



**Australian Government**

**Australian Fisheries Management Authority**

**Tropical Tuna and Billfish Fisheries  
Resource Assessment Group  
TTRAG 25**

**Meeting Minutes**

**3 and 4 September 2019**

**Mooloolaba**

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# 1 Preliminaries

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## 1.1 Welcome and Apologies

The Chair, Dr Cathy Dichmont, opened the TTRAG 25 meeting at 1pm. The following participants were in attendance at the meeting:

Members	
Dr Cathy Dichmont	Chair
Dr Don Bromhead	AFMA member
Dr Robert Campbell	Scientific member, CSIRO
Mr Pavo Walker	Industry member
Dr Julian Pepperell	Recreational fishing member
Mr Gary Heilmann	Industry member
Mr James Larcombe	Scientific member, ABARES
Mr David Mobsby	Economics member
Dr Ian Knuckey	Scientific member
Invited Participants	
Mr Paul Williams	Industry invited participant
Observers	
Mr Phil Ravanello	Industry representative invited participant (in attendance in place of Mr David Ellis)
Mrs Sara Murphy	AFMA
Dr Jason Hartog	CSIRO (oceanography project PI)
Dr Kylie Scales	University of the Sunshine Coast
Executive Officer	
Ms Amelinda Byrne	AFMA

Apologies were received from Mr David Ellis and Dr Rich Hillary prior to the meeting.

## 1.2 Pecuniary interest declarations

The Chair asked all participants present at the meeting to declare any conflict of interest with the agenda items. Each participant with a declared conflict of interest was then asked to leave the room while the remaining members discussed their individual claims.

The attendees declared their conflict of interests as follows:

Member/ participant	Declared Interests
<b>Dr Cathy Dichmont (Chair)</b>	Has a consulting company, but has no pecuniary interests in the tuna fisheries. <i>No conflict of interest declared.</i>
<b>Dr Don Bromhead</b>	Employee of AFMA, which includes a salary. Is the Manager of the tropical tuna fisheries. No pecuniary interest in tropical tuna fisheries. <i>Declared an interest under agenda item 5.</i>
<b>Ms Amelinda Byrne</b>	Employee of AFMA, which includes a salary. Acting as the Executive Officer for the TTRAG 24, but has no pecuniary interest in Australian tropical tuna fisheries. <i>No conflict of interest declared.</i>
<b>Dr Robert Campbell</b>	Employee of CSIRO, no pecuniary interest in Australian tropical tuna fisheries. Is actively engaged in research on the Eastern and Western Tuna and Billfish Fisheries. PI of the following research project: “ <i>Data management, provision of fishery indicators and implementation of the harvest strategies for Australia’s tropical tuna fisheries</i> ”. <i>Declared interest under Agenda item 5.</i>
<b>Mr Gary Heilmann</b>	Industry member, director of a processing company, no longer holds ETBF boat or quota SFRs. <i>Declared an interest in Agenda item 4.</i>
<b>Dr Ian Knuckey</b>	Has a consulting company with interests in electronic monitoring in the tuna fisheries, and is a member on several other AFMA Committees. <i>Declared an interest in Agenda item 5.</i>
<b>Dr James Larcombe</b>	Employee of ABARES, involved in fisheries research, primarily through engagement with the Western Central Pacific Fisheries Commission. Has no pecuniary interest in the Australian Tropical Tuna Fisheries. <i>Declared an interest in Agenda item 5.</i>
<b>Mrs Sara Murphy</b>	Employee of AFMA, which includes a salary. Participating as an observer for the TTRAG 52, but has no pecuniary interest in Australian tropical tuna fisheries. <i>No conflict of interest declared.</i>
<b>Mr David Mobsby</b>	Employee of ABARES, involved in fisheries research, primarily through the economic survey of the Eastern Tuna and Billfish Fishery. Has no pecuniary interest in the Australian Tropical Tuna Fisheries. <i>Declared an interest in Agenda item 5.2</i>
<b>Kylie Scales</b>	Employee of the University of the Sunshine Coast. Is actively engaged in the ETBF Oceanography research project. <i>Declared an interest in Agenda item 5.</i>
<b>Jason Hartog</b>	Employee of CSIRO. Is actively engaged in the ETBF Oceanography research project. <i>Declared an interest in Agenda item 5.</i>
<b>Dr Julian Pepperell</b>	Independent fisheries consultant and representative of the recreational fishing sector. Is currently undertaking research into game fishing. Is involved in projects including the monitoring of fish landed at game fishing tournaments and pop-up satellite tagging on juvenile Black Marlin.

	<i>Declared an interest in Agenda item 5.</i>
<b>Mr Phil Ravello</b>	Is currently the program manager of the industry association, Tuna Australia. Salary from industry. <i>Declared an interest in Agenda items 4 and 5.</i>
<b>Mr Pavo Walker</b>	Owns several ETBF boat SFRs, and ETBF quota SFRs for all species. Holds a Coral Sea permit and minor line permits. <i>Declared an interest in Agenda item 4.</i>
<b>Mr Paul Williams</b>	Director of a company that holds an ETBF boat SFR, ETBF quota SFRs, and holds a Commonwealth fish receiver's permit. <i>Declared an interest in Agenda item 4.</i>

In all cases where a member, invited participant or observer declared a conflict of interest, the participant left the room. The remaining members unanimously agreed they were permitted to participate in the item of discussion.

The TTRAG noted that the expertise of the members and invited participants present and was critical for full and comprehensive discussions, further noting that the role for the TTRAG was to provide advice and recommendations to other Committees for final decision.

### 1.3 Adoption of Agenda

The TTRAG agreed on the agenda with no further additions.

The agenda was endorsed by TTRAG and the final agenda adopted is provided in Appendix 1.

### 1.4 Acceptance of minutes

TTRAG25 acceptance of TTRAG24 minutes was held over to the morning of the second day of this (TTRAG25) meeting due to the minutes being circulated quite late. On the morning of the second day, there was some discussion regarding the genetics project for further discussions to be held for a way forward for the continuation for the project over the next 12-months or so. This will be further progressed intersessionally with discussions between AFMA and CSIRO. The action item for the recreational project needed to be included in the action items for the next meeting and will be provided to the TTRAG at the March 2020 meeting.

The TTRAG accepted the minutes from the previous meeting without further amendment.

### 1.5 Actions arising

The RAG discussed the action items arising following TTRAG 24 and ongoing action items from previous RAG meetings and commented on the progress on each item (Table 1).

A summary of actions arising from this meeting is included at Appendix 2.

Table 1. Status of actions arising from previous TTRAG meetings.

	Action	Meeting raised	Responsibility	Status as submitted to TTRAG25	Discussion at TTRAG25
1	<b>Estimating Recreational Catch:</b> AFMA to contact NSW fisheries for the charter boat logbook data. Dr Julian Pepperell with contact Danielle Ghosn to see what recreational club data she can provide.	TTRAG 14	AFMA/Dr Julian Pepperell	ONGOING: The member noted that the final report will be due in October.	ONGOING: Dr Pepperell informed TTRAG that this will be finalised by the next meeting, noting that the report for the project will be finalised shortly.
2	<b>Quota zones:</b>  1. AFMA and CSIRO to prepare a paper that includes information from the harvest strategy, stock status information, the CSIRO MSE analysis and connectivity review assess sustainability issues in implementing inshore and offshore quota zones for swordfish.  2. AFMA suggested contacting John Annala from New Zealand Ministry of Primary Industries to see if New Zealand would be interested in supporting the swordfish project and investigate	1. TTRAG 15  2. TTRAG 19  3. TTRAG 19	AFMA/CSIRO	<i>AFMA to discuss further with Tuna Australia. Addressing 2) and 3) is not needed until 1) is addressed</i>  1. ONGOING: This project stalled due to a lack of required funds to undertake the field-based components. AFMA to discuss with FRDC about the flexibility in modes of funding this research. The upcoming project to redevelop the HS will inform consideration of whether a quota zones approach is appropriate.  2. ONGOING: This will remain as ongoing action to contact John Annala from MPI pending industry/AFMA getting FRDC funding for the project.	4. ONGOING: AFMA to discuss further with Tuna Australia if this remains a priority.

	Action	Meeting raised	Responsibility	Status as submitted to TTRAG25	Discussion at TTRAG25
	<p>the potential of New Zealand providing some funding.</p> <p>3. AFMA to follow up with Karen Evans of CSIRO to determine exactly how many swordfish samples would be required from each zone to satisfy an adequate sampling design, for each inshore, offshore and potential western New Zealand. David Ellis to also work with AFMA to assist in sourcing offshore samples and possible funding from the ETBF.</p>			<p>3. ONGOING: Dr Evans is progressing attaining regional swordfish samples.</p>	
3	Dr Robert Campbell to follow up with Simon Hoyle if there is value and if it is practical to conduct the two-stage process for models not tested under Group-A	TTRAG 17	Dr Robert Campbell	ONGOING: No further progress on this item however, Dr Campbell noted the paper on the initial work has now been published.	ONGOING: Dr Campbell noted there was no further action on this item since the last meeting.
4	Dr Campbell to touch base with SPC staff to discuss the inclusion of NSW recreational tagging data in the SPC tagging database.	TTRAG 19	Dr Robert Campbell	ONGOING: Dr Campbell spoke to Peter Williams. The RAG agreed that there should be continuing discussions around license agreements with NSW for potential use by RFMOs (SPC in particular).	ONGOING: No further action form ABARES, however, Dr Campbell informed the TTRAG of discussions with NSW recreational fisheries and received positive

	Action	Meeting raised	Responsibility	Status as submitted to TTRAG25	Discussion at TTRAG25
				The TTRAG agreed that the conversations should continue but should now be now be undertaken and listed as an action for ABARES to progress.	feedback from NSW officers on the value of providing this data to SPC.



	Action	Meeting raised	Responsibility	Status as submitted to TTRAG25	Discussion at TTRAG25
5	<p><b>CPUE analyses:</b></p> <p>1. Dr Campbell to contact ABARES scientists regarding their 'clustering' analyses work to determine if it may provide insights for improving the CPUE analyses (and vice versa).</p>	TTRAG 21  TTRAG 22	Dr Robert Campbell CSIRO ABARES	<p>ONGOING: Dr Campbell has previously held discussions with ABARES with the TTRAG agreeing that this is an ongoing item.</p> <p>The TTRAG also agreed this item will be slightly rewritten to acknowledge staffing changes at ABARES (and has been amended for TTRAG25 accordingly).</p>	ONGOING: This work is still underway.
6	Data Strategy: AFMA to begin a logbook review with industry and Dr Campbell to determine if there should be any amendments in logbook data fields (including those discussed at TTRAG21). AFMA will report progress at the next TTRAG meeting.	TTRAG 21	AFMA industry Dr Campbell	ONGOING: The TTRAG agreed that this is still an ongoing item with work being undertaken internally at AFMA on beginning the process.	ONGOING: The AFMA member noted that this is an ongoing process with internal work underway at AFMA.
7	Size monitoring project: AFMA and Tuna Australia to work together to assess options for the ongoing collection of size data and report back to TTRAG22, including if required, developing a more detailed scope for the annual research statement.	TTRAG 21	AFMA and Tuna Australia	ONGOING: The AFMA member will provide an update to the TTRAG.	COMPLETE: The AFMA member informed the TTRAG of recent approval to continue this project under a co-management arrangement.

	Action	Meeting raised	Responsibility	Status as submitted to TTRAG25	Discussion at TTRAG25
8	<p>Indicators and CPUE standardisation:</p> <ol style="list-style-type: none"> <li>1. Dr Campbell to remove the regional maps that are not relevant for the billfish and tuna species, and a brief explanation of the main proportion percentage in the regions, to make the regions used in each analysis easier for the TTRAG to interpret.</li> <li>2. Dr Campbell to put legend in the map to clearly indicate which regions are for and develop a clear name to identify Region 5 “extension” (e.g. Tasman Region).</li> <li>3. Dr Campbell to include the plots for Region 5 catch by fleet and the CPUE indices for the tropical tuna species.</li> <li>4. Dr Campbell to include the catch data from the area of Region 5 extension to the indicators table. This will be noted by the longitudinal marker.</li> </ol>	TTRAG 22	CSIRO	ONGOING: This section will be discussed under agenda item 3.	COMPLETE: Dr Campbell has addressed all of these actions where it was possible. He noted however, that when aggregating fleet data, there is a loss of much of the data.

	Action	Meeting raised	Responsibility	Status as submitted to TTRAG25	Discussion at TTRAG25
9	Dr Campbell will look to explore potential changes in fishing practices (particularly with the start of set location) associated with the introduction of Marine Parks, and determine potential implications for CPUE standardisations.	TTRAG 23	CSIRO	ONGOING:	ONGOING: The TTRAG noted that there has been some difficulty in obtaining this data in the format needed for analysis by Dr Campbell.
10	AFMA to coordinate and lead development of a discussion paper that provides an initial list of potential economic in-season indicators, including identifying those that are already collected, where other indicators can be sourced, and any associated costs to assist TTRAG in undertaking a step-wise review of the feasibility and cost effectiveness of developing in-season indicators. This to be completed by the September TTRAG meeting.	TTRAG 23	AFMA/TTRAG	ONGOING: David Mobsby has provided a paper to the TTRAG for consideration economic indicators for further discussion under agenda item 3.	COMPLETE: Mr Mobsby provided an economic indicators paper and further discussed under agenda item 4.3.

	Action	Meeting raised	Responsibility	Status as submitted to TTRAG25	Discussion at TTRAG25
11	AFMA to determine how EM are recording heads that are brought up on board and report back to TTRAG with a short discussion paper including data collection options after consultation with AAP.	TTRAG 23	AFMA	<p>ONGOING: This is relevant to determining predated fish. Difficult to determine species but they are recorded as 'tuna – discards'.</p> <p>Determining clean hooks can be done, but this is not determined as economically viable at this stage.</p> <p>The TTRAG would be interested that there would be random video samples kept for a long period as videos are only 6 months. AFMA can look into/review whether it is economically viable to retain records of clean-hooks and will discuss internally whether data retention policies allow AFMA to store clips for longer than 6 months (as requested by TTRAG24).</p>	<p>ONGOING: Previous status comments still apply - This is relevant to determining predated fish. Difficult to determine species but they are recorded as 'tuna – discards'.</p> <p>Determining clean hooks can be done, but this is not determined as economically viable at this stage.</p> <p>The TTRAG would be interested that there would be random video samples kept for a long period as videos are only 6 months. AFMA can look into/review whether it is economically viable to retain records of clean-hooks and will discuss internally whether data retention policies allow AFMA to store clips for longer than 6 months (as requested by TTRAG24).</p>

	Action	Meeting raised	Responsibility	Status as submitted to TTRAG25	Discussion at TTRAG25
12	<p>Electronic logbooks</p> <p>TTRAG to consider whether a research priority is required to address the uncertainty around changes in fishing practices, particularly for monitoring fishing depth.</p> <p>AFMA to seek to include the following data fields into future ETBF e-logs - Vessel log speed (important distinction from vessel speed), Shooter speed, and bubble dropper length.*</p> <p>TTRAG to consider development of TDR based research and/or data collection in the ETBF to better understand and account for (in CPUE analyses) the relationship between fishing strategies (including vessel log speed, shooter speed and dropper lengths etc.) and fishing depth.**</p>	TTRAG 23	AFMA	<p>TTRAG agreed to combine previous items 17, 18 and 20 into one item.</p> <ol style="list-style-type: none"> <li>1. In progress – to be discussed under item 5</li> <li>2. AFMA has been in discussion with the internal licensing area to have these fields included, particularly with the introduction of e-logs. AFMA has notified industry on the mandatory introduction of e-logs by 1 October 2019.</li> <li>3. In progress to be discussed under item 5.</li> </ol>	<ol style="list-style-type: none"> <li>1. COMPLETE: This was further discussed under item 5.</li> <li>2. ONGOING: AFMA have had internal discussions and will continue.</li> <li>3. Ongoing: This is further discussed as part of the research item 5.</li> </ol>
13	<p>ABARES to continue work with SPC staff to discuss the inclusion of NSW recreational tagging data in the SPC tagging database.</p>	TTRAG 24	ABARES	<p>ONGOING: this item was moved from item 7, with ABARES continuing these discussions, rather than Dr Campbell.</p>	<p>ONGOING: This item relates to item 4 and is discussed above.</p>

	Action	Meeting raised	Responsibility	Status as submitted to TTRAG25	Discussion at TTRAG25
14	AFMA to examine VMS data to check and verify sets reported on logbooks as having mainline lengths greater than 100km.	TTRAG 24	AFMA	ONGOING – not yet actioned	ONGOING: AFMA has not had an opportunity since the July meeting to progress, but will look to continue in future to determine whether the data indicating sets over 100km in length are accurate or in error.
15	TTRAG to consider frequency distributions of values for all factors used in CPUE standardisations and provide advice regarding the removal of outliers.	TTRAG 24	TTRAG/ Dr Campbell	ONGOING	ONGOING
16	Dr Campbell to revise Table 5 in the CPUE Standardisations paper to reflect the new size categories, and fix labelling (e.g. YFT-5) to clarify the cluster analyses.	TTRAG 24	Dr Campbell	Ongoing	Ongoing
17	Dr Campbell to present Coral Sea area trends in catches and CPUEs for striped marlin and Swordfish to the September TTRAG meeting	TTRAG 24	Dr Campbell	Ongoing.	COMPLETE: This has been completed for TTRAG25 and will be further discussed under item 4 with Dr Campbell also completing this work across all areas for all species.

	Action	Meeting raised	Responsibility	Status as submitted to TTRAG25	Discussion at TTRAG25
18	<ol style="list-style-type: none"> <li>1. Dr Hillary to include an additional level of effort share being 25% in the operating model.</li> <li>2. Dr Hillary to relabel the HCR plot “limit” to being the “threshold”</li> <li>3. Dr Hillary to present future results to include both the average, the confidence intervals (violin plots) and the individual model runs (the “worms”) similar to the work presented for the Southern Bluefin Tuna management procedure testing. TTRAG also requested that the HCR plot labelling being changed to reflect that the x axis “index” is the CPUE, and the Y axis “HCR response” is the relative TACC change. All of these modifications would help TTRAG members to better understand how the HCR is working.</li> </ol>	TTRAG 24	Dr Hillary	<p><i>These items have been merged as they relate to the HS redevelopment</i></p> <p>ONGOING: these items will be included in the next tranche of work presented to the TTRAG via an intersessional paper (likely November 2019).</p>	ONGOING: Dr Hillary will include these modifications ahead of the intersessional teleconference.
19	AFMA to include SBT catches in the Catchwatch reports alongside the target species for information.	TTRAG 24	AFMA	COMPLETE: SBT has been included in the Catchwatch report as requested by the TTRAG.	Noted as complete
20	AFMA to review the background basis for differing CDR conversion factors used by CSIRO and AFMA.	TTRAG 24	AFMA	ONGOING: AFMA started this review (2018) but has not progressed further, will look to complete by March 2020 TTRAG.	Noted as ongoing – to be presented to March TTRAG

	Action	Meeting raised	Responsibility	Status as submitted to TTRAG25	Discussion at TTRAG25
21	AFMA to clarify whether there is an expectation from the AFMA Commission whether they are expecting to see the completed WTBF indicators from TTRAG at the September Commission meeting.	TTRAG 24	AFMA	COMPLETE: the AFMA Commission will discuss the indicators at the Commission meeting in October.	Noted as complete
22	ABARES (with Dr Ash Williams as lead at IOTC SC) and CSIRO to look at framework with AFMA on the template and populating IOTC information.	TTRAG 24	ABARES AFMA CSIRO	COMPLETE: This will be further discussed under item 4.	Noted as complete
23	AFMA and TTRAG Chair to discuss the most appropriate avenue to address the transition for Dr Campbell. Dr Knuckey to also send AFMA details on how similar situations have been handled, based on his prior experiences.	TTRAG 24	AFMA TTRAG Chair	ONGOING Discussions are ongoing with this item and will be progressed intersessionally ahead of the March 2020 TTRAG meeting.	Noted as ongoing. Discussions between CSIRO and AFMA are underway and AFMA will seek input from Dr Knuckey in the intersessional period.



	Action	Meeting raised	Responsibility	Status as submitted to TTRAG25	Discussion at TTRAG25
24	CSIRO and AFMA to discuss and secure extension of the ETBF stock structure project including relevant funding components (in particular salary time) to ensure collection and analyses of year-2 swordfish samples from AU and NZ.	TTRAG 24	AFMA	ONGOING AFMA and CSIRO are discussing extending this project.	Noted as ongoing. AFMA is working with CSIRO to try a secure a project extension and get agreement on funding for the extension work. ABARES noted that there will be samples sourced from the Cook Islands and this will hopefully provide some clarity on connectivity with the north eastern assessment area.

**Table 2. Status of annual action items**

	Action	Next Discussion	Responsibility	Status as submitted to TTRAG 25	Discussion at TTRAG25
1	Review, update and input TTRAGs suggestions into the fishery events spreadsheets	TTRAG 24 – July 2019	AFMA to prepare updated draft	ONGOING: AFMA to input RAGs suggestions as they occur for the July TTRAG meetings.	Noted

## 1.6 Out of session correspondence

The TTRAG noted the out of session correspondence between the TTRAG 24 and TTRAG 25 meetings with no further correspondence added to the list.

## 2 Review of fishery performance

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### 2.1 Catchwatch report

The Catchwatch report was presented to the TTRAG by the AFMA member, noting a couple of key statistics. The AFMA member went through the cumulative catch by target species noting that the last report was viewed by the TTRAG in July and trends are largely the same and continued. Catches for bigeye and swordfish and striped marlin remain low. Yellowfin catches were around average as were Albacore Tuna.

The AFMA member also presented new data in the report on SBT catches. TTRAG asked that AFMA include a monthly cumulative effort plot in the Catch Watch reports in future.

**ACTION ITEM 1** – Include an effort plot in a comparison to catch rates to fully reflect whether effort has gone down alongside catches. Including adding a cumulative plot for SBT by month.

### 2.2 Current catches and effort in the domestic fishery

The TTRAG industry members (including recreational members) provided updates of the current catches and conditions in the fishery.

An industry member noted that the oceanographic conditions have been unusual this year as there is normally a strong increase in albacore catches and bigeye have not been appearing in the fishery as usual. The higher catch period for Rays Bream season usually appears around May/June but is only just starting to appear now. He noted that the usual mid-year appearance of albacore did not occur, and is hoping that the usual October downturn of the albacore season doesn't occur. Bait prices (particularly squid) remain very high and are affecting the catches of swordfish. There was discussion regarding the American pole and line fleet catching high numbers of small Albacore off the west coast of New Zealand. On the positive side, recent yellowfin abundance off Mooloolaba has been the highest it's been in a number of years. The industry members overview was supported by an industry invited participant.

A scientific member noted that the monthly Catch Watch plot of swordfish catches could be affected by the targeting practices of the fleets. Industry agreed that this could be a reason, as well as the eddy systems not occurring across the north-east coast as usual.

Another industry member noted that the past couple of years have seen lower catches in the fishery with early catches in the fishery (particularly bigeye) appearing in the first quarter, has dissipated. He noted the weather systems have been unusual with oceanographic conditions, including the cyclones that occurred earlier this year, affecting the current systems with the east Australian current 'blocked' for a time appearing earlier this year. TTRAG members asked whether there is an intention to still have a member appointed from the south coast, with the AFMA member noting that work is being done in collaboration with Tuna Australia to identify a candidate.

The recreational fishery scientific member noted that there hasn't been much time since the last meeting, and it is usually the quieter game fishing season, however, yellowfin catches have been

higher with large fish being caught. The SBT season catches were lower on the east coast than usual, with catches off Sydney only occurring for a short time. The Mako shark tournament that usually catches and tag/releases on average over 100 sharks, only tagged 2 Makos, 2 tiger sharks and a blue shark. Western Australia has experienced a very good sailfish season. There have been a number of charter boats going to Fraser Island, with a number of Blue Marlin caught and released, which is unusual that far south. Swordfish catches have also been fairly low this year and whether this is availability, or whether there is no effort (as the rush and popularity for swordfish is over) on the south coast as SBT comes into the fishery.

## 3 Meeting updates

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### 3.1 Outcomes from the AFMA Commission meeting

The AFMA member briefly noted the most recent AFMA Commission meeting, held in Canberra on 23 July 2019. This meeting consisted of a full-day meeting on 23 July, but due to a number of new Commissioners attending their first meeting, an 'introductory' day for issues and processes were held the day ahead of the meeting. There were no substantive issues discussed by the Commission of relevance to the tropical tuna fisheries.

### 3.2 Update from the 15th session of the WCPFC Scientific Committee

Dr Larcombe and Dr Campbell provided an overview of key papers, discussions and outcomes from the recent 15<sup>th</sup> Session of the WCPFC Scientific Committee, held in Pohnpei, FSM in August 2019. The key issues covered included the following:

#### WCPFC Fishery Catch and Economic Statistics Update

2018 overall provisional statistics for the WCPO tuna fishery show the total catch of 2,716,396 t, to be the second highest on record and 55% of the global tuna catch. The skipjack catch of 1,795,048 t was the fifth highest, Yellowfin (666,971 t) was the second highest, Bigeye was below the 10 year average and South Pacific Albacore (65949 t) was 14% lower than 2017.

Industry asked if there were limits on skipjack catches in the purse seine fishery with scientific members explaining that catch is limited by the allowed fishing days under the Vessel Day Scheme, with participants in that scheme limited from fishing in high seas pockets.

Dr Larcombe noted recent increases in the total delivered value of the catch and that economic performance of the purse seine fishery in positive but has declined in both the tropical and southern longline fisheries recently (after an improvement in southern longline conditions between 2013 and 2017).

#### Skipjack Tuna Stock Assessment

Dr Larcombe described the new Skipjack Tuna assessment with a new 8 region model and updated model inputs. Purse seine associated catch increased in 2018. The key outcomes were that Skipjack are not overfished or subject to overfishing with median spawning biomass depletion at ( $SB_{\text{recent}}/SB_{F=0}$ ) was 44% with a probable range of 37 to 53% (80% probability interval) and median recent fishing mortality ( $F_{\text{recent}}/F_{\text{MSY}}$ ) was 0.45 with a probable range of 0.34 to 0.60. However he noted fishing mortality has continued to increase year on year for almost five decades.

The AFMA member asked what had caused the very steep jump in fishing mortality around 2008/09. Dr Larcombe was uncertain but indicated it may relate to a poor recruitment.

## Striped Marlin Stock Assessment

Dr Larcombe described the new 4 region South-West Pacific Striped Marlin assessment with a new geostatistical CPUE method for the Japanese and Chinese Taipei fleets and updated information on maturity and alternative growth models. Overall catch has declined since the late 1990s mainly due to declines in Japanese catches and then later Australian and New Zealand catches. The decline in Japanese catch may relate to the reduction in that fleet generally due to economic factors and increased focus on SBT fishing in the southern area. TTRAG queried the New Zealand longline catch map, asking why NZ LL catch was represented when their longline vessels are not allowed to retain striped marlin. TTRAG noted that recreational catches used may assume zero discarding. The longevity of the species still needs to be clarified. The weighting on the size data may be causing data conflicts in the analysis.

The key outcomes were that Striped Marlin are:

- are **likely overfished** (median recent spawning biomass depletion ( $SB_{\text{recent}}/SB_{F=0}$ ) was 19.8% with a probable range of 9 to 46%), and
- **close to undergoing overfishing** according to MSY-based reference points (median recent fishing mortality ( $F_{\text{recent}}/F_{\text{MSY}}$ ) was 0.911 with a probable range of 0.31 to 1.89).

He noted the very high level of uncertainty around the results due to a lack of information about which parameter values might deserve higher weighting and that the status of the stock is more pessimistic compared to the previous assessment. However he also noted that the biomass depletion level appears to have stabilised over the last decade and possibly increased in the most recent years with a simultaneous substantial decline in fishing mortality

Dr Larcombe noted that SC15 recommended that WCPFC16 consider measures to reduce the overall catch of this stock, including through the expansion of the geographical scope of CMM 2006-04, in order to cover the distribution range of the stock, and that there is some additional projection work yet to be done.

- **Oceanic Whitetip Shark Stock Assessment**

Dr Larcombe described the new Oceanic Whitetip Shark assessment which now included discard mortality scenarios in the historical catches that seek to reflect the impacts of the no-retention CMM on stock status and also included updated growth and fecundity profiles. The key outcomes were that oceanic whitetip remain overfished (median recent spawning biomass depletion ( $SB_{\text{recent}}/SB_0$ ) was 4% with a probable range of 0.03 to 0.05) and overfishing is occurring. However, recent fishing mortality is estimated to have declined and spawning biomass stabilised.

He noted that post release mortality studies conducted show that about 44% of released sharks survive and scenarios for this are included in the assessment runs. The depletion continues to fall and stabilises (at a very low level) after the no retention ban came into effect in 2013. Flim is used in the ERA and some of the sensitivity shown on the plots on p38 are between Flim and Fcrash

He noted that this is a data rich assessment and the SC tested whether data poor assessments would work okay still and give fairly accurate results.

The SC recommended:

- Few if any major fisheries targeting oceanic whitetip. The greatest impact on the stock is attributed to bycatch from the longline fisheries.
- Noting no-retention measure, further efforts to mitigate catch and improve handling and release practices [such as leaving the shark in the water and cutting off the line at the

mouth] have been shown to reduce mortality and are required to further reduce fishing mortality and improve stock status.

### **Tropical Tuna CMM effectiveness**

Dr Larcombe noted that the 'Tropical Tuna Measure' (CMM 2018-01) is the primary management tool for controlling catch and effort within WCPFC and is focussed in skipjack, bigeye and yellowfin and has objectives for each these stocks. It imposes effort limits for purse seine and catch limits for longline. The Scientific Committee assesses its likely effectiveness each year under 2013-15 average conditions, optimistic and pessimistic conditions. Bigeye tuna projection results under the measure are strongly influenced by the assumed future recruitment levels and the time period of the projections, with the stock predicted to be at or above recent levels if recent recruitment is maintained but to decline if recruitment returns to long-term averages. For yellowfin and skipjack, long-term recruitment patterns were assumed to hold into the future, with Yellowfin depletion to increase under pessimistic catch scenarios.

### **Harvest Strategy update - Target Reference points for Yellowfin and Bigeye Tuna**

Dr Larcombe noted that WCPFC are due to agree TRPs for Yellowfin and Bigeye Tuna in 2019 and that SC15 reviewed information on minimum level of a TRP for each species that avoids breaching the agreed limit reference point (LRP) with a specified level of probability:

- For yellowfin, a 5% risk equates to a minimum TRP of 34%, a 10% risk equates to a minimum TRP of 32%.
- For bigeye, the results a highly dependant the future recruitment scenario:
  - "recent recruitment", a 5% risk equates to a minimum TRP of 33%, a 10% risk equates to a minimum TRP of 30%.
  - "long term recruitment", a 5% risk equates to a minimum TRP of 38%, a 10% risk equates to a minimum TRP of 34%.

He noted that the tropical tuna measure contains an "objective" to maintain yellowfin and bigeye at or above their average biomass in 2012-15 ( $SB_{2012-15}/SB_{F=0}$ ). This equates to around 33% for YFT and 36% for BET.

Finally, Dr Larcombe noted that:

- the Skipjack tuna interim TRP is up for review this year and is likely to be adjusted to reference a particular year(s) rather than a specific depletions level (currently 50%).
- The South Pacific Albacore interim TRP was previously agreed at 56%  $SB_{F=0}$  <sup>1</sup> to be achieved within a timeframe of no more than 20 years.

### **Harvest Strategy update - Catch Trajectories to achieve Albacore Tuna TRP**

Dr Larcombe described work undertaken by SPC to look at alternative catch trajectories that achieve the SP Albacore TRP within the 20 year timeframe. He noted that the target can be achieved through many different approaches however, catch (and effort) reductions from the 2014–16 average (of ~60,000 t) are required under all scenarios, and the resulting stock trajectories have different consequences for the associated fisheries. Albacore is currently around 52% depletion but the projections that there will be a downturn in biomass from around 2022 regardless of the recruitment coming in.

## Harvest Strategy update - MSE testing of HCRs for Skipjack and Albacore

Dr Larcombe briefly described MSE testing of harvest control rules for Skipjack and SP Albacore. Skipjack tuna MSE work is the most advanced in terms of progress in testing of candidate harvest control rules. For Albacore tuna, progress is being made on the development of the CPUE 'estimator' that drives the harvest control rule.

## Harvest Strategy update – Multispecies issues

Dr Larcombe noted that the main target species in the WCPO are caught by an overlapping mix of fisheries, and that an important consideration when developing harvest strategies is how to account for mixed fishery interactions. Towards this end, SC15 reviewed two potential approaches for modeling mixed fisheries in the WCPO harvest strategy evaluations.

- fully integrated multispecies approach
- single species/hierarchical approach

Noting the challenges in developing a fully integrated multispecies-based operating model, SC15 endorsed the use of a "hierarchical approach" based on single species operating models and single species harvest strategies.

However Dr Larcombe noted that there is more work to do on this, particularly around understanding the implications for the current structure proposed which may leave Yellowfin without a harvest strategy. This could carry significant risk for the yellowfin stock.

## Sharks

Dr Larcombe noted that there are now more robust estimates of post-release mortality within the longline fisheries and the shark handling and release factors that influence this mortality. There is good evidence that releasing a shark by leaving it in the water and cutting the line to minimise the trailing line length results in a significant reduction in post release mortality. SC15 recommended that:

- When the safe release guidelines are next updated they should properly reflect these findings and subsequent research on post release mortality mitigation.
- Analysis to explore and quantify the impact of different combinations of gear, mitigation and handling practices on fishing related mortality be updated.

## Seabirds

Dr Larcombe noted the new WCPFC study estimates the mortalities of seabirds in WCPFC longline and purse seine fisheries at 13,000 to 19,000 individuals per year during 2015 to 2018. Longline fisheries south of 30S accounted for approximately one-quarter of mortalities, with concern over the hotspot of seabird mortality east of Tasmania which accounted for around 60% of the longline seabird bycatch south of 30S and 15% of the total seabird bycatch in the WCPFC-CA.

## 4 Fishery Indicators

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At the start of this agenda item, TTRAG noted there were four key ETBF papers to discuss, being:

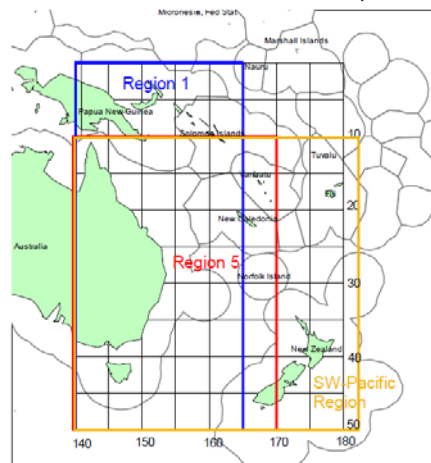
- Agenda item 4.1 – *Annual catch by fleet and fishing method within the South West Pacific – 2019 Update* (Dr Rob Campbell, CSIRO)

- Agenda item 4.2 – *Area-specific standardised CPUE indices for longline target species in the ETBF* (Dr Rob Campbell, CSIRO)
- Agenda item 4.3 – *Fishery economic indicators – Eastern Tuna and Billfish Fishery* (Mr David Mobsby, ABARES)
- Agenda item 4.4 – *Stock status and fishery indicators for the principle target species within the ETBF – 2019 Update* (Dr Rob Campbell, CSIRO)

TTRAG were also required to update and finalise the annual TTRAG Advice paper to TTMAC and the AFMA Commission.

TTRAG determined that rather than discuss each ETBF paper under Agenda Item 4 in the specified agenda order, it would make more sense to review the papers by species, discussing the relevant sections of each paper and then for that species, finalise the advice contained in the ETBF Advice paper to the AFMA Commission and TTMAC.

As such the minutes below reflect the discussion as it occurred, by species category. Dr Campbell presented the papers under 4.1, 4.2, and 4.4 and led editing of the ETBF Advice paper. Note that the regions referred to below (R1 for billfish and R5 for tunas) are defined in the following map.



## Yellowfin Tuna

In relation to the initial draft ETBF indicators paper section on Yellowfin Tuna, TTRAG noted:

- **Stock Assessment** - Yellowfin in the Pacific is assumed to be separate Eastern and Western and Central Pacific stocks. A question was raised around how this assumption holds up against recent genetics analyses and AFMA committed to checking with Dr Peter Grewe. The latest assessment indicates the WCPO stock is not overfished nor subject to overfishing. Depletion is highest in equatorial regions 3, 4, 7 and 8 and high mortality on juveniles could result in growth overfishing (reduced adults to the longline fishery). The SC has recommended reductions in fishing mortality on juveniles. Short term projections show stock will likely increase in size over 2020/21 and will fall again to 2015 levels after this.

**ACTION ITEM 2** – AFMA to check with Dr Peter Grewe regarding the assumption of stock structure of Yellowfin in the Pacific.

- **WCPFC Catches** - Yellowfin catches have been highest ever in past 3 years although the increase in “other” fishery catches may be due to better reporting. Dr Campbell clarified the reference points and meaning of terms overfished and overfishing, relative to MSY and depletion based reference points.

- **ETBF statistics** – ETBF Yellowfin catches show significant interannual variability with peaks in 2011 and 2015. Mean sizes also vary over time. A scientific member queried why the ETBF is not seeing smaller fish in the data and TTRAG noted this may be due to longline catching larger fish, fishing effort shifting off the shelf where boats are less likely to catch smaller fish, and the impact of quota resulting in boats not retaining smaller fish. TTRAG noted Dr Campbell is still to change the size class terminology to that agreed in 2018 (small = recruits).
- **ETBF CPUEs** – TTRAG noted the reduction in recruit sCPUEs, the increase in mature fish sCPUE and the overall variable but relatively stable (in the long-term) combined fish sCPUEs.

In relation to Yellowfin tuna catch trends in the South West Pacific region, TTRAG noted:

- ETBF catch of yellowfin comprise around 11% of Region 5 catch
- Total catch in region 5 dropped in 2018 to under 10000mt (from ~17000mt in 2017) due to reduced purse seine catch. It was noted that the EU are not represented in the flag plot for longline despite presence in the area.

In relation to the Areas based analyses of standardised CPUE for Yellowfin Tuna, the paper highlighted:

- Recruits CPUE is highest in northern area of the ETBF and generally consistent trends over time between areas
- Mature fish CPUE is highest in the offshore ETBF areas off central Australia, and temporal patterns are generally consistent between areas

TTRAGs final advice to TTMAC and the AFMA Commission regarding Yellowfin Tuna are drafted and included in **Attachment A**. Some points discussed by TTRAG in finalising the advice paper included:

- TTRAG queried whether the statement that connectivity between ETBF and tropical regions may be small was ok to maintain, noting the statement also said connectivity is uncertain.
- The need to be consistent in use of size class terminology (adults and sub-adults).
- A scientific member questioned the drop in the proportion of small yellowfin tuna in the ETBF catch but TTRAG was less concerned, with a simultaneous increase in large fish proportion. ETBF proportion of regional catch is low.
- TTRAG discussed the question of “at what point do we become concerned about catch trends in the region” and that the genetics and oceanography projects are integral to our ability to address these questions. TTRAG noted that the increasing recruitment trends in the broader WCPO stock assessments are not evident in the ETBF fish size data and that this requires further analysis and explanation, especially to the Commission.
- A scientific member noted that the ETBF advice paper provides information but lacks interpretation (i.e. statements regarding implications of the indicators for the management of the fishery). The AFMA member noted that statements around implications of different TACC decisions given the status of the indicators for tropical tunas had traditionally not been provided by TTRAG as firstly, these species were considered to be part of broader WCPFC stocks and without a domestic harvest strategy there are no local reference points to benchmark advice and TTRAG was reliant on regional stock assessments and SC advice. However, TTRAG did develop additional advice for swordfish in 2018 when the use of that harvest strategy was suspended, pending redevelopment, and agreed it would look to provide a summary of key points for all species at this meeting.



## Bigeye Tuna

In relation to Bigeye tuna catch trends in the South West Pacific region, TTRAG noted:

- Region 5 longline and total catches have steadily declined since 2014 and are now at the lowest level (~1400 mt) since at least 2006, consistent with low catch trends in the ETBF
- The ETBF has accounted for 22-23% of Region 5 catches in the past two years
- Region 5 accounts for only 1% of WCPO bigeye catches.

In relation to the Areas based analyses of standardised CPUE for Bigeye Tuna, the paper highlighted:

- Standardised CPUEs are lowest in the nearshore waters off QLD for both Recruit and Mature sized fish, and low off south eastern Australia. There is no one area that is consistently highest in sCPUE for either size category. sCPUE over time is fairly consistent in trends between areas (just differ in magnitude).

In relation to the ETBF indicators paper section on Bigeye Tuna, TTRAG noted:

- **Stock Assessment** - Bigeye in the Pacific is assessed as separate Eastern and Western and Central Pacific stocks although mixing is recognised to occur in the central Pacific. Biomass depletion has increased steadily overtime until very recently, with depletion highest (and catches highest) in tropical regions 3, 4.7 and 8 and fishing mortality is very high on juveniles. The main biomass area is between 10N and 10S (tropics). Recent high recruitments have the stock projected to increase slightly in the short to medium term. The stock is not overfished or subject to overfishing.
- TTRAG commented that conversely the ETBF has seen extremely poor and low catches and CPUE in the fishery in the past 2-3 seasons, a sustained period not previously seen in what has typically been a variable CPUE pattern over time. TTRAG agreed that given the domestic CPUE trends it would be important to highlight these domestic signals in the advice paper to the Commission.
- **WCPFC Catches** – Bigeye tuna catches increased by 13% in 2018 but are not near the peak catch periods.
- **ETBF statistics** – ETBF Bigeye catches show significant interannual variability with peaks in 2007/08 and 2015/16. Recent catches in 2017 and 2018 are the lowest in the past 20 years. Mean sizes have been higher than average between 205-2018 but recently dropped significantly.
- **ETBF CPUEs** – TTRAG noted with concern the three continuous years of low recruit sized (sub-adult) fish CPUEs and the two historically low CPUE years for adult fish.

TTRAGs final advice to TTMAC and the AFMA Commission regarding Bigeye Tuna are drafted and included in **Attachment A**. TTRAG discussion highlighted the need to emphasise the recent low catches (well below average) and low standardised CPUEs.

## Albacore Tuna

In relation to the ETBF indicators paper section on Albacore Tuna, TTRAG noted in particular:

- The stock is neither overfished nor subject to overfishing, with fishing mortality highest on the adults and spawning biomass depletion levels at about 52%. Sub-tropical longline fishery had the biggest catches in all regions. Projections indicate that depletion will increase somewhat (biomass decrease) in the next few years.
- ETBF standardise CPUE is steady but with a small dip in the most recent year compared to the longer term average. ETBF mean fish size has increased in the past year.

In relation to Albacore tuna catch trends in the South West Pacific region, TTRAG noted:

- The ETBF accounts for a very small part of the Region 5 catch (<10%) with China accounting for nearly half of the catch in the region in 2018. Region 5 accounts for about 20% of the South Pacific total catch.

In relation to the Areas based analyses of standardised CPUE for Albacore Tuna, the paper highlighted:

- Standardised CPUEs are consistently highest in ETBF waters off New South Wales (nearshore and offshore) but trends over time vary between areas and CPUEs off Queensland are less variable.

TTRAGs noted few concerns regarding the region and domestic indicators for Albacore tuna and its final advice to TTMAC and the AFMA Commission regarding Albacore Tuna were drafted and included in **Attachment A**.

## Swordfish

In relation to the initial draft ETBF indicators paper section on Swordfish, TTRAG noted:

- Swordfish is assessed as a south-west Pacific stock with high catch areas in the north-east and in the Australia and NZ region. Spawning biomass depleted rapidly between the late 1990s and 2010 but has been slower depletion since, with high fishing mortality during that period on age 4-6 year classes. The stock is highly likely not overfished and it appears is not experiencing overfishing but SC recommends that appropriate management measures be put in place for the area 0-20S and current restrictions on catches south of 20S also be maintained.
- TTRAG discussed the connectivity of ETBF swordfish with other regions, noting tagging data summaries presented by the AFMA member that indicate predominantly north-south and potential seasonal return movements, as opposed to east west movements. Connectivity remains a critical uncertainty and TTRAG emphasised the need for the ETBF genetics project to obtain samples from NZ and Cook Islands
- ETBF catch in 2018 is the lowest since the mid-1990s
- ETBF sCPUEs for recruit sized fish remain below the 5 year and long term averages (albeit with a slight increase in 2018), while sub-adult CPUEs remain low and adult CPUEs show the first indication of a decline (as expected from previous declines in smaller fish).

In relation to Swordfish catch trends in the South West Pacific region, TTRAG noted:

- Region 1 has shown a significant increase in Swordfish catch in 2018, largely due to an increase in EU longline catch in the area, which has driven a reduction in the proportional catch share of the ETBF in this region in 2018 (from 70% in 2017 to 54% in 2018). This percentage share is just 31% when the region considered is extended east to just past NZ. New Zealand's catch of swordfish in this broader region has also declined with TTRAG wondering if this is reflected in NZ CPUEs and was due to the substantial and increased EU longline catch in waters adjacent to the NZ fishery, noting evidence for cyclic movements (seasonal residency) and local depletions in other fisheries.

In relation to the Areas based analyses of standardised CPUE for Swordfish, TTRAG noted:

- Standardised CPUEs are consistently lower in the nearshore waters for both Recruit and Mature sized fish, and highest in offshore waters including Lord Howe area and extending toward Norfolk Island. sCPUE trends over time are fairly consistent between areas (just differ in magnitude).
- TTRAG noted a dip in dark blue CPUE line (Area 7) in Figure SWO-3(A-D) that Dr Campbell would look at further.

**ACTION ITEM 3** – CSIRO to further analyse the CPUE swordfish data in Area 7, Figure SWO-3(A-D).

TTRAGs final advice to TTMAC and the AFMA Commission regarding Swordfish are drafted and included in **Attachment A**. TTRAG noted a number of issues while reviewing and editing the ETBF advice paper, including:

- The stock assessment explored a wide range of movement diffusion parameters and TTRAG considers 25% far too high based on available evidence and this should be addressed in future assessments, after the current MSE analyses are done (and noting no new assessment in the next couple of years).
- There is a need to get better estimates of the recreational fishery catch of swordfish, which is not yet expected to exceed 100 fish per year according to one TTRAG scientific member.
- There is a need to better understand trends in sizes and CPUEs of the international fleets operating adjacent to the ETBF.
- There is evidence that EU catch may have continued in Region 1 in 2019.
- TTRAG agreed that significant components of the advice developed in 2018 pertaining to CPUE standardisations and bait still remained relevant. Squid bait price rises are likely to have impacted on targeting practices for swordfish and therefore CPUEs, particularly in the past 12 months have reached a critical point. Bait type is captured in the CPUE standardisations.
- Industry noted that while there was a breakout provision for the swordfish 2 year TACC (if indicators require it) that due to increased international catch a reduction in ETBF TACCs would not help the regional stock levels. The AFMA member noted the Australian Government is seeking that WCPFC agree to strengthened regional CMM for this species, noting that the ETBF is the only fishery in region 1 that manages its catches. Some TTRAG members stressed that the issue of regional catch and connectivity must be explained to the Commission in addition to the indicators of local stock depletion. Region 1 catch is likely too high and some members noted also that environmental factors could be impacting the stock and availability.

## Striped Marlin

In relation to the ETBF indicators paper section on Striped Marlin, TTRAG noted:

- The stock is now considered to be likely overfished (median spawning biomass depletion is 0.19 but with high uncertainty levels) and may have overfishing occurring however there has been a reduction in catches and fishing mortality in the past decade that has stabilised biomass (with possible slight increases) and depletion levels. Fishing mortality is higher on the older age classes
- In the period since quota was introduced, ETBF catch levels peaked in 2015 (~350mt) but were around 250mt in 2018, below the five year and long term average. Recent catches have had a higher proportion of smaller fish.
- ETBF standardised CPUEs vary between years (lower in 2018 relative to 2017) but are on average higher in recent years (2014-18) than in the mid-2000s.

In relation to Striped Marlin catch trends in the South West Pacific region, TTRAG noted:

- Striped marlin catches in Region 1 are at their lowest level since at least 2006 (~350mt) with declines due to longer term reductions in Japanese catch and recent reductions in ETBF catch. New Caledonia is the other significant catch fishery in the region.

In relation to the Areas based analyses of standardised CPUE for Striped Marlin, the paper highlighted:

- sCPUE is consistently highest in central ETBF offshore waters, and trends over time are somewhat variable between areas.

TTRAGs final advice to TTMAC and the AFMA Commission regarding Striped Marlin are drafted and included in **Attachment A**. In developing its advice, TTRAG noted that similar to Swordfish there is uncertainty regarding connectivity of striped marlin that impacts on management advice, and that the WCPFC CMM for this stock is ineffectual in ensuring its sustainability and needs to be strengthened. These points were included in the advice paper.

## ETBF Economic indicators

Mr David Mobsby (Economic Member, ABARES) presented his paper *'Fishery Economic indicators – ETBF'* which was developed at the request of TTRAG to provide an overview of a preliminary suite of possible economic indicators for the ETBF that would increase TTRAG understanding of economic drivers of the fishery and potential impacts on catches and catch rates and which TTRAG could refer to when developing advice to the AFMA Commission and TTMAC.

Mr Mobsby highlighted the following key points, findings and results:

- Real GVP (in 2017-18 dollars) declined from a peak of \$117 million in 2001/02 to \$27 million in 2012/13 but has increased since (e.g. \$50 million in 2015/16) due to higher catch and market prices.
- Average weighted price in real terms fell from a peak in 2001/02 (\$14/kg) to less than \$6/kg in 2006/07 but has since recovered somewhat to near \$8/kg.
- Fuel and squid bait prices are highly variable over time with recent fuel prices low but squid bait prices at their highest level since at least 2000/01.
- NER to the ETBF was negative between 2002/03 and 2009/10 but generally improved since and the fishery has had positive NER since 2010/11. Economic performance plot shows profit occurring when top half of bars exceeds size of bottom half of bars.
- Export prices for most ETBF key commercial species peaked in early 2017 and have shown varying levels of decline since.
- Exchange rates for the AUD against the USD and JPY have varied but overall declined since mid-2013.
- Export value by destination market has shifted from being largely Japan focussed to now being US dominated.
- The FFA model of estimating fishery economic conditions has the advantage of not relying on surveys and can be updated in the current season where price and catch data is available. However its treatment of fishing costs is fairly simple (fuel cost based) and doesn't account for changes in fisheries behaviour that can impact the cost index – so for example fishing closer to port to reduce overall fuel cost (relative to price).

The RAG/MAC discussion focussed on the following points/issues:

- Industry noted diesel prices trend is about right but seems overall high to costs payed by ETBF operators, while Yellowfin export prices seemed low. FFA get their estimates from the markets. Japanese import prices are more the prices that operators will get from exporting.
- US is a growing market and the freight cost to the US is also falling.

- It would be useful to look at economic conditions indices on a species specific basis which could help to explain changes in targeting or fishing strategies in the fishery (noting that bait use and market prices are species specific).
- It may be useful to examine shifts in fuel usage and travel distances and how these change with changing economic factors in the fishery.
- TTRAG considered the value of economic indicators to management decision making, noting that consideration of economic returns is a fundamental objective of AFMA, and understanding current economic conditions has the potential to influence Commission decisions (e.g. timeframes to TRPs under harvest strategies). TTRAG finds it useful to understand the drivers of fishery dynamics over time (e.g. which can impact HS inputs) regardless of whether the information is of immediate use to the Commission. TTRAG did not consider that the work needed to be further developed under a formal research project.

TTRAG thanked the Mr Mobsby for his excellent first draft of developing economic indicators for TTRAG consideration.

## WTBF Indicators

Due to time constraints, the WTBF indicators will be circulated for comments from the RAG out of session.

**ACTION ITEM 4** – AFMA to circulate WTBF indicators paper to TTRAG for out of session feedback prior to the November TTMAC meeting

## 5 Research

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### 5.1 Research update

The AFMA member briefly noted the Research Update paper, indicating that the research project currently in progress and research process deadlines have not changed since this paper was discussed at the July TTRAG24 meeting. There was no substantive discussion by TTRAG.

### 5.2 Annual Research Statement

The AFMA member presented a revised draft of the Annual Research Statement for Tropical Tuna Fisheries for 2020/21. He noted that:

- the Research Statement is due to be presented to AFMA Research Committee, along with gaps analysis and scope forms, in mid-September and therefore the draft needs to be finalised and agreed by TTRAG now.
- TTRAG24 agreed to delay identifying new “non-core” major research items until the current major projects were finalised, but agreed that there was potential for smaller research projects.
- TTRAG24 identified a number of priority research areas, with the agreement that AFMA will draft research scopes for each of these for consideration at TTRAG25 and these scopes are to be discussed along with the Annual Research Statement. AFMA provided draft scopes on:
  - a) The RAG Assessment project
  - b) ETBF/WTBF Data Dictionary
  - c) Understanding fishing depths associated with different fishing strategies and practices

- d) Stock structure
- e) Consideration of economic information to inform Target Reference Points in the ETBF Harvest Strategy.

TTRAG agreed that AFMA would update and recirculate the revised Annual Research Statement after TTRAG had gone through and reviewed the research scope documents (see below).

## 5.3 Research Scopes

The AFMA member sequentially described each of the research gap analysis and scope forms for the potential research priorities identified at TTRAG24. The scopes and associated TTRAG discussion were as follows:

### 1. RAG data analyses, assessment and harvest strategies support

The AFMA member noted that this is the core project providing the essential data analyses and assessment work for TTRAG that underpins the harvest strategies, indicators and associated TACC decision making processes, as well as supporting analyses for byproduct and bycatch management decision processes. The current project ceases in mid-2020 and a new project is needed from that point on. TTRAG agreed that the priority for this research was high (in fact essential) and that it should be continued to be funded by the ARF. TTRAG noted that there may need to be a clarified provision for byproduct analyses in the scope form and elements included to recognise the need to adapt analyses to outcomes from the ETBF oceanography and genetics projects in future.

### 2. ETBF and WTBF Database, Data and monitoring documentation

The AFMA member noted that fishery monitoring and data collection in the tropical tuna fisheries has been conducted for nearly three decades but the evolution and changes that have occurred through time, which are critical to understand when using and interpreting the data, is poorly documented. With a number of the fisheries long-term data experts retiring from the fishery over the next 6-18 months it is critical for the ongoing future of data collection and analyses in the fishery that past data and monitoring processes, systems and changes to these are properly documented to support the fishery going forward. A scientific member queried how the project would be funded and whether this should have been core AFMA work. The AFMA member noted that the data expertise lies both internal and external to AFMA and the work was critical for future management of the fisheries. TTRAG agreed that this research priority was essential/high.

### 3. Understanding fishing depths and implications for key commercial and protected species management.

The AFMA member noted that a lack of understanding of fishing depths associated with different gear setting and fishing strategies across the fishery hinders AFMA's ability to make informed decisions to improve protected species management, hinders industries' abilities to reduce protected species interactions, and increases the risk that CPUE indices feeding into TACC decision processes do not reflect the underlying abundance of key commercial stocks. A project using time depth recorders targeted at different sectors of the fishery with different fishing strategies could provide valuable information to inform key commercial and protected species management. TTRAG considered that such a project was not immediately "essential" but was still a high priority if the project could be cost effectively linked in with the recently funded Tuna Australia project on gear drift and oceanography. TTRAG agreed that this should be discussed further with Tuna Australia and pursued in future (rather than immediately).

#### 4. Stock structure of ETBF key commercial species

The AFMA member noted that inclusion of this scope in the TTRAG25 paper was an error after TTRAG24 determined that further consideration of stock structure research should be undertaken after the conclusion of the current stock structure project.

#### 5. Economic information to inform ETBF Harvest Strategy target reference points (TRPs)

The AFMA member noted that while the Commonwealth Harvest Strategy does not apply as strictly to international fisheries (such as the ETBF) it does seek that such fisheries management are consistent with its intent and approach. The ETBF is a multi-species fishery and as such the CHSP would imply that seeking to maximize economic returns from the fishery overall, rather than on an individual species basis, is an appropriate goal. To date, harvest strategy for Swordfish and Striped marlin has targeted proxy biomass levels of SB48. However, under the CHSP there is scope to set TRPs at other levels, if in line with optimizing economic returns from the fishery overall. Explicit consideration of what TRPs would best optimize long-term economic returns has not occurred for the ETBF as yet but could assist in considering alternate TRP levels for species managed under domestic HS. TTRAG agreed that the timeframe for putting such a project in place in time to inform the ETBF Harvest Strategy redevelopment project was too short, and as such could not endorse this as a high priority for a specific research project to be developed. However, TTRAG recognised that it should continue discussions on this issue going into the future and there was potential to include information such as the ETBF economic indicators papers developed by ABARES in upcoming discussions of appropriate TRP levels to set in the ETBF harvest strategy.

#### Conclusions

The AFMA member committed to using the TTRAG feedback on the research gaps and scopes forms to update both those forms and the Tropical Tuna Annual Research Statement, after TTRAG25, and then recirculate to TTRAG for a final check post meeting, prior to submission to TTMAC for comment.

### 5.4 Oceanography Project update

Dr Hartog presented the paper "*Oceanographic and environmental factors impacting on the tuna species in the WCPO, with a focus on Australia's ETBF*". The purpose of the paper was to provide an update to TTRAG on progress made by the CSIRO led ETBF Oceanography project. TTRAG was asked to provide review and comment on the progress made by the project team. Dr Kylie Scales also attended this presentation and as a member of the project team also contributed to the progress update and discussions.

Dr Hartog highlighted the following key points regarding progress under the project:

- the objectives were to increase understanding the environmental influences and drivers to temporal availability of key ETBF species, develop and deliver predictive models as seasonal and decadal time scales and provide forecasts of habitat distribution for ETBF and regional partners.
- The project has undertaken work attempting to develop sets of models that can correctly hindcast fishing conditions in a manner that is consistent with the observed CPUE trends. Comparing monthly CPUE to the metric in #3 of the metrics definition. This isn't to try and predict what CPUE will be, but hopefully under/over years based on understanding past trends of historical conditions where there were also high catches and where those conditions are again occurring, which result in possible high catches.

TTRAGs subsequent questions and discussion focussed on the following:

- The project is focussing to date on the local ETBF data but needs to also make use of regional tools like Seapodym that might assist in helping to answer the question of what ocean-climate conditions lead to influxes of fish from outside the EEZ, prior to then trying to predict where in the fishery those fish might be most available. Industry members used Hurricane Oma as an example to reiterate that TTRAG is interested in the big picture of what is happening in the broader WCPO and how that influences ETBF, rather than just the localised models. Industry questioned how useful monthly timescales are for informing fishing locations.
- TTRAG emphasised the importance of the project to answering some key questions in the fishery and noted that if the project needed more time to achieve its objectives then TTRAG (and AFMA) would support an extension
- Dr Hartog asked in what format and through what process TTRAG preferred that project updates are communicated. TTRAG noted that there should be a steering committee meeting associated with the next meeting in March 2020 and would appreciate updates to subsequent TTRAG meetings through the year. The TTRAG updates provide opportunity for industry to provide valuable insights and CSIRO are encouraged to continue to engage with industry (including skippers) to gain insights into potential ocean and fishery relationships based on industries on the water experience. Tuna Australia can assist in organising such engagement.
- Dr Hartog noted that CSIRO are intending to increase engagement with SPC scientists, in particular Dr John Hampton, to make use of their expertise, with Dr Hampton visiting Hobart later in the year.

## 6 Other business

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### 7 Date and venue for next meeting

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The TTRAG noted the next face to face meeting is to be held in March 2020 TTRAG meeting, with final dates decided out of session.

TTRAG also noted the need to hold an intersessional teleconference, as agreed at the July TTRAG, to allow Dr Hillary to receive feedback and progress the harvest strategy work ahead of the March 2020 meeting. AFMA and CSIRO will discuss and circulate a proposed teleconference date shortly.

The Chair thanked all participants and observers for their contributions and closed the meeting at 6.00pm.



# Appendix 1: Adopted Agenda

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## Landmark Resort Mooloolaba

Tuesday 3 September – Wednesday 4 September 2019

Commencing at 1pm

### 1. Preliminaries

- 1.1. Welcome and apologies
- 1.2. Pecuniary interest declarations
- 1.3. Adoption of Agenda
- 1.4. Acceptance of TTRAG 24 minutes
- 1.5. Actions arising/out of session developments
- 1.6. Out of session correspondence

### 2. Review of fishery performance

- 2.1. AFMA Catchwatch report (AFMA)
- 2.2. Current catches and effort in the domestic fishery – verbal updates from scientists, industry and recreational fishing members since last RAG Meeting (July 2019)

### 3. Meeting updates

- 3.1 Outcomes from the AFMA Commission meeting (AFMA)
- 3.2 Update from the 15<sup>th</sup> session of the WCPFC Scientific Committee (WCPFC) (ABARES/CSIRO)

### 4. Fishery indicators

- 4.1. South West Pacific Data – update (CSIRO)
- 4.2. Coral Sea Catch Rate Standardisations (CSIRO)
- 4.3. ETBF Economic indicators (ABARES)
- 4.4. ETBF Fishery indicators (CSIRO)
- 4.5. WTBF Indicators (AFMA)

### 5. Research

- 5.1. Research update (AFMA)
- 5.2. Annual research statement (AFMA)
- 5.3. Research Scopes (AFMA)
- 5.4. Oceanography project update (CSIRO)

### 6. Other business

### 7. Date and venue for next meeting

## Appendix 2: Actions arising from TTRAG 25

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	Action	Responsibility
1	AFMA to Include an effort plot in a comparison to catch rates to fully reflect whether effort has gone down alongside catches. Including adding a cumulative plot for SBT by month.	AFMA
2	AFMA to check with Dr Peter Grewe regarding the assumption of stock structure of Yellowfin in the Pacific.	AFMA
3	CSIRO to further analyse the CPUE swordfish data in Area 7, Figure SWO-3(A-D).	CSIRO
4	AFMA to circulate WTBF indicators paper to TTRAG for out of session feedback prior to the November TTMAC meeting.	AFMA