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# **Meeting of the Tropical Tuna Resource Assessment Group (TTRAG)**

**MEETING MINUTES  
TTRAG 41**

**16-17 JULY 2024**

## TROPICAL TUNA RESOURCE ASSESSMENT GROUP (TTRAG)

**Chair:** Dr Cathy Dichmont

**Date:** 16-17 July 2024

**Meeting:** 41

**Venue:** The View Hotel Brisbane.

**Attendance:** All members attended the meeting venue, except those identified otherwise in **Table 1**.

**Table 1.** Meeting participants and their attendance

Participant	Role	Attendance
<b>Members</b>		
Cathy Dichmont	Chair	In person
Robert Curtotti	Economic Member	Online
Pavo Walker	Industry Member	In person 16 <sup>th</sup> , online 17 <sup>th</sup>
Gary Heilmann	Industry Member	In person
Julian Pepperell	Scientific/Recreational Fisheries Member	In person
Ashley Williams	Scientific Member	In person
Rich Hillary	Scientific Member	Online, absent for Agenda Items 3, 5, 6 and 7.
Ian Knuckey	Scientific Member	Online
James Larcombe	Scientific Member	In person
Lara Ainley	AFMA Member	In person
Elissa Mastroianni	Executive Officer	In person
<b>Invited Participants</b>		
David Ellis	Industry Invited Participant	In person
Terry Romaro	Industry Invited Participant	In person
Laura Tremblay-Boyer	CSIRO presenter	Online, absent for Agenda Items 9-13 inclusive.
<b>Additional Presenters</b>		
Kylie Scales	USC presenter	Online, Agenda Item 10
Ian Bladin	TTMAC Recreational Fishing Invited Participant	Online, Agenda Item 9
Grahame Williams	TTMAC Recreational Fishing Member	In person, Agenda Items 8 and 9
Steph Brodie	CSIRO presenter	In person, Agenda Items 1-3
Steph Blake	ABARES presenter	Online, Agenda Item 5
Dan Corrie	AFMA presenter	Online
<b>Observers</b>		
Denham Parker	CSIRO observer	Online 16 <sup>th</sup> , in person 17 <sup>th</sup>

## 1 Preliminaries

### 1.1 Welcome and apologies

The forty-first meeting of the Tropical Tuna Resource Assessment Group (the RAG; TTRAG41) was opened at 09:03am on 16 July 2024 by the Chair, Cathy Dichmont. The Chair welcomed members and observers to the meeting and:

- a) made an Acknowledgement of Country;
- b) noted there were no apologies<sup>1</sup> for the meeting; and
- c) advised members the meeting would be recorded to assist with the preparation of the meeting record. The recording will be deleted once the record is finalised.

### 1.2 Declaration of interests

The RAG noted the standing declaration of interests. No updates were provided additional to those circulated with the meeting papers. The standing declarations of interest are at **Attachment 1**.

The RAG agreed that David Ellis, Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) employees, and scientific members held potential conflicts of interest with *Agenda Item 11 – 2025/26 ETBF and WTBF Annual Research Statement*.

Conflicted members were asked to leave the room while the RAG considered the nature of the conflict and appropriate action to be taken when the agenda item is discussed. The remaining RAG members agreed that these meeting participants should contribute to the discussion and any advice provided. Before finalising advice, the non-conflicted members would confirm they were comfortable with the outcomes. Conflicted members returned to the room and were informed of the RAG's agreed approach.

### 1.3 Adoption of Agenda

The RAG adopted the draft agenda with no amendments (**Attachment 2**). The order of agenda items was revisited throughout the meeting to meet the availability of members and invited presenters.

One additional item was proposed for discussion under *Agenda Item 13 – Other Business*, namely an update on the Fisheries Ships of Opportunity (FishSOOP) project from Scientific Member Ian Knuckey.

### 1.4 Actions arising from previous meetings

The RAG noted the current status of action items from previous meetings and noted that completed items will be removed. The RAG suggested removal and consolidation of several items, including agreement to move a number of items to an agenda for a proposed data needs workshop discussion (see *Agenda Item 12 – TTRAG Priorities and Meeting Schedule*). The updated status of action items can be found at **Attachment 3**.

### 1.5 Out of session correspondence

The RAG noted the out of session correspondence between TTRAG40 and TTRAG41 as detailed in **Table 2**, below

**Table 2.** Correspondence provided to TTRAG members since TTRAG 40.

Date	Description
7 May 2024	Draft TTRAG40 meeting minutes provided to members and other meeting participants. Feedback and comment sought by Friday 24 May.
28 May 2024	Final TTRAG40 meeting minutes circulated to members and other meeting participants, incorporating feedback provided during the comment period.
6 June 2024	Calendar invite, including Microsoft Team link, for TTRAG41.

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<sup>1</sup> Some meeting participants were not able to join for the full 2 days, their attendance is recorded in Table 1.

14 June 2024	Draft agenda provided to members, invited participants and observers with a request for suggestion or comment if members wished to provide it.
17 June 2024	Update regarding progress towards final ERA reports for the WTBF and ETBF. Provision of draft WTBF ERA report and a copy of the letter outlining an extension to deadlines for the WTO conditions relating to both fisheries' ERAs.
19 June 2024	Confirmation of TTRAG41 venue and provision of updated Agenda (including the venue and minor corrections).

## 2 Member updates

### Industry members update

The RAG noted the following updates from industry members and invited participants:

- There is increasing financial pressures on industry due to market and economic factors. Increases in wages, fuel prices and bait prices, compounded by low fish prices, are impacting profitability. The high price and low availability of freight has depressed prices further, with fish being forced into domestic markets rather than international markets.
- The regulatory impact on fishers also remains high. Overlapping requirements (including between biosecurity, immigration, maritime safety, various other State and Federal departments, and AFMA) place increased cost and burden on industry.
- Catches of southern bluefin tuna (SBT) have been good as have yellowfin tuna, which arrived in a spike with El Niño conditions. However, both species are being landed at the same time and so are competing for freight and market space.
- The large flush of albacore expected in July has not come through yet, and only 4% of the TACC has been caught to date.
- Marlin catches display the opposite trend, with unusually large catches for this time of year (when they would normally be expected around Christmas). Swordfish catches are a little lower than normal.
- The quality of Australian products remains very high, but it is difficult to compete with cheaper and lower quality fish (from countries with lower operating costs and/or subsidisation).
- Discussions with AFMA and southern bluefin tuna quota holders on cost apportionment between the ETBF and the SBTf are ongoing.
- The same issues in are present in Western Australia (WA). Operators there are trying to work through immigration requirements that would allow for operation of ultra-low temperature freezer boats.

### Recreational fishing update

The RAG noted the following verbal update from the recreational fishing member:

- Although not under the same level of pressure as commercial fishers, economic conditions have also influenced the recreational sector. Club memberships remain steady, but the number of people entering competitions is decreasing, likely due to increasing fuel costs.
- There has not been much fishing since TTRAG40 due to poor weather. Catches of yellowfin tuna and blue marlin fishing remain poor. No small yellowfin tuna has been reported.
- This year's 0+ black marlin age class seem to indicate a good season, with lots of 5-6 kg fish caught from Gladstone to southern Queensland.
- Striped marlin catches are large off the Sunshine Coast and Gold Coast, where they may not have traditionally been caught. Large catches for these species line up with commercial fishers' reports.
- Social media suggests plenty of swordfish being caught in southern Australia and New Zealand. A University of Tasmania research project is looking at how to monitor this.
- A recent tournament in WA suggests healthy blue, black, and striped marlin populations, with hundreds of individuals tagged and released.
- SBT has also taken off in the recreational sector. Not much monitoring is being done and it is diverting recreational fishing attention from other species.

### Scientific members update

The RAG noted the following updates from scientific members:

- IOTC adopted two management procedures at their most recent meeting in May 2024, one for skipjack tuna and one for swordfish.
- The WCPFC Scientific Committee meeting is coming up in August 2024 with a number of stock assessment and harvest strategy work to discuss. The RAG noted key interests in upcoming stock assessments for South Pacific Albacore (SPA), oceanic whitetip sharks, and silky sharks.

### **AFMA Management update**

The RAG noted the written AFMA management update (**Attachment 4**), and provided the following comment:

- Pacific bluefin tuna catches have been increasing rapidly, noting the increase trend continuing into 2024. The stock estimates suggest this is due to increased biomass, with a WCPFC Northern Committee stock assessment presented this year (July 2024).
- There is an active discussion on increasing Australia's catch limits in response to improved stock status. However, in the meantime AFMA have introduced conditions requiring pacific bluefin tuna which are "alive and vigorous" be released, noting and accepting that you may not be able to identify a fish to species level until it is on deck.

## **3 Climate Change – Ecosystem Status reports**

### **Climate Risk Framework and proposed trial**

The RAG noted the presentation on the Climate Risk Framework (CRF) and proposed trial from AFMA Climate Adaptation and Strategic Reform Senior Manager, Dan Corrie. In particular:

- The program comprises our key pieces of climate adaptation work: climate and ecosystem status reports; fishery summaries and fact sheets; the Climate Adaptation Handbook; and the CRF.
- The CRF aims to integrate with what is already being done (by scientists, industry members, and management) and how decisions are already made by applying 4 steps: 1-consider risk, 2-identify existing mitigation, 3-determine residual risk, 4-provide advice to the AFMA Commission. The RAG would be involved in all 4 steps.
- There is no specified way residual risk will be assessed or how management is applied, so that it can be flexible and specific to the fishery's unique circumstances.
- AFMA are proposing trialling the CRF for swordfish, in line with the TTRAG38 recommendation<sup>2</sup> to engage with the CSIRO project team lead by Dr Beth Fulton to understand the drivers potentially impacting swordfish abundance. The purpose of the trial would be to understand the predicted changes in abundance, clarify measures already in place and support early consideration of risk in the harvest strategy MSE process.
- This would be a trial of the CRF only and will aim to get a sense of what the constraining factors (e.g. international requirements and dynamics) and limitations of the framework may be. Swordfish is a great trial candidate because of the harvest strategy review and MSE testing process already underway.
- The trial is expected to occur in early 2025. AFMA aims to have the RAG work very closely with the CRF working group and be involved in the whole trial process and development.

The RAG suggested considering other factors such as spatial shifts rather than simply abundance predictions (which may result in TACC changes), especially considering the latitudinal breadth of the ETBF. AFMA

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<sup>2</sup> See [TTRAG 38, meeting record](#)

confirmed that the second version of the CRF aims to consider the broader and varied implications of climate change more fully and recognises that adjustments to TACCs may not always be appropriate responses.

The RAG discussed how best to manage an amorphous risk, and noted the need to consider both long-term risk, as well as what can be done quickly/flexibly where immediate climate related issues emerge. Scientific member Ian Knuckey suggested clarifying that neither AFMA nor the RAG can address climate risks, but rather allow for risk, and include language to this effect in the framework. A useful measure would be the difference for a particular stock with no management changes, compared to implementing change, and seeing whether we could quantify that difference as a measure of success.

The RAG agreed that this topic required further discussion, with the potential to include the CRF working group or run a dedicated workshop in the future.

#### Action Item

AFMA to work with TTRAG to arrange a time to discuss this more fully.

TTRAG EO to provide links to the CRF document, once available online, to members.

### Climate and Ecosystem Status Report

The RAG considered the 2024 Climate and Ecosystem Status Report (**Attachment 5**) presented by Steph Brodie (CSIRO).

Industry members provided the following information to update the Observations section of the report:

- Juvenile black marlin have been observed this year, but not in 2023.
- March water temperatures were unusually cold this year and are now unusually warm off Mooloolaba and Hamilton Island.
- With the warm water has come an influx of yellowfin tuna, coinciding with the SBT.
- Albacore tuna numbers came later than usual this year.
- Spearfish have been caught off Sydney this year, in line with anecdotal observations of other species shifts.

RAG members also provided the following general suggestions for the report:

- To specify which year observations apply to.
- Amend the global sea surface temperature (SST) graph so it is specific to our (tropical tuna) region of interest.
- Include an indicator for catches by month for each species relative to the past (which could be displayed similar to the SST graph). Likewise, including where catches are recorded would be useful to identify spatial shifts.
- The links provided in the report are useful. It may be worthwhile including only a link and reference to the 10-day forecasts as these can change quickly.

The RAG noted that CSIRO are looking to begin compiling a record of observations as this report continues to develop each year. In addition, annual consideration of the report would allow the RAG to validate predictions from climate models and identify short term factors which may influence discussion or decisions for the coming year.

The RAG agreed to receive a copy of the report out of session once it was publicly available, and noted this information would be recalled in September when recommending TACCs for the ETBF and WTBF.

**Action Item**

CSIRO to circulate the updated Climate and Ecosystem Status report to members when publicly available.

#### 4 Swordfish Harvest Strategy Review MSE Workplan

The RAG noted that following discussions at TTRAG40<sup>3</sup> a workplan was needed to prioritise and structure the delivery of the identified MSE testing options agreed at that meeting. The RAG considered the workplan proposed by the CSIRO project team, in **Table 3** below.

**Table 3.** Prioritised list of options for MSE testing for the swordfish harvest strategy review, including expected timing of consideration of results and progress through the RAG.

Harvest Strategy Component	Options for MSE testing	Timing (RAG meeting)
1. Operating Model – general	<ul style="list-style-type: none"> <li>- Update OM to include latest catch and effort data available</li> <li>- Compare predictions from updated OM against 2021 assessment</li> </ul>	July 2025
2. Operating model (Base case)	<ul style="list-style-type: none"> <li>- Assume single spawning stock</li> <li>- Change zero migration to updated asymmetric movement parameters from Patterson et al. (2021)</li> <li>- 3 steepness options (0.65, 0.8, 0.95)</li> <li>- M-at-age vector from the diagnostic case of the (2021/2025) WCPFC assessment</li> <li>- Exclude distant water fishery with high catches in far northeast of the assessment area</li> <li>- Retain modified feature of current HS to allow a response to future undercatch</li> </ul>	July 2025
3. Operating model (Reference grid)	<ul style="list-style-type: none"> <li>- Undercatch scenarios based on mean undercatch from 2013-23 (but remove covid year)</li> <li>- Increase/decrease AU catch share relative to other fleets (CSIRO to explore different levels using WCPFC data as a guide)</li> <li>- Group other fleets by target/bycatch in adjacent high seas to the ETBF (use selectivities for grouping)</li> </ul>	September 2025
4. Robustness grid	<ul style="list-style-type: none"> <li>- Permanent low recruitment (lowest of a moving 5-year average) (regime shift)</li> <li>- Lower M-at-age compared to 2021 assessment</li> <li>- Assume separate spawning stocks in each region</li> <li>- Low levels of undercatch (~15%) – i.e. similar to pre-covid levels</li> <li>- Implementation scenarios where undercatch is incorrectly projected for the next year</li> <li>- High movement rates between R1 and R2</li> <li>- Higher increase of DWFN catch</li> <li>- Include DWFN fleets in far northeast</li> </ul>	March 2026
5. Harvest Control Rule	<ul style="list-style-type: none"> <li>- Consider a narrower buffer width (for longer term TACC setting). CSIRO to explore different widths</li> <li>- Consider 3, 4 and 5-year average of recent CPUE for HCR input</li> </ul>	March 2026
6. RBCC setting	<ul style="list-style-type: none"> <li>- 3 TACC schedules:               <ul style="list-style-type: none"> <li>o every year</li> <li>o every 3 years (constant annual TACC)</li> <li>o every 5 years (constant annual TACC)</li> </ul> </li> <li>- Status quo maximum changes to TACC (10%)</li> <li>- Test asymmetric TACC change e.g. max 10% down and max 11.1% up for annual TACC setting.</li> </ul>	March 2026

<sup>3</sup> See [TTRAG40, meeting minutes](#)

Harvest Strategy Component	Options for MSE testing	Timing (RAG meeting)
	<ul style="list-style-type: none"> <li>- Evaluate setting a TACC relative to a tuned TACC (in addition to the current HS that uses the previous year TACC to set the new TACC)</li> </ul>	
7. Tuning objective	<ul style="list-style-type: none"> <li>- 2 tuning criteria:               <ul style="list-style-type: none"> <li>o CPUE-based                   <ul style="list-style-type: none"> <li>▪ Use the ETBF sub-adults index</li> <li>▪ Move away from current 2012-2015 average CPUE. For example, could use an average CPUE over a long period or a multiplier (determined from tuning to B48) of long-term average (1998-present). CSIRO to explore difference reference periods.</li> </ul> </li> <li>o Depletion-based                   <ul style="list-style-type: none"> <li>▪ Depletion at B40 or B48</li> <li>▪ SSB relative depletion in Region 1 (for base case run only)</li> </ul> </li> </ul> </li> <li>- Projection period – tune to achieve objective on average over the 2035-2040 period</li> </ul>	<p>CPUE-based, July 2025</p> <p>Depletion-based, March 2026</p>

The RAG confirmed that harvest strategy MSE testing was the priority for the project team, and as such agreed that there would be no new CPUE standardisation work conducted until 2026. Noting this, the RAG agreed to endorse the workplan.

The RAG discussed the timeline of the workplan with regards to the review of the Commonwealth Harvest Strategy Policy (CHSP) currently underway and considered that the timing laid out in the agreed workplan is within the new CHSP finalisation time range, so any outcomes of the review should be able to be accommodated in this process.

Likewise, the trial of the Climate Risk Framework (as discussed under Agenda Item 3) would work well with this process, allowing adaptability/risk management with respect to climate change to be built into a revised swordfish harvest strategy.

The RAG noted that the question around swordfish stock structure remains fundamental to this work, and agreed to discuss this research need further under Agenda Item 11.

## 5 ETBF and WTBF Ecological Risk Assessment (ERA) Progress

The RAG considered additional information provided by ABARES that reviewed relevant information and literature for turtle species identified as potentially high risk in the draft ETBF ERA. The RAG considered the presentation from Steph Blake (ABARES), in particular:

### Trophic levels

- Studies of trophic level, stable isotopes and dietary composition were reviewed, and a weight-of-evidence approach was used to suggest the following trophic level inputs for the ETBF ERA:
  - o Green turtle – trophic level is likely to be below 3.25 (risk score of medium-2)
  - o Loggerhead turtle – trophic level is likely to be above 3.25 (risk score of high-3)
  - o Hawksbill turtle – trophic level is likely to be around 3 (risk score of medium-2)
  - o Olive Ridley turtle – trophic level is likely to be above 3.25 (risk score of high-3)
  - o Flatback turtle – trophic level is uncertain (risk score of high-3)
  - o Leatherback turtle – trophic level is likely to be above 3.25 (risk score of high-3)
- Studies included did not always necessarily include trophic level numbers, but ‘low, medium, high’ qualifiers were used because of potential variability in isotopes used to determine trophic levels.



## Post-capture mortality

- Reviewed at vessel release condition (using logbook data, and meta-analysis of published research on at-vessel release condition in other similar fisheries) and post-release mortality (via literature review and meta-analysis of published research) to estimate overall post-capture mortality.
- The weight of evidence suggested the following post-capture mortality inputs for the ERA:
  - Loggerhead turtle – most likely medium (“generally alive” risk score of 2)
  - Olive Ridley turtle – uncertain but may be medium (“generally alive” risk score of 2)
  - All other turtles – uncertain, with better understanding of hook type use in the fleet
- Anatomical position of the hook is the most informative predictor of post-release mortality, with circle hooks more likely to result in shallow hook interactions and therefore greater survivability.
- The RAG clarified that circle hooks are used exclusively in the ETBF and WTBF as a turtle interaction mitigation measure. The RAG added that the comments fields of the logbook often (though not always) contain information on hook position during interactions. ABARES confirmed that both these pieces of information will be useful in refining these estimates of post release mortality.

### Action Item

TTRAG EO to provide information to ABARES regarding the logbook comments fields.

## Species identification and composition

- Relevant congruence analyses were reviewed, along with a comparison of human observers and logbook data.
- Total sea turtle interactions and species identification are well reported in logbooks, and provide better resolution than EM data. However, it is not possible to apportion the unspecified “turtle” category to individual species with confidence.
- Including spatial and temporal factors, along with some modelling, might provide more information, but it is still unlikely you would be able to confidently estimate what percentage of unspecified turtles are what individual species.

The RAG acknowledged the work of the ABARES team and thanked them for providing such high quality advice, especially at short notice. The RAG discussed the intersection between Marine Stewardship Council (MSC) certification and the ERA process. Although both assess ecological risk in some way, their functions are not exactly aligned, and it is still important for the RAG to give the ERA due time and consideration.

The AFMA member informed the RAG they have sought additional clarification in how the residual risk analysis was applied, the capacity and resources required to re-run the level 2 results, and the availability of the CSIRO ERA project team to discuss the results in further detail. The RAG confirmed their need to remain informed on the answers to these queries and address the ERA results in their entirety.

Overall, the RAG endorsed the additional information provided by ABARES and recommended it be included in a re-run of the level 2 analysis for the ERA. The RAG will then further examine the residual risk beyond simply the numerical outputs of the process.

The RAG noted the advice provided by ABARES is in draft only, so additional information gained from the RAG could be incorporated. The RAG agreed that any changes to the advice as result of discussions in the meeting could be provided out of session. Likewise, an assessment of the applicability of the current ETBF results to the WTBF could be provided out of session, noting the RAG did not expect ABARES to conduct an entire additional literature review for the WTBF.

#### Action Item

ABARES to provide any updates to the ETBF advice (including inclusion of use of circle hooks) to the RAG out of session, and investigate the potential applicability of the ETBF results to the WTBF results.

## 6 Multi-season TACC procedure

The RAG recalled their support for setting the same TACC each year for three years (multi-season TACC approach) and considered the procedural document drafted by AFMA to guide the implementation of this approach. Specific advice included:

- Action items identified as procedural (see **Attachment 3**) should be included in the document.
- Wording to the effect of 'confirming that TACC advice can continue or remains appropriate' be included in the flow chart.
- Suggested wording around 'significant change' requiring review in the non-TACC setting years, rather than just 'change'.
- Clarifying and separating out what quantitative indicators, and what information (including anecdotal information) would be reviewed.
- Including changes to existing WCPFC conservation management measures (CMMS) and new CMMs and decisions.
- Specifying which information would be considered by the RAG and which by the MAC (including industry desire for increased catch or fishery development opportunities).
- Confirming whether the striped marlin harvest strategy (or any additional requirements) necessitate reviewing indicators on an annual basis, noting that the reason an annual approach is employed for striped marlin is because of the status of the stock, which also justifies inclusion of additional indicators.

Further specific detail on advice and amendments to indicators and their review frequency is available in the table in **Attachment 6**.

#### Action Item

AFMA to investigate origin of and required review frequency of indicators for striped marlin.

The RAG confirmed that the procedure for the WTBF would be the same as the ETBF (with the exception of reviewing CPUE standardisation, Economic Conditions Index report, weight frequency or climate and ecosystem status reports, as these are not available for the WTBF).

The RAG agreed that in non-TACC setting years, the papers provided on the indicators would be taken as read. In meetings during those years, the RAG would only discuss any questions/queries regarding the data, address any issues, and ratify the data in session.

The RAG noted the procedure would be provided to TTMAC and the AFMA Commission for comment and endorsement, and that any updates to the procedure would be provided to members out of session.

## 7 Over-and under-catch levels

The RAG recalled that there have been ongoing discussions around yellowfin tuna pulse events; recognising there is a genuine need to create flexibility to utilise pulse events where possible. The RAG noted that AFMA are exploring options to provide flexibility to utilise pulse events.

The RAG recognised the management and administrative constraints imposed on the issue of pulse events by the 28-day quota reconciliation period, which was implemented to reduce distortion in the market when the individual transferable quota (ITQ) system was first introduced. Industry members were of the view that

the operating environment of the quota market is now longstanding, and a change to the 28-day reconciliation period would not undermine the ITQ system. Noting this, members asked if this matter could be referred to TTMAC or AFMA Economic Working Group.

#### **Action Item**

AFMA to take questions regarding the 28-day quota reconciliation process to the MAC and suggest for consideration by the AFMA Economic Working Group.

The AFMA member highlighted that we could treat over-catch and under-catch separately, and also separate potential issues with the quota reconciliation process. In light of this, members agreed that an increase in undercatch to 20% would go some way to addressing pulse events and that it is a good idea to look at carrying over more uncaught quota where possible.

The RAG discussed the consequences of increasing the under-catch and/or over-catch limits for yellowfin tuna on the sustainability of the stock. The RAG agreed that increasing the under-catch and/or over-catch limits for yellowfin tuna to 20% would not impact the sustainability of the stock.

## **8 Fishery Indicators**

The RAG considered the presentations from Laura Tremblay-Boyer (CSIRO) on the updated annual catch and effort data summaries for the ETBF and WTBF (data covering 1997-2023).

### **ETBF catch and effort data summary**

- Annual effort remained stable, in line with previous years. This is true for number of hooks, sets, and vessel days.
- There was a slight decrease in overall retained catch, noting increased SBT catch; a decrease in albacore catch; and similar levels of yellowfin, swordfish and striped marlin catch.
- There has been a large increase in recorded discards of swordfish (about 6,000 individuals, up from 2,500 in 2022). Industry reported that there has been an increase in small sized swordfish, which would normally be discarded, but that this number still seems unusually high.
- Compared to 2022, monthly nominal CPUE per individual fish has increased for SBT, decreased for bigeye, and remained stable for albacore and yellowfin.
  - Monthly CPUE was high for swordfish and albacore in August and September, as opposed later in the year as would normally be expected. Industry members did not report any particular changes in the 2023 season that would explain this.
  - The RAG noted that this index was for numbers of fish, rather than weight, and that it would be good to consider nominal CPUE by weight as well for context.
  - Likewise, it would be good to see this data presented for more recent years as the last 5 or 10 years may display a different monthly trend than this long-term average.
- There has been negligible change in the spatial distribution of effort or catch composition over the last two years.
- Trends for all operational variables remained stable.
- The RAG recommended including total catch (discarded and retained) in next year's data summary.
- Fishing strategy (identified as metiers) were similar in 2023 as compared to 2022. The RAG recommended the metier analysis, and a time series showing the amount of effort in each targeting strategy, to be included in the summary report each year.

### **WTBF catch and effort data summary**

- Effort (whether measured by number of hooks, shots or vessels) remains stable at very low levels.
- Both retained and discarded catch numbers and composition have remained relatively stable for the past 5 years.

- Nominal CPUE is stable for all species, with a small increase for swordfish and yellowfin tuna.
- No strong spatial trends emerged in 2023.
- All operational variables remained stable, with the exception of a shift to later set times. Given there have been some issues with time zones in the database, it would be worthwhile for the CSIRO project team to reach out to Andrew Carlyle in the AFMA Data Team to check whether there has been a change in how times are being recorded at the database level.

### ETBF weight frequency data summary

The RAG noted the presentation from CSIRO on weight frequency data summary in the ETBF, in particular:

- Albacore tuna displayed a slight increase in quarter 1 (Jan-Mar) of 2023, but otherwise similar to previous years. Size distributions per region were also similar to previous years.
- Bigeye tuna are showing a move to a larger size mode and the WCPFC assessment for this species also showed an increase.
- Yellowfin tuna showed no major changes (with usual variability still present).
- Swordfish sizes appear to be smaller this year than last, which aligns with industry observations.
- Although 2023 striped marlin sizes were similar to 2022, this species continues to display a general decrease in size, with sizes still at the lower end of the mean weights for the time series.

### ETBF CPUE Standardisation

The RAG recalled that there were no changes to the CPUE standardisation method, as agreed in March<sup>4</sup>. However, CSIRO highlighted some minor amendments and corrections, including:

- Distance to the shelf was removed due to some convergence issues (this did not significantly change the indices).
- An issue was identified in the way weights were allocating sizes to sets, and also weights to sets. When corrected, this changed the size-based indices only, with the corrected data evening out the jump in sub-adult swordfish evident between 2021 and 2022. The same was true of adult swordfish.
- These corrections would not have changed the RBCC for previous years.

The RAG noted these amendments and re-confirmed their endorsement of the CPUE methods.

The RAG then considered the standardised CPUE results presented by CSIRO. For each species, the RAG noted the following results:

- Albacore – relative abundance appears stable. The index is lower than last year but given the variability evident in this species, this is not a cause for concern.
- Yellowfin tuna – relative abundance appears to have increased. As for albacore, indices are a little lower this year, but well within the history of variability for the species. Targeting and hook density appear to influence this index.
- Bigeye Tuna – the large peak evident in 2007 is still present in this model, and driving the appearance of overall decline in the index for this species. However, there was not much change in 2023 as compared to 2022. Year by quarter and hook density appear to influence this index.
- Swordfish – relative abundance appears to have increased. Sub-adult standardised CPUE was more similar to nominal CPUE than in COVID years (2019-2021). However, it remains highly variable and does not display much change from 2022. Light usage reduced variability, bait and hooks per basket appear to influence this index.

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<sup>4</sup> [TTRAG40, meeting minutes](#)

- Striped marlin – relative abundance appears to have increased. This species displayed a strong standardisation effect, but not much difference from 2022. Hook density per line drove a flattening of standardised CPUE as compared to nominal CPUE.

The RAG discussed the high number of swordfish discards this year and considered the possibility that this could be driving up the recruitment index for this species. Industry members suggested that increased discards might be related to increasing catches of SBT. Analysis conducted in the meeting by CSIRO confirmed that the discards of swordfish does not appear to be associated with SBT targeting. Although the number of small fish reported in the catch has also increased, it would be worth checking whether there are any errors in the number of discards.

The RAG also discussed an increase in striped marlin catch for 2023. Analysis conducted in the meeting by CSIRO confirmed that the increase did not appear to indicate any particular change (either in regions where marlin are caught or in increasing targeting for SBT) but rather a general increase across the fishery. Recreational catch (including tagging) was also fairly high. The results of the WCPFC assessment for striped marlin this year may provide further insight on this topic.

#### Action Item

AFMA to investigate the high level of discards for swordfish to see if there are any errors in the data contributing to the increase.

The Chair acknowledged Dr Tremblay-Boyer's work and achievements over the last few years and commended her for the influence she has had in the RAG and its processes. The whole RAG thanked her and wished her well while on extended leave.

## 9 Recreational sector objectives and operating environment – striped marlin

The RAG noted the presentation (**Attachment 7**) by TTMAC Recreational Fishing Member, Grahame Williams, in particular:

- Objectives of the club sector include fishing sustainably, to catch and predominately release as many fish per day as possible, to record sized fish (commensurate with line size), catch striped marlin for food, and to contribute to research programs.
- Objectives of the non-club sector (i.e. fishers not associated with game fishing clubs) include catching for food and recreation, as well as catch and release (14% of tagged striped marlin released by non-club members).
- At least 37,826 striped marlin have been tagged and released over the 49 years of the program. Around 14% of these are from non-club fishers with the remaining 86% from club members.
- Consistent with the objective to catch and release fish, the NSW Game Fishing Association (NSWGFA) has rules requiring use of circle hooks when fishing with bait and minimum weight requirements, both of which are aimed at reducing mortality and encouraging release of fish.
- Very broad estimates put annual mortality at 22.36 tonnes, for both the club and non-club sector, and considering a mortality estimate of around 15% for tagged and released fish. However, these are rough calculations only, and the margins of error for the estimate would likely be very large.

The RAG discussed a low point in striped marlin tournament catch numbers in 2013 and considered that although it is possible there was a biological shift (possibly further south) it is difficult to confirm this

retrospectively. The RAG also discussed some uncertainty around the 15% mortality estimate for tagged and released fish, given the possibility that striped marlin may reject external tags better than other species<sup>5</sup>.

The RAG noted that one striped marlin tagged in Australia ended up in New Zealand, and Industry Invited Participant, David Ellis, noted that some commercial Australian fishers have also caught New Zealand-tagged fish. Scientific Member Rich Hillary suggested it would be valuable to get information on striped marlin travelling between Australia and New Zealand, as well as anything that could allow better estimates of movement in the ETBF model.

The RAG thanked Mr Williams for his presentation and agreed that the rough annual mortality estimates and the broad aims for the recreational sectors (to maintain strike rates in number of fish per day and continue catching good sized fish) are useful factors for the RAG to consider.

The RAG agreed that this presentation had sufficiently answered questions regarding the objectives and operating environment of the recreational striped marlin fishery, and as such the research need for a survey was no longer necessary.

#### **Action Item**

Grahame Williams to provide available tagging data to CSIRO and liaise with New South Wales Department of Primary Industries to enable further data to be available to CSIRO.

TTRAG EO to circulate the presentation to members.

## **10 Presentation on toothed whale depredation**

The RAG noted the presentation from Kylie Scales (USC) on toothed whale depredation, in particular:

- Using logbook and electronic monitoring (EM) data, this project considered when and where interactions with toothed whales are occurring, and what factors may be driving these interactions.
- Overall, the best predictors for depredation were hauling during dawn, shallower sets, use of lightsticks, month (March and April), area (24-27 degrees south), and warmer sea surface temperatures. However, these factors are inter-related, and it is difficult to know what the impact of other factors (for example, whale migration routes) may be.
- The project also did some preliminary risk-overlap mapping, with suitable whale habitat overlaid with fishing effort. Researchers hope to improve predictive habitat mapping (to include oceanographic variables such as eddies and fronts) to enable progress towards more real time adaptive management.
- Toothed whale depredation events are fairly rare (although industry suggest false killer whale interactions are increasing) occurrences and the process for identifying them from EM footage is time consuming, meaning the amount of data available for analysis was limited. The amount of footage provided was also limited.

The RAG noted that if collection of depredation data was to continue in this way, it would have to be on an ongoing basis, as EM footage is only kept for 6 months. The RAG also noted that Tuna Australia are looking at on-boat methods for collecting a range of data, which could include depredation data.

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<sup>5</sup> Scientific and Recreational Member Julian Pepperell informed the RAG of a study conducted in the US used both external and archival tags on the same fish, and when recaptured striped marlin had only the archival tags still in place, suggesting they may reject tags better than other species.

The AFMA Member recalled that the RAG and AFMA have asked whether depredation can be included in e-logs with the suspected species recorded and agreed to follow up on that request.

The RAG thanked Dr Scales for her time and presentation and noted this will likely be a matter which will continue to warrant future consideration by the RAG.

**Action Item**

AFMA to follow up again on the request to have depredation included in e-logs and check whether any information/data on this has come through.

## 11 2025-26 ETBF and WTBF Annual Research Statement

In providing advice on the ETBF and WTBF research priorities for the 2025-26 financial year, the RAG discussed three broad research priorities, as follows:

### Broadbill swordfish connectivity and stock structure

The RAG agreed that this remains the most pressing research need for the fishery and discussed several potential approaches including tagging, microchemistry, and close-kin-mark-recapture (CKMR) genetic methods. The considered whether a back-up plan for determining broadbill swordfish connectivity and stock structure (in the event that there were no applications for the CKMR project or sampling for the project is beyond reach). However, the RAG agreed that CKMR is most likely to give a definitive answer and given the significance of understanding stock structure it is important to choose a method that can provide answers with confidence.

The RAG agreed that the highest priority research project is a scoping study for a close kin mark recapture (CKMR) project to answer questions about swordfish stock structure and connectivity, rather than abundance. The scoping study will assess sampling needs, logistics, and feasibility; and include liaison with key domestic and potential international partners. The study **must** include CKMR scoping for broadbill swordfish and **may** include striped marlin (if the proponent has the capability and capacity to include it). The research priority will be suggested to FRDC for funding in 2025/26 and may extend across multiple funding years.

**Action Item**

AFMA to re-word the previous CKMR research project scope to include striped marlin and circulate the 2025-26 Annual Research Statement for agreement out of session.

### WTBF CKMR

The RAG recognised the importance of answering similar questions on stock structure in the Indian Ocean but noted there is a proposal with IOTC for a large-scale project which is yet to be funded, and that this is beyond the scope of work which could be funded through the ARC or FRDC annual research processes.

### Discard size estimates

Current discard size estimates are based on observer data collected up until 2015, when Electronic Monitoring (EM) was introduced, and there is a need to confirm whether these estimates are still accurate enough for application in the CPUE model. The RAG agreed that updating estimates of discard size classes is also a priority, but not for inclusion in the 2025-26 Annual Research Statement. AFMA will investigate what opportunities may exist within the EM program to address this need.

**Action Item**

AFMA to follow up whether it is possible to estimate discard sizes through EM review processes; and understand what would be required from the EM service provider to undertake additional research objectives, like this for example, and assess whether this should be incorporated into long term EM review protocols.

## 12 TTRAG Priorities and Meeting Schedule

The RAG agreed to the priorities for upcoming meetings detailed in **Table 4**. The RAG recommended that the additional ongoing priorities table be updated and provided out of session.

**Table 4.** Priorities agreed to at TTRAG 41 for upcoming meetings

Date	Meeting	Priorities
September 2024	TTRAG42	Consider south west pacific catch summaries, and the latest WCPFC stock assessment results.
		Consider ETBF and WTBF indicator summary, noting this is a reminder of data already considered by TTRAG41.
		Run Swordfish Modified Harvest Strategy and obtain RBCC.
		Consider striped marlin constant catch scenario and set RBCC.
		Finalise TACC advice for the ETBF and WTBF.
March 2025	TTRAG43	Consider updated seabird interaction report
		ERA progress, if available.
		Consider RFMO management procedure, as we consider our own swordfish harvest strategy review <ul style="list-style-type: none"> <li>• WCPFC management procedure framework – south pacific albacore</li> <li>• IOTC management procedure – bigeye tuna</li> </ul>
		Consider outcomes of the Commonwealth Harvest Strategy Policy review.
		Review current and future data needs: <ul style="list-style-type: none"> <li>• Critically review what data is currently collected in order to identify and priorities what needs to be collected into the future.</li> <li>• Consider EM/Logbook congruence study recommendations, reviews (CPUE standardisation), risk assessments (ERA) and future harvest strategies</li> <li>• Consider any data needs in additional fields for e-log i.e. whale depredation, seabird mitigation requirements, discard sizes, WCPFC recommended fields, economic survey missing fields and programs for collecting that dat</li> <li>• E-log and e-monitoring data needs and specification, including consideration of the e-log schema, where errors occur and how they may be managed (e.g. range checks).</li> </ul>
July 2025	TTRAG44	Research priorities for 2026/27: this should consider the ongoing contract for providing scientific advice on tropical tunas.
Proposed intersessional meetings		AFMA to convene a climate change teleconference to be convened in late June or early July to consider ERA results and residual risk scores in further detail.
		Pending clarification from Dan Corrie, AFMA to convene a climate adaptation workshop.

The RAG agreed that TTRAG 42 would be held online on 24 September 2025. The RAG agreed that the ongoing priorities table would be updated based on TTRAG 41 discussions out of session.



### 13 Other Business

As identified at the start of the meeting Scientific Member Ian Knuckey gave an update on the FishSOOP project, in particular:

- The original FRDC trial has concluded. The draft report is being written now and a final report is expected to be available soon.
- There are now over 30 units on vessels around Australia, including 6 in the ETBF, collecting oceanographic data from regions not covered well by other methods.
- There was generally good industry acceptance because the units are easy to install, don't interfere much with fishing activity, and provide data back to them directly. The skippers participating were comfortable with having their information publicly available which was important in building trust in the project.
- The Integrated Marine Observing System (IMOS) have agreed to take responsibility for ongoing data collection and storage, in a project coordinated by UNSW. Fishwell will remain the main interface between UNSW and industry. The project will look to increase automation, where possible, and expand the program.
- Fishwell would like to provide information for each fishery to the RAGs as the program continues into the future.

The RAG congratulated Fishwell on the work and agreed to add a FishSOOP program update as a standing item for the TTRAG agenda.

One additional item of other business was identified by Scientific and Recreational Fishing Member Julian Pepperell. The 7<sup>th</sup> International Billfish Symposium will be held in San Diego from October 8-10 and members are encouraged to share these details with interested parties.

The Chair thanked RAG members, invited participants, observers and presenters for their participation in the meeting, and closed the meeting at 16:39 on 17 July 2024.