



Project: Sustainable Management of Tuna Fisheries
and Biodiversity Conservation in the ABNJ

ABNJ Workshop Summary Report: Western and Central Pacific Ocean Tuna Management

Nadi, Fiji | 20-21 February 2018

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Partners:



With support of:



Executive Summary



A capacity building workshop was held in Nadi, Fiji on 20-21 February 2018 with a goal to create a better understanding among Western and Central Pacific Ocean States of the precautionary approach, Harvest Strategies (HSs) and management strategy evaluation (MSE) for sustainable tuna fisheries. Interest in the workshop was underscored by the participation of 23 individuals from 11 countries, representing a diverse range of roles and experience in the Western and Central Pacific Fisheries Commission (WCPFC) processes.

The workshop was part of the project to achieve “Sustainable Management of Tuna Fisheries and Biodiversity Conservation in Areas Beyond National Jurisdiction” (ABNJ Tuna Project). On 5 November 2013, the Global Environment Facility approved this five-year project, which the United Nations Food and Agriculture Organization (FAO) coordinates and for which WWF leads key components, such as HS capacity building.

The workshop was designed to complement and support the capacity building that has already been delivered to WCPFC members, including through the Management Options Workshop (MOW) process and the work that the Pacific Community (SPC) is about to initiate for the countries in the region. It was open to all Members, Participating Territories and Cooperating Non-member(s) of the WCPFC.

The workshop featured an agenda of creative interaction and dialogue among participants, aimed at providing hands on opportunities to learn harvest strategy concepts and run mock simulations of management strategy evaluations of harvest control rules. The workshop was conducted in English.

Evaluation results from the workshop indicated that attendees gained an increased understanding of the importance of HSs and significantly increased both their knowledge of HS principles and concepts and also their confidence in being able to apply them in Commission and in-country settings. Participants expressed a desire to learn more about the fundamentals of the Harvest Strategy process, particularly MSE. They also desired more fishery-specific examples in the workshop content and a training link to the national level as national interests dictate how countries behave at a regional level. There was strong support among workshop

participants for the use of management strategy evaluation to consider tradeoffs between potentially competing management objectives and facilitate the negotiation of tuna management arrangements.

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Introduction

A capacity building workshop was held in Nadi, on 20-21 February 2018 with a goal to create a better understanding among Western and Central Pacific Ocean States of the precautionary approach, Harvest Strategies (HSs) and management strategy evaluation (MSE) for sustainable tuna fisheries. Ultimately, a key objective of the workshop was to help accelerate the development of tuna HSs within the Western and Central Pacific Ocean via a unique agenda incorporating the key elements of fisheries management issues currently relevant to Western and Central Pacific Fisheries Commission (WCPFC) members. Interest in the workshop was underscored by the participation of 23 individuals from 11 countries and assistance from another 15 resource experts. (Appendix A).

The workshop was part of the project: “Sustainable Management of Tuna Fisheries and Biodiversity Conservation in Areas Beyond National Jurisdiction” (ABNJ Tuna Project). On 5 November 2013, the Global Environment Facility approved this five-year project, which the United Nations Food and Agriculture Organization (FAO) coordinates. The overarching project is focusing on three component areas:

- 1) Supporting implementation of sustainable and efficient fisheries management and fishing practices;
- 2) Reducing illegal, unreported and unregulated fishing through strengthened and harmonised monitoring, control and surveillance; and
- 3) Reducing ecosystem impacts from tuna fishing, including bycatch and associated species.

WWF is the lead organisation for a number of the ABNJ Tuna Project outputs, including supporting the improved understanding of the application of the precautionary approach through HSs by tuna Regional Fisheries Management Organisations (RFMOs).

The February 2018 WCPO workshop in Fiji was the second of two rounds of workshops planned for WCPFC region over the 5-year life of the ABNJ tuna project. The workshop was designed to complement and support the capacity building that has already been delivered to WCPFC members, including through the Management Options Workshop (MOW) process and the work that the Pacific Community (SPC) is about to initiate for the countries in the region. It was open to all Members, Participating Territories and Cooperating Non-member(s) of the WCPFC. The workshop was planned in concert with SPC to directly support the WCPFC's ongoing work plan for harvest strategy development, and SPC staff played a central role in workshop presentations and conduct.

In accordance with the ABNJ Tuna Project, funding for attendance at the workshop was only provided for participants from developing countries, and the facilitator and presenters.

WCPO 2018 ABNJ Workshop Goals, Objectives & Design

Within this overall project background and context, a specific goal and objectives were developed for the workshop to guide the design of an agenda and approach.

Overall Workshop Goal

The workshop's overarching goal was to build capacity of decision-makers (the primary target audience) so that they can engage in tuna RFMO management deliberations in a more informed manner and have an increased chance of effectively representing their interests in a way that is consistent with sustainable resource outcomes – i.e., 'level the playing field' so that commissioners from countries with less sophisticated management systems and technical support can meaningfully participate in RFMO decision making regarding harvest strategies-harvest control rules (HS-HCRs).

Workshop Context, Agenda & Summary

Context

Lack of clearly defined HCRs among tuna RFMOs is a central weakness and threat to maximising long-term fishery benefits from global tuna management. The most powerful fishing states routinely block effective, progressive management decisions within multinational tuna RFMOs to protect their perceived interests. While the development of HS-HCRs is technically complex and their agreement challenging, they offer increased certainty and vastly improved decision-making when implemented. Creating sufficient understanding among commissioners for them to effectively engage in and influence the decision process is key to obtaining improved outcomes from RFMO deliberations. Although considerable progress on increasing the understanding of the elements of HS among WCPFC participants has been made through the MOW process, there remains a considerable knowledge gap. This workshop was intended to help remedy that gap by increasing understanding of all states to engage, particularly by using simpler and more creative communication and interaction strategies aimed at the target commissioner audience.

Agenda

The workshop's agenda is presented in Appendix B. General design elements included a focus on HS principles and management objectives on Day 1, coupled with a Day 2 focus on HCRs and MSE. The agenda was designed to be interactive with emphasis on active dialogue rather than presentations.

Day 1 Summary

Participants were treated to a traditional Fijian kava welcome ceremony, in which The Hon. Semi Koroilavesau (Fijian Minister for Fisheries), Feleti Teo (WCPFC Executive Secretary), Kesaia Tabunakawai (WWF Pacific) Emelie Mårtensson (FAO) took part (Figure 1). After Mr Koroilavesau opened the workshop with a welcoming address, Feleti Teo and Emelie Mårtensson provided presentations on the ABNJ project and the workshop's context. Kesaia Tabunakawai of WWF Pacific then gave a brief introduction on WWF and its partnership role in the workshop.

The first day was designed in a bookend fashion, led by Graham Pilling's (SPC) presentations introducing harvest strategy concepts. This introduction was followed by two interactive, small group breakout sessions, led by facilitator Ian Cartwright, designed around storytelling and

game strategies to engage participants, in order to create learning through sharing and discussion. To maximise involvement, the participants were assigned into four groups, ensuring participants from the same country were sitting separately.



Figure 1. The Hon. Semi Koroilavesau, Fijian Minister for Fisheries, Feleti Teo (WCPFC Executive Secretary), Kesaia Tabunakawai (WWF Pacific) Emelie Mårtensson (FAO) in the Fijian kava welcome ceremony.

The first of the breakouts was designed to get the participants thinking about the elements of fisheries management, particularly around harvest strategy development and implementation. Each member of the group rolled a large die with six concepts (e.g. target reference point, precautionary approach and F_{MSY}), including two of the currently, generally agreed management objectives for tuna fisheries in the WCPO. Each participant would role the die and explain their understanding of the concept, and the group would then discuss the concept, with the group's resource person ensuring all participants were clear on their understanding of each concept after the group had discussed it.

The central idea of this exercise was to get dialogue started at the workshop and generate discussion about start learning about and absorbing some of the harvest strategy concepts. Each group reported back on their key learnings or points of interest. The exercise effectively generated active discussion on the understanding or lack of understanding of some of the concepts. Some participants were definitely very uncomfortable with the concepts and appreciated having the glossaries on hand. It was useful for resource people to be able to generally gauge participants level of understanding.

The second small group breakout on Day 1 consisted of a game to take 27 harvest strategy principles and arrange/map them on the floor in a way that seemed logical with respect to their interrelationships (Figure 2). The intent was to help build an understanding of these principles and their relationship in the management process by sharing ideas and asking participants to share their rationale in choosing a particular arrangement. The exercise generated significant discussion and helped identify gaps in understanding. While there were some common, core

themes among the groups, no two groups mapped the principles in the exactly same way, though it should be noted that most groups conjured similar ideas in relation to how science influences harvest strategy and policy.



Figure 2. Arranging harvest strategy principles during small group, breakout session at the WCPO 2018 ABNJ workshop in Fiji.

After the activities, Bill Holden, Marine Stewardship Council Pacific Manager outlined the importance of HS/HCR in the context of MSC certification of tuna fisheries in the Pacific.

James Larcombe (AU Dept. of Agriculture, Fisheries and Forestry) then gave an overview of the WCPFC Harvest Strategy Work Plan, which was adopted by the Commission in December 2017, stepping participants through the progress to date for the four main WCPO tuna species and planned next steps.

Alice McDonald (Forum Fisheries Agency) gave a case study presentation on potential harvest strategy options and their implications for the South Pacific Albacore tuna stock. She contrasted the unique aspects the South Pacific Albacore stock and fisheries that make it challenging to seek an optimum trade-off of prospective management objectives, for instance, in comparison to the relative ease in deciding the WCPO skipjack stock and related decisions about its target reference point. The day's end was completed with a facilitated group discussion following the presentation, which enabled participants to delve deeper into a range of HS concepts.

Day 2 Summary

A recap of Day 1 was led by the facilitator, Ian Cartwright. The agenda for the second day was designed to more fully introduce the harvest control rules (HCRs) and management strategy evaluation (MSE) aspects of tuna harvest strategies. This comprised a mix of presentation material with small group, breakout sessions where participants got hands on experience running and 'playing with' a simplified MSE model, the 'tunaMSE'.

Mr. Cartwright began by providing a set of series of seven questions for each group to discuss. This was new addition to the workshop format. The aim of the session was to check in with participants to gauge their level of understanding of the concepts presented on Day 1, and to help ground participants' knowledge.

Following the group discussion, Robert Scott (SPC) provided an introduction to MSE concepts and approaches. He presented on management objectives and performance measures used to evaluate MSE results before leading the participants into group sessions using the tuna MSE tool (Figure 3). The first exercise was to introduce participants to the tunaMSE demonstration model and familiarise them with the interface using the 'Manual Management' tab. Participants were asked to change the 'catch limit' and 'catch limit duration' parameters to explore how these two parameters can affect the stock. Participants were asked to review the graphs and performance indicators to see how the stock responded to their management decisions.

After participants were comfortable with the tool, they moved to the 'HCR Management' tab and were asked to build on their understanding of MSE by exploring the difference between manual projections and automated Harvest Control Rule (HCR) projections using a variety of approaches including constant catch and constant exploitation rate. Various projections were run using the threshold triggers to maximise long-term average catch.

Ahead of these exercises, Dr Scott highlighted some of the pitfalls of managing using constant catches, for example not being responsive to stock variability and changes in fleet structure.

Under the threshold exploitation rate HCR option, Dr Scott showed difference between aggressive, moderate and conservative HCRs, and how approaches utilising more gradual rates exploitation rate reduction in response to trigger thresholds can reduce catch variability.

Participants interrogated the impact of amending the control parameters (F_{Targ} , B_{Lim} and B_{Thresh}) in the performance statistics on the HCR 'selection' tab. They observed total catch, stable harvest, catch rate and the probability of the stock staying above $(SB/SB) < 0.2$ for each of the HCR scenarios run.

A new HCR option was added to the MSE tool for the WCPO workshop. Participants learnt about the empirical trend approach, where the example HCR type in the MSE tool used CPUE as the index. If CPUE increases, increase catches and vice versa. Participants saw how a higher slope multiplier is more reactive to changes in the index, while in comparison, using a greater number of years to create the multiplier slope is less reactive to short term variability of the index.

Additional exercises were run as competitions among tables with the objectives of maximising long term catch and maintaining the stock in the green. The exercises are outlined below:

1. Maximising Pgreen, while ensuring long-term catch being above 220 ('000 t).
2. Maximise long term catch while ensuring that the stock $\geq 50\%$ Pgreen.
3. Minimising annual catch variation, maintaining the stock in the green zone (Pgreen $\geq 50\%$), while long-term catch should not be below 220,000t.





Figure 3. Working with tuna MSE demonstration tool - breakout session at the WCPO 2018 ABNJ workshop in Fiji.

Winners for each exercise were given chocolate sardines. The participants were animated during the exercises and enthusiastically engaged in the competition. A key to maintaining the participants' engagement through to the end was to have each group's results from their analysis visible on the main screen, using an excel spreadsheet. This display enabled groups to see how they measured up against each other as their results were posted. This heightened the sense of friendly competition.

After the MSE competition, Graham Pilling linked the workshop's goals to the current process within WCPFC. He highlighted the need for improved communication between science managers, and within country dialogues, for a successful process. To that end, the NZ-funded capacity building and input gathering process for individual or small groups of WCPO countries is really needed, which is SPC's intended design for delivering WCPO's harvest strategy work plan.

Finally, facilitator Ian Cartwright wrapped up the workshop with next step goals on how participants can use what they learned in the workshop in the WCPFC and in-country meetings.

The final moments of the workshop were spent having the participants complete a workshop evaluation survey, and a closing ceremony by Duncan Williams (WWF Pacific) and Aisake Batibasaga (Fijian Director of Fisheries) to thank the presenters and participants for their attendance.

Workshop Evaluation Feedback

At the close of the workshop, participants completed an evaluation form. The form's key purposes were to assess ABNJ Tuna Project metrics and help understand how well workshop objectives had been met, particularly whether attendees: (1) gained an improved understanding of HS and HCR principles and tools; which (2) would enable their more effective engagement in tuna RFMO processes designed to adopt related policies and management measures. A total of 26 surveys were completed in writing at the workshop and subsequently entered into [SurveyMonkey](#) software to assist with analysis. The evaluation results are presented below.

Demographics of Participants

The survey included four questions to gather background on the participants with respect to their attendance at RFMO related meetings, their roles, their country/organisation affiliations and their experience.

RFMO related meetings attended

More than 92% of the participants attend WCPFC meetings (commission meetings, working parties, and/or scientific meetings), with 60% participating in preparatory meetings within their country and some indicating that they also attend Forum Fisheries Agency meetings. No participants indicated that they did not participate in either RFMO meetings or in-country meetings, with one participant not responding.

Participant Roles

Attendees reflected a diverse mix and sometimes multiple roles among the choices of fisheries manager/director (35%), scientific advice (31%), management advice (35%), and policy advice (13%). No participants selected NGO or industry member. Another 15% (four participants) identified other roles: compliance, political, and special advisor.

Country/organisation affiliation and language

Participants predominantly identified themselves as being from a WCPFC Member (59%), WCPFC co-operating non-member (14%), and WCPFC Participating Territory (14%). Attendees predominantly appeared confident in English during the workshop, with a few exceptions such as Wallis and Futuna and Vietnam.

Years in the fisheries sector

Responses ranged from less than one year to 37 years of experience in the fisheries sector, with an average of 13 years and a median of 10 years.

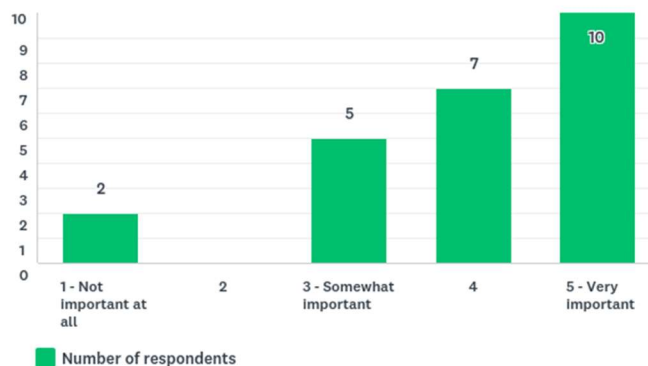
Gender

The survey did not include a question on gender, however gender of participants was noted at the workshop to meet the ABNJ Tuna Project reporting metrics. Of the 23 people who were there purely as participants, eight were female (35%) and 15 were male (61%).

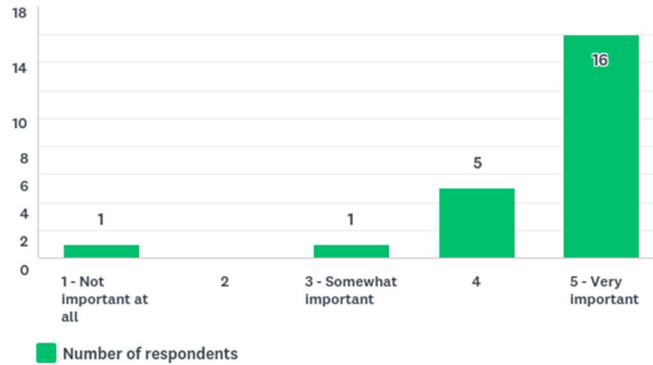
Before and After Awareness

The survey asked participants how important they considered HS to be as a tool to improve the sustainability of tuna fisheries - before and after the workshop (on a scale of 1 to 5, with 1= Not Important at all and 5 = Very Important). The before workshop responses averaged 4.0, with 42% indicating HS to be very important and 29% indicating only 'Somewhat Important' or less. In comparison, the after workshop rankings averaged 4.5, with 70% indicating HS to be very important and 8.7% indicating somewhat important or less (Figures 4 and 5).

Q5 BEFORE the course did you consider Management Procedure (Harvest Strategies) an important tool to improve the sustainability of tuna fisheries?



Q7 AFTER the course did you consider Management Procedure (Harvest Strategies) an important tool to improve the sustainability of tuna fisheries?

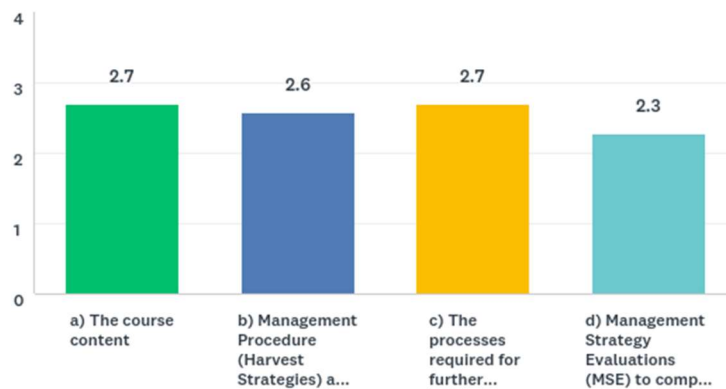


Figures 4 and 5. Results for before and after: *Did you consider Management Procedure (Harvest Strategies) an important tool to improve the sustainability of tuna fisheries?* Results are based on a ranking scale of 1 to 5, where 1 = not important at all and 5 = very important.

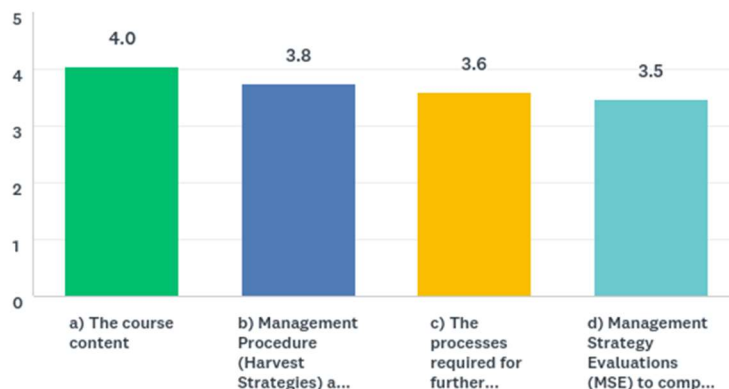
Before and After Knowledge

Participants were asked to rank their knowledge of ‘course content’ from a before and after workshop standpoint related to three topical areas: (1) harvest strategies and reference points; (2) processes within WCPFC for further development and implementation of harvest strategies and conservation measures; and (3) Management Strategy Evaluation (MSE) to compare trade-offs among achieving different fishery objectives. In all categories responses indicated sizable increase in knowledge as summarised in Figures 6 and 7.

Q6 BEFORE the course, how would you rank your knowledge related to:



Q8 AFTER the course, how would you rank your knowledge related to:



Figures 6 and 7. Results for each of the harvest strategy concepts with the question: *BEFORE vs AFTER the course did you consider Management Procedure (Harvest Strategies) an important tool to improve the sustainability of tuna fisheries?* Results are based on a ranking scale of 1 to 5, where 1 = not confident at all and 5 = very confident.

Effectiveness of Workshop Content

The evaluation survey was designed to gather information on the workshop's possible impact on the participants' level of understanding of key harvest strategy principles and concepts, and whether that understanding would support the use of these ideas and a confidence to engage in Commission dialogues surrounding development and implementation of HS-HCR type management measures. The results from these queries is summarised below.

Improved Understanding

Participants were asked whether they had a similar or improved level of understanding after the workshop surrounding nine topical areas, which included various harvest strategy principles, how these principles are used by WCPFC, the roles of different actors in the Commission process, types of management objectives, an understanding of trade-offs among objectives and why harvest strategies are tested with simulation models.

Questions for which $\geq 84\%$ of participants indicated having an improved understanding after the workshop were:

- The advantages of using a Management Procedure (Harvest Strategy) to manage a fishery? (92% had an improved understanding)
- Types of performance objectives for the fishery? (92% improved)
- That objectives may require trade offs? (84% improved)
- Why Management Procedure (Harvest Strategies) are tested in simulation models? (92% improved).

Questions for which 65 to 84% of participants indicated having an improved understanding after the workshop were:

- How the management principles discussed in the workshop are used by WCPFC to currently manage fisheries? (80% improved)
- What the precautionary approach is to management? (72% improved)
- The difference between a target and limit reference point? (68% improved).

Questions that scored less than 65% of participants having an improved understanding after the

workshop were:

- The role of the different actors in the Management Procedure (Harvest Strategy) decision-making process? (64% improved understanding)
- What the next steps are for the WCPFC to adopt a Management Procedure (Harvest Strategy) for tuna species? (60% improved).

Expected Use of Knowledge

When asked if they would use the knowledge gained at the workshop in each of the preceding nine topical areas, over 90% of respondents replied ‘yes’, with the range from 92 to 100%. The lowest scoring ‘yes’ responses (both 92%) were:

- Why Management Procedures (Harvest Strategies) are tested in simulation models?
- What the next steps are for the WCPFC to adopt a Management Procedure for tuna species?

See Figure 8 for further detail.

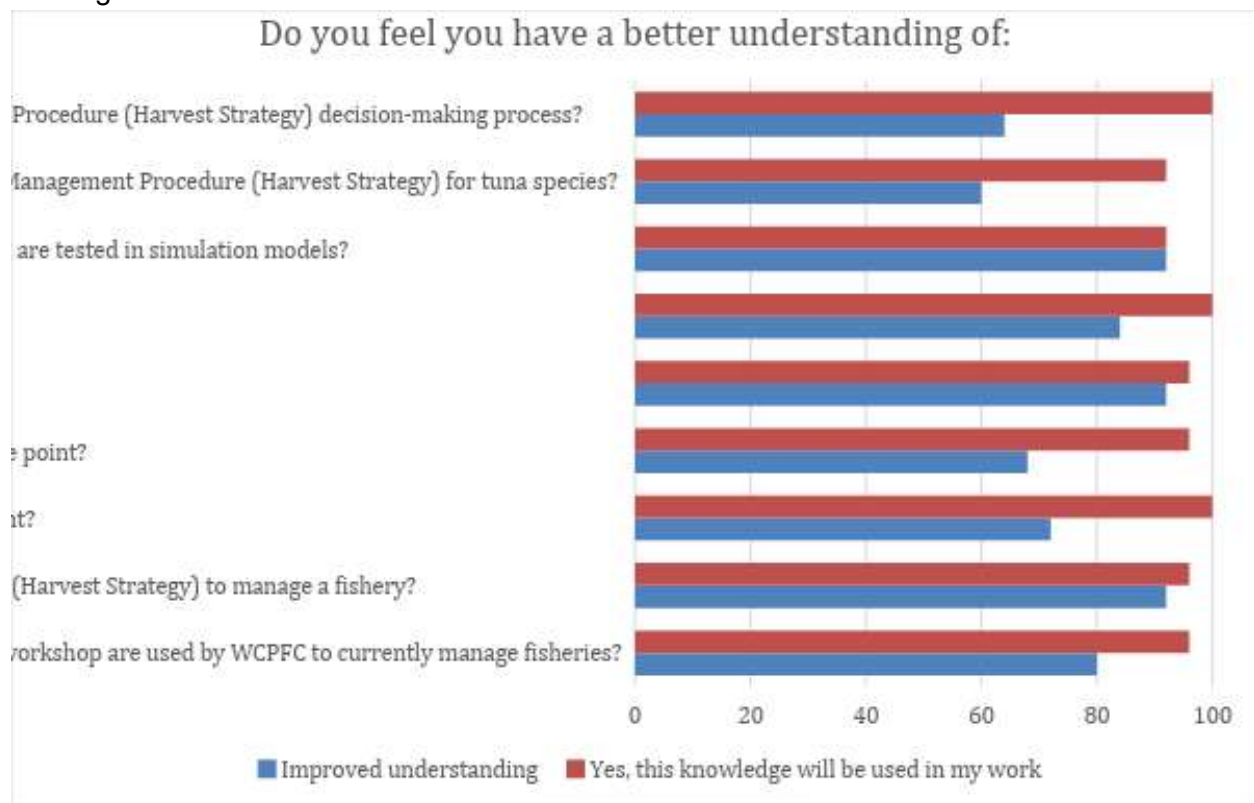
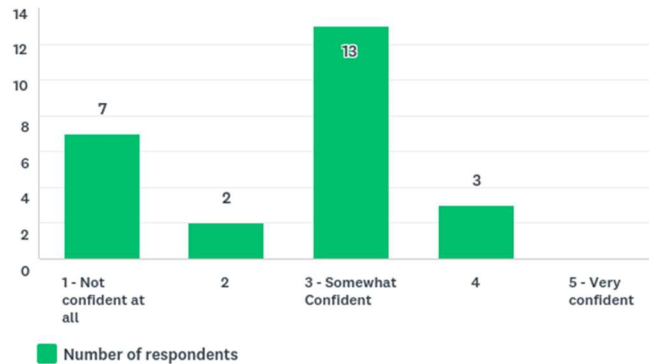


Figure 8. Results on the effectiveness of the workshop: whether participants’ understanding was improved or remained the same and if they will use the specific concepts in decision-making process in the future.

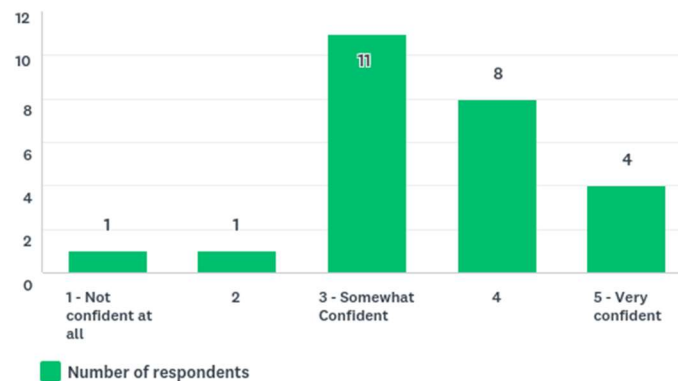
Confidence to Engage in Management Process Dialogues

Participants were asked to rank their confidence to engage in dialogues around the implementation of sustainable tuna management including the formulation of harvest strategies, from a before and after workshop standpoint. Respondents noted a significant increase in confidence to do so after the workshop as summarised in Figures 9 and 10 and Table 1.

Q10 BEFORE the course, did you feel confident in engaging in dialogues around the implementation of sustainable tuna management, including the formulation of Management Procedure (Harvest Strategies)?



Q11 AFTER the course, did you feel confident in engaging in dialogues around the implementation of sustainable tuna management, including the formulation of Management Procedure (Harvest Strategies)?



Figures 9 and 10. Results of respondents' confidence to engage in Commission dialogues on harvest strategy concepts before and after the workshop. Results are based on a ranking scale of 1 to 5, where 1 = not confident at all and 5 = very confident.

TOPICAL AREA	BEFORE		AFTER	
	Average ranking	Percentage of 'above average' responses (i.e., 4 or 5)	Average ranking	Percentage of 'above average' responses (i.e., 4 or 5)
Confidence to engage in dialogues around the implementation of sustainable tuna management including the formulation of harvest strategies	2.48	12%	3.52	48%

Table 1. Before and after comparison in confidence to engage in management dialogues indicated by WCPO 2018

workshop participants in Fiji. Based on a ranking scale of 1 to 5, where 1 = not confident at all and 5 = very confident.

Workshop Delivery

The survey included questions about the amount and level of content presented and discussed, where 96% of the respondents indicated that the quantity of material was 'good' (on a 1 to 3 scale from 'not enough' to 'too much'), and 96% rated the level of content 'good' (on a 1 to 3 scale from 'too simplistic' to 'too complicated').

Written comments on the questionnaires added some additional thoughts to these ratings, a number of which were echoed in workshop discussions.

Other Insights: Future Workshops & Commission Process

Besides the evaluation survey results summarised above, considerable feedback was received from participants through written comments on survey and one-on-one discussions. The workshop 'delivery (resources) team' also shared some reflections during a post-workshop debriefing.

There was great deal of support for the Toy MSE as an educational tool, and the balance between theory and activities. There were comments made, particularly from resource people, that the informality and generality of the workshop was sorely needed in the WCPO. The WCPFC Management Options Workshops was observed to be "more like a negotiations". There was also general support for even more WCPO-specific examples and context.

There was a consensus among the resource people that the breadth of participation was low, especially as the focus of the first WCPO first workshop was on the Asian countries. Participation by other WCPFC CCM delegations was deemed to be due to a clash with other meetings called at late notice, and lack of outreach by some partners.

On a more specific note, the last MSE exercise didn't have a 'winner', as it turned out there wasn't an actual solution that could meet all three HCR design parameters. This outcome was a largely a result of the time crunch leading up to the workshop given its proximity to the Sengal workshop less than three weeks previous. The need to both parameterize and make adjustments to the model provided insufficient time to realize that the WCPO bigeye stock dynamics wouldn't provide enough contrast to demonstrate some of the key principles of using MSE to balance competing management objectives. While dampening some of the typically observed, concluding excitement of workshop MSE sessions and creating a bit of confusion, participants responded enthusiastically with this portion of the workshop. The future lesson here is one of allowing sufficient preparation time for pre-workshop testing.

Evaluation question: How do you think the presentation material could be improved?

Eleven respondents specifically mentioned how much they appreciated the presentations. Some of these participants noted that the presentations were clear and only needed minor modification. A few constructive comments were received:

- The presentations should have been provided to the participants in advance for prior reading
- Map MSE tool to Majuro plot (in addition to Kobe plot) given prominence /importance of Majuro plot in the WCPFC context
- One person noted that they felt the workshop needed an extra day, and two of the French speaking participants would have like material in French
- More simple analogies

Evaluation question: Please identify the topics that you think needed more attention?

Twenty of evaluation respondents responded to this question.

A number of important ideas were expressed by the participants that have implications for future workshops and Commission processes. Of note from the comments, discussion and answers to the evaluation questions is that more time was needed to work on the elements of harvest strategies.

The areas identified that would benefit from more attention are highlighted below:

- **More fishery-specific examples and in-country workshops**

A pervasive theme during Day 1's breakout sessions was the link and context of national issues and concerns, and how to reconcile these at the regional level, in order to move forward. There are also a broader set of stakeholders involved in fisheries management and industry at the national level who need to be aware of the WCPO Harvest Strategy development process. The issue of national interests and objectives links with participants' desire to better understand the concepts being discussed through the use of concrete examples.

On Day 1 of the workshop, Alice McDonald gave a case study presentation on harvest strategy decisions and its effects on southern albacore tuna. This was the only case study presentation. A summary of participants' comments are below:

- Personally, I would like to see more fishery-specific information. However noting that there is a suggestion that "country" workshops are a good idea - specific information could be provided at these workshops. These workshops would then be tailored to support both in-zone and regional processes.
- Concrete examples on particular species so the concepts are better understood.
- There is a challenge to harness and sustain knowledge acquired over the last few days, due to staff turnover, which is a big issue. We will likely get stuck at implementation.

- **HCRs**

Some respondents (15%) made a note they considered HCRs needed more attention:

- Creating HCRs
- HCR and MSE - framework used/evaluation process
- HCRs - just the basics on what a HCR is, what it tells you, when you use it, and what it doesn't tell you (i.e. it doesn't tell you how to implement the change in catch/effort)
- Different Harvest Control Rules for consideration

- **Scenarios and tradeoffs**

Some respondents (19%) noted that trade-offs evaluations and/scenarios needed more attention without specific elaboration. One respondent did state a desire to understand how scenarios and trade-offs are negotiated.

- **Some Harvest Strategy elements**

Some respondents felt certain basic Harvest Strategy elements were not fully addressed during the workshop. Specifically:

- Difference between F/B_{MSY} and TRP/LRPs (maybe! It's a difficult/political issue)
- TRP, LRP, Harvest Strategies
- Risks, probability and uncertainty

- **More background on how MSE works and use of the MSE demonstration tool**

Some respondents (23%) indicated that they would like to have more detailed information on the MSE approach, including more simulation exercises. Observing some of the group discussions and session report backs, it appeared that a number of participants did still not fully understanding the MSE approach. Another concern was that many participants did not realise

that management objectives should be seldom changed once set. Some comments are below:

- Demonstration of MSE tool. Because this tool will be used to increasing skill, helpful to get more understanding on the relation of the parameters in making projections. The participants may know how to use the tool but do not understand the interpretation of the results
 - More details inside the MSE elements and functions at the next session
 - A course on data collection methods and data control process could be interesting
- **Decision-making and implementation process specific to WCPFC**

A number of participants expressed a desire to hear more about what they were learning in the context of the WCPFC processes, including how negotiations and implementation might occur. How does the HS process work in reality and how do we make its output operational.

Acknowledgements

The ABNJ team is grateful for the time The Hon. Semi Koroilavesau (Fijian Minister for Fisheries) gave to open the workshop and inspire the participants to learn from the workshop in order to motivated to progress the WCPFC harvest strategy work plan.

A design team of Rich Lincoln (Ocean Outcomes), Daniel Suddaby (Ocean Outcomes), and SPC scientists Drs John Hampton, Graham Pilling, Robert Scott and Finlay Scott worked closely with project partners to assist with planning content and approach for the WCPO 2018 workshop in Fiji. Chris Grieve (Meridian Prime) and Mr. Lincoln were responsible for creative design of the interactive breakouts that used storytelling and game strategies, while Mr. Cartwright provided contextual analysis throughout the workshop. A big thanks to Dr. Andre Punt who created the tuna management strategy evaluation (MSE) demonstration tool that allowed participants the hands-on training opportunity to test the implications of various HCRs for achieving fishery performance metrics.

Special thanks go to the WWF Pacific team for their tireless work organising the logistics in Nadi. This includes Akata Kikau, Artika Singh, Duncan Williams, and Kesaia Tabunakawai, in addition to Kathryn Read (consultant for Ocean Outcomes).

The success of the workshop would not have been possible without the masterful facilitation and entertainment skills of Ian Cartwright, who has assisted the ABNJ process for a number of workshops and whose input is always appreciated and valued. Many thanks for the excellent presentations and continued assistance throughout the workshop from Dr John Hampton, Dr Graham Pilling, Dr Robert Scott, Dr Finlay Scott, Feleti Teo, Emelie Mårtensson, Kesaia Tabunakawai, Bill Holden, James Larcombe, Alice McDonald.

Appendices

Appendix A: Participant and Resource people lists

Participant list

Name	Country
James Larcombe	Australia
Matt Kertesz	Australia
Dr Lara Ainley	Cook Islands
Marino Wichman	Cook Islands
Naiten Bradley Philip Jr	Federated States of Micronesia
Eugene Pangelinan	Federated States of Micronesia
Eva Baleitilagica	Fiji
Jone Amoe	Fiji
Sanaila Naqali	Fiji
William Sokimi	Fiji
Aisake Batibasaga	Fiji
Marie Soephlen	French Polynesia
Mbwenea Teoki	Kiribati
Kaon Tiamere	Kiribati
Sarah Williams	New Zealand
Jan Tahaka Oli Pitu	Solomon Islands
Francis Tofuakalo	Solomon Islands
Dr Chumarn Pongsri	Thailand
Sampan Panjarat	Thailand
Pham Lan Phuong	Vietnam
Doan Mahn Cong	Vietnam
Vaitootai Andre, Tui Mata'utu	Wallis and Futuna
Chancelier Romain	Wallis and Futuna

Presenters and resource personnel

Name	Country
Alice McDonald	Forum Fisheries Agency
Bill Holden	Marine Stewardship Council
Daniel Suddab	Ocean Outcomes
Dr Finlay Scott	SPC
Dr Graham Pilling	SPC
Dr John Hampton	SPC
Dr Robert Scott	SPC
Dr Tim Adams	Forum Fisheries Agency
Duncan Williams	WWF Pacific
Emelie Mårtensson	FAO
Feleti Teo	WCPFC Secretariat
Ian Cartwright	Thalassa Consulting
Kathryn Read	Consultant
Richard Lincoln	Ocean Outcomes
SungKwon Soh	WCPFC Secretariat
Tony Beeching	WCPFC Secretariat

Appendix B: Agenda



Project: Sustainable Management of Tuna Fisheries and Biodiversity Conservation in the ABNJ

Workshop Aims

The goal of this workshop is to create a better understanding among Western and Central Pacific Ocean States of the precautionary approach, harvest strategies (HSs) and management strategy evaluation (MSE) for the management of sustainable tuna fisheries.

Ultimately, the objective of this workshop is to accelerate the development of tuna HSs within the Western and Central Pacific Ocean (WCPO) by directly supporting the existing Western and Central Pacific Fisheries Commission (WCPFC) harvest strategy implementation plan, and to this end we have closely collaborated with the WCPFC Science Services Provider, the Pacific Community (SPC), for the planning and execution of the workshop. Our goal is to utilise a unique agenda that considers some of the key elements of fisheries management issues currently relevant to WCPFC members. The workshop is not an event where decisions or recommendations will be made. However, it is intended that participation in this workshop will empower member states to engage meaningfully in the developments that are occurring with Western and Central Pacific Ocean tuna management over the coming two-four years.

The Event

The workshop program will include discussion of harvest strategy frameworks and the current Western and Central Pacific Fisheries Commission (WCPFC) management strategy evaluation (MSE) process. It will further equip participants with the skills and background necessary for effective and informed participation in the development of Western and Central Pacific Ocean tuna harvest strategies. Using an innovative and 'hands on' simulation tool workshop participants will learn how MSEs can test and contribute to the development of robust control rules within an overall harvest strategy approach. To avoid contention, the workshop will present general examples of control rules, focusing on principles and process, rather than the specifics of proposed harvest strategies for WCPFC stocks.

The workshop is intended to complement and support the capacity building that has already been delivered to WCPFC members, including through the Management Options Workshop (MOW) process and help 'set the stage' for the work that the SPC is about to initiate for the countries in the region. We believe that the workshop will assist Commission members to understand and appreciate the value of robust and well-tested (via MSE) harvest strategies, and thereby engage effectively at future international negotiations. We therefore strongly encourage fisheries managers/directors, together with their scientific advisors, to consider attending this workshop.

Workshop context

The workshop is part of the “Sustainable Management of Tuna Fisheries and Biodiversity Conservation in Areas Beyond National Jurisdiction” (ABNJ Tuna Project).

On 5 November 2013, the Global Environment Facility approved the five-year ABNJ Tuna Project, which the United Nations Food and Agriculture Organisation coordinates. The overarching project will focus on three component areas:

1. Supporting implementation of sustainable and efficient fisheries management and fishing practices
2. Reducing illegal, unreported and unregulated fishing through strengthened and harmonised monitoring, control and surveillance
3. Reducing ecosystem impacts from tuna fishing, including bycatch and associated species

WWF is the lead agency for a number of the ABNJ Tuna Project outputs, including supporting the improved understanding of the application of the precautionary approach through HSs by tuna Regional Fisheries Management Organisations (RFMOs). This series of workshops, together with support to science-management dialogues (led by FAO), fall under the first component of the Project.

The activities of the ABNJ Tuna Project are designed to supplement and reinforce existing efforts, not duplicate them, so these workshops are organised with the cooperation of existing initiatives in each of the oceans. In the case of the WCPO, there is active cooperation and collaboration with SPC, the organisation in charge of developing most of the WCPFC MSE work.

This workshop is the second of two rounds of ABNJ workshops for the WCPO, similar to RFMO capacity building workshops that are also being held for the Indian, Atlantic and Eastern Pacific Oceans for the 5-year life of the ABNJ tuna project.

DRAFT Agenda

DAY ONE – 20 FEBRUARY 2018

0800 – 0850	Registration	
0900 – 0930	Opening and introductions <ul style="list-style-type: none"> Official Fijian Government welcome Workshop in the context of WCPFC processes ABNJ overview WWF Introduction 	Ian Cartwright, Facilitator The Hon. Semi Koroilavesau, Minister for Fisheries Feleti Teo Emelie Mårtensson Kesaia Tabunakawai
0930 – 1030	Context setting overview <ul style="list-style-type: none"> Importance of HS/HCR in the context of MSC certification of tuna fisheries in the Pacific Harvest strategy concepts Wrap up and stage setting 	Bill Holden Graham Pilling Ian Cartwright
1030 – 1100	Break	
1100 – 1230	Small group session 1 – Exploring harvest strategy (HS) concepts: sharing and reinforcing understanding basic management principles <ul style="list-style-type: none"> Breakouts 	Ian Cartwright
1230 – 1330	Lunch	
1330 – 1500	Small group session 2 – How harvest strategy concepts fit together in overall management: exploring and sharing participants’ understanding <ul style="list-style-type: none"> Breakouts 	Ian Cartwright
1500 – 1530	Break	
1530 – 1550	Session 2 continued - what did we learn <ul style="list-style-type: none"> Facilitated discussion 	Ian Cartwright
1550 - 1650	Real world application: <ul style="list-style-type: none"> Overview of the WCPFC Harvest Strategy Work Plan Southern Pacific albacore case study Presentation and facilitated discussion	Ian Cartwright James Larcombe Alice MacDonald

1650 – 1700	Day 1 wrap up – Facilitated discussion	Ian Cartwright
1700	Close Day 1	
6:30pm: Workshop dinner - Fijian Lomu - Tanoa Hotel Poolside		

DAY TWO – 21 FEBRUARY 2018

0900 - 0910	Opening: Day 1 reflections, Day 2 overview	Ian Cartwright
0910 - 0930	Management Strategy Evaluation (MSE) Concept Overview <ul style="list-style-type: none"> • Role of management strategy evaluation (MSE) 	Robert Scott
0930 - 1030	Going deeper: Management objectives and performance measures to evaluate MSE results <ul style="list-style-type: none"> • Breakouts 	Robert Scott Ian Cartwright
1030 - 1100	Break	
1100 - 1230	Demonstration of MSE tool – Presentation and facilitated discussion <ul style="list-style-type: none"> • What we do now • How to test decision choices on key management inputs Simple automatic harvest control rule 	Robert Scott
1230 - 1330	Lunch	
1330 - 1500	Small group session 3 – Creating harvest control rule (HCR) scenarios and evaluating trade-offs; final HCR challenge and ‘fun competition’ Hands-on testing of harvest control rule options and discussion of trade-offs among competing objectives, performance measures <ul style="list-style-type: none"> • Breakouts and round table discussions 	Robert Scott
1500 - 1530	Break	
1530 - 1615	Looking ahead: WCPFC process on harvest strategy/management procedure development <ul style="list-style-type: none"> • Facilitated discussion 	Graham Pilling Ian Cartwright
1615 - 1645	What did we learn – how will we use it in WCPFC? <ul style="list-style-type: none"> • Facilitated discussion 	Ian Cartwright
1645 - 1700	Evaluation and farewell	Ian Cartwright

	<ul style="list-style-type: none">• Workshop evaluation• Closing thanks and send-off	Duncan Williams (WWF Pacific) and Aisake Batibasaga (Fijian Director of Fisheries)
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Abbreviations/Acronyms

ABNJ	Areas Beyond National Jurisdiction
FAO	United Nations Food and Agriculture Organisation
HCR	Harvest Control Rule
HS	Harvest Strategy
MSE	Management Strategy Evaluation
RFMO	Regional Fisheries Management Organisation
WCPFC	Western and Central Pacific Fishery Commission

Appendix C: Evaluation form

Evaluation Form

ABNJ Western and Central Pacific Ocean Tuna Management Workshop Nadi, Fiji, February 2018

We are collecting information on who attends the ABNJ harvest strategy workshops, what participants gained from them, and how we can improve future workshops. Please answer all questions that you can. The information will be aggregated with other answers collected, and any reports related to this feedback will not identify individual respondents. We appreciate your feedback as it will help to improve the value of future workshops.

Please provide any additional feedback or details to any questions if you would like. This should only take a few minutes. Thank you for your participation!

Workshop Participation

1) **Do you attend...** (circle all that apply)

Commission meetings	Scientific committee meetings	Working Parties to Commission
Preparatory meetings within your country	None of these	Other (please specify) _____

2) **Your role is...** (circle all that apply)

Fisheries manager/director	Scientific advice	Management advice	
Policy advice	NGO	Industry member	Other (please specify) _____

3) **Is your country/organisation considered:** (circle all that apply)

WCPFC Member	WCPFC Cooperating Non-member	Participating Territory	WCPFC Observer Status
G77 State	Non-G77 State	Coastal State	Other (please specify) _____

4) **Approximately how long have you been involved in the fishery sector?** _____ years

BEFORE the Course Awareness & Knowledge

5) **BEFORE the course, did you consider Management Procedure (Harvest Strategies) an important tool to improve the sustainability of tuna fisheries?** (circle one)

Not Important		Somewhat Important		Very Important
		3		
1	2		4	5

6) **BEFORE the course, how would you rank your knowledge of the course content?** (circle one)

Limited		Neither Limited nor Good		Very Good
		3		
1	2		4	5

7) **BEFORE the course, how would you rank your knowledge of the use of Management Procedure (Harvest Strategies) and reference points for management of tuna stocks?** (circle one)

Limited		Neither Limited nor Good		Very Good
		3		
1	2		4	5

8) **BEFORE the course, how would you rank your knowledge of the processes required for further development and implementation of Management Procedure (Harvest Strategies) and conservation measures in the WCPFC?** (circle one)

Limited		Neither Limited nor Good		Very Good
		3		
1	2		4	5

9) **BEFORE the course, how would you rank your knowledge of Management Strategy Evaluations (MSE) to compare trade offs among achieving different fishery objectives?** (circle one)

Limited		Neither Limited nor Good		Very Good
		3		
1	2		4	5

AFTER the Course Awareness & Knowledge

10) **AFTER the course, do you consider Management Procedure (Harvest Strategies) an important tool to improve the sustainability of tuna fisheries?** (circle one)

Not Important		Somewhat Important		Very Important
		3		
1	2		4	5

11) **AFTER the course, how would you rank your knowledge of the course content?** (circle one)

Limited		Neither Limited nor Good		Very Good
		3		
1	2		4	5

12) **AFTER the course, how would you rank your knowledge of the use of Management Procedure (Harvest Strategies) and reference points for management of tuna stocks?** (circle one)

Limited		Neither Limited nor Good		Very Good
		3		
1	2		4	5

13) **AFTER the course, how would you rank your knowledge of the processes required for further development and implementation of Management Procedure (Harvest Strategies) and conservation measures in the WCPC?** (circle one)

Limited		Neither Limited nor Good		Very Good
		3		
1	2		4	5

14) **AFTER the course, how would you rank your knowledge of Management Strategy Evaluations (MSE) to compare trade offs among achieving different fishery objectives?** (circle one)

Limited		Neither Limited nor Good		Very Good
		3		
1	2		4	5

Effectiveness of Course Content

15) **Do you feel you have a better understanding of:** (circle one for each question and sub question)

- | | | |
|---|------|----------|
| A) How the management principles discussed in the workshop are used by WCPFC to currently manage fisheries? | Same | Improved |
| → Will you use this knowledge in your work? | Yes | No |
| B) The advantages of using a Management Procedure (Harvest Strategy) to manage a fishery? | Same | Improved |
| → Will you use this knowledge in your work? | Yes | No |
| C) What the precautionary approach is to management? | Same | Improved |
| → Will you use this knowledge in your work? | Yes | No |
| D) The difference between a target and limit reference points? | Same | Improved |
| → Will you use this knowledge in your work? | Yes | No |

16) Do you feel you have a better understanding of:	(circle one for each question)	
A) Types of performance objectives for the fishery?	Same	Improved
→ Will you use this knowledge in your work?	Yes	No
B) That objectives may require trade-offs?	Same	Improved
→ Will you use this knowledge in your work?	Yes	No
C) Why Management Procedure (Harvest Strategies) are tested in simulation models?	Same	Improved
→ Will you use this knowledge in your work?	Yes	No
D) What the next steps are for the WCPFC to adopt a Management Procedure (Harvest Strategy) for tuna species?	Same	Improved
→ Will you use this knowledge in your work?	Yes	No
E) The role of the different actors in the Management Procedure (Harvest Strategy) decision-making process?	Same	Improved
→ Will you use this knowledge in your work?	Yes	No

Overall Effectiveness of Course Content

17) BEFORE the course, did you feel confident in engaging in dialogues around the implementation of sustainable tuna management including the formulation of Management Procedure (Harvest Strategies)? (circle one)

Not Confident At All	Somewhat Confident	Very Confident
1	3	5
2	4	

18) AFTER the course, do you feel confident in engaging in dialogues around the implementation of sustainable tuna management including the formulation of Management Procedure (Harvest Strategies)? (circle one)

Not Confident At All	Somewhat Confident	Very Confident
1	3	5
2	4	

Course Delivery

19) **How do you feel about the volume of material covered in each section?** (circle one)

Too Much

Good

Not enough

20) **How do you feel about the level of the material covered given your prior experience?**
(circle one)

Too complex

Good

Not Enough

21) **How do you think the presentation of the material could be improved?** (write in below)

22) **Please identify the topics that you think needed more attention.** (write in below)

Thank you for your participation! It is greatly appreciated.