm identification and catch composition data. It was also suggested that the project could include fishers sending in photographs of whole catches of coral trout for catch composition and species identification.	Important to develop an indicator of stock abundance aside from CPUE from the limited number of active sunset sector trout boats. Not recommended as an immediate priority for funding noting Spanish mackerel is the higher priority focus at present given declining biomass.

Examining standardised CPUE for coral trout	Until additional work flagged on the coral trout stock assessment occurs, the only way to understand stock performance (changes in abundance) is to examine standardised CPUE. Examining raw (nominal) CPUE from logbooks will likely provide a false indication of stock performance. Therefore, a small project is required to put new catch and effort data into the standardised catch rate series and report on catch for a standardised unit of fishing effort (accounting for factors like time of day, wind strength, tide, moon-phase etc.).	Important to consider standardised CPUE as an indicator of stock performance and understand stock trends. Considered a relatively simple project with an additional year of CPUE data to be input into the existing standardisation. To be progressed by TSSAC as a high priority tactical research need. **ESSENTIAL**
Management Strategy Evaluation (MSE) testing of the fishery harvest strategy.	Noted that MSE testing is best practice ahead of implementing a harvest strategy to test if the Strategy is achieving the stated objectives for the fishery. AFMA has advised that funding for MSE testing will be dependent on the outputs of the HS Project and whether there is sufficient mechanical decision rules developed for testing. RAG advised that a project could be formed to conduct MSE testing and setup a mechanism to feedback the results from this testing into development, refinement and evaluation of different decision rules.	FFRAG considered that a project could be formed to conduct testing and evaluation/development of decision rules. FFRAG noted that the requirement for this approach would depend on the outcomes of the FFRAG 6 meeting where further consideration of harvest strategy options would occur.
Stock structure and broader ecological understanding of Spanish mackerel.	Testing the assumption of single Torres Strait management unit (single stock) noting most assessment data comes from Bramble Cay. In investigating potential environmental drivers of mackerel abundance, it is important to understand where recruits to the fishery are coming from, the structure within Torres Strait stock as well as level of connectedness with adjacent stocks in other fisheries. It is also important to understand the related ecological factors - what is driving recruitment (spawning success), feeding patterns, where spawning aggregations occur and to use this info to manage the Torre Strait stock e.g. predict where good fishery catch rates might occur, where/when protection may be required.	Noted as scientifically important but not recommended as a priority for the fishery at this stage. Recommended for TSSAC to discuss, progress potentially through FRDC channels as a broader project and look for collaboration with state governments noting other reports of declining Spanish mackerel catch rates across northern Australia.
Shark depredation	Study to investigate increased shark interaction with fishery operations and depredation impacts on Finfish Fishery catch rates (how to capture and track over time, potential mitigation options). RAG noted that this would be a good, broad level project that could investigate a number of fisheries that lose catch to sharks and could be funded by FRDC for example.	Recommended for TSSAC to discuss, progress potentially through FRDC channels as a broader project with further collaboration opportunities for other stakeholders.
Fishery independent survey data	Given the small number of boats supplying fishery dependent data (for mackerel and trout) as indicators and the risk of losing these signals of stock abundance should sunset harvest cease (e.g. reduced TAC resulting in no leasing, break downs, boats leaving the fishery) there is a need for a project to consider options for understanding	General RAG support for consideration of a project to look at alternatives to fishery dependent data though not recommended as an immediate priority for funding/progression given

	Spanish mackerel and coral trout biomass. Suggestion that biological sampling for Spanish mackerel has industry collecting frames from which tissue samples are being taken and stored which might form the basis for an ongoing project to develop and conduct gene-tagging[1] and/or close-kin genetic analysis (c.f. blue-fin tuna) to understand stock dynamics and abundance of mackerel over time. Though noted as expensive, it was also suggested that traditional tagging/recapture may be another valid approach. Additionally, a key input to the east coast coral trout assessment is abundance counts from underwater visual surveys. The Torres Strait assessment model uses values from the east coast model to assume coral trout abundance per hectare per reef habitat type. There is a need for survey work to validate these assumptions for use in Torres Strait stock assessment.	higher priorities for the fishery at this stage. Noted that an underwater visual survey for coral trout would be challenging in Torres Strait but underwater drone technology and baited cameras may help augment the dive survey approach. A future project could be formed to examine the feasibility and design of an approach to achieve an UWVS for coral trout in Torres Strait to prepare for when funding might become available to progress this work (given Spanish mackerel is the focus for research funding for now).
Otolith morphology	Suggested that more cost-effective long-term sampling for Spanish mackerel might be achieved by developing an index of mackerel ages based on the shapes and sizes of otoliths recorded so far. It was considered that development of this technique might mean less time is spent reading each otolith in future but cost would still be incurred in collecting each sample from industry and extracting the otoliths, meaning the return on such an investment may be low.	Not recommended as a priority for progression at this stage based on consideration of costs-benefits.
Optimum ratio B MSY to B MEY for Spanish mackerel	While stakeholders may select a higher future target reference point (e.g. B60) to support good catch rates and stock sharing, noted this will mean a trade-off for a lower RBC as less harvest will occur to keep more fish in the water and less boats will be active in the fishery. RAG supported a desktop study (e.g. applying Pascoe et al.[2] work to the Torres Strait Spanish mackerel stock c.f. QDAF east coast work) to determine the optimum ratio between B MSY and B MEY and the appropriate proxy economic target for the fishery.	General RAG support for this work as a smaller desktop study potentially in-line with future reviews of the harvest strategy. Not recommended for progression as an immediate research priority.

[1] https://www.csiro.au/~/media/OnA/Files/Southern-Bluefin-Tuna-Gene-tagging-factsheet-06-2018.pdf?la=en&hash=A51A86269A01BBDCD74754C74E687D61B48B5301

[2] *Estimating proxy economic Target Reference Points in Data-poor singe-species fisheries,* Pascoe, Thebaud & Vieira, Marine and Coastal Fisheries Dynamics, Management and Ecosystem Science 6:247-259 (2014) http://dx.doi.org/10.1080/19425120.2014.966215

Attachment C – Committed TSSAC funds for multi-year projects 2020-21 and beyond. Orange cells indicate present financial year. Yellow cells indicate where costings are anticipated to support minimum predicted TSFF research funding needs.

Research priority from ARS	Project Title	Total project budget (all years) $	Cost 19/20 $	Cost 20/21 $	Cost 21/22 $	Cost 22/23 $	Cost 23/24 $
1a - Fishery stocks, biology and marine environment.	Fishery independent survey, stock assessment, Harvest Strategy and Recommended Biological Catch calculation for the Torres Strait Tropical Rock Lobster Fishery.	868,142	227,983	319,335	290,824		
1a - Fishery stocks, biology and marine environment.	Spanish mackerel stock assessment.	92,375	46,442	45,933			
1a - Fishery stocks, biology and marine environment.	Torres Strait Finfish Fishery: Coral Trout and Spanish Mackerel Biological Sampling	79,400	79,400	46,000 (46k from TSSAC budget, TSRA 75.7 k)			
1a - Fishery stocks, biology and marine environment.	Climate variability and change relevant to key fisheries resources in the Torres Strait — a scoping study.	45,000	45,000				
1a - Fishery stocks, biology and marine environment.	MSE for the TSPF harvest strategy (direct source)*.	2,500	2,500				

1a - Fishery stocks, biology and marine environment.	Beche-de-mer Environmental Risk Assessment	15,000	15,000				
	Sub-total – Ongoing project commitments for AFMA funding	**1,097,417**	**416,325**	**365,268**	**290,824**		
1a - Fishery stocks, biology and marine environment.	Torres Strait Sea Cucumber Stock Status Survey (note this project is funded by TSRA and will be managed by the TSSAC, but a grant provided by TSRA again).	289,239	207,641	81,598			
2a - Promoting social benefits and economic development in the Torres Strait, including employment opportunities for Traditional Inhabitants.	Measuring non-commercial fishing (indigenous subsistence fishing and recreational fishing) in the Torres Strait in order to improve fisheries management and promote sustainable livelihoods.	40,000	40,000				
	Sub-total grant funding from TSRA	**329,239**	**247,641**	**157,298**			
AFMA funding remaining in 2020-21 and 2021-22 financial year				**46,057**	**120,176**		

Attachment D: ***Status of Spanish mackerel draft harvest strategy components as reported at FFFRAG 5 .***

Guiding principles and key fishery attributes – factors that helped shape the development of the Harvest Strategy	
Recommended	Consistent with the Commonwealth Fisheries Harvest Strategy Policy and Guidelines (HSP, 2018). This is consistent with objectives of the *Torres Strait Fisheries Act 1984* (the Act).
	Have regard for traditional knowledge and the ability of communities to manage fishery resources locally, through acknowledging and incorporating customary and traditional laws, recognising; Malo Ra Gelar, Gudumalulgal Sabe, Maluailgal Sabe, Kulkalgal Sabe.
	Recognise commercial fishing by traditional inhabitants is important for local employment, economic development and for the passing down of traditional knowledge and cultural lore. Enough fish needs to be left in the water for fishers to make money and to protect the traditional way of life, livelihoods and cultural values.
	TACs should vary according to stock status (up and down): • If biomass decreases be cautious. Stock is not to go below the limit; • If biomass is increasing be conservative; 'bank' fish.
	Having regard for the current stock size (B_{31}) and that B_{60} is not quickly achieved (possibly greater than 12 years) without significant reductions in catch which may in turn cause significant economic and social impacts on the Fishery, a shorter-term target reference point is first required.
	Torres Strait Spanish mackerel stock are assumed separate from other regional stocks. They do not mix with the Queensland East Coast and the Gulf of Carpentaria stocks (see Buckworth et al. 2007 and Newman et al. 2009).
	There is potential for variations in availability and abundance of Spanish mackerel, due to their movement, schooling and aggregation patterns for feeding and spawning.
	Spanish mackerel are a shared resource important for subsistence, commercial, traditional, charter and recreational sectors.

Outstanding	None identified at this time. Subject to any further FFRAG and Working Group advice

Operational objectives What we want the harvest strategy to achieve.	
Recommended	Maintain the stock at (on average), or return to, a target biomass point (B_{TARG}) equal to a stock size that aims to protect the traditional way and life and livelihood of traditional inhabitants and is biologically and economically acceptable.
	Maintain stocks above the limit biomass level (B_{LIM}), or an appropriate proxy, at least 90 per cent of the time.
	Reduce fishing levels if a stock is below B_{TARG} but above B_{LIM}.
	Implement rebuilding strategies, if the stock moves below B_{LIM}.
Outstanding	None identified at this time. Subject to any further FFRAG and Working Group advice

Indicators Indicators provide information on the state of the stock and how the stock is doing against agreed reference points (reference points are addressed below and are a specified level of these indicators)	
Recommended	Biomass – Catch and effort data from daily fishing logbooks is used as a proxy for abundance in the stock assessment model which is used to calculate biomass of the stock as a proportion of unfished biomass (B_0).
Outstanding (1)	Fishing mortality (B) based indicators. The stock assessment model can estimate a level of F to move the stock towards the target. There was some consideration from the FFRAG of using an F-based indicator in the harvest strategy. Advice is sought from the FFRAG on whether there is value in further exploring this as an option.

Reference points A reference point is a specified level of an indicator used as a basis for managing a stock or fishery. Reference points will generally be based on indicators of either the total or spawning stock size (biomass) or the amount of harvest (fishing mortality). Reference points show where we want (target) and don't want (limit) the stock levels in the fishery to be.		
Recommended	Unfished biomass (B_0) = B_{1940} = 100%.	The year 1940 is considered the start of the commercial operations in the Fishery. The unfished biomass B0 therefore is the model-estimate of spawning stock biomass in 1940.
	Short-term target (B_{TARG}) reference point = B_{48}	B_{48}[3] is the default target (a proxy for B_{MEY} - biomass at maximum economic yield) in the Commonwealth HS Policy and the project team advise that B48 is less than BMEY.
	Limit reference point (B_{LIM}) = B_{20}	B_{LIM} is the spawning biomass level below which the ecological risk to the stock is unacceptable and the stock is defined as 'overfished'. This is an agreed level which we do not want the stock to fall below. B_{20} is the default limit proxy in the Commonwealth HS Policy[4].
Outstanding (2)	B_{48} is less than B_{MEY}	The HS project team advise the current target of B_{48} is less than B_{MEY}. FFRAG discussion and advice on this calculation is required to ensure a common and clear understanding.
Outstanding (3)	Long term B TARG = B_{60}	Advice from the HS project team and RAG scientific members is sought on the suitability of B60 in comparison to other target biomass levels above B_{MSY} having regard for the biology of the species and performance of the HS in meeting its objectives.

[3] Comm HSP: The target reference point for key commercial fish stocks is the stock biomass required to produce maximum economic yield from the fishery (BMEY). For multispecies fisheries, the biomass target level for individual stocks may vary in order to achieve overall maximum economic yield from the fishery. In cases where stock-specific BMEY is unknown or not estimated, a proxy of 0.48 times the unfished biomass, or 1.2 times the biomass at maximum sustainable yield (BMSY), should be used. Where BMSY is unknown or poorly estimated, a proxy of 0.4 times unfished biomass should be used. Alternative target proxies may be applied provided they can be demonstrated to be compliant with the policy objective.

[4] Comm HSP: All stocks must be maintained above their biomass limit reference point (BLIM) at least 90 per cent of the time. Where information to support selection of a stock-specific limit reference point is not available, a proxy of 0.2 times unfished biomass should be used.

		Stakeholders have recommended that the HS ensures enough fish are left in the water to support commercial fishing but also protect the traditional way of life and livelihoods of traditional inhabitants. Advice to date is that a higher target biomass level (referring to 60%), would increase catch rates and improve profits in the fishery over other lower reference points, such as B_{48}. Having regard for any advice from the HS project team advice is sought however, RAG advice on the suitability of of B_{60} against other possible higher target biomass levels. There are likely to be trade-offs between medium-term returns from the fishery (significantly reduced TAC) and longer-term returns (more fish in the water meaning less cost to catch and therefore higher returns. Also there would be more fish in the water for other users). Quantitative analysis and/or evidence from comparable fisheries is sought to enable more evidence based advice and decision making on the longer-term target.

Decision Rules (*also called Harvest Control Rules*) These rules are designed to maintain and/or return the stock to the target reference point.		
Recommended	If stock falls below the limit reference point (B_{LIM}).	The Fishery is closed (all commercial fishing for Spanish mackerel is to cease) and subject to a rebuilding strategy. The nature of the rebuilding strategy will be determined on the basis of the stock assessment (to be applied immediately) and the rate of recovery (i.e. number of years to achieve a biomass greater than B_{LIM}).
	Re-opening the Fishery[5]	Following closure of the Fishery, the Fishery can only be re-opened when a stock assessment determines the Fishery to be above the biomass limit reference point.
Outstanding (4)	If the stock is above the limit reference point but below the target reference point.	The RBC is to be set at level that allows for the stock to build towards the target. Importantly the decision rule can be designed to build the stock at different rates (e.g. the number of years for the stock to build to the target reference point or the rate of building near the target or limit).

[5] Comm HSP: Once a stock has been rebuilt to above the limit reference point with a reasonable level of certainty, it may be appropriate to recommence targeted fishing in line with its harvest strategy, which will continue to rebuild the stock towards its target reference point.

		An outstanding action has been for the FFRAG to consider scenarios with multiple timeframes to build the stock to reach B_{48}. Specifically to examine a 12 year recovery time (equivalent to 3 times the average age of maturity) and explore 10 and 8 year recovery periods as alternatives. Having regard for any advice from the HS project team, advice is sought from the RAG on appropriate building rates to incorporate into the HS decision rules and/or a work plan for examining options noting scenarios will be examined and presented by the Spanish mackerel stock assessment team (*AFMA funded project 2019/0831*) as part of the next stock assessment update to be presented at the FFRAG planned for 27-28 November 2019.
Outstanding (5)	If stock is overfished (below B_{LIM})	Consistent with the Commonwealth HS policy the FFRAG and FFWG have recommended that commercial fishing for Spanish mackerel should cease if the stock falls below B_{LIM}. Further FFRAG discussion and advice is now sought to consider additional decision rules and actions required to guide rebuilding and to trigger any necessary reviews of the HS, noting the HS should be designed to avoid the stock breaching the limit. FFRAG are to note and discuss the HS policy requirements to be included in the Spanish Mackerel HS if the stock falls below $B_{LIM:}$ a) that targeted commercial fishing for Spanish mackerel will cease, b) a rebuilding strategy will be developed to build the stock above B_{LIM} with a reasonable level of certainty. c) If B_{LIM} is breached while the fishery is operating in line with HS, the HS must be reviewed. FFRAG to provide advice on: a) A process to understand how the stock has rebuilt above B_{LIM} with certainty in the absence of commercial fishing e.g. model projections. b) whether a decision rule with a lower level of fishing pressure would be appropriate if the stock is above but close to B_{LIM}.
Outstanding (6)	Utilisation related Decision Rules (desired	Decision rules have yet not been established for harvest related performance metrics such as future ‘target’ catches or ‘target’ catch rates desired by industry per primary vessel or per TIB dory

	fishing intensity) noting a fishery may have indicators and reference points including spawning stock size (biomass) or the amount of harvest (F or fishing mortality i.e. utilisation of the resource).	day. Given that limited catch and effort data has only recently become available from TIB sector, the HS focus has been on agreeing biomass based reference points and decision rules. Additionally at the last FFRAG/FFWG meeting with regard to considering various longer-term target biomass reference points, industry expressed a strong preference for management to focus on building the biomass back to BTARG in the coming years, before exploring any other scenarios. FFRAG are asked to confirm this approach and consider how future decision rules may incorporate increased growth of the TIB sector.
Outstanding (7)	Precautionary increases to total allowable catches.	Stakeholders recommended that if the stock assessment outcomes suggested increases in the TACs, these increases should only occur slowly through some kind of change limiting rule, noting that an increased TAC would likely not affect the TIB sector with a low present level of utilisation. Stakeholder advised a preference for 'banking' these fish to contribute to the biomass and future catch rates rather than harvesting this extra stock. At the last FFRAG/WG meeting a number of challenges were identified with applying a change limiting rule for possible TAC increases. Instead the RAG/WG placed priority on examining different building rate scenarios which may achieve this desired precautionary outcome. FFRAG are asked to confirm this approach and provide advice on how to progress change-limiting rules if necessary.

Monitoring and assessment cycle	
Recommended	Based on the most recent estimate of the stock status (0.31 times unfished biomass) and declining biomass (and CPUE) trend, a stock assessment should be performed annually until the biomass is estimated to be above B_{40}.

Outstanding (8)	Subject to any further advice from the HS project team, FFRAG advice is sought on: a. An appropriate assessment cycle when the stock is above B_{40} and/or methods for evaluating future assessment cycles. b. Likely data needs to support monitoring stock performance under the Strategy over time, noting that some biological data is to be sampled in 2019 and 2020 as a snapshot to augment our understanding and assessment of the stock but no monitoring program advice has been developed or presented to date. c. Standard procedures for applying the decision rules to the stock assessment outcomes and any other minimum stock assessment scenarios and/or sensitivities that should be examined e.g. to support 2019-20 season TAC setting the FFRAG (meeting 4) used a methodology of selecting the median of a range of plausible stock assessment scenarios to recognise a range of uncertainty.

Table 1. Status of Coral trout draft harvest strategy components.

Guiding principles and key fishery attributes Factors that helped shape the development of the Harvest Strategy	
Recommended	Consistent with the Commonwealth Fisheries Harvest Strategy Policy and Guidelines (HSP, 2018). This is consistent with objectives of the *Torres Strait Fisheries Act 1984* (the Act).
	Have regard for traditional knowledge and the ability of communities to manage fishery resources locally, through acknowledging and incorporating customary and traditional laws, recognising; Malo Ra Gelar, Gudumalulgal Sabe, Maluailgal Sabe, Kulkalgal Sabe.
	Recognise commercial fishing by traditional inhabitants is important for local employment, economic development and for the passing down of traditional knowledge and cultural lore. Enough fish need to be left in the water for fishers to make money and to protect the traditional way of life, livelihoods and cultural values.
	Coral trout are a shared resource important for subsistence, commercial, traditional, charter and recreational sectors.
	TACs in the Torres Strait Finfish Fishery should vary according to stock status (up and down): • If biomass decreases be cautious. Stock is not to go below the limit; • If biomass is increasing be conservative; 'bank' fish.
	Since the 2007 Government funded licence buyback there has been limited effort in the fishery and the available total allowable catch has been under-caught.
	Four coral trout species commercially caught in Torres Strait. These four species (Common, Islander, Passionfruit and Blue-spot) are managed under a 'species group arrangement with a shared total allowable catch. There is a risk of local depletion of any of the four species in the Coral trout 'species group' as the existing assessment model assumes all four species are one stock.
Outstanding	None identified at this time. Subject to any further FFRAG and Working Group advice

Operational objectives What we want the harvest strategy to achieve.	
Recommended	Maintain the stock at current levels given: • the assessment is preliminary meaning it does not supply enough evidence to support changing the TACs without further development and catch data to support it; and • noting the present high estimate of biomass and recent low harvests, industry are supportive of a conservative B_{TARG} for the stock to manage the fishery at a level which leaves more fish in the water than a straight MSY target rate[6].
	Maintain stocks above the limit biomass level (B_{LIM}), or an appropriate proxy, at least 90 per cent of the time.
	Reduce fishing levels if a stock is below B_{TARG} but above B_{LIM}.
	Implement rebuilding strategies, if the stock moves below B_{LIM}.
Outstanding	None identified at this time. Subject to any further FFRAG and Working Group advice.

Indicators Indicators provide information on the state of the stock and how the stock is doing against agreed reference points (reference points are listed below and are a specified level of these indicators)	
Recommended	Biomass – Catch and effort data from daily fishing logbooks is used as a proxy for abundance in the stock assessment model which is used to calculate biomass of the stock as a proportion of unfished biomass (B_0).

Outstanding (9)	The current stock assessment is considered preliminary and as a result, the biomass calculation is not yet relied on as an accurate indicator of abundance or biomass. The FFRAG/FFWG did recommend a CPUE proxy for B80 to be used as a trigger for future stock assessment (see *Monitoring and Assessment* below). Further discussion and advice is sought from the FFRAG on development of these and other indicators.	
Reference points A reference point is a specified level of an indicator used as a basis for managing a stock or fishery. Reference points will generally be based on indicators of either the total or spawning stock size (biomass) or the amount of harvest (fishing mortality). Reference points set out where we want (target) and don't want (limit) the desired stock levels in the fishery to be.		
Recommended	Unfished biomass (B_0) = B_{1950} = 100%.	The year 1950 is considered to be the start of the commercial operations in the Fishery. The unfished biomass B0 therefore is the model-estimate of spawning stock biomass in 1940.
	Target (B_{TARG}) reference point = B_{60}	The target biomass B_{TARG} is the spawning biomass level equal to 60% of B_0 to take account of the fact that the resource is important for the traditional way of life and livelihood of traditional inhabitants, is leased to sunset licence holders and the target biomass level must be biologically and economically acceptable. The current agreed B_{TARG} is based on the assumption that B_{MSY} is 50% of B_0 for this species and B_{TARG} should be set at 1.2 B_{MSY}. Stakeholders were supportive of a target that can take into account the patchiness of the stock (small areas with good trout catch rates separated by large areas of desert), the preliminary nature of the stock assessment, the risk of localised depletion, the basket of four species and that a proportion of the stock is not available.
	Limit reference point (B_{LIM}) = B_{20}	B_{LIM} is the spawning biomass level below which the ecological risk to the stock is unacceptable and the stock is defined as 'overfished'. This is an agreed level which we do not want the stock to fall below. B20 is the default limit proxy in the Commonwealth HS Policy[7].

[7] Comm HSP: All stocks must be maintained above their biomass limit reference point (BLIM) at least 90 per cent of the time. Where information to support selection of a stock-specific limit reference point is not available, a proxy of 0.2 times unfished biomass should be used.

Outstanding (10)	Consideration of alternative approaches to guide decision making in the fishery.	Reference points for coral trout have been agreed though, as per below, additional work is required on development of decision rules to move the stock relative to these points. Given that the initial stock assessment model does not provide a sufficient basis to support formation of decision rules, FFRAG advice is sought on possible alternative approaches for a strategy to guide decision making, for example the FFRAG may want to consider tiered harvest strategies approaches from data-poor fisheries. Such tiered strategies may set out a precautionary base-level (or status quo) position, outline what data are required to progress the fishery and what the next tier may mean for a fishery in terms of improved understanding/decreased risks to the stock and less precautionary catch levels.

Decision rules (also called harvest control rules). These rules are designed to maintain and/or return the stock to the target reference point.		
Recommended	Maintain current TAC until next Stock assessment	There is no current agreed decision rule for setting catch limits. The FFRAG/FFWG meeting recommended that the current constant RBC of 134.9 tonnes be adopted as the interim RBC until the stock assessment is updated. The current preliminary assessment indicates the stock is likely to be greater than 80% of the unfished biomass level. In the future the decision rules would recommend a harvest level (as a recommended biological catch -RBC) on the basis of evaluating the resource status.
	If stock falls below the limit reference point (B_{LIM}).	The Fishery is closed (all commercial fishing to cease) and subject to a rebuilding strategy. The nature of the rebuilding strategy will be determined on the basis of the stock assessment (to be applied immediately) and the rate of recovery (i.e. number of years to achieve a biomass greater than B_{LIM}).
	Re-opening the Fishery[8]	Following closure of the Fishery, the Fishery can only be re-opened when a stock assessment determines the Fishery to be above the biomass limit reference point.

[8] Comm HSP: Once a stock has been rebuilt to above the limit reference point with a reasonable level of certainty, it may be appropriate to recommence targeted fishing in line with its harvest strategy, which will continue to rebuild the stock towards its target reference point.

Outstanding (11)	Maintain current TAC until next Stock assessment	FFRAG are to provide further advice on the operational objective for maintaining the stock at present levels, specifically what an appropriate level of harvest might be to maintain the present impact on the stock, noting: a. while the available TAC has been 134.9 t a maximum of 46 t of harvest has been reported taken per year since the 2007 buyout; b. potential risks to individual species within the species basket (the four different coral trout species) noting the species distribution and catch composition is not well understood which add uncertainty around the biomass estimates; c. there is no absolute certainty as to when additional data will be available to Fishery (improved TIB data, independent dive survey).
Outstanding (12)	If stock falls below B LIM	Consistent with the Commonwealth HS policy the FFRAG and FFWG have recommended that commercial fishing for coral trout should cease if the stock falls below B_{LIM}. Further FFRAG discussion and advice is now sought to consider additional decision rules and actions required to guide rebuilding and to trigger any necessary reviews of the HS, noting the HS should be designed to avoid the stock breaching the limit. FFRAG note and discuss the HS policy requirements to be included in the Spanish Mackerel HS if the stock falls below $B_{LIM:}$ a) that targeted commercial fishing for Spanish mackerel will cease, b) a rebuilding strategy will be developed to build the stock above B_{LIM} with a reasonable level of certainty. c) If B_{LIM} is breached while the fishery is operating in line with HS, the HS must be reviewed. FFRAG to provide advice on: c) A process to understand how the stock has rebuilt above B_{LIM} with certainty in the absence of commercial fishing e.g. model projections. a) whether a decision rule with a lower level of fishing pressure would be appropriate if the stock is above but close to B_{LIM}.

Outstanding (13)	If the stock is above the limit reference point but below the target reference point.	The RBC is to be set at level that allows for the stock to build towards the target. Importantly a decision rule must be designed and agreed to build the stock at different rates (e.g. the number of years for the stock to build to the target reference point or the rate of building near the target or limit). FFRAG are to advise on a process for this decision rule to be developed.
Outstanding (14)	Harvest based decision rules (desired fishing intensity) a fishery may have indicators and reference points including spawning stock size (biomass) or the amount of harvest (F or fishing mortality).	Decision rules have not yet been established for harvest related performance metrics (measuring how the stock is being used) such as future 'target' catches or 'target' catch rates desired by industry per primary vessel or per TIB dory day. The focus so far has been placed on agreeing biomass based reference points and decision rules.
Outstanding (15)	Precautionary increases to total allowable catches.	Stakeholders recommended that if the stock assessment outcomes suggested increases in the TACs, these increases should only occur slowly through some kind of change limiting rule, noting that an increased TAC would likely not affect the TIB sector with a low present level of utilisation. Stakeholder advised a preference for 'banking' these fish to contribute to the biomass and future catch rates rather than harvesting this extra stock. At the last FFRAG/WG meeting a number of challenges were identified with applying a change limiting rule for possible TAC increases. Instead the RAG/WG placed priority on examining different building rate scenarios which may achieve this desired precautionary outcome. FFRAG are asked to confirm this approach and provide advice on how to progress change-limiting rules if necessary
Monitoring and assessment cycle		
Recommended	FFRAG has recommended that a stock assessment should be conducted during the 2021-22 season, once further data is available, ahead of setting catch limits for the 2022-23 season. Postponing the stock assessment for three years would allow enough time for additional data to be included. The additional data priorities identified are:	

	a) the 1994-95 CSIRO fish survey data which may form a valuable baseline datum; b) improved catch and effort data from TIB fishers; and c) fishery independent data such as an underwater survey or biological sampling.
	Trigger reference points (or breakout rules) were recommended for the years between stock assessments. The agreed trigger reference points will use standardised CPUE data as a proxy for biomass and the yearly fishery catch data to ensure the maximum yield of the fishery zones are not being exceeded. The specific trigger points for when an assessment would be undertaken the next season are: a) In line with the recommended target reference point (B TARG = B60) and taking into account the conservative approach preferred by industry, if the biomass of coral trout is less than B_{60} (B TARG) then an integrated stock assessment will be conducted. To determine the biomass level, this trigger will use CPUE data as a proxy for biomass. It was agreed that the average CPUE from 2012 until 2017 (inclusive) would be used as an indicative reference point of the CPUE at B_{80} (average = 120.8 kg per vessel per day) from which the CPUE at B_{60} can be calculated and used as the trigger reference point. Given the ratio of 80:60 is equal to 0.75 then the trigger reference point which would activate the rule that an assessment must be undertaken is: *if the standardised CPUE falls below 90.6 kg per (primary) vessel per day* (computed as 0.75*120.8 = 90.6). b) If the combined yearly total catch of the four coral trout species from both commercial sectors is greater than 90 tonnes. Ninety tonnes was agreed because this 2/3 of the current constant RBC of 134.9 tonnes. If either (a) or (b) above occurs, the stock assessment must be repeated the following year in order to monitor the condition of the stock.
Outstanding (16)	FFRAG to provide advice on likely data needs to support monitoring stock performance under the Strategy over time. The FFRAG advice should also take into account the possible scenario where assessments are able to be funded in accordance with the recommended cycle and/or the additional data recommended to support a further stock assessment are not readily available. FFRAG to provide advice on procedures for interpreting the stock assessment outcomes under HS and how decision rules are to be applied based on these outcomes. While a stock assessment may be triggered through analysis of CPUE data in intervening years between assessment FFRAG advice is sought on what the process should be following this trigger being met and what decision rules should be applied based on the outcomes of this stock assessment i.e. whether the TAC should be changed to reflect this suggested change in biomass.

18. The Torres Strait Scientific Advisory Committee operates under a Five Year Strategic Research Plan. The SRP is the overarching document providing the TSSAC's strategic themes which guide priority setting for research in the Torres Strait fisheries over a five year period. The document identifies three research themes, and under these, strategies and possible research activities against these themes. The document also provides guidance to researchers on research application development and the TSSAC and PZJA forums in assessing applications through the assessment criteria in the SRPs appendices. The SRP was finalised by the TSSAC in mid-July 2018.

19. The TSSAC requires each fishery to develop a five year fisheries research plan, which fits into the themes identified in this SRP.

Torres Strait Fisheries Strategic Research Plan 2018-2023

20. The SRP specifies the research priorities and strategies that the PZJA intend to pursue in Torres Strait fisheries, and provides background to the processes used to call for, and assess, research proposals. The research priorities can be broad, covering all topics within the SRP, some of which may be funded by AFMA, and some of which may require funding from other funding bodies.

21. There are three research themes within the SRP, under which the FRAG could identify research priorities for the Finfish Fishery (see below). There are several strategies under each theme and suggested ideas to help the FRAG to form ideas about the sorts of projects which may go under these themes and strategies.

Rolling Five Year Fishery Research Plans

22. In the past, fishery specific research planning was undertaken through fishery specific research priorities being included in the SRP and each Torres Strait fishery completing a list of annual research priorities, which fed into the TSSAC annual research statement. This process has now been simplified by combining individual fishery planning into one rolling five year research plan per fishery. The plans are written by the relevant Torres Strait forum (Working group, MAC or RAG) based on the themes and strategies identified in the 5 year SRP. These plans are then used by AFMA and the TSSAC to create an annual research statement (ARS), listing annual priorities for Torres Strait research across all fisheries. The new plan should simplify this process.

23. The rolling five year research plans will be updated annually, thus always having a five year projection for research. It is possible that these plans will not be finalised in time for the development of the TSSAC 2020-21 ARS. In this case, fisheries will be asked to submit a one year list of research priorities for 2019-20, and the rolling five year research plan will be applied to the following year (2020-2021 and beyond). Annual schedule for the TSSAC is at listed below.

Torres Strait fisheries strategic research themes, strategies and research activities

Theme 1: Protecting the Torres Strait marine environment for the benefit of Traditional Inhabitants	
Aim: Effective management of fishery stocks based on understanding species and their biology and ecological dependencies so it can support Traditional Inhabitant social and economic needs.	
Strategy 1a - Fishery stocks, biology and marine environment	Possible research activities under this theme may include: a. Stock assessment and fishery harvest strategies for key commercial species. b. Ecological risk assessments and management strategies for fisheries. c. Minimising marine debris in the Torres Strait. d. Addressing the effects of climate change on Torres Strait fisheries through adaptation pathways for management, the fishing industry and communities. e. Incorporating Traditional Ecological Knowledge into fisheries management. f. Methods for estimating traditional and recreational catch to improve fisheries sustainability.
Strategy 1b – Catch sharing with Papua New Guinea	Possible research activities under this theme may include: a. Status of commercial stocks and catches by all sectors within PNG jurisdiction of the TSPZ. b. Good cross-jurisdictional fisheries management through better monitoring and use of technology.
Theme 2: Social and Economic Benefits	
Aim: Increase social and economic benefits to Traditional Inhabitants from Torres Strait Fisheries.	
Strategy 2a - Promoting social benefits and economic development in the Torres Strait, including employment opportunities for Traditional Inhabitants	Possible research activities under this theme may include: a. Models for managing/administering Traditional Inhabitant quota b. Understanding what influences participation in commercial fishing by Traditional Inhabitants. c. Understanding the role and contribution of women in fisheries. d. Capacity building for the governance of industry representative bodies e. Methods for valuing social outcomes for participation in Torres Strait fisheries. f. Identifying opportunities and take-up strategies to increase economic benefits from Torres Strait fisheries.
Theme 3: Technology and Innovation	
Aim: To have policies and technology that promote economic, environmental and social benefits from the fishing sector.	
Strategy 3a – Develop technology to support the management of Torres Strait fisheries.	Possible research activities under this theme may include: a. Electronic reporting and monitoring in the Torres Strait, including for small craft. b. Technologies or systems that support more efficient and effective fisheries management and fishing industry operations.

TSSAC annual research cycle

	TSSAC Process
February	Research providers submit pre-proposals for assessment, which meet the scopes provided by TSSAC in November. EOIs submitted are circulated to fisheries managers/ RAGs & MACs for comment; Fisheries Managers, RAGs/MACs identify any additional research priorities for potential FRDC funding.
March	TSSAC meets via teleconference to assess pre-proposals and Management/RAG/MAC comments. Applicants notified of TSSAC comments on their pre-proposals and asked to develop the consultation package (for review by AFMA by end of March) for use during full proposal development.
April	Researchers to complete full proposal (6 weeks total with consultation period)
May	Late May/ early June. TSSAC meet face to face to review full proposals and endorse final applications, or suggest necessary changes before endorsement. Applicants advised of the TSSAC's final evaluation.
June	
July **(START)**	TSSAC confirm the research budget for the new financial year (it doesn't generally change from year to year - $410 000). New contracts and variations for essential research projects prepared and put in place, confirming forward budgets. RAGs, WGs and MACs to identify THEIR PRIORITY RESEARCH NEEDS for funding in the next financial year by updating their *five year rolling fisheries research plan*. This should be framed around strategies in the 5 year strategic research plan. Provide to TSSAC EO by end August.
August	RAGs/MACs submit their five year rolling fishery research plan to the TSSAC Executive Officer, currently lisa.cocking@afma.gov.au, by end August.
September	TSSAC EO drafts the TSSAC Annual Research Statement (ARS) with each fisheries priorities for the current year.
October	TSSAC meets (face to face or via teleconference) to finalise the PZJA ARS and agree on priorities for the TSSACs call for applications in November. AFMA develop scopes for the priority research projects and send to TSSAC out of session for consideration.
November	The annual research call opens in November. Scopes sent to researchers seeking pre-proposals.

PZJA Torres Strait Finfish Resource Assessment Group	Meeting 7 8 October 2020
OTHER BUSINESS	Agenda Item No. 4.1 FOR NOTING

RECOMMENDATION

1. That the RAG **NOMINATE** any additional items of business for the meeting.

PZJA Torres Strait Finfish Resource Assessment Group	Meeting 7 8 October 2020
NEXT MEETING and MEETING CLOSE	Agenda Item 4.2 For DISCUSSION and ADVICE

RECOMMENDATIONS

Finfish RAG are asked to:

1. **NOTE** that FFRAG 8 is scheduled for **4-5 November 2020** where the RAG will review a stock assessment for Spanish mackerel presented by the project team. Based on this available information the RAG are to form advice on Recommended Biological Catches (RBCs) for the 2021-22 season (**Table 1**).

2. **NOTE** that if additional advice on the Spanish mackerel assessment is required following FFRAG 8 an additional meeting will be held and the FFWG meeting will be postponed. Members will be advised in the second week of November 2020 whether an additional FFRAG meeting will be required.

3. **NOTE** that FFWG is scheduled for **25-25 November 2020** with the key business being considering FFRAG RBC advice and the updated Spanish mackerel stock assessment to form TAC recommendations for the 2021-22 season.

4. **NOTE** closing remarks on the present FFRAG 7 meeting from the Chairperson.

Table 1. Upcoming Torres Strait Finfish Fishery dates: PZJA and advisory group meetings.

Date	Group	Key agenda items
8 October 2020	FFRAG 7 Data meeting	Review data inputs to 2020 Spanish mackerel stock assessments. Research priorities (advice for October 2020 TSSAC meeting).
4-5 November 2020	FFRAG 8	Spanish mackerel stock assessment. RBC advice for 2020-21 season, Spanish mackerel and coral trout.
25-26 November 2020	FFWG	TAC setting advice to PZJA for 2020-21 season.
January 2021 (Date TBC)	PZJA	Decision on 2021-22 season TACs.
1 July 2021 - Torres Strait Finfish Fishery 2021-22 Season Opens		