Australian Government
Australian Fisheries Management Authority

Tropical Tuna and Billfish Fisheries Resource Assessment Group TTRAG 26

Meeting Minutes

20 January 2020

Out of Session

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1 Preliminaries

1.1 Welcome and Apologies

The Chair, Dr Cathy Dichmont, opened the TTRAG 26 meeting at 2.05pm. 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	
Dr Rich Hillary	CSIRO, principal investigator on the harvest strategy redevelopment contracted to CSIRO.
Mr Phil Ravanello	Industry representative invited participant (in attendance in place of Mr David Ellis)
Dr Ann Preece (until 3:20pm)	CSIRO, involved in data and assessment project currently contracted to CSIRO.
Executive Officer	
Ms Darci Wallis	AFMA

Apologies were received from Mr David Ellis 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 asked to leave the teleconference while the remaining members discussed their individual claims.

The attendees declared their conflict of interests as follows:

Member/ participant	Declared Interests
Dr Cathy Dichmont (Chair)	Has a consulting company, but has no pecuniary interests in the tuna fisheries. *No conflict of interest declared.*
Dr Don Bromhead	Employee of AFMA, which includes a salary. Is the Manager of the tropical tuna fisheries. No pecuniary interest in tropical tuna fisheries. *No conflict of interest declared.*
Ms Darci Wallis	Employee of AFMA, which includes a salary. Acting as the Executive Officer for the TTRAG 26, but has no pecuniary interest in Australian tropical tuna fisheries. *No conflict of interest declared.*

Dr Robert Campbell	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: "*Data management, provision of fishery indicators and implementation of the harvest strategies for Australia's tropical tuna fisheries*". *No conflict of interest declared.*
Dr Rich Hillary	Employee of CSIRO, no pecuniary interest in Australian tropical tuna fisheries. Is the PI for the Management Strategy Evaluation (MSE) project for the tropical tuna and billfish species. *No conflict of interest declared.*
Mr Gary Heilmann	Industry member, director of a processing company, no longer holds ETBF boat or quota SFRs. *Declared an interest in Agenda item 2.*
Dr Ian Knuckey	Has a consulting company with interests in electronic monitoring in the tuna fisheries, and is a member on several other AFMA Committees. *No conflict of interest declared.*
Dr James Larcombe	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. *No conflict of interest declared.*
Mr David Mobsby	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. *No conflict of interest declared.*
Dr Julian Pepperell	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. *No conflict of interest declared.*
Mr Phil Ravanello	Is currently the program manager of the industry association, Tuna Australia. Salary from industry. *Declared an interest in Agenda items 2.*
Mr Pavo Walker	Owns several ETBF boat SFRs, and ETBF quota SFRs for all species. Holds a Coral Sea permit and minor line permits. *Declared an interest in Agenda item 2.*
Mr Paul Williams	Director of a company that holds an ETBF boat SFR, ETBF quota SFRs, and holds a Commonwealth fish receiver's permit. *Declared an interest in Agenda item 2.*
Dr Ann Preece	Employee of CSIRO, no pecuniary interest in Australian tropical tuna fisheries. PI Principle on Data management, assessment & implementation of Harvest Strategy for Australia's Tropical Tuna Fisheries and co-investigator on Management Strategy Evaluation (MSE) project for the tropical tuna and billfish species. *No conflict of interest declared.*

In all cases where a member, invited participant or observer declared a conflict of interest, the participant left the teleconference. The remaining members unanimously agreed they were permitted to participate in the item of discussion, noting the expertise of the individuals and benefits of these members contributing to discussions.

1.3 Adoption of Agenda

The TTRAG agreed on the agenda with the research proposal for the Tropical Tuna fisheries submitted to AFMA for funding in 20-21 under other business if time permits.

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

1.3 Out of session correspondence

The TTRAG noted the out of session correspondence between the TTRAG 25 and TTRAG 26 meetings with no further correspondence added to the list.

2 ETBF Management Strategy Evaluation (MSE) update and discussion

2.1 Introduction

The AFMA member provided some background on the ETBF harvest strategy redevelopment project currently being undertaken by CSIRO.

The AFMA member also provided a summary of decisions and advice provided by TTRAG to the project team on the operating model (OM) for Swordfish and Striped Marlin including:

- Assessment should exclude distant water fishing catch from the north east region as this is unlikely to be connected to the stock,
- How illegal, unreported and unregulated (IUU) fishing should be taken account of in the model (include scenarios with zero IUU fishing and varying positive levels within the region),
- A range of migration hypothesis should be considered in the MSE to take account of the uncertainty in these patterns and the stock structure (using the genetics project where possible), and
- Consideration of how to structure the fishery:
    - the ETBF fleet (region 1 and 2),
    - other fleets with usable CPUE series also being standalone (region 2), and
    - remaining fleets (region 2).

The AFMA member provided an overview of the decisions made to date regarding the Harvest Strategies:

- the HCR should be based on standardised catch per unit effort (sCPUE), which TTMAC and TTRAG have agreed should be the broad basis and starting point,
- CSIRO to explore both a sub-adult only and combined sub-adult and adult CPUE index alone, as well as explore a possible recruitment index,
- sCPUE has been subject to continual improvement over time. While it's not a specific component of this project, it was acknowledged that industry holds some concerns with the current standardisation and it will continue to be improved over time, and
- TACC periods of both single and multi-year total allowable commercial catches (TACCs) should be explored.

TTRAG also noted the following past advice provided in relation to the initial development of the harvest strategy:

- with the current recommended harvest control rule (HCR), the probability of being at the target reference point (TRP), reduces as the ETBF catch share is reduced to 50%. Based on this outcome, TTRAG had recommended that CSIRO explore the possibility of the catch share being reduced to 25%,
- sCPUE based HCR would be able to move the spawning stock biomass (SSB) towards the target regardless of whether initial biomass was above or below the target, and
- the multi-year TACCs performed better than the single year TACCs as the single year TACCs had a tendency for the HCR to 'chase noise' in the CPUE signal. This created high catch variability and poor performance relative to the reference points compared to the multi-year TACCs scenarios.

Dr Rich Hillary confirmed that the work done to date related to testing the higher level elements and assumptions of the harvest strategy.

TTRAG noted previous discussions and recommendations on further work to be explored:

- a single simulation to better understand and track on an annual basis how the HCR works for a given situation,
- different HCR gradients, TRP buffer zones and moving average timeframes for the sCPUE index,
- providing better clarity around the TRP that will be used,
- interactions of the over and under provisions in multiyear TACCs, and
- meta-rules and exceptional circumstances settings that might be explored.

TTRAG noted that most of the work done to date has been on Swordfish, however many of the operational features, objectives and other higher level elements will be able to be applied to Striped Marlin as there are similarities between the species.

2.2 MSE Update

Dr Rich Hillary provided a presentation on the progress to date on the MSE, specifically conditioning the various OMs, and some specific questions for TTRAG about the key features required in the candidate harvest strategies to ensure this is suitable and fit for purpose.

TTRAG noted the progress to date with the operating models which use the same data as the stock assessment but have some major updates to the movement and stock structure scenarios. In addition, the MSE does not use the Western and Central Pacific Fisheries Commission (WCPFC) assessment but rather a bespoke operating model and uses a standardised CPUE series. The Striped Marlin operating model uses the revised 2019 stock assessment and explores spatially structured options which weren't explored with the previous WCPFC assessment, a single CPUE index and will have the same general HCR structure as the Swordfish harvest strategy.

TTRAG noted the three stock structure scenarios being considered as part of the MSE for swordfish, which should provide an indication of the impacts different stock structures have on the performance of the harvest strategy:

- one spawning population across both regions (current default);
- one genetic population with spawning populations in each region and possible migratory linkages; or
- fully separate stocks.

TTRAG noted that while there is research being undertaken to better understand the reproductive connectivity of Swordfish in the region, a decision on whether to adopt a candidate harvest strategy may be made before the results of that research are available. To overcome this, the MSE work will consider a broad range of stock connectivity scenarios to cover the possible results coming out

of this work. TTRAG were advised that that the genetics project may be unable to get two years worth of samples from New Zealand, with the possibility of samples between Australia and the Cook Islands being considered. AFMA will be discussing this issue further with CSIRO to seek a possible solution. TTRAG noted that a lot more data from New Zealand would be available for Striped Marlin.

TTRAG discussed what would be appropriate rates of migration across the boundaries, noting that the current assessment model shows per capita between 2 or 3 times the probability of a fish moving from the ETBF region into region 2 than returning to the ETBF region from region 2. This does not fit our understanding (from available evidence) of the likely actual movement for this stock.

TTRAG agreed that the high migration rates (11 and 25%) are too high, and agreed that the migration rate should be capped at 10%, with a 0% and 5% option also considered.

TTRAG considered how the non-ETBF fleets future effort and catch should be incorporated into the OM. While these could be fixed at current levels, there was general agreement that the catch and effort in particular non-ETBF fleets has the potential to increase substantially within our region. An industry member noted there are already indications of increasing catches by non-ETBF fleets, with two boats landing ~400 tonnes into New Zealand. TTRAG noted that the other fleets would be grouped together, unless they are large targeted fleets (e.g. EU fleet).

TTRAG agreed the bycatch fleets catches should be kept at the recent levels, with three scenarios to be explored for the EU fleets (50% reduction, 50% increase and current levels of catch and effort).

2.3 Further discussion of objectives and operating features of a revised harvest strategy

TTRAG considered the next steps and questions posed in the CSIRO paper '*Update on MSE work and questions to TTRAG on objectives and operating features of revised harvest strategy*'.

Objectives & timeframe for the candidate harvest strategies

TTRAG considered possible objectives for the revised ETBF harvest strategy, noting the context of this being an international fishery, the relevant requirements of the Commonwealth Harvest Strategy Policy (CHSP) and that the fishery is undergoing marine stewardship council (MSC) certification. The AFMA member noted that for international fisheries the CHSP doesn't specifically prescribe management arrangements, although any harvest strategies or position taken to international negotiations by Australia should be consistent with the objectives of the CHSP. In the case of multi-species fisheries, like the ETBF, the CHSP prescribes achieving an overall maximum economic yield (MEY), or proxy, for the fishery rather than a target of MEY for each species.

It was noted that while the overarching objectives of sustainability and economic returns might not necessarily change dependant on whether Australia had effective control over the spawning stock (i.e. separate stock scenario) or limited control (i.e. combined stock), how these were achieved would differ. However, TTRAG noted that if Australia had effective control over the stock, there would be a stronger expectation to align closely with CHSP.

TTRAG members noted there are two options available for framing an objective: spawning stock biomass (SSB) depletion and CPUE and TACC based objectives. The SSB depletion option aligns easily with the CHSP, however, it is hard to estimate SSB depletion as it is not currently directly estimated within the harvest strategy itself but is a part of the (unobserved) Operating Model. The

CPUE and TACC based objectives can be observed (and therefore linked to real world outcomes), although they are generally noisy and have a complex relationship to SSB.

Overall, TTRAG agreed that a CPUE based objective would be preferred, as long as the MSE considers the consequences and the harvest strategy can demonstrate that the stock is sustainable from a biomass perspective. TTRAG noted that the fishery is currently undergoing a MSC assessment and the requirements of this accreditation should also be considered. TTRAG noted that while a specific level of TRP (e.g. biomass depletion %) isn't specified by MSC, it is a requirement that the TRP doesn't result in the spawning biomass being reduced to the limit reference point (LRP). The harvest strategy must be able to ensure the stock fluctuates around the TRP. Furthermore, it might be difficult to meet MSC requirements with an empirical HCR (essentially a proxy of biomass, but noting problems in that relationship noted by Dr Hillary) unless indicators of spawning biomass depletion are built into the monitoring and performance assessment of the harvest strategy. A RAG member noted that depletion estimates are generally preferred by MSC, although they have accepted MSE outcomes with an empirical HCR. The RAG noted that if an empirical estimate is used, depletion indicators would also be presented.

TTRAG noted advice from industry members about the difficulty of providing a minimum CPUE or biomass level that would have a significant impact on profitability. They advised that there is definitely a minimum level, however, this is difficult to define considering this is a multi-species fishery. In response to comments that Swordfish are a bycatch for some operators, the AFMA member noted it's still targeted by some and cautioned that swordfish stocks should be maintained at higher levels. This would allow targeting of these species and support economic viability of those operators in years of poor availability of Yellowfin Tuna (the primary target species across the fishery) or other species.

In response to the question of what CPUEs are needed to support industry profitability and economic viability, an Industry member indicated that if Swordfish CPUE dropped by 20% from recent average levels his business would still be profitable albeit marginal. TTRAG suggested that three scenarios are considered for CPUE based TRPs, being the recent average CPUE level as well as a CPUE above and below this level (e.g. 20% above/below).

TTRAG members questioned whether WCPFC had any specific requirements in setting of TRPs and were advised by the AFMA member that the TRP is a negotiated outcome that can be set at any level as long as it doesn't have more than 20% probability of taking the stock below the limit reference point. Generally, the median of the assessment outcomes across all models is used to assess the stock status against B_{MSY} as the default as no other specific limit reference points have been set for Billfish. However, the WCPFC tends to use MSY-based reference points as limits, with fishing mortality > F_{MSY} regarded as overfishing and spawning stock biomass < B_{MSY} regarded as overfished. The current median estimated biomass levels at WCPFC for Swordfish range between $B_{32\text{-}35}$, noting this is highly uncertain.

Dr Hillary noted that if the ETBF harvest strategy was to use a SSB depletion based TRP, there is less control over-achieving a desired CPUE. For example, if the harvest strategy was tuned to get the OM SSB depletion to a certain level, in turn the resulting CPUE would just be that associated with that level of depletion. Alternately the HS could use a CPUE based TRP that has biomass depletion as a core performance indicator.

For the SSB, TTRAG agreed that options other than the proxy B_{MEY} (B_{48}) should be considered, with the minimum being a level that could be included in the MSE work that wouldn't have a high likelihood of breaching B_{LIM}. TTRAG suggested considering SSB depletion of B_{48} and ~10% above and below B_{48} (B_{58} and B_{38}).

TTRAG agreed that the MSE work should consider the following objectives for CPUE and SSB:

- **average CPUE level between 2012-2015 (when the fishery was relatively stable), 20% above and 20% below, and**
- **SSB depletion range of B_{38}, B_{48} and B_{58}.**

TTRAG also considered what timeframes would be appropriate for the projection period. Considering the life history of this species, TTRAG agreed with the recommendation from CSIRO of 20 years. To complement this, TTRAG considered the appropriate period to meet the objectives. As this is a long-lived species, there is a minimum period of when the stock could conceivably recover. TTRAG noted that considering the life history, changes should be seen with 5 or 10 years, this would still be considered a transition period. Based on this, TTRAG agreed to a 15-year period.

TTRAG agreed the projection period should be 20 years for the OM and 15 years as the maximum time to achieve the objectives.

TTRAG noted that further advice from TTMAC regarding objectives would be required, with TTRAG providing advice on biomass levels/CPUE targets to inform the MAC discussion. TTRAG acknowledged the advice from Dr Rich Hillary that as specific objectives had not been chosen at this meeting, it was unlikely that a final decision on a candidate harvest strategy would be possible at the March meeting, with additional work likely to be required following the March meeting before a final decision can be made. TTRAG noted that the MSC assessment for the fishery has a deadline of late- August, with the assessors expecting a harvest strategy to be in place prior to this. If there were any delay to the implementation of a harvest strategy in the ETBF then the MSC assessors would need to be made aware of this.

Operational constraints

TTRAG considered the options provided in the CSIRO presentation on operational constraints: frequency of change in the TACC and any minimum and maximum change rules. Considering the buffer around the TRP within the HCR, no minimum change rules were recommended by TTRAG as the buffer already provides a default minimum. TTRAG considered the suggested maximum change limits recommended in the CSIRO paper, a 10% limit for annual changes but for two or three-year blocks larger limits should be explored. TTRAG supported only one and three year blocks be considered in the MSE analysis. TTRAG noted that the options of using both percentage of TACC and actual tonnages for the maximum change rule, supporting the CSRIO recommendation of a maximum change rule of 10% for one year TACC changes. For the three-year block, TTRAG suggested a 27% (10% cumulative change over three years) and no maximum change rule be considered.

TTRAG recommended that a one and three year period should be considered for TACC changes, with a maximum change rule of 10% for an annual TACC change and both 27% and no maximum change for a three year change rule. TTRAG recommended no minimum change rules, noting other options can be considered at future meetings if required.

HCR Control Parameters

Dr Rich Hillary discussed the primary HCR (Figure 1 below) to be used in the harvest strategy. It was confirmed that the CPUE index would be a moving average of the CPUE. Dr Rich Hillary confirmed that a moving average was better for the TRP when compared to using the trend, noting there can be a lag in the response.

TTRAG noted that the response within the HCR shown in the Figure below is currently symmetrical (i.e. the proportional change in the RBCC for a given change in CPUE is the same above or below the TRP), until the CPUE index approaches the threshold. Once below this threshold the proportional change in the RBCC for a given change in CPUE increases in order to prevent further declines in the stock. Dr Rich Hillary also indicated that there is the option to have a minimum CPUE index below which the TACC could be zero, noting this can be more complicated in a multi-species fishery and need to be considered carefully.

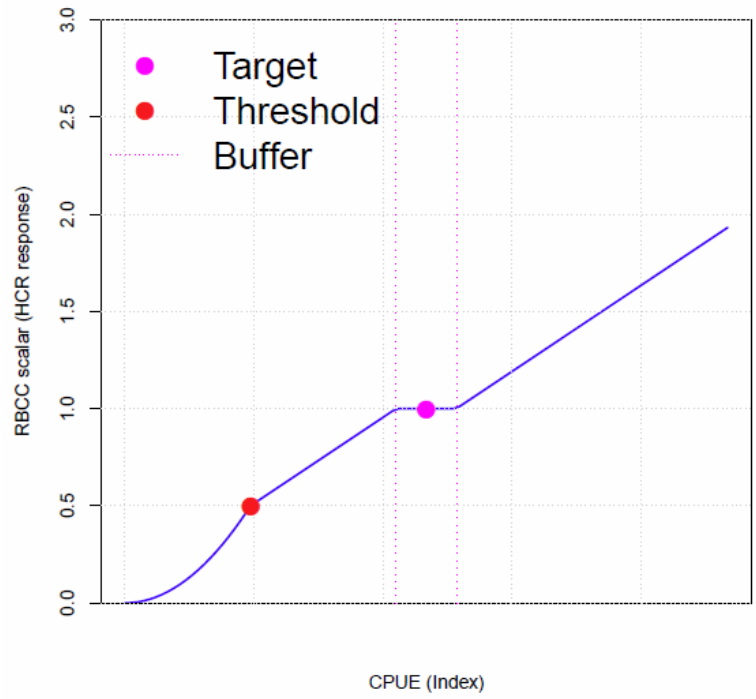

Figure 1: Candidate HCR to be explored in the MSE work

Dr Rich Hillary noted it is also possible to explore both symmetrical and asymmetrical RBCC vs CPUE responses within the MSE, with symmetry providing more stability as any increase or decrease in the CPUE index has equivalent percentage increase or decrease in the TACC. Asymmetry is useful if the harvest strategy needs to move the SSB up or down. TTRAG noted the need to have enough flexibility in those rules to achieve required result.

The AFMA member requested that more precautionary increases and decreases be considered in the MSE, noting that they were open to other options being considered as well.

TTRAG supported the inclusion of the buffer, as this provides for more stability and reduces the reactivity of the HCR, especially considering there is a 10-15% confidence interval within the CPUE. TTRAG supported the exploration of a range of symmetrical and asymmetrical responses within the HCR.

Robustness trials and future on-ETBF fishery scenarios

Due to time constraints, these questions were not considered, with suggestions and options to be provided to the March meeting for consideration.

Exceptional circumstances and meta-rules

Due to time constraints, these questions were not considered, with suggestions and options to be provided to the March meeting for consideration.

3 Other business

Due to time constraints, the research application was not discussed in detail. The AFMA member suggested that if possible, RAG members provided comments on the by 24 January 2020 to allow time for these comments to be summarised and sent back out to RAG members for confirmation before being provided to the ARC by the required deadline in late January.

There was a discussion regarding the cost between the current proposal and previous contract, with the AFMA member agreeing to confirm the costs of both proposals and providing this information to the RAG.

ACTION: AFMA to send email to TTRAG members confirm the costs between the previous contract and current proposal and providing the updated process for comments on the research proposal.

4 Date and venue for next meeting

The TTRAG confirmed the next meeting would be in Canberra on 25 and 26 March 2020, with TTMAC likely to be on 27 March 2020.

The Chair thanked all participants and observers for their contributions and closed the meeting at 5:15 pm.

Appendix 1: Adopted Agenda

Out of Session Teleconference

Monday 20 January 2020

Commencing at 2pm

1. Preliminaries

1.1. Welcome and apologies

1.2. Pecuniary interest declarations

1.3. Adoption of Agenda

1.4. Out of Session Correspondence

2. ETBF MSE update and discussion

2.1. Introduction (AFMA)

2.2. MSE Update (CSIRO)

2.3. Further discussion of objectives and operating features of a revised harvest strategy (CSIRO)

3. Other business

3.1. Research proposal *'Data management, provision of fishery indicators and implementation of the harvest strategies for Australia's tropical tuna fisheries'*

4. Date and venue for next meeting