

PZJA Torres Strait Finfish Resource Assessment Group

Meeting Number 3

19-20 November 2018
Northern Fisheries Centre, Cairns

Meeting Record

Note all meeting papers and records are available on
the PZJA webpage: www.pzja.gov.au



Australian Government
Australian Fisheries Management Authority

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Meeting Participants

Table 1. Attendance and declarations of interest – Finfish RAG Members.

Name	Organisation	Declaration of interest
David Brewer	Independent RAG chair	Runs a fisheries consultancy, which has no current Torres Strait projects or pecuniary interests. Noted that his consultancy may have interests in future Torres Strait research.
Selina Stoute	AFMA	No interests declared.
Tom Roberts	QDAF	No interests declared.
Andrew Trappett	AFMA, RAG EO	No interests declared.
Rocky Stephen – industry member	Kos and Abob Fisheries, Ugar	Councillor for Ugar, President of Kos and Abob Fishers Association. Eastern cluster representative on the PZJA Finfish Working Group. Sit on Prawn MAC and TS SAC. Does not hold a TIB licence.
Allison Runck	TSRA member	No pecuniary interests declared noting that TSRA holds access rights to Torres Strait Finfish Fishery and generates revenue on

Name	Organisation	Declaration of interest
		behalf of Traditional Inhabitants through seasonally leasing access.
Tony Vass	Industry member	No financial interests in the Torres Strait. Does not own or operate a licence in Torres Strait.
Michael O'Neill	QDAF, Science member	Principal scientist for TSSAC recommended project to develop a harvest strategy for the Torres Strait Finfish Fishery. Member of PZJA Finfish Working Group.
Ashley Williams – scientific member	ABARES, JCU	Involved in previous TS research, is an author on the ABARES Fishery Status Reports.
Rik Buckworth	Consultant,	Independant. Fisheries Scientist with Sea Sense Consultancy, adjunct at Charles Darwin University. No pecuniary interest declared. Hoping to secure future research projects.

Meeting observers and declarations of interests registered.

Name	Organisation	Declaration of interest
Yen Loban	TSRA	Chairperson of the TSRA Finfish Quota Management Committee. TIB licence holder. TSRA Member for Muralag.
Trevor Hutton	CSIRO	CSIRO receives research funding. Principal investigator for TSSAC recommended project to develop a harvest strategy for the Torres Strait Finfish Fishery.
George Leigh	QDAF	No interests. QDAF gets external funding and bids for research contracts.
Matthew Holden	UQ Maths Department.	No interests.

Actions tabled

Table 1. Action items tabled at the present Finfish RAG meeting (FRAG 3)

Number	Agenda Item	Action
FRAG 3, Action 1.	3. Harvest Strategy update	HS Project Team are to provide information on performance indicators to inform stakeholders ahead of next RAG/stakeholder meeting e.g. performance figures from recent seasons, kg per operation day etc.
FRAG 3, Action 2.	4. Coral trout assessment	HS Project Team are to work with AFMA on creating a list explaining Torres Strait Coral trout data sources and to examine data.

FRAG 3, Action 3.	4. Coral trout assessment	QDAF, UQ and AFMA to review Coral trout data sources to examine whether there is any duplication with TDB01 docket book data (e.g. JCU island ledgers).
FRAG 3, Action 4.	4. Coral trout assessment	Ash Williams to investigate supplying older ELFSIM MSE dataset to HS Project Team to support Coral trout assessment and HS development.
FRAG 3, Action 5.	4. Coral trout assessment	QDAF, UQ and AFMA to investigate the reported 1995 peak in Coral trout catches (evident in Williams et.al 2007 MSE) (RAG queries whether this was targeted fishing for live trout?)
FRAG 3, Action 6.	4. Coral trout assessment	AFMA to work on characterising trout fisher behaviour - how far do dories travel from the primary boat?
FRAG 3, Action 7.	4. Coral trout assessment	AFMA to report on rationale and timing for ban on live trout fishing in Torres Strait.
FRAG 3, Action 8.	4. Coral trout assessment	RAG and trout assessment team are to consider issue of whether boats targeting live trout have a different effect on the Coral trout model than those boats working fillets.
FRAG 3, Action 9.	4.& 5. stock assessments	AFMA to report to RAG and HS Project Team on when island community freezers have been operational.
FRAG 3, Action 10.	4.& 5. stock assessments	AFMA to check whether TFS01 Daily Fishing Logbook data supplied to QDAF, UQ includes A) dorie driver data field and B) % of each Coral trout species recorded by fishers.
FRAG 3, Action 11.	5. Spanish mackerel assessment	QDAF to run a sensitivity analysis on the Spanish mackerel model using the GBR effort creep assumed figure.
FRAG 3, Action 12.	5. Spanish mackerel assessment	QDAF to examine whether analyses can be performed on individual drivers of dories over time (reliant on data being provide by AFMA) and if this is a useful factor in mackerel model.
FRAG 3, Action 13.	5. Spanish mackerel assessment	QDAF to work with AFMA and Tony Vass on continuing examination of number of boats fishing and CPUE from the pre-buyout period (2002-2005) to see if 'paper-fish' are evident in the data.
FRAG 3, Action 14.	5. Spanish mackerel assessment	AFMA to investigate when the Community Development Program stopped incorporating fishing using TDB01 docket books (fishers being paid by CDP through dockets).
FRAG 3, Action 15.	5. Spanish mackerel assessment	Data meeting to be held at QDAF with RAG technical members to go over Spanish mackerel catch data sources and assessment methodology.
FRAG 3, Action 16.	5. Spanish mackerel assessment	AFMA and QDAF to investigate feasibility and costings for inclusion of greater coverage for Torres Strait in the 2019 state-wide recreational fishing survey.

Agenda Item 1 - Preliminaries

1.1. Welcome and meeting preliminaries

The third meeting of the PZJA Torres Strait Finfish Fishery Resource Assessment Group (FRAG) was opened in prayer by Rocky Stephen at 8:45 am. FRAG Chairperson, David Brewer, acknowledged the traditional owners of the land on which the meeting was held. Mr Kenny Bedford, Industry Member, was noted as an apology. It was noted that Malu Lamar, Registered

Native Title Body Corporate, were invited participants but declined to send an attendee to the meeting.

1.2 Adoption of agenda

The agenda was adopted noting that the Western Line Closure issue had been added by AFMA to the agenda since a draft was circulated.

The RAG Chair presented (**Attachment A**) on procedures for the groups operation and how advice is presented to the PZJA in line with *PZJA Fisheries Management Paper 1*. The presentation also outlined member's roles and responsibilities and a code of conduct for how members were to present advice.

1.3 Declarations of interests

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 (above). In line with the AFMA standard for declaring conflicts of interest in Commonwealth MACs and RAGs to best protect the integrity of advice, members with grouped interests (science, industry etc.) 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).

Industry members

Industry members and observers left the room (Rocky Stephen, Tony Vass, Yen Loban). The RAG noted that while industry members did have direct interests in the fishery they are well placed to provide valuable on-water practical advice. It was noted that industry members and observers can benefit at an individual and/or community level from RAG advice (e.g. RBC advice). However, members have demonstrated a capacity to act in the interest of the Fishery as a whole and that potential and perceived conflicts can be managed during relevant discussions. It was therefore agreed that industry members should participate in all agenda items with declarations of interests to be updated by members and addressed by the RAG throughout the meeting.

Science members

Science members and the Harvest Strategy project team left the room (Dave Brewer, Ash Williams, Rik Buckworth, George Leigh, Trevor Hutton and Michael O'Neill). The RAG considered their declared interests, noting that there was potential conflicts with some researchers likely to tender for future research work. The RAG noted that AFMA was seeking advice from the RAG at this meeting on future research priorities. The RAGs advice would be considered by the Torres Strait Scientific Advisory Committee.

These potential conflicts were weighed against the expected input the members would provide from their subject matter expertise and wide scientific experience base. It was therefore agreed that the scientific members and observers should participate in all agenda items with declarations of interests to be updated by members and addressed by the RAG throughout the meeting.

TSRA member and observer

TSRA member and observers (Allison Runck, Yen Loban) left the room. The RAG noted that TSRA had declared their role in holding finfish entitlements and generating revenue from the leasing of those licences on behalf of Traditional Inhabitants. It was noted that TSRA support fisheries development in the region with a further significant investment in infrastructure underway.

The RAG noted that while TSRA held Finfish Fishery sunset licences and revenue generated from the leasing, these holdings are managed on behalf of traditional inhabitants. It was therefore agreed that the TSRA member and observer should participate in all agenda items with declarations of interests to be updated by members and addressed by the RAG throughout the meeting.

1.4 Actions arising

The RAG noted progress against actions arising from the March 2018 RAG Meeting 2 as outlined on page 8 of the meeting papers provided.

Agenda Item 2 – RAG Updates

2.1 Industry update

The RAG noted the following updates from industry on strategic issues relevant to the fishery:

- Traditional Inhabitant Industry members are expecting an increase in finfish take as infrastructure improves and more community freezers come back into service.
- Good catches of Spanish mackerel have recently been taken from Ugar with good catch rates.
- Industry encouraged AFMA and TSRA to work on getting licences issued to fishers from the 1 July season start date for the 2019 season. AFMA advised that the transfer of some licences was delayed to ensure all obligations under the *Native Title Act 1993* were met.
- Industry responded to a query from AFMA about reports it had received of increasing shark predation on mackerel grounds – industry advice is that shark predation has always been an issue in Torres Strait but the intensity may vary yearly. QDAF and NT fisheries both echo reports from fishers on increasing shark numbers and interactions with commercial fisheries.

2.2.1 AFMA Update

- The RAG noted that changes in the availability of quota in the Queensland east coast fishery might be driving change in demand for Coral trout from Torres Strait this present season.
- The RAG noted tabled updates from AFMA including a short presentation on data returned to date from the Fish Receiver System (Catch Disposal Records, CDRs) since implementation on 1 Dec 2017.
- AFMA advised on reporting improvements within the TIB sector including:
 - 20 fishers holding TIB licences have reported 9.2 t of catches via CDRs in 12 months:
 - 2.5 t mackerel
 - 6.3 t trout
 - 0.354 t other reef-line species
 - 11 fish receivers are active in reporting finfish catches from TIB licence holders.
- The RAG noted the following points:
 - Encouraging levels of catch data reporting to date has come from the Traditional Inhabitant Boat (TIB) sector with over nine tonnes of finfish reported since December 2017 - noting that only hundreds of kilograms have been reported in recent seasons from voluntary docket books.
 - Some reporting has included area fished with improvements to be made:
 - 23 per cent of CDRs returned left 'area fished' blank.
 - 30 per cent of CDRs returned report fishing in area 16 (Darnley Island)
 - 45 per cent of CDRs returned report fishing in area 17 (Cumberland area)
 - 2 per cent of CDRs returned report fishing in area 18 (Seven Reefs area)
 - 61 per cent of TIB sector CDRs received have voluntary effort information (number of fishers, number of days, area fished).

2.2.2 TSRA Update

The RAG noted the following points from TSRA:

- Fisheries Infrastructure project was in progress; with the Erub Community Freezer noted as a priority for upgrade with Mer & Ugar community freezers to follow.

- The TSRA Fisheries Summit nominated a number of new Traditional Inhabitant Members including additional members for the Finfish RAG. These nominations were assessed by AFMA and the members were appointed beginning January 2019.
- TSRA advised that they had closed their scoping project for gillnetting barramundi and jewfish in top-western communities as they were unable to get a scientific permit for the gillnetting component of the study. They would be interested in the RAG considering the risks of gillnetting to the fish stocks in a future RAG meeting.
- TSRA would be seeking advice from the Torres Strait Scientific Advisory Committee at their December meeting on closing the *Traditional Take of Torres Strait Finfish (RR2015/0823)* project noting concerns that the project was not meeting its original objectives.
- The removal of the reef-line Western Line Closure was raised during a recent community visit to Dauan (noting that the closure bisects the community) who were keen to have the closure removed given it bans commercial reef-line fishing in half the waters surrounding their community.

2.2.3 QDAF Update

The RAG noted a number of updates from QDAF including:

- Various working groups (e.g. reef-line) are busy implementing the *Queensland Sustainable Fisheries Strategy*.
- Vessel Monitoring Systems (satellite tracking) are to be rolled-out in a staggered approach across QLD fisheries, beginning 1 January 2019, noting that this will apply to both primaries and tenders.
- A State-wide recreational fishing survey is scheduled for 2019. The RAG requested AFMA to consult with QDAF as to whether the survey design will adequately cover the Torres Strait and if not, whether it could be modified to do so.
- The east coast Coral trout assessment is to be released in early 2019 with substantial revisions to the assessment.
- The east coast Spanish mackerel assessment is being updated with the results indicating the stock is at about 40 per cent of virgin biomass with a projected Total Allowable Catch of 600 to 800 t.

2.3 Native Title Update

- No updates tabled. A Malu Lamar representative was not present.

Agenda Item 3 – Harvest Strategy Project

The RAG noted an update from Harvest Strategy Project Team leader Trevor Hutton, CSIRO on progress on the project to date (**Attachment B**) and that further comments would be taken from the RAG at Agenda Items 3 and 4.

The RAG noted the following points:

- New Traditional Inhabitant industry members joining the RAG from January 2018 will provide an opportunity for further input into harvest strategy development.
- The project team suggest that the next stakeholder meeting should have an independent facilitator/chair.
- There is a need for the project to be clear about the objectives for the fishery set out in the management plan versus the process of developing a harvest strategy.
- There is a need for continued work on defining objectives noting that a number of options are available. It was noted that the expectation of stakeholders was likely to be for stakeholder meetings to be held to obtain input from industry, as per other harvest strategies under development.

- There is still work to do on clarifying the identified data issues with Coral trout (to be further detailed under Agenda Item 4).
- It was noted that a CSIRO project was examining best practices for Management Strategy Evaluation (MSE), which would have relevant outcomes for the fishery.
- RAG noted general information presented by the project team on MSE testing noting that consideration was required on MSE to support the next steps following the development of a draft harvest strategy framework by the present project.

FRAG 3, Action 1.	The harvest strategy project team are to provide information on performance indicators to inform stakeholders ahead of the next RAG/stakeholder meeting e.g. performance figures from recent seasons, such as kilos per operation day.
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Agenda Item 4 – Coral trout preliminary assessment and harvest strategy development.

Coral trout preliminary assessment method

The RAG noted preliminary work performed on building a model of the Torres Strait Coral trout population. The RAG noted a presentation on the available trout data and catch rate standardisation from Dr Matt Holden (University of Queensland) (**Attachment C**) and a presentation on the preliminary habitat modelling from Dr George Leigh (QDAF) (**Attachment D**). The RAG noted advice from Dr Holden that the further work is to be undertaken to resolve issues in the trout data and assessment model.

The RAG recommended a number of actions on the assessment methodology, habitat mapping and initial findings detailed below. The RAG considered that with work the model will be a good starting point in the near term to gauge stock status and may be further developed to incorporate extra information such as survey data and more detailed habitat work as it might become available in future.

RAG advice on the data and stock assessment model:

- Consideration should be given to improving catch reporting on Coral trout, including:
 - reviewing or splitting the *Torres Strait Finfish Fishery Daily Fishing Logbook (TSF01)* into two separate logbooks tailored to either reef-line fishing targeting trout or Spanish mackerel. It was noted that this was the arrangement in the fishery prior to 2003 when fishers used either the old specific *SM02 logbook* for mackerel and the “*Queensland East Coast Line Fin Fish Fisheries Logbook*” (LF series of logbooks LF01 and LF02) for recording reef-line fishing. Information is required from fishers on operation by tender (better understanding the effort portion of CPUE).
 - Improving awareness of spatial patterns in Coral trout fishing (use of onboard monitoring, working with fishers on characterising historic patterns of behaviour, logbook changes and vessel monitoring systems on dories were suggested).
- Further work is required on the historical catch and effort data for analysis including examination of any evidence for ‘paper-fish’ (deliberately inflated catch records post investment warning in 2002).
- Analysis is recommended on AFMA licensing data and older QDAF licensing data to determine variability in number of dories per operation (should be recorded in licensing data) with a boat table to be created to enable a time series to be created that spans both management agencies, noting that the CPUE series presented has two distinct time series that would ideally be merged into one series (QLD managing up to 2000, AFMA post 2000 – noting AFMA took over licensing for the Protected Zone in 2015).
- Further consideration should be given to naivety/social learning (impacting trout catchability) versus a decline in abundance as a factor in examining a decline in trout stocks in general citing concerns with studies on this behaviour from the east coast stocks.

- The RAG had some concern that apparent social learning in Coral trout may be due to other factors such as harvesting excess production of the stock. RAG recommended that older ELFSIM data should be analysed to see whether effects of social learning might be a factor explaining trends in these data.
- The RAG did not recommend survey work to confirm trout-per-hectare as a research priority, based on a cost-for-benefit analysis and the present low levels of fishing effort in the fishery noting low demands for access at present.

Points on the data and assessment model

The RAG noted a number of points on the data and the preliminary assessment:

- Two models of Catch Per Unit Effort (CPUE) are being examined with one model combining the entire Torres Strait plus another model where two highly fished bioregions of the fishery identified by the project team are modelled separately (Zone 3 and Zone 5 – see map below Figure 1).
- Most catch data are from Reporting Zone 5 (Cumberland Passage area) which industry members supported, citing this as an area with convenience of access, good anchorage and good species composition (good catch rates of the preferentially targeted Common Coral trout (*P. leopardus*) in this area.
- Determining the drivers of CPUE trends in the data set is challenging at present.
- The major factors being analysed in the model are ‘region’ and ‘vessel’ effects.
- Fishing for live trout began again in the Torres Strait in 2016/17 after a ban by the PZJA. It was considered that this fishing might have significantly different CPUE than fishing for trout for fillets and may need to be treated separately. AFMA are to report back to the RAG on the rationale for this decision and timings of the ban. The RAG EO shared the executive summary of 2004 research by Bruce Mapstone et al. of east coast live-trout boats (Effects of Line Fishing, ELF) which did not appear to have substantially different fishing behaviours to fillet boats.
- RAG noted that the footprint of the trout fishery was likely to be inaccurate due to poor spatial data on where harvests occurred – noting that the daily fishing log only has catch for the primary boat and location with no details of where and how much each dory fished. It was suggested for AFMA to work with the project team and industry on helping to characterise fisher behaviour e.g. how far do dories fish from the primary vessel.

Points on habitat modelling

The RAG noted that the assessment methodology is based on the Queensland East Coast model where trout abundance per hectare is established through underwater visual surveys. The RAG discussed the method of inferring these habitat derived fish density data to the Torres Strait:

- The abundance of trout species on the east coast is likely due to a habitat effect plus a tidal effect – noting that species composition is likely driven by larval dispersal with tidal flows representing a good predictor for corals and productivity (tides bringing food to sedentary corals).
- Ideally the assumptions of trout per hectare of habitat type would be validated through some form of Torres Strait survey data, with Roland Pitcher’s data being suggested as potentially useful. It was also suggested that some TSRA Land & Sea Unit aerial/remote sensing surveys for coral bleaching could also potentially be useful.
- Noted that wet reef habitat is assumed to extend down to 20m depth although it is known that some of this habitat extends deeper to 50m which may be worked by some trout fishers.
- It will be important to consider the impacts of climate change on trout stocks, noting preliminary impact studies on Torres Strait suggest trout may be at risk.
- It was noted that while the habitat types are inferred from East Coast the underlying hydrography of the Torres Strait may be different e.g. tides and PNG river outflows may alter carrying capacity of coral ecosystems compared to similar reefs on east coast.

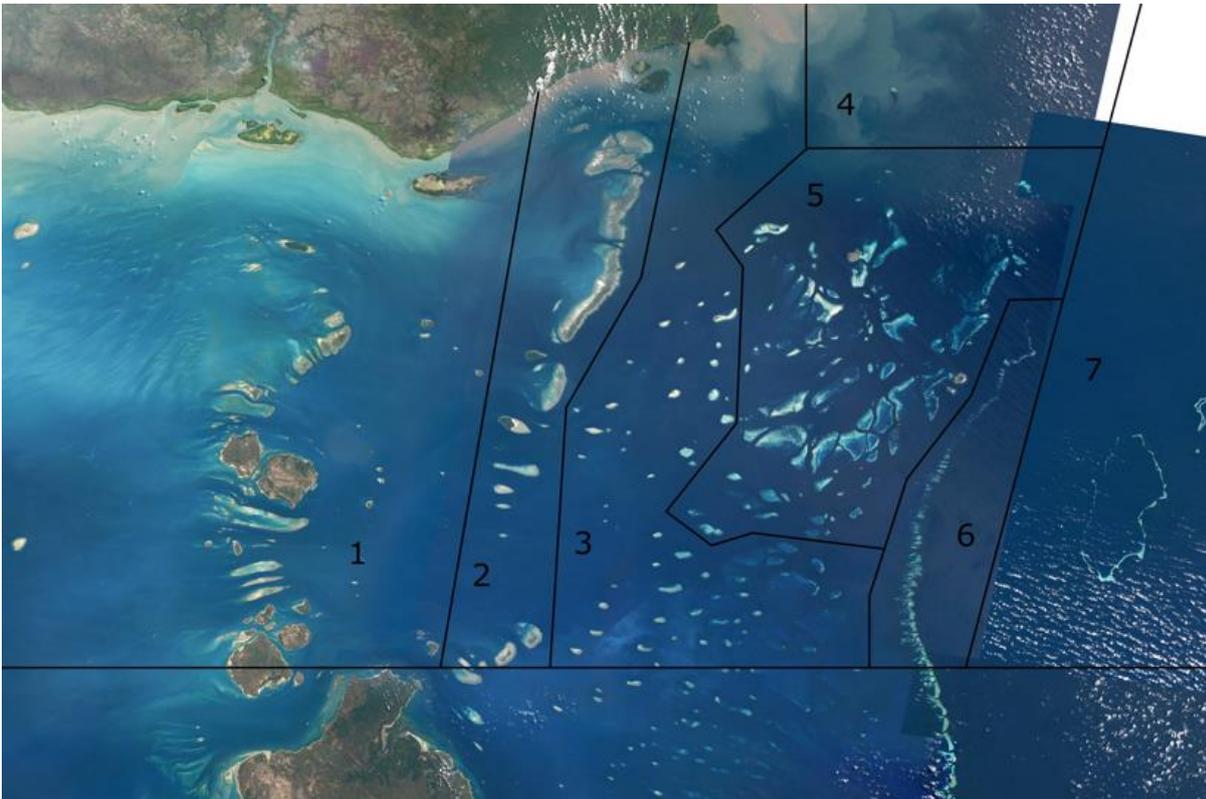


Figure 1. Torres Strait bioregions used in the Coral trout analysis.

Outcomes of preliminary assessment work

The RAG noted the outcomes of work to date on assessing Torres Strait Coral trout stocks- noting caveats and data issues identified for examination:

- Habitat analysis indicates that currently there appears to be no biological problem with the Coral trout stock in Torres Strait.
- Falls in standardised catch rate (CPUE) are apparent in the preliminary data in mid 1990s (TS3 Region) and again in the early 2000s (TS5 Region), which is suggested by the project team to be more closely related to taking out the naivety of Coral trout rather than depleting the population.

The RAG noted the following caveats on the preliminary work:

- The preliminary results presented are from the analysis of habitat and population density only and are not outputs from the population model (but they are an important input).
- The results are subject to uncertainty with the major issue being transferring habitat types and fish densities from the Great Barrier Reef to Torres Strait.
- One possible challenge for assessing the Torres Strait Coral trout assessment is the potential low levels of fishing effort in recent times. In the absence of fishing effort sufficient to impact the status of the stock (therefore creating a contrast between unfished and fished population dynamics), it can be difficult to model future biomass trends under different levels of effort.

List of coral trout action items

<p>FRAG 3, Action 2.</p>	<p>HS Project Team to work with AFMA on creating a list explaining Torres Strait Coral trout data sources and to examine data that underlies the 2001-2005 reference period used to set present catch limit.</p>
<p>FRAG 3, Action 3.</p>	<p>QDAF, UQ and AFMA to review Coral trout data sources to examine whether there is any duplication with TDB01 docket book data (e.g. JCU island ledgers).</p>

FRAG 3, Action 4.	Dr Williams to investigate supplying biological data on Coral trout from older Torres Strait studies. QDAF and UQ are to send Dr Williams specification on what data they require.
FRAG 3, Action 5.	QDAF, UQ and AFMA to investigate the reported 1995 peak in Coral trout catches (evident in <i>Williams et.al 2007 MSE Report</i>) (RAG queries whether this was targeted fishing for live trout?)
FRAG 3, Action 6.	AFMA to work with industry on characterising trout fisher behaviour - how far do dories travel from the primary boat? Number of bombies fished? Variability in hang time?
FRAG 3, Action 7.	AFMA to report on rationale and timing for ban on live trout fishing in Torres Strait.
FRAG 3, Action 8.	RAG and trout assessment team are to consider issue of whether boats targeting live trout have a different effect on the Coral trout model than those boats working fillets.

Coral trout harvest strategy development

The RAG noted the risks associated with using Catch Per Unit Effort as an indicator in developing the trout harvest strategy considering that catch rates may not be a good signal of how the fishery is tracking.

It was considered that the available ELFSIM data (from older 2000's Coral Reef Centre work) and ELFSIM model could help inform the harvest strategy development and may also aid Management Strategy Evaluation work to be performed (noting this is to be a separately funded project in 2019/20).

It was also suggested that the harvest strategy could feasibly have a tiered approach based on additional expansion and survey work, where the fishery starts with a lower level of risk, lower level of catch and lower level of scientific understanding and can progress to a higher tier with additional data such as survey work.

Agenda Item 5 – Spanish mackerel stock assessment and harvest strategy development

The RAG noted a presentation from Dr O'Neill on preliminary work performed on updating the Spanish mackerel stock assessment with additional fishery catch data up to the end of June 2018, estimates of total harvests, catch rates and an estimate of recruitment variation (**Attachment E**).

Key inputs and changes made to the assessment

Total harvests from 2017/18 season used in the assessment update:

- Commercial harvest (TIB) ≈ 2-11 t
- Islander traditional harvest ≈ 10 t
- Leased (sunset licences) commercial harvest (TVH) ≈ 77 t
- Charter ≈ no information; assumed in rec estimate
- Recreational ≈ 2 to 5 t
- Papua New Guinea ≈ 0 t

Previous assessment updates had used a higher value for TIB sector harvests (22 t) during periods of poorer catch data. The assessment is assuming that in recent years TIB commercial harvests have a lower value and varied from 2-11 t. The RAG noted that in recent years only one island community freezer has been operational and requested confirmation of when other freezers were offline. The RAG noted that the new CDR program would provide valuable information on take from this sector of the fishery.

The RAG noted that the last assessment update (2016) was a deterministic model of recruitment and that the update presented now has some estimation of recruitment variation.

The RAG supported the use of a 2 t estimate for recreational take of mackerel – noting the model uses a range of 2 to 5 t recreational take (mean estimate 2 t with standard error meaning maximum value is up to 5 t).

CPUE trends

The initial finding of this assessment update was a decreasing trend in total harvests and catch per unit effort (CPUE) evident in daily fishing logbooks from sunset (non-traditional inhabitant) fishers. It was noted that this matched reports received from fishers that CPUE has been dropping off at Bramble Cay in recent seasons.

The RAG considered that a number of factors might explain this downward trend in CPUE including reporting issues, environmental variability (salinity, turbidity and temperature) effort creep and the past impacts of foreign fishing. Industry advised that the 1996-97 year in the standardised CPUE series appears to coincide with bad PNG droughts and was reportedly a year of low CPUE among fishers.

RAG advice on the assessment update

Prior to accepting the updated stock assessment the RAG recommended a further analysis is to be undertaken and a dedicated data sub-group meeting to be formed to progress some of the issues.

RAG recommendations are:

- QDAF to run a 'matrix' activity examining the interaction between key model variables to examine plausible interactions (via Multi Chain Monte Carlo) analyses:
 - Historical variables (e.g. how fleet make-up has changed over time, foreign fishing impacts)
 - Mortality
 - CPUE
 - Vulnerability
 - Recruitment variation (age data to inform strength of year classes)
 - Catchability
 - Effort creep
- QDAF to work with RAG scientific members to review data being input into the model with a view to expanding and examining the catch rate standardisation to see if different signals might be available. The RAG requested that AFMA organise a data meeting with QDAF, Dr Ashley Williams and Tony Vass to examine and provide further technical advice on the treatment of stock assessment data inputs.
- Examine the effect of effort creep on the model with a suggestion to test this effect using the Queensland East Coast assumed value. Industry noted that use of GPS chart plotters is now common now and have likely improved fishing efficiency overtime. Industry suggest that unlike in the QLD East Coast Fishery, there have been few changes in fishing gear.
- Further examination of harvests from the Traditional Inhabitant Boat sector to examine the time series of when island community freezers were operational.

RAG noted that there is a priority for collection of age and length frequency data which informs critical parts of the mackerel assessment model such as vulnerability assumptions and recruitment signals (strength of year classes). The RAG noted a presentation by the QDAF Long Term Monitoring Program is planned under at Agenda Item 6 and may inform consideration on potential methods to address this need.

Other points discussed

The RAG noted:

- Reports from Rik Buckworth that suggest recent catch rates also appear to be low for mackerel in Northern Territory fisheries.
- Advice from QDAF that catch rates appear to have declined in Queensland East Coast fisheries through 2016 and 2017 seasons.

- It is important for RAG members to always make clear to stakeholders the difference between analyses of catches as either: raw harvest figures, catch rates (raw harvest per hour) and standardised catch rates (that account for other factors).

Spanish mackerel harvest strategy development

The RAG noted additional slides from Dr O'Neill on developing a harvest strategy for Spanish mackerel. The RAG noted some example control rules which were presented to demonstrate how they may function once developed in moving the stock towards its reference point.

The RAG noted industry advice that a stakeholder meeting should be held prior to the next RAG meeting to assist with the development of the harvest strategy development. Particular focus is to be placed on getting stakeholder advice on the operational objectives of the strategy (such as what CPUE or biomass level stakeholders may want) and advice on indicators for how the fishery is performing. It was noted that this consultation between scientists and fishers would also help reinforce the need for strong catch and effort data from communities to support management of their fishery.

RAG advised that it would be important for the harvest strategy development for mackerel to examine and make decisions on treating what proportion of the harvests comes from Bramble Cay, noting that fishing this breeding aggregation was potentially a driver of hyper-stability (should it be occurring). It was advised that drafting the strategy may examine forms of spatial controls on harvests e.g. area triggers or total allowable catches. It was noted that prior characterisation and treatment of TSF01 Daily Fishing Logbook data will be required noting that it contains amounts of unreliable spatial reporting of where catches occurred.

It was noted that the harvest strategy will provide information on how to assess the stock e.g. can a CPUE index be used annually or is the assessment model to be run every year.

Spanish mackerel action items

FRAG 3, Action 9.	AFMA to report to RAG and HS Project Team on when island community freezers have been operational.
FRAG 3, Action 10.	AFMA to check whether TFS01 Daily Fishing Logbook data supplied to QDAF, UQ includes A) dorie driver data field and B) % of each Coral trout species recorded by fishers.
FRAG 3, Action 11.	QDAF to run a sensitivity analysis on the mackerel model using the GBR effort creep assumed figure.
FRAG 3, Action 12.	QDAF to examine whether analyses can be performed on dory driver (reliant on data being provide by AFMA) and if this is a useful factor in mackerel model.
FRAG 3, Action 13.	QDAF to work with AFMA and Tony Vass on continuing examination of number of boats fishing and CPUE from the pre-buyout period (2002-2005) to see if 'paper-fish' are evident in the data.
FRAG 3, Action 14.	AFMA to investigate when the Community Development Program stopped incorporating fishing using TDB01 docket books (fishers being paid by CDP through dockets).
FRAG 3, Action 15.	Data meeting to be held at QDAF with RAG technical members to go over Spanish mackerel catch data sources and assessment methodology.
FRAG 3, Action 16.	AFMA and QDAF to investigate feasibility and costings for expansion in Torres Strait for the 2019 state wide recreational fishing survey.

Agenda Item 6 – Data needs

The RAG noted a presentation from the QDAF Long Term Monitoring Program on the design of their program for collection and analysis of biological data to support their mackerel assessment. The following points were noted:

- The QDAF LTMP has been operating for 20 years and it has taken a long time to build rapport with fishers to get reliable data – this has been the key to a successful monitoring program.
- The program targets multiple avenues to get data including on water sampling, port sampling, drop off freezers.
- To be representative 10 to 15 per cent of the total harvest is sampled (e.g. 22 t sampled of 200 t harvested).
- Strong need that any frames donated for sampling have not been graded (i.e. only large fish or only small fish are donated for scientific study). The sampling must be representative of what the fishery catches.
- QDAF have an industry liaison position (officer) who works with industry to chase up where frames have been caught, ask for samples etc.
- Spatial data is reported to 30 minute level, not to individual reef level.

Agenda Item 7 – Rolling five-year research plan

Due to a lack of available time, the RAG agreed to provide advice out-of-session on the five-year rolling research plan.

Agenda Item 8 – Western Line Closure

Due to a lack of available time, the RAG did not consider this agenda item.

Agenda Item 9 – Other business

RAG members did not request any other items of business.

Agenda Item 10 – Date and venue for the next meeting

The Chairperson closed the meeting and thanked participants for their constructive input, their informative presentations and hard work on the very technical issues discussed. The Chair encouraged the harvest strategy project team to continue to engage RAG members out of session. It was noted that a data meeting would be convened with RAG technical members by AFMA/QDAF out of session prior to Christmas 2018, focussed on examining data inputs for the mackerel assessment. This sub-group meeting will report outcomes back to the RAG.

It was noted that the RAG was building a good base from which to support the next meeting in March 2019 likely on Thursday Island.

LIST OF ATTACHMENTS

Attachment A – RAG Procedures Presentation, Dave Brewer, FRAG Chair.

Attachment B – Harvest Strategy Project Update, Trevor Hutton, CSIRO.

Attachment C – Coral Trout data and preliminary model, Matt Holden, UQ.

Attachment D – Coral Trout Assessment and Habitat Mapping, George Leigh, QDAF.

Attachment E – Spanish mackerel assessment update (preliminary examination), Michael O'Neill, QDAF.