



Australian Government

Australian Fisheries Management Authority

Tropical Tuna and Billfish Fisheries Resource Assessment Group (TTRAG) 36

FINAL Minutes

13 September 2022

Maroochydore RSL

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1 Preliminaries

1.1. Welcome and Apologies

1. The Chair, Dr Cathy Dichmont, welcomed members and opened the meeting at 9:05am with an acknowledgement of country.
2. The major outputs of this meeting are two documents providing TTRAG advice to TTMAC for consideration in recommending TACCs for the ETBF and WTBF.
3. The following participants were present at the meeting:

Present	
Dr Cathy Dichmont	Chair
Ms Kate Martin	AFMA member
Mr Gary Heilmann	Industry member
Dr Julian Pepperell	Recreational fishing member
Dr Ian Knuckey	Scientific member
Mr Pavo Walker	Industry Member
Mr Terry Romaro	Industry member (western fisheries, online)
Dr Robert Curtotti	Economics Member, ABARES
Dr Ashley Williams	Scientific member, CSIRO
Invited Participants/Observers	
Ms Selina Stoute	AFMA
Mr Nathan Jackson	AFMA
Mr Robert Curtotti	ABARES
Dr Laura Tremblay Boyer	CSIRO
Dr Don Bromhead	ABARES, invited participant (online)
Mr Paul Williams	Industry invited participant
Mr David Ellis	Industry invited Participant
Mr David Smith	AFMA Commissioner (online)
Mr Wez Norris	AFMA CEO (Online, Agenda item 2.4 only)
Executive Officer	
Mr Maxwell Bayly	A/g TTRAG Executive Officer

4. Apologies were received prior to the meeting from James Larcombe and Rich Hillary

1.2. Declaration of Interest

5. 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.
6. In all cases where a member 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.
7. Conflicts of interest for industry members and invited participants for Agenda item 2

Member/participant/Observer	Declared Interests
Dr Cathy Dichmont (Chair)	Has a consulting company but has no pecuniary interests in the tuna fisheries. Is the current Commonwealth Research Advisory Committee (ComRAC) chair.
Ms Kate Martin	Employee of AFMA, which includes a salary. Is the Manager of the tropical tuna fisheries. No pecuniary interest in tropical tuna fisheries.
Ms Selina Stoute	Employee of AFMA, which includes a salary. Is the Senior Manager of the Tuna and International section. No pecuniary interest in tropical tuna fisheries.
Mr Nathan Jackson	Employee of AFMA, which includes a salary. Is a graduate in the Tuna and International section. No pecuniary interest in tropical tuna fisheries.
Mr Max Bayly	Employee of Department of Agriculture, Fisheries and Forestry, which includes a salary and a MOU with AFMA, which includes a salary. Is Employee of DAFF and under a MOU as the temporary Executive Officer TTRAG, has no pecuniary interest in Australian tropical tuna fisheries.
Dr Don Bromhead	Employee of ABARES, involved in fisheries research, primarily through engagement with the Western Central Pacific Fisheries Commission and Indian Ocean Tuna Commission. Also involved in ongoing research analysing logbook and Electronic Monitoring Data in the ETBF and GHAT fisheries. Has no pecuniary interest in the Australian Tropical Tuna Fisheries.
Dr Laura Tremblay Boyer	Employee of CSIRO, no pecuniary interest in Australian tropical tuna fisheries. Is the Principal Investigator (PI) for the Management Strategy Evaluation (MSE) project for the tropical tuna and billfish species.
Dr Ian Knuckey	Has a consulting company with interests in electronic reporting in the tuna fisheries, and is a member on several other AFMA Committees. Has previously worked on a project on FADs in Tasmania and work relating to the Commonwealth resource sharing framework. Is working on a recreational and indigenous capacity building project with DAWE.
Dr Julian Pepperell	Independent fisheries consultant and representative of the recreational fishing sector. Is currently undertaking research into gamefishing. Is involved in projects including the monitoring of fish landed at game fishing tournaments and pop-up satellite tagging on juvenile Black Marlin.
Dr Ashley Williams	Employee of CSIRO, no pecuniary interest in Australian tropical tuna fisheries. Is the PI for the project on Data Management, Assessment and implementation of Harvest Strategy for Australia's Tropical Tuna

	and Billfish Fisheries.
Mr David Ellis	Is currently the CEO of the industry association, Tuna Australia which includes a salary paid by industry.
Mr Gary Heilmann	Industry member, director of a processing company, no longer holds ETBF boat or quota SFRs.
Mr Pavo Walker	Owns several ETBF boat, holds a Coral Sea permit and minor line permit.
Mr Paul Williams	Director of a company that holds an ETBF boat SFR, ETBF quota SFRs, and holds a Commonwealth fish receiver's permit.
Mr Terry Romaro	Director of a company that owns Eastern Tuna and Billfish Fishery (ETBF) boat statutory fishing rights (SFRs), minor line SFRs, ETBF longline SFRs, Western Tuna and Billfish Fishery (WTBF) boat SFRs, WTBF longline SFRs, Western Skipjack Tuna Fishery (WSTF) purse seine permit, Small Pelagic Fishery (SPF) purse seine, mid-water trawl SFRs, and SPF quota SFRs. Shareholder of a company that owns shares in a proposal to fish with foreign longliners in the WTBF. Industry member on Southern Bluefin Tuna (SBT) and Tropical Tuna MAC, Invited participant for TTRAG, and industry representative at the Commission for the Conservation of SBT (CCSBT) & IOTC. Invited participant for squidRAG and squid concession holder. Director of a company who owns a fish processing facility in Port Lincoln.
Mr Robert Curtotti	Employee of ABARES, involved in fisheries economic research related to the Eastern Tuna and Billfish Fishery. Has no pecuniary interest in the Australian tropical tuna fisheries.

1.3. Adoption of Agenda

8. The draft meeting agenda was circulated on 25 August 2022 and is detailed in Appendix A.

1.4. Adoption of Minutes

9. The TTRAG noted that minor comments received out of session from attendees on the TTRAG 35 meeting minutes were incorporated into the draft at Attachment 1.4a of the meeting papers.

10. The TTRAG adopted the TTRAG35 meeting minutes.

1.5. Actions Arising

11. The AFMA member provided a verbal update of notable changes to the actions arising since the June TTRAG 35 meeting. A summary of the status of action items is provided in Table 1.

12. The RAG noted the status of action items from previous meetings (Table 1). The comments from the RAG on the actions arising can be found in Tables 1 and 2 below.

13. A summary of actions arising from this meeting are included at Appendix B.

1.6. Out of session Correspondence

14. The TTRAG noted the out of session correspondence between the TTRAG 35 and TTRAG 36 Meetings as provided in the written update by AFMA.

2 Review of Fishery Indicators

2.1. South West Pacific (SWP) Data – update (CSIRO)

14. The Scientific Member, Dr Ash Williams (CSIRO), provided the RAG with an update of South West Pacific Data for 2022 speaking to a series of graphs and tables.
15. The update included total annual catch time-series for the period 2006-2021 within several regions of the southwest Pacific Ocean for the five target species of the Eastern Tuna and Billfish Fishery (ETBF). The figures presented summarised the proportion of catch taken by the ETBF relative to the total catch in the southwest Pacific Ocean are also included. The five target species for the ETBF are:
 - South Pacific albacore tuna (*Thunnus alalunga*)
 - Bigeye tuna (*Thunnus obesus*)
 - Broadbill swordfish (*Xiphias gladius*)
 - Striped marlin (*Kajikia audax*)
 - Yellowfin tuna (*Thunnus albacares*)
16. The main region of interest is based on two of the nine areas used in the stock assessment models for yellowfin tuna and bigeye tuna within the western central Pacific Ocean (WCPO). These various regions have been defined as they capture both the fishing operations of the ETBF, and the general population structure of the ETBF's target species. Region 5 is used for the three tuna species, Region 1 is used for the two billfish species, while the southwest Pacific region is used for all species.
17. The catch data used in this analysis were supplied by the Pacific Community (SPC), which is the Scientific Service Provider to the Western Central Pacific Fisheries Commission (WCPFC). The data were received on 4 August 2022. Catch, in metric tonnes, was disaggregated by year, fishing method (longline, purse seine, pole & line, and troll) and fishing fleet. A comparison of the Australian catch component in the data supplied by SPC with the Australian catch data provided by AFMA has been provided in earlier iterations of this report (Campbell, 2017; Campbell, 2018).
18. The RAG recommended the following updates for Dr Williams:
 - a. Keeping the flag colour consistent across all figures in the *catch by flag* graphs.
 - b. Clarify the striped marlin recreational graphs.
19. The RAG noted the recreational catch has assumed to not have changed and this was the third year the same catch data has been used.
20. The RAG discussed extending the swordfish (SWO) maps into Region 5, with invited participant noted there was foreign catch of SWO occurring in region 5 and East of New Zealand. The RAG noted that

Region 1 is used to ensure consistency with Secretariat of the Pacific Community, however there is scope for this to be revisited at the March meeting.

ACTION item – TTRAG37 to revisit the regions used in considerations of TACC for ETBF target species to ensure they are consistent with the needs of the RAG.

21. Industry Member Gary Heilman arrived at 09:21.

2.2 Economic indicators

22. The Economics Member (ABARES) reported on economic indicators for the most recent full year of data (2020-21). It was noted the data presented uses an economic indicators index derived from the Pacific Island Forum Fisheries Agency that has been adapted for the ETBF.
23. Gross value of production (GVP) in the ETBF decreased between 2001–02 and 2012–13 from \$128.0 million to \$29.8 million in real terms (2021–22 dollars), reflecting lower landed catch and falling average prices. Average prices are likely to have been influenced by movements in the Japanese Yen and Australian dollar exchange rate.
24. Between 2012–13 and 2015–16, GVP increased to an 11-year high of \$55.3 million in 2015–16 in real terms (2021–22 dollars). This increase resulted from higher landed catch and rising prices of key targeted species (particularly yellowfin tuna).
25. The decrease in GVP between 2015–16 and 2021–22 largely resulted from lower bigeye tuna, Broadbill swordfish and Yellowfin tuna production value.
26. The RAG noted the key points from the Economics Presentation:
- a. Economic indicators largely improved from 2019-20 to 2020-21, largely as a result of lower fuel and bait prices.
 - b. However, a fuel price increase and lower CPUE will negatively impact the economic conditions for 2021-22.
 - c. 2021-22 GVP calculations are only preliminary as there have not been the standard discussions with industry concerning operations prices.
27. The RAG noted the 2021-22 weighted Economics Conditions Index is nearly the worst it has even been
- a. Industry members suggested this may be due to effects from la niña and COVID-19.
28. The RAG discussed CPUE trends used for GVP calculations in the ETBF. It was noted CPUE calculations use logbook weight data, which has shown to be inaccurate when compared to CDR data. Furthermore, the degree of accuracy may change year to year which poses a potential issue for calculating relative CPUE trends.
- a. CSIRO noted that the standardised CPUE series, used for non-economic indicators, is based on logbook numbers instead of logbook weight and the afore mentioned concern will not affect the standardised CPUE series.

Action Item - ABARES to examine congruence between logbook and CDR data in the ETBF over time to determine if there is a need to alter the calculation of CPUE to ensure a consistent factor for GVP calculations.

2.3 ETBF Indicators

29. For each of the five quota species in the ETBF being; south pacific albacore, bigeye tuna, yellowfin tuna, swordfish and striped marlin - Dr Ash Williams presented data in four key areas:
- ETBF catch trends
 - Size trend
 - CPUE trend
 - WCPFC – Stock assessment

South pacific albacore

30. South pacific albacore tuna (*Thunnus alalunga*) was last assessed and presented at the WCPFC scientific committee meeting in 2021.
31. Albacore tuna are not overfished. The median estimate of spawning biomass was 0.52 $SB_{F=0}$ with a range (80% CI) of 0.41-0.57 $SB_{F=0}$. The estimated spawning biomass to be below the level that would be considered overfished (0.2 $SB_{F=0}$).
32. Albacore tuna are not subject to overfishing. Fishing mortality was estimated to be below the level that would achieve maximum sustainable yield (F_{MSY}).
33. The ETBF is considered to be part of a common south pacific albacore stock.
34. Noting the stock is not assessed as overfished or subject to overfishing it is important to note the following from a recent WCPFC SC17 meeting (2021): under “status quo” conditions (2017–2019 or 2020 average catch or, separately, fishing effort) results of model projections show a steep and rapid decline in biomass towards the LRP in the year 2021 followed by an increase in biomass thereafter.
35. The 2021 ETBF catch of albacore tuna was 1097 t which represents 4.1% of the provisional total catch (26479 t) of albacore tuna within the southwest Pacific region (10-50oS and 140oE-175oW).
36. In the ETBF, the 2021 catch of albacore tuna (1097 t) was slightly above both the five-year (2016-2020) and ten-year average (2011-2020). Catches of albacore tuna have generally aligned with overall effort in the ETBF over the last decade.
37. The median of processed fish weights has increased slightly over time, with some evidence of a recruitment pulse entering the fishery in 2020 and progressing into 2021.
38. The standardised CPUE index of albacore tuna has been increasing since 2018 after a period of stability. It remains above the recent five-year average of 1.18 in 2021 despite a slight decline from a peak in 2020.
39. **TTRAG recommended the TACC of 2,500 t**

Bigeye tuna

40. Bigeye tuna are not overfished, however bigeye tuna are unlikely to be subject to overfishing. There was a 12.5% probability that the recent fishing mortality was above F_{MSY} .
41. The 2021 ETBF catch of bigeye tuna was 392 t which represents 15.2% of the provisional total catch (2577 t) of bigeye tuna within the southwest Pacific region (10-50oS and 140oE-175oW). The average contribution is 11.62% over the previous five years (2016-2020).
42. In the ETBF, the 2021 catch of bigeye tuna is below both the five-year and ten-year average catch. Catches of bigeye tuna in the ETBF have been gradually declining over time, however catches have shown a slight increase in 2020 and 2021.
43. All three standardised CPUE indices for bigeye tuna (adults, recruits and combined) showed an increase in 2021 and each are above the recent five-year average CPUE. Each of the indices have been below average or declining over the last five to ten years and these increases show a return of the index toward the long-term average.
44. The ETBF has taken less than 0.5% of the total WCPFC catch and 12-36% of the annual catch in Region 5 (ETBF and adjacent areas) since 2010.
45. **TTRAG recommends the TACC of 1,056 t**

Yellowfin tuna

46. Yellowfin tuna are not overfished. There has been a long-term decrease in yellowfin tuna spawning biomass, but the depletion rates have been relatively stable over the last decade.
47. Yellowfin tuna are not subject to overfishing. The median estimate of fishing mortality was 0.36 of F_{MSY} with a range (80% CI) of 0.27–0.47 and there is a 0% probability that fishing mortality was above F_{MSY} .
48. The 2021 ETBF catch of yellowfin tuna was 1610 t which represents 11.7% of the provisional total catch (13787 t) of yellowfin tuna within the southwest Pacific region (10-50oS and 140oE-175oW). The average contribution is 8.8% over the previous five years (2016-2020).
49. In the ETBF, the 2021 catch of yellowfin tuna (1610 t) was near both the five-year and ten-year average catch in the ETBF of 1783 t and 1754 t respectively. These trends in catch are largely reflective of the overall changes in effort in the ETBF.
50. The size distribution of yellowfin tuna has been variable throughout the history of the ETBF between small, prime, and large-sized fish. Over the last three years, there has been a marked increase in the prevalence of prime-sized fish and concurrent decline in small-sized fish.
51. **TTRAG recommends the TACC of 2,400 t**

Broadbill Swordfish

Summary of implementation of the Harvest Strategy

52. Broadbill swordfish were last assessed in the WCPO in 2021 using data up to 2019.

53. Broadbill swordfish are not overfished. There is a 10% probability that spawning biomass is below $0.2 B_0$.
54. Broadbill swordfish are unlikely to be subject to overfishing. There is a 20% probability that fishing mortality is above F_{MSY} .
55. The 2021 ETBF catch of broadbill swordfish was 630 t which represents 63.7% of the provisional total catch (989 t) of broadbill swordfish within Region 1 of the southwest Pacific. The average contribution is 66.44% over the previous five years (2016-2020).
56. The number of active vessels in the ETBF has decreased substantially in the past 2 decades from around 152 in 1999, to 35 in 2020. Catches of broadbill swordfish in the fishery have been gradually declining over time from a peak of approximately 2823 t in 1999.
57. There are temporally sequential trends in the standardised CPUE indices for the different size classes (small, prime, large, combined) of broadbill swordfish that are consistent with a series of weak cohorts moving through the fishery over the last few years.
58. Industry members raised strong concerns about the CPUE standardisation, which they consider does not reflect changes to fishing behaviours (avoidance due to a lack of market) over recent years, and the inability of the standardisation to capture oceanographic conditions such as eddies. However, scientific members noted that while the overall nominal CPUE decreases significantly in recent years (consistent with industry observations), the std-CPUE also declines and is considered to capture some of the recent changes in the fishery. The RAG noted this discussion should be raised further at TTRAG in March meeting in 2023.
59. The RAG advice was derived from implementation of the ETBF modified swordfish Harvest Strategy (endorsed by TTMAC in 2022) – see Agenda 2.4 for details.

Striped Marlin

Striped marlin were last assessed in the WCPO in 2021 using data up to 2019. In summary:

60. Striped marlin are potentially overfished. The median estimate of recent spawning stock biomass was $0.2SB_{F=0}$ with 69% of model runs below the value expected to support catches at MSY.
61. Striped marlin are potentially subject to overfishing. Estimates of fishing mortality were very uncertain, ranging from 0.03-3.5 of F_{MSY} with the median estimate at 0.91 F_{MSY} and 56% of model runs estimating that overfishing is occurring.
62. Recruitment has shown a general downward trend over the assessment period consistent with previous assessments, but with recent recruitment somewhat above the average predicted by the stock-recruit relationship.
63. The 2021 ETBF catch of striped marlin was 209 t which represents 67% of the provisional total catch (312 t) of striped marlin within Region 1 of the southwest Pacific (0-50oS and 140-165oE).
64. In the ETBF, the 2021 catch of striped marlin (209 t) is below both the five-year and ten-year average catch in the ETBF of 246 t and 269 t respectively. Catches of striped marlin in the ETBF have been declining gradually over time since a peak of 730 t in 2001.

65. Overall catches from the stock have declined over the past 15 years while biomass has been relatively stable but at historically low levels since 2005.
66. The distribution of processed fish weights of striped marlin has been stable over time with a recent minor decline apparent in the proportion of large fish harvested.
67. TTRAG reviewed the following indicators in reference for triggering a review of MSE and HS for Striped Marlin:
 - The most recent WCPFC stock assessment of south western Pacific Striped Marlin
 - Any changes in targeting practice
 - Industry desire to increase catch.
 - i. TTRAG assessed the most recent WCPFC stock assessment of south western Pacific Striped Marlin which was in 2019, and noted there has not been a new stock assessment since last year's TTRAG recommendation.
 - ii. Industry members noted there have been no changes in targeting practices. The 2021 catch of striped marlin (209 t) is below both the five-year and ten-year average catch in the ETBF of 246 t and 269 t respectively. Catches of striped marlin in the ETBF have been declining gradually over time since a peak of 730 t in 2001, these changes in catch have mirrored changes in overall effort in the ETBF.
 - iii. Presently there is no change in industry's desire to increase catch.

TTRAG does not anticipate conditions that would trigger MSE and HS work at the present time.

TTRAG recommends the TACC of 351 t

68. A summary of stock assessment outcomes is provided noting that the major outcome of this meeting the production of the attached document "TTRAG Advice for the Eastern Tuna and Billfish Fishery for the 2023 Season" which provides detailed information on each quota species.
69. The RAG recommended the following for CSIRO to consider:
 - a. For albacore, separating the median weight graph into above and below 20°S and showing both figures
 - b. Providing an explanation for when there is a significant change in CPUE or when there is a significant difference between standardised and nominal CPUE

2.4. ETBF Broadbill Swordfish RBCC (CSIRO)

70. Dr Ash Williams presented the Swordfish RBCC report on behalf of Dr Rich Hillary.
71. The RAG noted the following key points concerning the revised Harvest Strategy:
 - a. A modification to the HS was applied during the extreme under-catch period.
 - b. Under the revised HS, if the HS recommends a decrease in the RBCC, the following rules apply:
 - i. If current catches are further below the RBCC than the RBCC is below the current TAC, no change is recommended;

- ii. If current catches are not further below the RBCC than the RBCC is below the TAC, the residual difference is discounted from the TAC reduction;
- iii. If the RBCC is below current catches, then the full TAC decrease is applied.
- iv. No alterations are made in the event of a TAC increase.
- c. The HS will be reviewed in 2023 and this extreme under catch period will be considered during the review.
- d. Dr Hillary presented findings of MSE results when applied to the revised HS, which indicate the revised HS supports the Swordfish Stock in the long term.

72. The RAG discussed standardised CPUE in 2020:

- a. Industry members and invited participants noted an increase in avoidance behaviours by fishers which is not reflected in the standardised CPUE results.
- b. The Scientific Member noted standardised CPUE is only reflecting prime sized fish and recruitment is likely playing a role.
- c. The RAG noted catch has remained stable through time, yet there has been a reduction in CPUE by approximately 50%.
- d. The RAG noted a disagreement between RAG members:
 - i. Industry members and invited participants believe avoiding behaviours are not well represented in the standardised CPUE indices.
 - ii. Other RAG members believed the standardised CPUE is consistent with recruitment patterns.
 - iii. It was noted standardised CPUE was likely to be affected by both fishing behaviour and recruitment.
- e. The RAG noted that MSE testing assumes that the CPUE model best meets the long term needs of the stock.

73. **The RAG supported an unchanged RBCC of 1047 t.**

2.5. Finalise RAG recommendations for TTMAC

74. Data provided in the presentations at agenda items 2.1-2.4 and associated papers together with RAG discussion during these agenda items was collated during and also following the meeting in the paper "*TTRAG Advice for the Eastern Tuna and Billfish Fishery for the 2023 Season*".

75. The RAG requested AFMA and CSIRO work together prior to the TACC recommendations TTRAG meeting to prefill the *TTRAG Advice for the Eastern Tuna and Billfish Fishery* paper, including a key points summary based on the CSIRO provided papers.

Action Item – AFMA and CSIRO to pre-fill *TTRAG Advice for the Eastern Tuna and Billfish Fishery* paper, including a key points summary based on the CSIRO provided papers, prior to the annual TACC setting TTRAG meeting.

2.6. WTBF indicators (AFMA/CSIRO)

76. The AFMA Member presented the summary paper on the indicators for the WTBF, noting that the AFMA Commission had previously requested that TTRAG provide it with an annual indicators paper to support Commission decisions on WTBF TACCs.
77. TTRAG reviewed and discussed the information provided on fishery indicators for WTBF species, which included a summary of information relevant to TACC decision points to assist TTRAG development of advice. In the absence of a local harvest strategy, TTRAG 21 supported the provision of annual information relevant to the consideration of TACC levels to the AFMA Commission, in a manner similar to that used for tropical tuna in the ETBF. That is, to provide an indicators paper which includes information relating to (for each stock):
- i. Stock Region
 - ii. Stock Status (based on the most recent regional stock assessments):
 - iii. IOTC Scientific Committee Advice.
 - iv. Present IOTC Management Arrangements.
 - v. Catch: IOTC and WTBF
 - vi. CPUE: IOTC and WTBF
 - vii. Mean Catch Weight: IOTC and WTBF
 - viii. Mean Catch Weight and Catch Proportions by Size: WTBF
78. The RAG noted general low effort in the fishery, however also considered the effects that taking the entire TACC over multiple years would have on the IOTC stock.
79. The RAG queried the need to visit this process each year, and if this could be more efficient to roll over the TACC each year unless exceptional circumstances such as a significant increase in fishing effort were identified.
80. TTRAG considered and discussed the implications of any given TACC decision (i.e. maintaining, increasing or decreasing the TACC) for all target species in the WTBF at both regional and subregional levels will be dependent on and informed by a number of factors:

Broadbill Swordfish

81. The implications of any given TACC decision (i.e. maintaining, increasing or decreasing the TACC) for the Broadbill swordfish stock at both regional and subregional levels will be dependent on and informed by a number of factors:
82. The most recent IOTC stock status advice (2020) has determined Broadbill Swordfish is not overfished and not subject to overfishing.
83. The current TACC OF 3000t is much higher than recent historical catch levels (150t in 2021/22 season or 5% of TACC). If caught, the TACC would represent ~10% of total IOTC catch.
84. There is little recent information available to determine if 3000 t catch in the WTBF is “locally sustainable” i.e. would lead to local depletions with associated economic impacts. Historically the domestic component of the fishery took upwards of 1,000 t, and in 2001 and 2002 took around 2,000 t. In any case the TACC levels should be reviewed if the fishery was to significantly expand, using and assessing catch and CPUE information from the expanding fishery.
85. At current catch levels, there is no risk to the IOTC stock, however if catch were to increase towards the TACC and other factors (recruitment, environmental etc.) took place then risk is uncertain.

86. TTRAG recognises that other considerations (whole of government position in allocation discussions) may be taken into account when setting the TACC level.

TTRAG recommends the TACC of 3,000 t

Bigeye Tuna

87. In 2019 a new stock assessment determined that IOTC bigeye tuna is not overfished but is subject to overfishing, and that reductions in fishing mortality are required to reduce the probability of the stock becoming overfished.
88. The current WTBF TACC of 2000 t is much higher than recent historical catch levels (60 t in 2021/22 season or 3% of TACC and 0.07% of IOTC catch). If caught, the TACC would represent ~2.3% of total IOTC catch.
89. Australia's TACC for bigeye tuna, if fully caught, represents (~2.3%), which is a small fraction of the total fishing mortality on this stock, particularly compared to historic catches by other IOTC fleets. Australia's catches to date will have made a negligible contribution to current status of the stocks that are overfished or subject to overfishing.
90. There is little information available to determine if a 2000 t catch in the WTBF is "locally sustainable" i.e. would lead to local depletions with associated economic impacts. Data for the domestic fleet, Japanese and Taiwanese longliners operating in the area of the WTBF and the Indian Ocean area around the Australian EEZ (latitudes 5°S to 49°S and longitudes 100°E to 139°E) show that there were significant catches recorded in this area prior to the year 2000.
91. The catch in this area in the decades preceding 2000 this regularly exceeded 1,000 t and occasionally exceeded 1500 t.
92. It was noted, feasible fishing areas are quite isolated and not suitable for fresh vessels. SFR holders are waiting for freezer vessels in this fishery.
93. TACC levels should be reviewed if the fishery was to significantly expand, using and assessing catch and CPUE information from the expanding fishery, alongside information on stock status and structure.
94. TTRAG recognises that other considerations (whole of government position in allocation discussions) may be taken into account when setting the TACC, noting there are no specific measures to limit catches of bigeye, however, at the Commission meeting in 2022 the IOTC adopted a management procedure (harvest strategy) for bigeye tuna.

Consistent with the adopted management objectives of the Commission, the management procedure is designed to achieve:

- a) a 60% probability that the bigeye tuna spawning stock biomass achieves the target reference point of SBMSY by 2034-2038;
- b) the bigeye tuna spawning stock biomass avoids breaching the interim limit reference point specified in Resolution 15/10 with a high probability; and operates with the following constraint:
- c) the maximum increase or decrease in the TAC shall be 15% relative to the previous TAC.

TTRAG recommends the TACC of 2,000 t

Striped Marlin

95. IOTC stock assessments have determined that IOTC Striped Marlin is both overfished and subject to overfishing, and that reductions in fishing mortality are required to recover the stock.
96. The current WTBF TACC of 125 t is much higher than recent historical catch levels (0.7t in 2021/22 season or <1% of TACC and <0.02% of IOTC catch). If caught, the TACC would represent ~4.8% of total IOTC catch. Given historic catch levels, it is unlikely the WTBF has contributed to the current poor stock status. Australia's TACC for striped marlin, if fully caught, represents (~4.8%), which is a small fraction of the total fishing mortality on this stock, particularly compared to historic catches by other IOTC fleets. Australia's catches to date will have made a negligible contribution to current status of the stocks that are overfished or subject to overfishing.
97. There is little information available to determine if a 125 t catch in the WTBF is "locally sustainable" i.e. would lead to local depletions with associated economic impacts. TACC levels should be reviewed if the fishery was to significantly expand, using and assessing catch and CPUE information from the expanding fishery, alongside information on stock status and structure.
98. TTRAG recognises that other considerations (whole of government position in allocation discussions) may be taken into account when setting the TACC level.

TTRAG recommends the TACC of 125 t

Yellowfin tuna

99. The adoption of Resolution 21/01 an interim rebuilding plan for Yellowfin Tuna is designed to apply to all contracting parties and co-operating non-contracting parties and not prejudice any future formal allocations. It is important to note this resolution does not establish an allocation but is designed to restrict the catch of Yellowfin Tuna in the Indian Ocean region. The resolution effectively states a floor in the measure which states if your reported catches of Yellowfin Tuna in 2014 of less than 5000 t and the average catch of the period 2015-2019 was below 2000 t then catches under the resolution 21/01 should not exceed 2000 t.
100. Resolutions remain active unless the Resolution specifically states otherwise. Therefore, to adopted interim resolution Australia is required to reduce the WTBF Yellowfin Tuna TACC to 2000 t.
101. IOTC stock assessments have determined that IOTC Yellowfin Tuna is both overfished and subject to overfishing, and that reductions in fishing mortality are required to recover the stock. It should be noted again that the IOTC uses different limit reference points to that defined in the Commonwealth Harvest Strategy Policy.
102. The current WTBF TACC of 2,000 t is much higher than recent historical catch levels (23 t in 2021/22 season or ~1.4% of TACC and ~0.01% of recent IOTC catch). If caught, the TACC would represent ~1.2% of total IOTC catch.
103. Australia's TACC for yellowfin tuna, if fully caught, represents (~1.2%), which is a small fraction of the total fishing mortality on this stock, particularly compared to historic catches by other IOTC fleets. Australia's catches to date will have made a negligible contribution to current status of the stocks that are overfished or subject to overfishing.

104. TTRAG recognises that other considerations (whole of government position in allocation discussions) may be taken into account when setting the TACC level.

TTRAG recommends the TACC of 2,000 t

3 Other business

3.1 EM and Logbook Congruence in the ETBF

105. Dr Don Bromhead presented methodology and preliminary findings of EM vs Logbook congruence research in the ETBF. The project is being run by ABARES on behalf of AFMA.

106. Dr Bromhead sought advice from the RAG for further inclusions to the research before the project was finalised, such as bycatch species of particular interest.

107. The RAG thanked Dr Bromhead for the presentation and recommended the following species be included in the next version of the report:

- a. Blue Marlin
- b. Black Marlin
- c. Shortfin Mako

108. The RAG commended the ETBF industry for the accuracy of logbook reporting relative to EM footage.

3.2 Dates for next meeting

109. The RAG requested AFMA distribute proposed meeting dates for 2023 to the RAG out of session.

Action Item – AFMA to distribute and confirm TTRAG meeting dates for 2023
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ADOPTED AGENDA Video Conference – 13- September 2022

Day 1

1. Preliminaries

- 1.1. Welcome and apologies
- 1.2. Pecuniary interest declarations
- 1.3. Adoption of Agenda
- 1.4. Adoption of Minutes
- 1.5. Actions Arising
- 1.6. Out of session correspondence

2. Review of Fishery Indicators

- 2.1. South West Pacific Data – update (CSIRO)
- 2.2. ETBF Economic indicators (ABARES)
- 2.3. ETBF Broadbill Swordfish RBCC (CSIRO)
- 2.4. ETBF indicators (AFMA/CSIRO)
- 2.5. Finalise RAG recommendations for TTMAC
- 2.6. WTBF indicators (AFMA/CSIRO)

3. Other Business

- 3.1. EM vs Logbook Congruence in the ETBF
- 3.2. Date and venue for next meeting

TTRAG 36 Appendix B

Table 1. Actions Items arising at TTRAG 36

	Action	Timeframe	Responsibility
1	TTRAG to revisit the regions used in considerations of TACC for ETBF target species to ensure they are consistent with the needs of the RAG.	TTRAG 37	TTRAG
2	ABARES to examine congruence between logbook and CDR data in the ETBF over time to determine if there is a need to alter the calculation of CPUE to ensure a consistent factor for GVP calculations.	TTRAG 39	ABARES / Economics Member
3	AFMA to distribute and confirm TTRAG meeting dates for 2023	As Soon As Possible	AFMA

Table 1. Actions Items as of TTRAG 36

	Action	Meeting Raised	Responsibility	Status at TTRAG 35
1	AFMA to revise the WTBF Indicators template to include subregional IOTC information, recreational fishery information, summary statements and historic catch trends for foreign fishing in the EEZ.	TTRAG 29	AFMA	COMPLETE: AFMA incorporated TTRAG’s suggestions for the WTBF indicators paper at TTRAG 36 in September Agenda Item 4.6 . Note recreational is yet to be incorporated and will be updated in 2023.
2	In relation to the ETBF data dictionary: <ul style="list-style-type: none"> a. CSIRO to provide AFMA with a copy of the CSIRO Tuna Legacy Data as described in the Data Dictionary. b. AFMA to provide more details for the ADC line tables to CSIRO 	TTRAG 29	AFMA	<ul style="list-style-type: none"> (a) COMPLETE Since TTRAG 31, AFMA has confirmed they have a copy of the Tuna Legacy database. (b) ONGOING: The ETBF Data Dictionary will be updated with new information on the new AFMA e-logs at the next FMS data strategy chapter update.

3	AFMA to update the Significant Events spreadsheet with the suggestions made by the RAG	TTRAG 32	AFMA	IN PROGRESS: Significant events spreadsheet not included in agenda for this meeting. Note AFMA Graduate currently compiling this spreadsheet.
4	AFMA to include Dr Robert Campbell's WCPFC SC paper that contains explanatory notes for significant events in the fishery alongside the Significant Events spreadsheet in future.	TTRAG 32	AFMA	IN PROGRESS: Significant events spreadsheet not included in agenda for this meeting, will be reported in early in 2023 new year to TTRAG. Note AFMA Graduate is currently compiling this spreadsheet.
5	Future data summaries to (1) remove the linear trend line from the catch plots and (2) provide more information of discards such as including life status and context around discards relative to effort, and (3) present future size data summaries to show trends over time (e.g. by year) rather than by quarter.	TTRAG 32	CSIRO	(1) ONGOING Linear trend line was removed from catch plots presented in papers under agenda item 5 (2) ONGOING: Requires additional data to be collected on life status ONGOING Annual trends in size data were presented in the ETBF size summary paper under agenda item 5
6	A RAG sub-group (consisting of AFMA, industry and RAG scientist) meet to discuss how to progress gaining better information on depredation.	TTRAG 32	AFMA	ONGOING: The group has not yet been convened. Fisheries Research and Development Corporation (FRDC) funded project 2021-078. <i>'Improving the management of wildlife interactions in pelagic longline fisheries'</i>
7	ABARES to provide further explanation of inputs/outputs in calculation of 'Economic performance Annual Indicators' for ETBF.	TTRAG 33	ABARES	ONGOING: To be addressed and presented during the September TTRAG 36. Agenda Item 2.2.
8	ABARES to pursue options to take account of SBT in the catch figures and calculations of GVP and NER for the ETBF and include SBT in future ETBF economic indicators for TTRAG considerations.	TTRAG 33	ABARES	ONGOING: To be addressed and presented during the September TTRAG 36 2022. Agenda Item 2.2.

9	CSIRO will undertake quantitative analysis to determine possible ways to understand if the low catch to TACC for Broadbill Swordfish constitutes exceptional circumstances in some way. They will also investigate if there is the opportunity to collect and integrate additional data in to the CPUE standardisation around bait types and sizes, and to undertake discussions with industry if there are other data that could be useful but aren't included.	TTRAG 33	CSIRO	Complete: TTRAG 35 were presented and accepted the CSIRO developed and tested this Modified HS which mitigates the exceptional circumstance, to recommend a Swordfish TACC for the 2023 fishing season.
10	AFMA to investigate, if possible, whether bait changes have been experienced by NZ and the Spanish.	TTRAG 33	AFMA	ONGOING: AFMA is in the process of identifying potential data and will provide an update in the early new year TTRAG.
11	Japanese catch data to AFMA provided by Dr Rob Campbell to be included in this WTBF Indicators Paper.	TTRAG 33	AFMA	COMPLETE: Updated in WTBF Indicators will be presented at TTRAG 36. Agenda Item 2.6
12	AFMA to include any new stock structure advice elements in the WTBF Indicators Paper.	TTRAG 33	AFMA	COMPLETE: Stock structure advice and next indicators assessment details have been updated. Agenda Item 2.6
13	The Chair requested that, if the CSIRO yellowfin close kin study and associated stock structure work requested by the IOTC required further discussion by the RAG, it should be added to the agenda for the March 2022 TTRAG meeting.	TTRAG 33	RAG Members	ONGOING: Not yet actioned
14	AFMA to add collection/updating of recreational catch data for Australia and NZ, particularly non-club take of yellowfin and striped marlin for consideration as a future research priority.	TTRAG 33	AFMA	ONGOING: Not yet actioned.
15	AFMA to work with J Pepperell on development of a TTRAG35 paper summarising State recreational CPUE indices, Australian tournament sampling and size frequency and sex ratio monitoring reports for the 2021 and 2022 seasons, and, where possible, New Zealand recreational swordfish effort.	TTRAG 34	AFMA & J Pepperell	ONGOING: Not yet actioned.

16	AFMA to distribute a copy of the current ETBF e-log fields and confirm whether the additions recommended at TTRAG 23 were included (vessel log speed, shooting speed, branchline length, bubble dropper length).	TTRAG 34	AFMA	ONGOING: AFMA can confirm that shooting speed, branch line length and hook size have been added to the e-logs. AFMA is in the process of adding additional fields to the e-log such vessel log speed, bubble dropper and squid fields.
17	AFMA and Tuna Australia to capture historical dates of changes to squid bait species, with evidence to be provided through bait import documents and a questionnaire.	TTRAG 34	AFMA	ONGOING: Initial data has been received. Further data is yet to be received from industry.
18	AFMA to provide CSIRO with data capturing squid bait changes by mid-April 2022. CSIRO to include these changes in the Swordfish CPUE standardisation to be presented at TTRAG 35 in July.	TTRAG 34	AFMA & CSIRO	ONGOING: Data was received late and couldn't be presented at TTRAG 35. CSIRO to review data and will work with AFMA on additional data requirements.
19	AFMA to work with Tuna Australia to develop operationally feasible options to capture discard sizes for swordfish. i.e. (E-log comment section, tick box for fish between 10-20kg, head only, small, medium or large).	TTRAG 34	AFMA & Tuna Australia	ONGOING: AFMA is currently working on having additional fields added to e-logs pending further consultation with industry.
20	CSIRO to explore offsetting a decrease in the TAC under the HS, by comparing average catch to additional recent undercatch and applying a decision rule based on the relationship of actual and additional undercatch proportions (detailed in Appendix 3 in TTRAG 34) in time for TTRAG 35	TTRAG 34	CSIRO	Complete: TTRAG 35 were presented and accepted the CSIRO developed and tested this Modified HS which mitigates the exceptional circumstance, to recommend a Swordfish TACC for the 2023 fishing season.
21	CSIRO standardisation team to work with Jason Hartog to identify environmental factors included in the ETBF CPUE standardisations that could be informed by the outputs of the FRDC Oceanography Project.	TTRAG 34	CSIRO	COMPLETE: CSIRO have provided an update into the CPUE standardisations for all key species. Further updates to be to be presented in the new year at TTRAG 37.
22	TTRAG to be provided an update in the new year on the Management Procedure for big eye tuna.	TTRAG 35	ABARES/AFMA	ONGOING: Management Procedure for bigeye tuna to be presented at TTRAG 37

23	To provide the Draft Five Year Research Strategic document and Annual Research Plan out of session to the RAG for review and comment.	TTRAG 35	AFMA	COMPLETE: Out of session email correspondence Sent 11/08/2022
24	To collate comments for the Draft Five-Research Strategic Document and Annual Research Plan and provide an update at TTRAG 36	TTRAG 35	AFMA	ONGOING: AFMA's Strategic Research Plan has been revised and updated. It will be reviewed by the AFMA Commission meeting in November 2022. Given Australian Tuna and Billfish Research plan should align with AFMA's strategic objectives this will be completed in the new year 2023 and presented at July's TTRAG for comment and finalisation.
25	AFMA and Recreational Fishing member to have discussions out of session on revised expression of interest and report for the Recreational Fishing Data Collection Project and provide an update to the RAG.	TTRAG 35	AFMA/Recreational Fishing Member	COMPLETE: update to be provided at TTRAG 36 under agenda item 3 in Other Business.
26	CSIRO to provide budget to AFMA for the costing of the CSIRO project " <i>Scientific advice for management of Tropical Tuna and Billfish Fisheries</i> " out of session	TTRAG 35	CSIRO	COMPLETE: Received and out of session email on research papers 11/08/2022 and updated on annual research plan, prior to sending out of session.
27	AFMA and CSIRO to investigate the reasoning behind time series starting in 1998.	TTRAG 35	AFMA/CSIRO	COMPLETE: CSIRO provided an update to the RAG on the morning of Day 2 TTRAG36. A report was referenced from Dr Robert Campbell in 2018 noting that TTRAG agreed to start the analysis for ETBF for 1998. An industry member noted it was agreed that time series started 1998, due to unprecedented fishing year in 1997.

28	AFMA and CSIRO to investigate the differences and potential inconsistencies in set times, including auto-time adjustments from what is being recorded in electronic logs entries and the AFMA database.	TTRAG 35	AFMA/CSIRO	ONGOING: Not yet actioned
29	The modified harvest strategy will be reviewed 2023, the review must include assessing the continuation if the low recruitment within the fishery; if under-catch remains low and continues due to the market conditions; and review the percentage of Australian catch relatively to other countries fishing at/near the Australian EEZ has been incorporated adequately.	TTRAG 35	AFMA	ONGOING: Review will take place early 2023. TTRAG to be provided with regular updates and TTRAG to provide ongoing advice as part of the review.
30	AFMA to provide advice to TTMAC using the accepted modified broadbill swordfish harvest strategy and that it is used to apply the TAC for 2023.	TTRAG 35	AFMA	ONGOING: Advice from TTRAG 36 will be completed in time for TTMAC in October 2023.
31	AFMA to provide an update to the RAG regarding the breaches of data confidentiality and the possible legal repercussions.	TTRAG 35	AFMA	ONGOING: To be updated at TTRAG 36

Table 2. Action Items Relating to CPUE as of TTRAG36

Item	Meeting Raised	Status at TTRAG 33	TTRAG comments
CPUE analyses: CSIRO to contact ABARES scientists regarding their 'clustering' analyses work to determine if it may provide insights for improving the CPUE analyses (and vice versa).	TTRAG 21 TTRAG 22	ONGOING: This work is still being progressed noting a change in staff working on it at ABARES.	Taken as read.
CSIRO 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	ONGOING: CSIRO to obtain the specific boundaries of the marine parks and then will pass onto whoever takes on the work	Taken as read.

TTRAG to consider development of Time Depth Recorder (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.	TTRAG 23	ONGOING: Not yet actioned.	Taken as read.
AFMA to examine VMS data to check and verify sets reported on logbooks as having mainline lengths greater than 100km. TTRAG to consider frequency distributions of values for all factors used in CPUE standardisations and provide advice regarding the removal of outliers.	TTRAG 24	ONGOING: Not yet actioned.	Taken as read.
TTRAG to give further consideration to additional potential fields, specifically, those required by WCPFC logbooks and ROP, fields relevant to collecting data on depredation, and shape of mainline set.	TTRAG 29	ONGOING: Not yet actioned.	Taken as read.
AFMA to provide CSIRO with the locations of recreational fishing FADs off the southeast Queensland coast for consideration in future CPUE standardisations	TTRAG 31	COMPLETE: AFMA provided a spreadsheet of FAD locations in February 2022.	Taken as read.