Australian Government
Australian Fisheries Management Authority

Tropical Tuna and Billfish Fisheries Research Assessment Group (TTRAG)

MINUTES
TTRAG 11
17-19 MARCH 2015
HOBART

THE ELEVENTH MEETING OF THE TROPICAL TUNA AND BILLFISH FISHERIES RESOURCE ASSESSMENT GROUP (TTRAG11)

Hobart, 17-19 March 2015

Contents

List of Actions

	Action	Responsibility	Status
1	A long-term analysis project of SST, other oceanographic factors and catch data to be made a research priority. The purpose would be to use the current model for Southern Bluefin Tuna and re-adapt for Yellowfin Tuna. This could be done for bycatch species as well. In the mid-term, Robert Campbell to undertake a statistical analysis of the relationship between oceanography and fish distribution. AFMA to also investigate the potential for a collaborative study (with SPC and near neighbour countries like PNG, Solomon Islands, New Caledonia, Vanuatu and Fiji) that examines fine scale spatial and temporal CPUE and size data for additional information regarding mixing of tropical tuna species within and between the Australian and adjacent fishing zones.	Dr Rob Campbell	Ongoing. The project has been started. There are two stages to this project; 1) long-term analysis, 2) short-term statistical analysis with real-time data for industry. This second stage is to assist industry in becoming more economically efficient in their operations. Updates will be provided by Dr Campbell at the next TTRAG meeting (TTRAG 12).
2	Dr Robert Campbell to investigate what data on hook type (in relation to SWO catches), branchline length and bubble length are available in the observer data.	Dr Rob Campbell	Ongoing. Dr Campbell advised that hook type has now been investigated. Branchline length and bubble length will be investigated prior to the next TTRAG meeting (TTRAG 12).
3	TTRAG EO to distribute line-weighting trial report to TTRAG after it has been submitted to FRDC.	TTRAG EO	Ongoing, report has not yet been finalised.
4	The TTRAG recreational fishing member to provide members with any recreational research papers that are relevant.	Dr Julian Pepperell	This is a standing agenda item. Dr Pepperell will provide any relevant information at each TTARG meeting.
5	Dr Sandra Diamond to distribute Danielle Ghosn report on the club-based tournament fishery to TTRAG members.	TTRAG Chair	Ongoing. The report is in the process of being finalised.

6	Dr Rob Campbell to create a new area off the south coast of NSW specifically for Striped Marlin to include in the CPUE standardisations.	Dr Rob Campbell	Ongoing. Planned for the next TTRAG meeting (TTRAG 12).
7	AFMA to provide Dr Rob Campbell with the locations of the SBT management zones and a list of all the shot numbers within the zones.	AFMA	Ongoing.
8	AFMA to provide a presentation on e-monitoring at the next TTRAG meeting.	AFMA	Ongoing. Planned for TTRAG 12.

1 Preliminaries

1.1 Welcome and apologies and attendees

1. The TTRAG Chair opened the meeting at 8:55am.
2. Attendees:

Members
Dr Sandra Diamond, Chair (University of Western Sydney)
Mr Steve Auld (AFMA)
Dr Rob Campbell (CSIRO)
Dr Cathy Dichmont (CSIRO)
Dr Julian Pepperell (Recreational fishing scientist)
Mr Gary Heilmann (Industry)
Dr James Larcombe (ABARES)
Dr Rich Hillary (CSIRO)
Prof John Tisdell (Economist, University of Tasmania)

Invited participants
Mr Paul Williams (Industry)

Observers
Ms Sophie Fisher (AFMA)
Dr Ann Preece (CSIRO)
Dr Campbell Davies (CSIRO)
Dr Karen Evans (CSIRO)
Dr Peter Grewe[1] (CSIRO)

Executive Officer
Ms Stephanie Johnson (AFMA)

Apologies
Mr John Abbott (Industry)
Mr Pavo Walker (Industry)
Mr Cathal Farrell (Industry)

[1] Attended for Agenda Item 6 only

1.2 Pecuniary interest declarations

3. TTRAG discussed the declaration of pecuniary interest and how TTRAG will deal with potential conflicts of interest.

4. The attendees were asked to state their pecuniary interests.

    - Dr Sandra Diamond, employee of the University of Western Sydney. Has no pecuniary interest (financial or research) in tuna fisheries. Currently has a PhD student involved in game fishing tournament research. Dr Diamond is paid as the TTRAG Chair.
    - Dr Robert Campbell, employee of CSIRO, no pecuniary interest in Australian tropical tuna fisheries. Is actively engaged in research on the Eastern and Western Tuna and Billfish Fisheries. PI of the following research projects: "*Data management, provision of fishery indicators and implementation of the harvest strategies for Australia's tropical tuna fisheries*", and *"Developing innovative approaches to improve CPUE standardisation for Australia's multi-species pelagic longline fisheries"*.
    - Dr Cathy Dichmont, employee of CSIRO and a member of TTMAC, has no pecuniary interest in Australian Tropical Tuna Fisheries. Has a cross-cutting project that affects tuna fisheries. Is the CSIRO research representative on the northern hub that co-ordinates tropical fisheries research and proposals. Observer on the AFMA Research Committee (ARC) and the Commonwealth Fisheries Research Advisory Board (ComFRAB).
    - Mr Steve Auld, employee of AFMA, which includes a salary. Is the Manager of the tropical tuna fisheries, but has no pecuniary interest in Australian tropical tuna fisheries. Has a declared interest/involvement in all agenda items. Co-investigator on Dr Rob Campbell's multi-species fisheries project.
    - Ms Stephanie Johnson, employee of AFMA, which includes a salary. Is a Senior Management Officer for the tropical tuna fisheries. No pecuniary interest in tropical tuna fisheries.
    - Mr Gary Heilmann, director of several companies that hold; 2 ETBF boat SFRs and quota SFRs (less than 5% of quota species except for Albacore Tuna which is greater than 5% of the total ETBF quota), a fish receiver's permit and a Coral Sea fishery 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.
    - Dr Rich Hillary, employee of CSIRO, no pecuniary interest in Australian tropical tuna fisheries. Is the PI for the Management Strategy Evaluation (MSE) project for the tropical tuna and billfish species.
    - Dr James Larcombe, employee of ABARES, leads delegations to the WCPFC Scientific Committee and does Tropical Tuna research. Has no pecuniary interest in the Australian Tropical Tuna Fisheries.
    - Dr Julian Pepperell, independent fisheries consultant and representative of the recreational fishing sector. Is currently undertaking research into game fishing in NSW and Western

Australia fisheries. Is involved in projects monitoring fish landed at game fishing tournaments and pop-up satellite tagging on juvenile Black Marlin.

- Prof John Tisdell, employee at the University of Tasmania and is a scientific member of the Great Australian Bight Resource Assessment Group (GABRAG). Has no pecuniary interest in tropical tuna fisheries.

Observers

- Dr Campbell Davies – employee of CSIRO, no pecuniary interest in Australian tropical tuna fisheries. Is involved in projects regarding Southern Bluefin Tuna and also contributes to Dr Hillary's MSE project.
- Dr Karen Evans – employee of CSIRO, no pecuniary interest in Australian tropical tuna fisheries. Is involved in research on tropical tuna species and Broadbill Swordfish and also contributes to Dr Hillary's MSE project.
- Dr Ann Preece – employee of CSIRO, no pecuniary interest in Australian tropical tuna fisheries. Is involved in research on tropical tuna species and also contributes to Dr Hillary's MSE project.
- Ms Sophie Fisher – employee of AFMA, which includes a salary. Is a Management Officer for the tropical tuna fisheries. No pecuniary interest in tropical tuna fisheries.

Members not present

- Mr John Abbott, owns an ETBF boat SFR, and ETBF quota SFRs, and also holds a state licence fish receiver permit.
- Mr Pavo Walker, owns several ETBF boat SFRs, and ETBF quota SFRs for all species. Holds a Coral Sea permit and minorline permit.
- Mr Cathal Farrell, Manager of fish receiving business and holder of an ETBF boat SFR.

5. At the beginning of each agenda item, TTRAG members with a stated conflict of interest were asked to leave the room and the remaining members discussed their individual claims. In all cases, all members were agreed to be permitted to participate in the item discussion.

1.3 Adoption of agenda

6. The agenda was adopted by TTRAG (Attachment A) with a small number of amendments to scheduling and the addition of a "Risk-Cost-Catch project update" under agenda item 5.

1.4 Acceptance of minutes

7. The minutes were accepted by TTRAG with one minor amendment.

1.5 Actions arising/out-of-session developments

8. TTRAG discussed the action items arising from TTRAG 10 (Table 1), and commented on progress.

Table 1. Actions arising from TTRAG 10 and the status of these actions.

	Action	Responsibility	Status
1	AFMA to investigate if SBT catch can be included in ETBF Catchwatch reports and if previous SBT data can also be obtained.	AFMA	Not possible. AFMA indicated that this is difficult to do, but agreed to post a SBT Catchwatch report regularly on the AFMA website.
2	A long-term analysis project of SST, other oceanographic factors and catch data to be made a research priority. The purpose would be to use the current model for Southern Bluefin Tuna and re-adapt for Yellowfin Tuna. This could be done for bycatch species as well. In the mid-term, Robert Campbell to undertake a statistical analysis of the relationship between oceanography and fish distribution. AFMA to also investigate the potential for a collaborative study (with SPC and near neighbour countries like PNG, Solomon Islands, New Caledonia, Vanuatu and Fiji) that examines fine scale spatial and temporal CPUE and size data for additional information regarding mixing of tropical tuna species within and between the Australian and adjacent fishing zones.	Dr Rob Campbell	Ongoing. The project has been started. There are two stages to this project; 1) long-term analysis, 2) short-term statistical analysis with real-time data for industry. This second stage is to assist industry in becoming more economically efficient in their operations. Updates will be provided by Dr Campbell at the next TTRAG meeting (TTRAG 12).
3	Dr Robert Campbell to investigate what data on hook type (in relation to SWO catches), branchline length and bubble length are available in the observer data.	Dr Rob Campbell	Ongoing. Dr Campbell advised that hook type has now been investigated. Branchline length and bubble length will be investigated prior to the next TTRAG meeting (TTRAG 12).
4	AFMA to investigate the possibility of obtaining hook type and bubble dropper length data through e-logs.	AFMA	Not possible. There is still only a very small number of operators using e-logs, so this information will be investigated when more relevant.
5	Dr Robert Campbell to investigate the inclusion of the frontal index and bathymetry in the CPUE standardisation.	Dr Rob Campbell	Completed. Bathymetry did not display a large impact and frontal index is included in the standardisation.

6	AFMA to provide TTRAG industry members with a brief and simple explanation of model "fitting" and how to interpret some common model fit (diagnostic) plots at a future TTRAG meeting.	AFMA	No longer relevant. Industry members are encouraged to ask for clarification whenever they require it.
7	TTRAG EO to distribute line-weighting trial report to TTRAG after it has been submitted to FRDC.	TTRAG EO	Ongoing, report has not yet been finalised.
8	The TTRAG recreational fishing member to provide members with any recreational research papers that are relevant.	Dr Julian Pepperell	This is a standing agenda item. Dr Pepperell will provide any relevant information at each TTARG meeting.
9	Dr Ann Preece MSE project (Dr Rich Hillary is the primary investigator).	Dr Ann Preece/Dr Rich Hillary	Completed.
10	Dr Sandra Diamond to distribute Danielle Ghosn report on the club-based tournament fishery to TTRAG members.	TTRAG Chair	Ongoing. The report is in the process of being finalised.
11	TTRAG to request TTMAC to ask Dr Kevin Williams to expand his project on ETBF target species size monitoring to include data from the WTBF.	TTRAG	Completed.
12	TTRAG to develop a "wishlist" for additional data that could be included in logbooks.	TTRAG	No longer relevant. Additional data needs will be discussed when a change to logbooks is feasible.
13	Dr Rob Campbell to create a new area off the south coast of NSW specifically for Striped Marlin to include in the CPUE standardisations.	Dr Rob Campbell	Ongoing. Planned for the next TTRAG meeting (TTRAG 12).
14	AFMA to provide Dr Rob Campbell with the locations of the SBT management zones and a list of all the shot numbers within the zones.	AFMA	Ongoing.

2 Review of fishery performance

No pecuniary interests were declared under this agenda item.

2.1 Current catches and effort in the domestic fishery – verbal updates since TTRAG 10 (October 2014) from industry, recreational fishing members and scientists

9. The AFMA member provided TTRAG with an initial update on catch levels for the Eastern Tuna and Billfish Fishery (ETBF) for the end of the 2014/15 fishing season.

10. TTRAG noted that the Total Allowable Commercial Catch (TACC) for Broadbill Swordfish was 85% caught according to current logbook data[2] and this is very positive. A catch level of 90% is generally considered "fully caught" by AFMA as the final 10% of the TACC is usually contained within under/overcatch or is held by several small-scale quota holders.

11. Industry members indicated that the prices for Swordfish were also reasonably good during the second-half of the ETBF season, with operators receiving an average of $10-12 per kilogram rather than the usual $6-8 per kilogram. The reduction in the diesel fuel prices during the fishing season also added to an increase in profitability for operators this past season.

12. Members further noted that the catches of Yellowfin Tuna were reasonably positive this year, reaching approximately 1,900 tonnes rather than the average of 1,500 tonnes. This was also considered nearly "fully caught". The quality of Yellowfin Tuna was better off the NSW south coast, but the Mooloolaba operators only saw "summer quality" fish. The fish quality usually improves during the season, but industry members stated that this did not occur this year.

13. A similar trend was seen in catches of Bigeye Tuna, were the quality of the fish caught was not as good as in previous years. Both Bigeye and Yellowfin Tuna showed high levels of fat content, but this did not indicate high quality. Industry members stated that this was a very unusual occurrence, but the prices were not greatly affected as the majority of the catches of poorer quality fish species were exported to the United States.

14. Specifically for Bigeye Tuna, industry members stated that these fish appeared in greater numbers earlier in the season and they continued to be present for longer in comparison to previous years.

15. Overall, the 2014/15 fishing season was considered to be a good year for the Queensland ETBF operators. However, for the NSW operators, fishing was not as positive. There has been a greater reliance on Southern Bluefin Tuna catches by the NSW operators as they have not been seeing as many Yellowfin and Bigeye Tuna come through in the last few years. As stated by the Queensland industry members, there were no "winter quality" fish caught in the 2014/15 season.

16. Dr Robert Campbell indicated that he would review the Yellowfin Tuna length frequency data for the last few years to determine whether there are different cohorts of fish moving through or if there is a year class missing from the population. This will be included in the data presented at the next TTRAG meeting.

17. In December 2014, the presence of Striped Marlin was strong according to industry members, however of those caught, many were cut off. This was due to the very low prices for Striped Marlin in the market so any catches were not worthwhile for industry to land. Operators are generally avoiding catching Striped Marlin.

[2] Note; there is an approximate 2-4 week lag time in logbook processing.

18. Industry members stated that operators are not catching Albacore Tuna as they have not been seen. The catches of Mahi Mahi were also low in the 2014/15 season. This could be due to operators deep-setting or targeting Swordfish more frequently rather than other species. As prices have been high for Swordfish, this is more likely the case.

19. In terms of management of the ETBF, a 5-year List of Exempt Native Specimens (LENS) exemption was approved by the Department of Environment. This enables the fishery to continue to export the species caught. This is a very positive sign for the fishery.

20. TTRAG noted that Walker Seafoods is still in the process of gaining Marine Stewardship Council (MSC) certification, but this due to be finalised next month (April). It is expected that Yellowfin Tuna, Broadbill Swordfish and Albacore Tuna will be certified with no issues, but the certification of Mahi Mahi is likely to incur several conditions. This is due to the minimal management on this species currently as it is not a target species in the ETBF. However, AFMA is beginning to look more closely now at the data for Mahi Mahi and will continue to monitor it. While Walker Seafoods is financing the MSC assessment and certification, the whole ETBF has been assessed in the process. However, only Walker Seafoods will be able to attach the MSC label to their product. Any other operators in the ETBF wishing to also use the MSC label will need to contact Walker Seafoods and contribute a payment. They will need to agree to operate under the same conditions as Walker Seafoods to maintain the same certification.

21. An industry member complimented AFMA on the new website and stated that the information for the fishery was clear, accurate and easy to find. AFMA's new website went live in January 2015, but due to the transition from the previous website, there was some delay in the posting of "Catchwatch" and other information.

22. The AFMA member informed TTRAG of the progress of the current implementation of electronic monitoring in the ETBF and Western Tuna and Billfish Fishery (WTBF). Strong resistance is continuing from several operators within the ETBF, but all full-time operators will be required to have e-monitoring systems installed on their boats by 1 July 2015. The e-monitoring camera footage will be used to monitor Threatened, Endangered and Protected species interactions and to verify logbook reporting. It is expected that e-monitoring will improve the accuracy of catch recording in logbooks, which will lead to greater reliability in the data for the ETBF in particular. A random 10% of camera footage across each fishery (ETBF & WTBF) will be reviewed and analysed and a performance report will be provided to operators on their reporting accuracy in comparison to their logbook.

23. TTRAG members noted that e-monitoring systems will replace human observer coverage in the tuna fisheries. If an operator has a camera installed they will not be required to carry human observers.

ACTION: AFMA to provide a presentation on e-monitoring at the next TTRAG meeting

24. On average, there will be 4 cameras installed per boat. These will have;

    1. A view of the tori line/seabird mitigation device
    2. A view of the sea door, to see any cut-offs
    3. A broad view of the deck
    4. A fine view of the processing area, for species identification

25. The AFMA member confirmed that e-monitoring is cheaper/more cost-effective than human observers and the same data is able to be collected, except for fish lengths. However, it is expected that with the advancement in technology, lengths will be able to be collected in future years.

26. The scientific members expressed their interest in e-monitoring, particularly in regard to the potential changes in the data for the fishery. With cameras, the "observer effect" will be removed and accuracy in reporting, particularly of seabird interactions should improve. Logbook data underpins management of the ETBF and WTBF and it is crucial that this data is reliable.

27. TTRAG noted that all AFMA-managed fisheries will ultimately move to electronic monitoring methods and there are currently trials occurring in international fisheries as well.

28. Dr Julian Pepperell provided the RAG with an update of the recent recreational catches. The Queensland and NSW game fishing seasons have been going well. There appears to have been strong recruitment of juvenile Black Marlin off Townsville in the last few years and catches[3] have been good. The 2014 season has been the best in terms of "big" fish and anglers are particularly happy. This recreational fishery has been operating for 50 years and Dr Pepperell stated that he is interested in looking at strike rate over time in comparison to Sea Surface Temperature (SST) as the high numbers of recent catches suggest that Black Marlin is sustainable. However, recreationally caught fish are not landed so there is no biological data for Black Marlin. It is intended that some biological data collection will occur in the future and will likely be in the form of fin clips.

29. Striped Marlin recreational catches have declined in recent years. This species has mainly been caught in NSW tournaments over the last 15 years. In February this year, unusually large numbers were caught, but this has not happened for several years.

30. Blue Marlin numbers caught and tagged have been high in the last two seasons and there is an increasing number of tournaments targeting this species. Yellowfin Tuna recreational catches have also been good in the last two season and 300-400 fish have been tagged. While these numbers are high, there have not been as many fish tagged as in previous seasons. Mahi Mahi and Mako Shark recreational catches have also been reasonably good in the last season.

31. In Western Australia, the billfish are the main species caught recreationally. The juvenile Black Marlin fishery off Exmouth had a record season in 2014 and the fish have turned up again this year. The overall numbers of recreational boats have declined both in Western Australia and NSW as more people are going out on larger boats. This is better for tackling the larger species in bad conditions.

32. In regard to the WTBF, AFMA officers visited Perth in February to meet with the main operator there. The main catches in this fishery are of Broadbill Swordfish and the 2014/15 season went well. The AFMA member informed TTRAG that there may be 8 more boats entering the fishery later in 2015. The WTBF TACCs are never fully caught so there is quota available. TTRAG particularly noted that with an increase in boats, there will be a need to monitor the fishery more closely and consider the effectiveness of the Harvest Strategy for the target species in the WTBF.

[3] Black Marlin recreational catches are catch and release.

3 Management Strategy Evaluation

The following members declared their interest under Management Strategy Evaluation items:

Dr Rich Hillary

In line with the requirements as a RAG scientific member who has declared interests under an agenda item, Dr Hillary left the room. The remaining members of TTRAG agreed that Dr Hillary should be allowed to return for all discussions and recommendations made under Agenda item 3.

The following TTRAG observers also declared their interests under this agenda item:

Dr Ann Preece

Dr Campbell Davies

Dr Karen Evans

In line with the requirements as a RAG scientific observer who has declared interests under an agenda item, Dr Preece left the room. The remaining members of TTRAG agreed that Dr Preece should be allowed to return for all discussions and recommendations made under Agenda item 3.

In line with the requirements as a RAG scientific observer who has declared interests under an agenda item, Dr Davies left the room. The remaining members of TTRAG agreed that Dr Davies should be allowed to return for all discussions and recommendations made under Agenda item 3.

In line with the requirements as a RAG scientific observer who has declared interests under an agenda item, Dr Evans left the room. The remaining members of TTRAG agreed that Dr Evans should be allowed to return for all discussions and recommendations made under Agenda item 3.

3.1 Update on the progress of the MSE project

33. Dr Rich Hillary and Dr Ann Preece provided presentations to the RAG for this agenda item. These presentations can be found at Attachments B, C and D.

Broadbill Swordfish

34. The first presentation was given by Dr Hillary on the Swordfish Harvest Strategy. TTRAG members noted that since 2010, there has been a change to the harvest control rule and a new stock assessment has been completed.

35. In terms of the changes to the harvest control rule, these changes include;

- New CPUE-based target and limit reference points;
    i. Shifted emphasis from CPUE-based economics to Spawning Stock Biomass (SSB) reference points
    ii. Target CPUE = Maximum Economic Yield proxy (0.48 SSB_0)
    iii. Limit CPUE = 0.2 SSB_0 equivalent (i.e. 0.5 SSB(MSY) proxy)
- New size-class definitions for recruits, prime and old
- LOESS smoother on CPUE
    i. Negligible effect on simulated swordfish HS performance

36. For the 2013 stock assessment, TTRAG members noted that there is some uncertainty in the stock status and spatial assumptions. Firstly, two different growth models were used in the assessment; the Hawaiian model and the Australian model. Both models indicated that within the Western and Central Pacific Fisheries Commission (WCPFC) Convention area, Swordfish biomass is not considered to be overfished or subject to overfishing. However, the growth curves differ between the two models with the Hawaiian model displaying a more optimistic curve than the Australian model. While more tagging data is needed, current indications suggest that the Australian growth model is more accurate.

37. For the spatial assumptions, it appears that the zone for Swordfish is becoming wider and catches are increasing in the equatorial Pacific region. However, the majority of the Swordfish catch still occurs off the Australian east coast and New Zealand east coast. The TTRAG scientific members commented that the increase in catches in the north-eastern corner of the Convention Area (equatorial Pacific region) appears unusual and it was queried as to whether Australia could obtain tagging data from other countries. This increase in catches is predominantly occurring in the area of French Polynesia. Unfortunately tags were unable to be obtained from French Polynesia.

38. It was further noted by TTRAG that these new catches in the north-eastern region of the WCPFC Convention Area were included in the 2013 stock assessment for Swordfish, but were not included in the 2008 assessment.

39. The indications from the tagging data that has been collected suggest that there are two concentrations in Swordfish; the first off Eastern Australian and the second off Eastern New Zealand. However, the data does not indicate a long-term movement trend.

40. It was speculated by the TTRAG scientific members and observers that the new catches in the north-eastern region of the WCPFC Convention Area could potentially be linked to the North-east Pacific Ocean stock, located off the west coast of the United States.

41. TTRAG discussed the possibility of removing the new catches in the North-eastern region of the Convention Area from the assessment. If this was done, Australia would account for more than 60% of the Swordfish catch in the Western and Central Pacific Ocean (WCPO) and would therefore, have more influence on the stock that previously thought.

42. The TTRAG industry members stated that it did not make sense to include the new catches in the assessment as it appears they are unrelated to the Australian Swordfish catches.

43. TTRAG further noted the appearance of the two spatially linked populations of Swordfish (east coast Australia and east coast New Zealand). It was agreed that further discussion is needed on the implications for the Australian stock assessments, particularly in regard to recruitment, if the Australian catches are actually from one separate population.

44. In terms of Catch Per Unit Effort (CPUE) and SSB, CPUE for Prime-size fish is currently below the target level and it is being brought down by the international catches. There is a mis-match between the target level for CPUE currently included in the Harvest Strategy and the current SSB level. There is also a mis-match between the data used in the 2013 assessment compared to the 2008 assessment. Further discussion is required to achieve consistency between these levels and assessments.

45. Due to the difference in growth models used, the unusual recruitment assumptions, the mis-match in target levels being used and the impacts of international catches, there is still a high level of uncertainty in the assessment for Swordfish.

46. Dr Ann Preece advised TTRAG that a workshop is being planned for the beginning of June to discuss the issues with the Swordfish assessment. Various scientists and TTRAG members will be invited to attend.

47. TTRAG noted the following conclusions from the presentation provided on the Swordfish assessment (also see Attachment B):

    - The recent assessment and simulations do not properly represent the swordfish spatial uncertainties.
    - There is a mismatch between CPUE-based proxy reference points and the Harvest Strategy Policy (HSP) SSB reference points, due to:
        - CPUEprime excludes a large portion of the spawning population,
        - Uncertain link between ETBF CPUE and abundance in the eastern region
        - Basic life history parameters remain uncertain (M/growth/maturity)
        - CPUEprime reference points were defined on the basis of a single year of comparison from a single assessment model.
    - The Harvest Strategy evaluation suggests that:
        i. The Harvest Strategy seems to be reasonably good at stabilizing CPUE, though not necessarily with an average at the desired target CPUE (or SSB).
        ii. If international effort remains constant or decreases, the Harvest Strategy is likely to avoid SSB limit violations.
        iii. If international effort remains constant, and the assessment is accurate, ETBF catches will likely decline (potentially a lot).
        iv. If the ETBF situation is more optimistic than the assessment suggests, the Harvest Strategy will respond sensibly by taking more catch, without increasing the SSB risk.
        v. The ETBF has limited capacity to prevent SSB limit violations if there is a doubling of international effort (if the western and eastern populations are strongly connected). If the western region is isolated, international effort will need to increase >4X to disrupt the Harvest Strategy.

48. TTRAG further noted that Dr Jess Farley (CSIRO) is intending to find a solution to the two different growth models for Swordfish. Scientists involved in the Hawaiian model and the Australian model will be brought together to discuss the differences in each model and determine a consistent solution.

Striped Marlin

49. Dr Ann Preece (CSIRO) provided a presentation to TTRAG on the Management Strategy Evaluation of the ETBF Harvest Strategy for Striped Marlin (Attachment C).

50. It was noted by TTRAG that the ETBF Harvest Strategy has been used for Striped Marlin since 2011. A Management Strategy Evaluation project was undertaken as there was concern that the Harvest Strategy could potentially increase the risk to the Striped Marlin stock. In the 2012 stock assessment, new biological data was included from the Australian recreational fishery. In 2013, the harvest strategy was adjusted to include new target and limit reference points and a smoothed CPUE standardisation.

51. Striped Marlin constitutes a single south-west Pacific stock and while Australia has previously accounted for a large proportion of the Striped Marlin catch in the WCPO, catches are now being dominated by Pacific Island nations. As with Swordfish, new fishing effort data has been obtained over the last few years from the north-eastern region of the WCPFC Convention Area. This new effort has largely come from increases in the Taiwanese and Chinese fleets. Current evidence

indicates that Striped Marlin in the WCPO forms a single spawning population with no movement or migration across wider areas.

52. Dr Preece presented a number of harvest strategy projections for CPUE, effort, connectivity and catch where the data was separated into ETBF and non-ETBF (Attachment C). The overall results appeared relatively positive, so the risk of breaching the limit reference point (B_{lim}) was low.

53. TTRAG noted however that the point at which the harvest strategy becomes ineffective for Striped Marlin is still unclear. The current stock assessment incorporates the entire south-west Pacific stock and further investigation is needed to provide strength to the suggestion that two populations exist in the WCPO and that connectivity is low. These issues are intended to be discussed at the June 2015 workshop being held by CSIRO.

Yellowfin Tuna & Bigeye Tuna

54. Dr Rich Hillary provided a presentation on the MSE work undertaken for the tropical tuna species in the ETBF (Attachment D). The focus was on:

    i. The "local" operating models for Yellowfin and Bigeye Tuna
    ii. The implications of recent genetic work
    iii. The feasibility of ETBF-specific assessments
    iv. The costs and benefits of reducing current uncertainty

55. It was noted that "local" is defined as the WCPFC Area 5 catch and the Area 9 tag-and-release area (Coral Sea). In terms of fisheries, the Australian fishery was compared to "all" other longline fishing. The Area 5 WCPFC estimates in the assessment were very equatorially driven.

56. The summary of the main results for each species is as follows:

    - For Yellowfin Tuna, there has only recently been evidence of fishery impact, but very little of this is due to the ETBF.
    - For Bigeye Tuna, there was a high variation in the abundance indices and catch composition and conclusive evidence was unclear.

57. In terms of the implications for the harvest strategy, it is highly likely that there is a separate Yellowfin Tuna population in the Coral Sea. The evidence is reasonably clear with tens of thousands of tags released in the equatorial Pacific region (Area 8), but none recovered in Area 5. However further work needs to be done before the existence of a Coral Sea population can be confirmed. An industry member suggested that oceanography and the ocean floor configuration may inhibit the southward movement of Yellowfin Tuna.

58. For the Bigeye Tuna harvest strategy, the knowledge of abundance is very low, so the efficacy of a CPUE-driven harvest strategy cannot be assessed. Knowledge of the current biomass levels needs to be improved for this species.

59. The TTRAG industry members advised the RAG that every second year tends to be a good year for Yellowfin Tuna. They questioned where the fish go in other years if there is a discreet stock in the Coral Sea.

60. TTRAG further noted that connectivity for both species is the major issue. It is relatively inexpensive to sample fish, but the analysis costs can be high. For species management, the absolute abundance of Yellowfin and Bigeye Tuna must be determined. Stock assessments for these species are run every three years. The next assessment is still a while away, so there is some time to gain more data.

61. In regard to obtaining better estimates of stock abundance, three options were suggested; Conventional tagging, genetic mark-recapture and close-kin mark-recapture. It was noted by the

RAG that conventional tagging is expensive and juveniles are required for it to be done in the ETBF. This option was not recommended. Gene tagging also incurs a high cost and was considered a possibility, but while there are benefits, there are also other issues associated with it. Close-kin mark-recapture was considered a real possibility by the CSIRO scientists present as well as TTRAG members. For the ETBF species, half-sibling genetic identification would be best-suited and this technique has already been successful in measuring Southern Bluefin Tuna abundance. Unfortunately the analysis costs for this option are also relatively expensive, but these are expected to decrease over the next few years.

62. TTRAG expressed interest in supporting further genetic studies for Yellowfin Tuna and Bigeye Tuna to gain clearer insight into stock connectivity within the WCPO.

3.2 Future progress of the MSE project

63. TTRAG noted that the future progress of the MSE project would be determined at a workshop to be held by CSIRO on 1-2 June 2015. It is intended that a range of fishery scientists will attend and invitations will also be extended to TTRAG members.

4 Stock connectivity review

The following members declared their interest under the stock connectivity review item:

Dr Rich Hillary

In line with the requirements as a RAG scientific member who has declared interests under an agenda item, Dr Hillary left the room. The remaining members of TTRAG agreed that Dr Hillary should be allowed to return for all discussions and recommendations made under Agenda item 4.

The following TTRAG observers also declared their interests under this agenda item:

Dr Ann Preece

Dr Campbell Davies

Dr Karen Evans

In line with the requirements as a RAG scientific observer who has declared interests under an agenda item, Dr Preece left the room. The remaining members of TTRAG agreed that Dr Preece should be allowed to return for all discussions and recommendations made under Agenda item 4.

In line with the requirements as a RAG scientific observer who has declared interests under an agenda item, Dr Davies left the room. The remaining members of TTRAG agreed that Dr Davies should be allowed to return for all discussions and recommendations made under Agenda item 4.

In line with the requirements as a RAG scientific observer who has declared interests under an agenda item, Dr Evans left the room. The remaining members of TTRAG agreed that Dr Evans should be allowed to return for all discussions and recommendations made under Agenda item 4.

64. Dr Karen Evans (CSIRO) provided a presentation to TTRAG on species connectivity in the Western Pacific Ocean (Attachment E).

Albacore Tuna

65. TTRAG noted that the WCPO catch data for Albacore Tuna reflects broad-scale latitudinal movements of juveniles and adults. However, the catches by the Pacific Island nations tend to suggest that there is some localised residency in the stock.

66. From the tagging data for Albacore Tuna, there was clear identification of separate northern and southern hemisphere stocks. However, tags are largely unsuccessful with this species as fish do not have a high survival rate when caught on a line. More generally though, connectivity between the high and low latitudes in the Western Pacific Ocean was supported by the data that was collected and it appears that some mixing and dispersion is occurring across the wider Pacific Ocean.

Bigeye Tuna

67. It was further noted by TTRAG members that the catch data suggests that there is a size increase from west to east across the Western Pacific Ocean for Bigeye Tuna.

68. There have been several conventional tagging programs for Bigeye Tuna but the deployment of tags has not been spatially consistent. However, there is some suggestion of spatial structuring from east to west as well as possible semi-residence by some Bigeye Tuna within the Coral Sea and also the Solomon/Bismark Sea. Semi-residence is described as the existence of outward dispersal of fish from this area, but very small numbers or no fish moving into the area. It was noted that the tagging data for Bigeye Tuna is restricted to juvenile fish and some sub-adults.

69. While some spatial structuring and regional variation in growth, size and age at maturity is evident in the WCPO Bigeye Tuna stock, there was no clear evidence at this stage that Bigeye Tuna constitutes separate stocks.

Broadbill Swordfish

70. TTRAG acknowledged the data provided on connectivity in Broadbill Swordfish. It was recognised that there is evidence of aggregation around topographical features and seasonal latitudinal shifts in adult females.

71. Tagging data for Swordfish suggests some connectivity between the Vanuatu/French Polynesia region and New Zealand. There is also the suggestion of a semi-distinct/distinct Coral Sea population, but the degree of mixing between the Coral Sea and New Zealand is still unclear. This tagging data was focussed on juvenile Swordfish and very few adults were tagged.

72. TTRAG members noted that while some conclusions can be drawn from the Swordfish catch and tagging data, there are still high levels of uncertainty associated with growth and maturity of this species. AFMA, CSIRO and WCPFC are all working to reduce this uncertainty for future assessments.

Striped Marlin

73. Striped Marlin catch data suggests seasonal latitudinal movements of adults and the tagging data suggests some connectivity between the New Caledonia/Tonga region and New Zealand. There is also potential for connectivity with the Cook Islands and French Polynesia and there is suggestion of a semi-distinct/distinct Coral Sea population, but the degree of mixing between the Coral Sea and New Zealand is still unclear.

74. It was noted by TTRAG that there is evidence of four genetically discreet groups for Striped Marlin that correspond with separate spawning areas. Long-term temporal stability was represented in the data and there was a clear separation of samples from Australian waters and samples from all other locations.

Yellowfin Tuna

75. It was recognised by TTRAG that the Yellowfin Tuna catch rates in the ETBF were highly variable. There have also been large conventional tagging programs for this species and the data suggests that there is spatial structuring from east to west. As with Bigeye Tuna, there is possible semi-residence occurring by Yellowfin Tuna within the Coral Sea and also the Solomon/Bismark Sea. Semi-residence is described as the existence of outward dispersal of fish from this area, but very small numbers or no fish moving into the area.

76. TTRAG further noted that Yellowfin Tuna recapture position data is not highly reliable and transhipment at sea also occurs, which increases the difficulty in collecting data. The tags for Yellowfin Tuna only remain on the fish for approximately 7 months, so the data set for this species is reasonably small.

77. However in terms of otolith microchemistry data, this suggests spatial structuring of spawning populations and individuals from the western Pacific Ocean showed no similarities with those from the central Pacific Ocean. Furthermore, the Coral Sea region appears to be a major source of recruits to the ETBF.

78. TTRAG acknowledged that while some indications can be drawn from the data for all species, there are still key knowledge gaps and uncertainties that need to be improved. These issues will be discussed at the CSIRO workshop in June 2015.

5 Harvest Strategy review

The following members declared their interest under the research agenda items:

Dr Cathy Dichmont

Mr Gary Heilmann

Mr Paul Williams

In line with the requirements as a RAG scientific member who has declared interests under an agenda item, Dr Dichmont left the room. The remaining members of TTRAG agreed that Dr Dicmont should be allowed to return for all discussions and recommendations made under Agenda item 5.

In line with the requirements as a RAG industry member who has declared interests under an agenda item, Mr Heilmann left the room. The remaining members of TTRAG agreed that Mr Heilmann should be allowed to return for all discussions and recommendations made under Agenda item 5.

In line with the requirements as a RAG industry member who has declared interests under an agenda item, Mr Williams left the room. The remaining members of TTRAG agreed that Mr Williams should be allowed to return for all discussions and recommendations made under Agenda item 5.

79. Dr Cathy Dichmont provided TTRAG with a presentation on the risk-cost-catch trade-off for the Southern and Eastern Scalefish and Shark Fishery (SESSF). This information has relevance to the issues with the ETBF harvest strategy and the tier assessment structure.

80. TTRAG noted that the tier system is the likely way in which all harvest strategies are moving towards. This system is currently used in the SESSF and Tier 1 represents a full assessment and Tier 5 represents a more broad-scale risk assessment similar to an Ecological Risk Assessment (ERA). Some other fisheries however, use a Tier 6 and 7 for data-poor species such as Beche-de-mer and aquarium fish.

81. Currently for the SESSF, the CSIRO are testing all the tier levels for several species in the Atlantis SE model and comparing the results to the current system. This fishery currently uses Tiers 1-4 and it is generally expected that each assessment tier should have a risk level of below 10%, according to the Commonwealth Harvest Strategy Policy (CHSP). No species for the SESSF currently have this.

82. In terms of risk, there is a trade-off with catch. As the catch increases, the risk to the stock increases. Scientists and fishery managers need to decide whether to focus on the species catch or the risk. The Tier 4 assessment is better suited to addressing the species catch.

83. It was noted by TTRAG members that a Tier 1 assessment is good and is able to recover a stock. The Tier 2 assessment is not generally considered to be an appropriate assessment for most species. Tiers 3 and 4 are very species-specific assessments. A Tier 5 (a&b) assessment is not so specific and often data is excluded if below the limit reference point. The fisheries using Tier 5 assessments need to do more work; if fisheries begin at a data-poor level, they tend to stay at a data-poor level. Conversely, if a fishery begins at a data-rich level, they will tend to remain at this level.

84. In Australian fisheries management, species data is fitted into the tier system, however in the United States this is the opposite. The Tier system can be considered as a confidence indicator, i.e. how confident are we that we can assess a species at a certain level? A Tier 3 assessment is generally considered to be better than a Tier 4 from a biological perspective, but this is the reverse from an economical perspective.

85. The AFMA member then presented a revised Australian Tuna and Billfish Fishery (ATBF) harvest strategy framework document to the RAG. The intention with the revised document is to be proactive in the management of both the ATBF target and byproduct species. A revised CHSP is currently being developed by the Department of Agriculture and the revised ATBF harvest strategy framework document attempts to incorporate some of the likely changes to the CHSP. TTRAG were asked for their comment on this document, noting that it is still a work in progress.

86. The general intention with the revised harvest strategy is that it will be based on risk. A species may be assessed initially through an ERA-like process and depending on the results of this process, the species may be recommended to be assessed at a higher level or it can continue to be monitored at its current tier level. Any management measures that may be needed should be discussed by the TTMAC.

87. The TTRAG industry members agreed that Mahi Mahi and Escolar are the main byproduct species in the ETBF. These species are not generally targeted, but they may be occasionally, if the target species are not available.

88. It was highlighted by a TTRAG scientific member that there are no specific control rules currently included in the revised harvest strategy framework document. It is more of an overview. This level of detail will be determined at a later stage. However, some concern was expressed at the idea of including target and byproduct species in the same assessment system as the species are impacted very differently by the fishery—the variables to consider are very different.

89. TTRAG members were reminded that the revised harvest strategy must still ultimately comply with the Commonwealth Harvest Strategy Policy (CHSP). However, it is likely that the new CHSP will include "any species with commercial value" in one section, with a separate section for bycatch species.

90. Currently, different fisheries use different tier systems, for example the SESSF tier system does not suit migratory species such as tuna and billfish, or short-lived, seasonal species such as prawns. It is not yet known if one system will be developed to suit all fisheries under the new CHSP.

91. The AFMA member stated that the new CHSP is likely to include the guideline that a species must be kept above B_{lim} at least 90% of the time and it will be up to each individual fishery as to how this is achieved. This is where a tier system may become relevant.

92. Concern was expressed by various TTRAG members that each species is different so they cannot all be treated the same. Consideration needs to be given to how to treat species with low amounts of data and also those species that have highly variable life history dynamics and migration patterns. For example, Mahi Mahi is a highly fecund species, but they are not always seen by industry. It appears randomly and it is possible that using a harvest strategy for this species could restrict its commercial potential.

93. It was suggested by a TTRAG scientific member that a good place to begin would be to allocate the major species caught in the ETBF to either "target" or "byproduct" categories. It was agreed by all members that it will be difficult to deal with all the species caught in the fishery through a harvest strategy, so only those that hold some commercial value were included. A separate column was included for the key bycatch species for reference.

94. TTRAG industry members were concerned that in applying a harvest strategy to both target species and byproduct species, there would be an unnecessary amount of time and resources spent on assessing species that are not considered to be at risk of fishery impact. The AFMA member explained that this is the reason for the suggested initial ERA-type process, which would hopefully eliminate the need to further assess species of low risk.

95. TTRAG noted that while the current harvest strategy is not applied to the target tuna species, this will need to be changed with the new CHSP. The AFMA Commission is likely to increase pressure on TTRAG in regard to providing scientific advice on the tuna species. It should be made clear that the tuna and billfish species are also managed by Regional Fisheries Management Organisations, which adds another layer of complexity to the Australian management of these species.

96. It was also highlighted to TTRAG that it is unlikely that the new CHSP will constrain the assessment of species, i.e. if there are new methods or harvest strategy elements/control rules that would appear more suited to the ETBF species, TTRAG will still be able to explore these.

97. Several scientific members cautioned TTRAG that a tier system should not be developed with the intention that all species should aim to be assessed at the top tier. A specific tier level should be chosen that suits the risk and available data of a specific species. The tier system should be considered to be more of a "spectrum" and each species will fit somewhere within it. This is expected to be where the new CHSP and the Bycatch Policy are moving towards.

98. It was further noted by TTRAG that there are two options; either an assessment (such as a tier level) is used or a harvest control rule. These two options become less distinct with more data-poor fisheries. For the ETBF, a harvest control rule is currently used.

99. The TTRAG industry members re-emphasised their opinion that a harvest strategy should only be used for the target species and the byproduct and bycatch species should be treated separately. Unfortunately, this is unlikely to be permitted under the new CHSP.

100. While target and byproduct will be covered under the one harvests strategy policy, it is still possible to separate the species into each group and address them accordingly. The revised harvest strategy framework document should include two parts; key commercial (target) species and byproduct species. Justification for decisions should also be included so that TTRAG can provide guidance on what and why the RAG may decide to do.

101. The main species caught in the ETBF and WTBF were separated into categories by TTRAG and are displayed in the following table:

Key commercial species	**Byproduct species**		**Key bycatch species**
Albacore Tuna	Northern Bluefin Tuna	Blue Shark	Oceanic Whitetip Shark
Bigeye Tuna	Mahi Mahi	Bronze Whaler	Thresher Shark
Yellowfin Tuna	Wahoo	Dusky Shark	Crocodile Shark
Broadbill Swordfish	Opah	Tiger Shark	Silky Shark
Striped Marlin	Ray's Bream	Porbeagle	
	Escolar	Blacktip Reef Shark	
	Skipjack Tuna	Mako Shark	
	Spearfish	Hammerhead Shark	
	Sailfish		

102. Byproduct species were defined as;

- those species that are rarely caught, but frequently retained; and
- those species that are often caught, but rarely retained.

103. Bycatch species were defined as species that are rarely caught, but also not permitted to be retained. These species are often Threatened, Endangered or Protected (TEP) species.

104. It was agreed by TTRAG that it is difficult to define all the byproduct species. It was suggested that for a species to be classified as "byproduct", more than 100 pieces must have been caught and retained in the last 5 years. However, there may be a several exceptions to this condition. This issue will be further discussed at a future TTRAG meeting.

105. TTRAG further agreed that the risk level of a species to fishery impact could be a trigger for further assessment. If a species is considered at low risk, then the status quo would apply. The species at low risk should still continue to be monitored. TTRAG also noted that it is important to

consider how a species may be moved down the assessment levels once it has been treated/managed for a high risk.

106. TTRAG discussed and developed the following potential harvest controls rules that could be included in the new harvest strategy framework:

- Harvest Control Rule A – a full WCPFC assessment
- Harvest Control Rule B – to be applied to Albacore Tuna, Bigeye Tuna and Yellowfin Tuna (i.e. the species that are outside of the current harvest strategy policy).
- Harvest Control Rule C – split into two parts;
    i. C (main) – review data from Harvest Control Rule D and ensure accuracy; then
    ii. C (alternate) – a fishery-dependent relative index of abundance (CPUE or similar), based on catch only.
- Harvest Control Rule D – an ERA-type process, to be applied to byproduct species. If there was concern regarding a species at this level, that species would be elevated to Harvest Control Rule C.

107. These harvest control rules could provide the basis for a 4-tier system. However, it was noted that these are suggestions only at this stage and further consideration should be given to their definition and practicality, including how species may move between Harvest Control Rules.

108. TTRAG industry members emphasised that if one species is considered high risk, the fishery should not be shut-down as a result.

109. The AFMA member stated that he would take these suggestions and incorporate them into the revised harvest strategy framework document. The updated document will be presented and discussed further at a future TTRAG meeting.

110. In reference to previous byproduct species discussion from the TTRAG 10 meeting, Dr Robert Campbell presented the standardised CPUE data on the major ETBF byproduct species.

111. For Mahi Mahi, the standardised CPUE data did not largely change the overall trend for each species. However, TTRAG Industry members indicated that Mahi Mahi catch prior to 2002 should be excluded as trip limits existed for this species. Very small amounts of Mahi Mahi were caught in 2013, but industry members stated that large catches of this species occurred in November and continued through 2014. This data is not yet available to be included in the standardisation. It was recommended by industry members that Mahi Mahi should be reviewed again in the next year or two, when the 2014 data can be included.

112. For Wahoo, Opah and Black Oilfish/Rudderfish, no concerns were raised by TTRAG members.

113. Dr Campbell also compared the logbook data to the observer data for the target species. The Yellowfin Tuna data indicated that catch is underestimated in logbooks as the overall records from observers showed a higher catch trend. However, it was noted that observer data includes discards, but this is not included in logbooks data.

114. For Striped Marlin, the observer and logbook data was very similar, indicating that there is less discarding of this species and records are less uncertain.

115. TTRAG further noted that skippers often may not fully count the number of fish caught, rather they estimate the number caught. However, overall the CPUE trends were more positive than expected.

116. TTRAG expressed their appreciation of the additional work undertaken by Dr Campbell.

6 Research

The following members declared their interest under the research agenda items:

Dr Cathy Dichmont – 6.1 and 6.2

D Robert Campbell – 6.1 and 6.2

Dr Rich Hillary – 6.1 and 6.2

Mr Steve Auld – 6.1 and 6.2

Dr James Larcombe – 6.1 and 6.2

Professor John Tisdell – 6.1 and 6.2

Dr Julian Pepperell – 6.1 and 6.2

In line with the requirements as a RAG scientific member who has declared interests under an agenda item, Dr Dichmont left the room. The remaining members of TTRAG agreed that Dr Dicmont should be allowed to return for all discussions and recommendations made under Agenda item 6.

In line with the requirements as a RAG scientific member who has declared interests under an agenda item, Dr Campbell left the room. The remaining members of TTRAG agreed that Dr Campbell should be allowed to return for all discussions and recommendations made under Agenda item 6.

In line with the requirements as a RAG scientific member who has declared interests under an agenda item, Dr Hillary left the room. The remaining members of TTRAG agreed that Dr Hillary should be allowed to return for all discussions and recommendations made under Agenda item 6.

In line with the requirements as a RAG AFMA member who has declared interests under an agenda item, Mr Auld left the room. The remaining members of TTRAG agreed that Mr Auld should be allowed to return for all discussions and recommendations made under Agenda item 6.

In line with the requirements as a RAG scientific member who has declared interests under an agenda item, Dr Larcombe left the room. The remaining members of TTRAG agreed that Dr Larcombe should be allowed to return for all discussions and recommendations made under Agenda item 6.

In line with the requirements as a RAG scientific member who has declared interests under an agenda item, Prof Tisdell left the room. The remaining members of TTRAG agreed that Prof Tisdell should be allowed to return for all discussions and recommendations made under Agenda item 6.

In line with the requirements as a RAG scientific member who has declared interests under an agenda item, Dr Pepperell left the room. The remaining members of TTRAG agreed that Dr Pepperell should be allowed to return for all discussions and recommendations made under Agenda item 6.

6.1 List of current research projects

117. TTRAG discussed the status of the current research projects being undertaken for the ETBF and WTBF.

118. It was noted by TTRAG that research relating to marketing of fisheries/species and the "social licence" is becoming more prominent and this may be beneficial in adding value to the product of the tuna and billfish fisheries. It may be worthwhile for the RAG to consider such projects for future funding by the Fisheries Research and Development Corporation (FRDC).

119. In terms of the Expressions of Interest submitted for FRDC funding, TTRAG fully supported the Tropical Tuna Size Monitoring Program, to be undertaken by Dr Kevin Williams (WWFisheries).

120. A TTRAG industry member queried the research budget, stating that he expected it to have been lower for this year. However, while some projects are concluding another is beginning, meaning that final milestone payments as well as initial project costs are both due. The research budget stays at approximately the same level for this reason.

121. It was also noted that there was a finance administration error, which resulted in two payments being recorded for the size monitoring program in 2015/16. Industry members were concerned as to where the research costs are taken from.

122. In explanation of the source of research costs, the organisations responsible for funding each project in the ETBF and WTBF are outlined in the table below:

	Project Title
1	Data management, provision of fishery indicators and implementation of the harvest strategies for Australia's tropical tuna fisheries. **AFMA provides the funding for this project.**
2	Eastern Tuna and Billfish Fishery size monitoring program 2013-2015. **AFMA provides the funding for this project.**
3	MSE project – Rich Hillary the Primary investigator. **FRDC provides the funding for this project.**
4	Determination of SWO growth and maturity relevant to the southwest Pacific stock (Dr Jess Farley). **FRDC, the Secretariat for the Pacific Community (SPC) and AFMA provides the funding for this project.**
5	Developing innovative approaches to improve CPUE standardisation for Australia's multi-species pelagic longline fisheries (Dr Rob Campbell). **FRDC provides the funding for this project.**

123. In further regard to the research Expressions of Interest, TTRAG highlighted that the "Maximising net economic returns from a multispecies fishery" project submitted by Dr Sean Pascoe (CSIRO) should be monitored as there may be relevance to the tuna species as well.

6.2 Annual research plan

124. Dr Peter Grewe (CSIRO) attended TTRAG as an observer for the discussion of this agenda item.

125. TTRAG discussed the 2015 Annual Research Plan and determined the priorities for the 2016 Annual Research Plan.

126. The following priorities from the 2015 research plan received funding and have been completed:

- Expansion of the ETBF size monitoring programme to include data from the WTBF.
- Alternative methods to mitigate seabird bycatch in pelagic longline fisheries: Hook Pod trials. (TTRAG included this priority to display support for seabird bycatch mitigation. This project was funded internally within AFMA)

127. The following projects from the 2015 research plan did not receive funding and TTRAG agreed to keep these as priorities for 2016 with a few small amendments:

    - Determination of the spatial dynamics and movement rates of the principal target species within the ETBF and connectivity and population structure within the broader WCPO – beyond tagging. This may include but is not limited to: Stable isotope analysis, otolith micro-chemistry or novel genetic techniques.
    - Develop a spatial and temporal model to estimate economic returns to the Australian Tuna and Billfish Fisheries. The model will include key economic drivers, such as fish prices, the cost of fuel and quota allocations, as well as biological conditions and constraints. The modelling outputs will assist TTRAG and TTMAC identify and develop appropriate management options and strategies in order to maximise the economic efficiency of the fishery within sustainable limits. **Note: some aspects may be addressed by a current application being considered by ComFRAB.*

128. It was noted by TTRAG that in regard to the "*Determination of the spatial dynamics and movement rates of the principal target species within the ETBF…*" priority above, Dr Peter Grewe is currently undertaking a large amount of genetics work relating to stock structure and movement that could be used in this project if funding is successful. This work could potentially be undertaken for all of the ETBF target species.

7 Other business

7.1 AFMA Sharepoint system external access for MAC and RAG members

129. TTRAG discussed the development of an AFMA Sharepoint system that will provide external access to meeting papers, agendas, research paper etc. for MAC and RAG members.

130. The following suggestions of important aspects that should be included in the system were provided by members:

    - Apple mac computer friendly
    - Research paper repository
    - Alerts/notifications of changes made to papers or meeting minutes
    - RAG document repository (past meeting papers and attachments)
    - Individual member profiles

131. The majority of TTRAG members expressed their interest in the development of this system, however it was noted that some industry members may not find it so useful.

8 Date and venue for next meeting

132. The next TTRAG meeting (TTRAG 12) was tentatively agreed to be held on 21-22 July 2015, in Mooloolaba.

The TTRAG Chair closed the meeting.

Attachment A

Tropical Tuna and Billfish Fisheries Resource Assessment Group (TTRAG) 11

Freycinet room, CSIRO, Hobart

Tuesday 17 March – Thursday 19 March 2015

Commencing at 9:00am

1. Preliminaries

1.1. Welcome and apologies

1.2. Pecuniary interest declarations

1.3. Adoption of agenda

1.4. Acceptance of minutes

1.5. Actions arising/out-of-session developments

2. Review of fishery performance

2.1. Current catches and effort in the domestic fishery – verbal updates from industry, scientists and recreational fishing members since last RAG Meeting (October 2014)

3. Management Strategy Evaluation

3.1. Update on progress of the MSE project being undertaken by Dr Rich Hillary and Dr Ann Preece

3.2. Discussion on future progress of the MSE project

4. Stock connectivity review

5. Harvest Strategy review

6. Research

6.1. List of current research projects

6.2. Annual Research Plan

7. Other Business

7.1 AFMA Sharepoint system external access for MAC and RAG members

8. Date and venue for next meeting