



**WCPFC
THIRD MANAGEMENT OBJECTIVES WORKSHOP**

Faleata Sports Complex, Apia, Samoa
28th November 2014

Report on the Second Management Objectives Workshop

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¹ Revised text box bottom page 9 and rephrasing final bullet page 12.

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1. Introduction

The first Management Objectives Workshop (MOW1) facilitated by an Expert Group comprising Drs J. Ianelli and Robin Allen and Ian Cartwright, was convened by the Commission secretariat in Manila on 28-29 November 2012. The workshop (<http://www.wcpfc.int/meetings/wcpfc-management-objectives-workshop>) sought to increase the understanding of management objectives, indicators and reference points. A candidate list of management objectives was developed and categorised under by biological, economic, social and ecological objectives.

WCPFC9, in considering the outcomes of the MOW1, agreed to use the same group that provided input into that workshop, assisted by the Commission Secretariat and SPC, to develop a 'Strawman' consisting of a candidate list of management objectives, performance indicators, and target reference points for each major fishery. These were:

- Tropical longline
- Purse seine
- Southern longline
- Pacific bluefin tuna
- North Pacific albacore

The draft 'Strawman' was presented to the Scientific Committee (SC9) the Northern Committee (NC9) and the Technical and Compliance Committee (TCC9), for comment and suggestions. Elements of the 'Strawman' report were reviewed by the second Management Objectives Workshop (MOW2) and additional comments provided. The final 'Strawman' report, including revisions and suggestions, will be presented to the Commission at WCPFC10.

2. The workshop

MOW2 was opened by the WCPFC Executive Director, who emphasised that the workshop is an informal meeting of stakeholders with an interest in WCPO tuna fisheries and did not have formal standing in the Commission.. The workshop was facilitated by Ian Cartwright, supported by Dr Robin Allen and Dr John Hampton (SPC). Dr Jim Ianelli was not present due to unavoidable circumstances.

The workshop had three main elements:

- a series of plenary workshop presentations: the 'Strawman'; examples of the application of target reference points and trade-offs; and options for representing risk, uncertainty and performance indicators;
- break-out sessions, which discussed: candidate objectives, indicators and reference points; WPs 1-4; and possible future options for the further development of a fisheries management framework for the WCPFC; and
- a plenary discussion of the outcomes of the break-out group discussions.

The agenda for the workshop is provided at **Attachment A**. A participant list is provided at **Attachment B** and the presentations of the outcomes from the working groups are **Attachment C**.

3. The ‘Strawman’ Document: A report of the Expert Working Group: Management objectives, performance indicators and reference points

The Facilitator provided a brief overview of the ‘Strawman’ document and requested feedback on the document and more specifically on the tables of objectives, indicators and target reference points (TRPs) for each fishery. Suggestions for amendments were made following the presentation and during the break-out groups, and these are incorporated in the final version of the ‘Strawman’ Report (WCPFC10-2013-15b)

4. Economically profitable domestic fleets in the South Pacific Albacore: Potential objectives and reference points

Dr Graham Pilling (SPC) provided the presentation (MOW2-WP-01). The paper considered a MOW candidate objective – maximizing the economic yields from the southern longline fishery (i.e. Maximum Economic Yield or MEY), and considered an example of how to make this objective operational through candidate TRPs. The potential implications of management options were considered. It was emphasised that the presentation focused on principles using a broad strategic approach rather than the specifics of the costs and assumptions used.

Conclusions drawn in the paper include:

- Analysis based on current catch and effort settings for SPA suggest that there is considerable loss of potential economic value and to achieve MEY reductions of the order of 14-70% of 2010 effort levels could be required, depending on economic conditions.
- Substantial gains in value (and improved catch rates) can be made even with only moderate reductions in fishing effort.
- Vessels with lower costs will have sufficient returns to stay in the fishery long after other ‘average’ vessels with higher costs will exit the fishery due to inadequate returns.
- Resource rent at MEY or %MEY is one potential economic indicator that can help define TRPs (others incl. employment and other onshore economic benefits); all require access to industry/market data.

Key issues from plenary discussions and the break-out groups are provided below:

- Any economic analysis must take account of changes in markets and prices over time; it may be possible to add reactive modelling elements to deal with this requirement in the future
- Innovation and technology will have substantial impacts on efficiency and therefore the selection of reference points.
- Cost structures across fleets of SPA vary greatly and the costs of the American Samoan fishery were lower than those cited in the SPC paper.
- Maximising economic yield for all fleets considered too difficult due to diversity of interests.

- Given that the relationship between economic yield and fishing mortality (fishing effort) is relatively ‘flat topped’ i.e. economic yield is stable for a range of effort levels on the yield curve around MEY, it was agreed that ‘pretty good’ economic yield (PGEY) was a useful target.
- While there may be debate about cost structures, it is clear that economic viability in the SPA longline fishery is borderline
- Noted that game fishing has the potential to increase income/benefits for some CCMs, but factoring this into the model is not possible at this stage.
- CPUE should be the primary indicator as a proxy for economic yield secondary indicators could include costs, price, resource rent, and other national level indicators including contribution to GDP
- Relatively small cuts will provide good increases in economic yield, while making further cuts in an attempt to maximise economic yield would be both harder to achieve and provide diminishing gains
- Subsidised fleets means that the starting point of fleets may be different, but all will benefit from a move towards MEY. Further, if a sound fisheries management framework and rights are established are in place then subsidies don’t impact on sustainability. Lower cost / subsidised fleets may provide the most efficient “harvesting service” for rights holders, again once rights have been established and allocations agreed.
- While bigeye and yellowfin are a key component (usually seasonally) of Southern longline fishery, there is a need to retain the current management focus on albacore fishery; interactions between fisheries are a key consideration but perhaps a secondary one to be considered later
- The WCPFC Convention requires consideration of economic factors – Art. 5 (a), Art. 10 Paragraph 1(j), . In addition, the special requirements of SIDS and disproportionate burden assessment will require economic analysis Art. 10 3d and Art. 30
- Seek to agree CMM in the Commission (next week) to progress management framework and setting of limits/rights for the southern albacore stock.
- The issue of importance for indicators and references points for bycatch species was raised and attention drawn to a submission by Birdlife International on the topic. This submission is included as Attachment D

5. Maintaining viable fisheries across the extent of the stock: yellowfin and bigeye longline fisheries

Dr Graham Pilling (SPC) provided the presentation (MOW2-WP-02). The paper explored the use of a biological management objective for tropical fisheries: *maintaining yellowfin and bigeye biomass above levels that provide fishery sustainability throughout their range*. The paper considered how this objective could be made operational through the use of TRPs, where this objective is the only one applied to a fishery. It was emphasised that the example and analysis were provided to promote discussion rather than suggest that a particular management objective and ways of making it operational should be considered.

Conclusions drawn in the paper include:

- Notable reductions are required to achieve the identified catch rate levels by 2018, from around one quarter to achieve the lower CPUE target (2 individuals/1,000 hooks), to over 50% to achieve the slightly higher target biomass level.
- These reductions result in notable predicted increases in catch rates in all fisheries –tropical fisheries in the core yellowfin habitat benefit most, compared to those fisheries in temperate regions. In turn, southern temperate longline fisheries, while also benefiting from reductions, benefit less than other temperate fisheries.
- If catch levels are reduced, fisheries overall are predicted to benefit through increased catch rates over time. Further benefits in vulnerable biomass may be seen with projections extended for longer periods.
- Significant trade-offs that would be faced achieving these example target reference points, include those between the reductions in effort/catch, the timescale for rebuilding, and the potential for lower costs of capture and greater profitability that result.
- If range contraction were occurring - which is not directly incorporated within the projection model - increased benefits for temperate fisheries might be seen. As fish stocks recover, it is expected that range expansion from the tropics will lead to increasing catch rates in more marginal temperate regions.

Key issues from plenary discussions and the break-out groups are provided below:

- Disproportionate burden is taking on different meanings – i) that considered under Art (SIDS etc.) ii) that due to the costs of management action (e.g. impacts on PNA states of catch/effort reductions to address bigeye) and iii) range contraction/falling CPUE in high latitudes due to fishing in the core area.
- The rigorous approach using projections demonstrating trade-offs was acknowledged; if all model inputs are valid and current, then fisheries performance over time can be estimated, but the approach is questionable in terms of developing TRPs.
- While further refinements will help get a more complete picture, the current presentation is helpful in presenting information that many CMMs have been aware of for a while. The decline in yellowfin CPUE is just one example; other species are declining and there is a need for management action now if the aspirations of SIDS with small fleets can be achieved. This may require interim targets in order to prevent the situation from worsening.
- Need for better understanding of latitudinal dynamics and the regional variability in catch and CPUE.
- Objective of maintaining ‘acceptable’ catch rates throughout the range of a stock may require multiple objectives / indicators e.g. a TRP that results in a high yield in core area while allowing viable CPUE in high latitudes; win-wins are possible, especially with yellowfin
- At the moment tropical LL fishery is not profitable for a lot of sectors and achieving tropical objectives may help support temperate objectives
- Need to account for the reality that some are likely to gain more than others (resource abundance/availability is not homogeneous) and there is likely to be a need for impact-offset

mechanisms. Such mechanisms may include downstream impacts and should be developed and agreed upon by Commission.

- A view that it may be better to rely on avoiding LRPs with a high degree of certainty rather than rushing to identify a TRP with inadequate data.
- Fishery dependent data may not be representative of stock condition and will affect model outputs.
- Note the impact on the severity of management measures to address stock issues is driven by the timeframe to recovery to some target levels – severe cuts necessary to rebuild over five years and perhaps two generations (about 10 years) may be more appropriate for bigeye.
- Targets need to be taken into consideration for entire range of stock, not just where the highest catches are
- Need for different indicators at different latitudes – will help draw out regional biological differences (i.e. whole stock is performing one way, different more locally)
- A LRP with high probability of avoiding it as an HCR – may get around the issue of coming to consensus on specific numeric points, which can be v. contentious and time-consuming.
- Common thread – need a broader regional biomass target to support a variety of management options
- Consider national elements that would get lost in a broader regional objective
- Not clear if there is sufficient understanding of the latitudinal impacts of necessary catch/effort reductions across the range of the stock, or the relative changes to yellowfin and bigeye as management changes are made, particularly at the national level; the term ‘tropical’ tuna species tends to be used with insufficient clarity.
- The issue of who pays/benefits for necessary catch/effort reductions to achieve a certain target and further work is needed to consider differential costs/benefits – consider apply the ‘polluter pays’ principle.
- Assigning stronger LL rights to coastal states (e.g. through longline VDS) may provide better data collection, more robust assessment/decision making and improved management, as is occurring in the PS fishery. Allocation remains a sticking point.

6. Management strategies (objectives, indicators, reference points and harvest control rules): skipjack purse seine fisheries

Dr Shelton Harley (SPC) provided the presentation of (MOW2-WP-03). The paper provided a worked example of how fisheries management actions, relative to limit and target reference points, can be put into practice through a harvest control rule in the purse seine fishery for skipjack. Using the WCPFC adopted limit reference point and an arbitrary target reference point of 50% of the unfished biomass level, the performance of the fishery was examined under two simple HCRs. The HCRs were used to illustrate the concepts of ‘tradeoffs’ and ‘robustness’, which are critical to developing management strategies. The paper illustrated the issues that are likely to be considered in the future management of the fishery including trade-offs between maximising catches and minimising catch variability; what features would be important in harvest control rules for skipjack tuna; how rules for yellowfin and

bigeye tuna which involve major gear interactions may be designed; and how harvest control rules could assist decision making processes in the WCPFC.

Conclusions drawn in the paper include:

- Harvest control rules are a way to help ensure the stock remains near target and away from limit reference points.
- While the performance with respect to the target reference point was similar between the HCRs tested, the performance against the other performance metrics was quite different. HCR 1 (lower effort during good times) produced around 5% lower returns in terms of the value of the catch, but resulted in generally higher catch rates (therefore lower costs) than HCR 2.
- This example illustrates a trade-off between maximising total catch and/or catch value and reducing the variability of catch.
- With lower effort during good times (HCR 1), changes were very few and generally small, but for HCR 2 the effort limit was changed far more frequently. This could cause problems in terms of stability of the fleet and ability to manage the fishery.
- When uncertainty was added to the stock assessment results used to drive the rules, the performance against stock status and catch was only slightly worse than that under the 'tuned' conditions indicating that the rules were relatively robust to this uncertainty.
- If assessments are less certain then changes (which are generally disruptive to industry) are likely to be more frequent and larger. Harvest rules can be designed to avoid such large changes, but this often occurs at the expense of overall catches.
- Neither rule was able to keep the stock around the target level in the presence of effort creep, but the rules did keep the biomass quite close. This was achieved through more frequent changes in effort. A well-designed rule might be able to help address issues such as effort creep.
- The robustness of harvest control rules is important – it can sometimes be better to choose a more conservative rule (generally less catch) that does performs reasonably well and does not allow the fishery to exceed reference points in the long term.

Key issues from plenary discussions and the break-out groups are provided below:

- Where a stock is known to be under pressure, it was considered inappropriate to wait until a management process was perfected before action was taken; an interim TRP could be identified for skipjack whilst a more rigorous management process was developed in parallel.
- HCRs shown to work in other fisheries may be reviewed in relation to the current debate. Noting that other less complex fisheries such as southern bluefin tuna were less of a challenge in that a single species was being managed and relatively few states were involved.
- YFT is a more targeted species than BET, and the YFT fishery is amenable to management through catch based rules; however BET is likely to continue to be managed via technical measures such as limits on FAD sets or FAD closures, pending a better capability to monitor catch in near real time. In each case it is feasible to develop rule-based procedures, e.g. duration of FAD closure dependent on TAE.
- One view was that allocated rights need to be comprehensive in the long term, i.e. allocations of BET and YFT catch across PS, LL and other fisheries, it would then be possible to have economics driven trading among fishery components. For this to happen there would need to be a common

currency, e.g. impact of a given catch on the spawning biomass (so 1 tonne of PS bigeye 'quota' converts to some lesser tonnage of LL bigeye 'quota').

- It was suggested that 50%SB₀ could be a reasonable target that reflects both avoidance of the LRP, current and therefore known conditions in the fishery and attitudes of precautionary management amongst the major stakeholders.
- Stability within the purse seine fishery is highly valued.
- Although any given stocks should be managed across its range, it was thought that it was sometimes difficult to apply a HCR throughout. It was further noted that indicators could apply to parts of the range without necessarily being directly linked to the HCR.

7. Supplementary presentation on options for skipjack TRPs and HCRs

Following a request from the floor of the workshop for more specific information on setting a skipjack TRP (MOW2-PPT-06), and in accordance with advice from SC9, SPC-OFP provided a presentation on analysis on TRPs and HCRs for skipjack being undertaken (but not yet complete) for the PNA. In providing the presentation, the following three key issues were raised.

- Using current effort, which appears to be at an appropriate level in terms of fishery performance, the number of fishing days could be set and a corresponding TRP/HCR applied.
- The TRP is based on the last skipjack assessment in 2011, but there would be a new assessment in 2014 and any HCR would be applied to that assessment.
- The SKJ fishery is dynamic and effort creep and innovation could affect the HCR over time. The assessments should endeavour to capture such changes, which is likely mean that it is not appropriate to think of the 2010 nominal level of effort a long term goal.
- Reflecting on options for a TRP in the range of 0.4 – 0.6 it was not considered advisable to have a target lower than the levels that have been experienced (0.6), or a higher target level that requires immediate large reductions in fishing effort (0.4) and therefore a TRP that recognises current fishing conditions and current acceptable fishery performance was appropriate (0.5).

The following proposal was considered by the workshop, and refined by WCPFC10 to the current form:

The following was agreed at WCPFC 10 in 2014 with a view to recommending a TRP and HCR to WCPFC 11:

- Evaluate WCPO skipjack stock status against candidate target reference points of 40%, 50% and 60% of unfished spawning stock size.**
- Apply stock-wide harvest control rules such as those present in MOW2- WP/03 and examine robustness relative to the new assessment and major sources of uncertainty.**
- Include performance indicators relating to fish sizes, impacts on yellowfin tuna and bigeye tuna, and examine the acceptable magnitude of changes in fishing effort.**

The workshop recommended that an interim/provisional TRP should be set for the skipjack purse seine fishery, and that this should be in place by 2014 at the latest noting that such a proposal must not preclude the parallel development of a management framework and process.

An observation was made that the process described above appeared to be the reverse of what one would normally expect, that is, current effort seems to be ok, take that as a number of fishing days to fix a target. Identifying a HCR appears redundant, when all that is apparently required is to set the number of fishing days and conduct stock assessments periodically to ensure that the stock is safe.

8. Managing impacts on a key tuna species across gear types; Options for addressing bigeye tuna overfishing

Dr Shelton Harley (SPC) provided the presentation of (MOW2-WP-04). WCPO fisheries are among the most complex of multi-species, multi-gear fisheries in the world due to gear/species interactions. As a result it is generally impossible to manage any one part of the fishery in isolation. It was noted that there is a need to better understand how management measures based on one management objective (end bigeye overfishing) would impact on the achievement of others objectives, including those for other fisheries sectors or species. This paper examines differences in predicted catch, catch value and CPUE under various combinations of associated (FAD) effort and longline bigeye catch reductions that remove bigeye overfishing. The associated effort/bigeye catch reduction combinations used follow the analysis presented in "*SC9-MI-WP-01 [Measures_eval_final] REV2*". The aim of the analysis is to provide MOW2 with an indication of how such modelling could be used in the future to inform management decision-making. Use of this modelling and analysis would allow the Commission to adequately recognise the trade-offs that exist between fishery sectors/species, and to make better informed decisions. It was again emphasized that the paper and associated analysis was a theoretical exercise and that the data and modelling currently available should not be relied on as the basis for decision-making against the mix of objectives identified at MOW1 and since then.

Conclusions drawn in the paper include:

- A broad diversity of management actions can achieve the same conservation outcome. At the extreme ends, a 53% FAD reduction (akin to an 8 month FAD closure) could be accompanied by a significant (19%) increase in LL catch and still achieve the same bigeye status as a 14% FAD cut (just over 4 months FAD closure) and a 80% reduction in LL catch.
- The value of catch in the longline fishery varies very dramatically according to the scenario, and while in the purse seine fishery the relative changes are not large, the absolute changes are significant.
- The overall value of the catch in each sector is one of the indicators for CCMs to consider and other indicators such as those related to socio economics are also important.
- Understanding of fleet reactionary behaviour in response to changes in management is very limited at this stage. Understanding this and incorporating it in the modelling is a key action necessary in further fisheries management planning.
- Gross value of the fish taken is a relatively uninformative indicator by itself as the value of the LL fishery is "locked" by management and the value of the purse seine fishery is so high that relatively substantial absolute changes appear insignificant in relative terms.
- At the macro level, substantial LL value decline occurs as the magnitude of cuts increases, noting that this does not take into account variations in market price as supply is restricted.

- Considering changes in fisheries value provides a more informative view of the trade-offs in value of the different sectors, and demonstrates quite clearly the concept that there will be “winners” and “losers” with each decision and provides a basis for determining the magnitude of those gains and losses.
- Similarly, this type of information highlights the need for examining both short term and long-term objectives, and whether there is a need for temporary trade-offs under certain circumstances.
- Examination of CPUE changes under different scenarios is important in deciding on management regimes. This is because many of the candidate objectives already identified relate to concepts such as economic returns, profitability, efficiency and optimum utilisation. This type of indicator provides a useful contrast to earlier indicators such as overall value, in that while under some scenarios the catch and therefore value of LL is diminished, it is accompanied by very strong efficiency increases. This is important as it reduces the magnitude of financial impact.
- There are numerous additional indicators that can be used to assess the relative implications of a given management scenario. These would depend on the type of fishery interactions that are to be dealt with and the specific objectives agreed upon and may include: stochastic projections to determine stability (in catch, value, CPUE etc) within a fishery; estimated bycatch of other species; and the Commission’s progress.

Key issues from plenary discussions and break-out groups are provided below:

- It was noted that there may be a disproportionate burden in relation to the aspiration of the SIDS following changes in the fishery.
- A majority view was expressed that economic and financial assessments should be taken into consideration at the Commission level as indicated by the Convention. An alternate view was that economics information should only be collected and analysed at the country or sub-regional level.
- The degree to which biological considerations supersede economic /financial considerations is dependent on the status of the stock e.g. economic options are limited in the case of rebuilding a very depleted stock
- Analysis of options in MOW2-WP-04 all have same biological outcome for bigeye (elimination of overfishing), but impacts on parameters other than catch value are not clear.
- There is a need to ensure that models and modelling are ‘fit for purpose’. Multifan-CL focuses on species stock assessment and the analysis so far has been very specific (e.g. manage bigeye overfishing); and subject to clear and timely instructions from CMMs, in line with SC/TCC/Commission timetable, analysis should be expanded to include a range of potential indicators: economic, environmental etc.
- Multifan, which has been in development for 17 years and is improving all the time, generates results at a relatively coarse spatial level over six regions, but it is possible for some EEZ-level analysis but to review in detail at a finer scale would need additional work and a more sophisticated model. SEAPODYM which is more fine-scale, but in a very early stage of development, may be of use for generating additional insights.
- The impact of catches upon prices is an important consideration in developing economic projections

- WCPFC should determine what economic data it needs and how to access it. Currently, the Commission does not have detailed economic data, which may be held at a sub-regional or country level.
- In considering the economic aspects of the fisheries, it's important to review the value chain, not merely catch values. There should be consideration of the role of the market as well as operating costs of fisheries.
- Economics are dynamic, and projections are typically valid for one or two year, whereas conservation issues tend to be more long-term.
- The term 'Disproportionate burden' (in relation to SIDS) should to be quantified, Paper WCPFC10-2013-DP33, "PNA: Paper to support PNA and Tokelau proposal for avoiding disproportionate burden in the tropical tuna CMM", was cited as a useful reference on this issue.
- There is a potential for interactions with artisanal fisheries in mixed spp fisheries e.g. tropical purse seine was recognised.
- The example of spatial change in fisheries was cited, the Hawaii longline fleet fished more in the eastern Pacific this year, and there should be a way to develop an indicator that reflects these changes.
- The US ecosystem-based management process under the MSA was cited as good practise, where a number of additional relevant considerations are factored into the final measure, for example fishery management plans must consider impacts on small business
- While there is no fixed mechanism/protocol, the WCPFC currently makes implicit trade-offs and will continue to do so, noting that individual CMMs or groups of CMMs (e.g. PNA) will continue to take positions in national best interest, and, where appropriate, consider trade-offs during negotiation at the Commission.
- It was suggested that it may be useful to set boundaries on the Commission's decision space, as prescribed by for example the Convention, or codified practices developed over time.
- There are some areas where trade-offs should not apply and 'Red lines' should demark for example LRPs and HCRs.
- There needs to be mechanisms for the Commission to consider trade-off evaluations to determine whether they are acceptable and if not how they can be rearranged. Several options were proposed to develop fora to debate management framework issues outside of regular sessions of the commission, including: ad hoc meetings such as the recent TTM in Tokyo as required, attached to or as part of the existing meetings (SC and TCC), noting that SC already has a management issues theme. Noting that there was a reluctance to include additional meetings into an already busy schedule.
- Timing actions is an issue. Although as given fishery approaches a limit a decision/action is increasingly important [already negotiated in the case of a HCR], but even when the limit is reached, there is still leeway, subject to rules, with regard to the rate of rebuilding.
- As a point of clarification, SC should not advocate for a particular "management" option. The SC should expand its discussion on economic studies possibly within the existing Management Issues theme.

- It was recognised that individual parties/groups (CCMs, PNA, FFA etc.) may determine actions independent of the commission
- A narrow decision area as suggested above, with quantified trade-offs, makes the process more manageable

The related issue of fishing capacity controls (vessel numbers) was raised. A view was expressed that even if the VDS is effective, there will be insufficient catch available to make the current fleet viable, and so there is a need for capacity management. While the pressure exerted by excess capacity was acknowledged, the majority view was that in the medium to long term, more efficient vessels would replace the less efficient, generate better returns from the fishery and improve benefits to CMMs, and in particular SIDS. That is, the problem of capacity was one that related to fishing states and would be addressed by business decisions at the enterprise level.

9. Representing uncertainty, risk and performance indicators against fishery management objectives and reference points

Mr Wez Norris provided a presentation based on (MOW2-WP-05). The paper explores some alternative approaches for representing performance indicators, reference points, and risk for the purposes of informing management decisions. It is not a critique of the many existing approaches and does not consider the science of monitoring and assessment of performance indicators.

Visual communication tools can directly support fisheries management strategies by:

- Measuring PIs directly against multiple management objectives,
- Informing (and providing rationale for) a management response to the status of a performance indicator,
- Improving understanding of the status of the fishery among managers and stakeholders, and
- Recognise uncertainty and risk.

The options explored in the paper focus on graphical tools that, either wholly or in part, achieve these criteria.

Conclusions drawn in the paper include:

- A management strategy seeks to improve the ability of managers to make timely and proactive decisions for the management of a fishery. Visual tools representing the performance of the stock/fishery under such decisions assist not only managers to understand these scientific outputs and therefore what their objectives mean, but they also allow them to communicate that information to a broad audience including Ministers, industry and the public.
- Where indicators demonstrate that management intervention is required, managers and stakeholders need to have some understanding of future consequences, trade-offs, and uncertainty associated with potential management responses. Visual tools that demonstrate these therefore complement the implementation of a fishery management strategy.
- A single graphical tool is unlikely to meet all of these needs but building target and limit reference points, and some recognition of uncertainty, into commonly used tools (like the Kobe plot) would enhance their ability to support a management strategy approach. Management decision-making would also benefit from more regular use of secondary tools that allow for better presentation of performance over time and future projections.

- The above discussion represents a few options to generate discussion and thinking on communication of reference points and fishery performance, however the use of any one (or more) approaches will have limited value before objectives and PIs have been agreed for the fisheries. It is only at that point that “performance” can truly be monitored and assessed, and the outputs used to inform proactive management responses.
- Harvest control rule approach is the preferred management option, but should be preceded by a clear specification of rights.
- An opinion was offered that it was time to move on from the Kobe plot to more sophisticated communication tools and social indicators should include consideration of SIDS, cultural, social, political and economic. In response it was noted that following the Kobe process and there was an expectation that RRMOs would work with the Kobe II strategy matrix.

10. Development of a future work-plan for advancing the development of a management framework for the WCPFC

Each working group considered the way forward for the MOW process and the development of a management framework for the WCPFC. The following major points were raised, which are reflected in the future work plan in the first part of WCPFC10-2013–15a, which was developed following MOW2:

- The MOW process is seen as very useful, but further work needs to be integrated and proceed through Commission processes and supported properly. A two-day workshop before every Commission meeting may not necessarily be the best way to take this process forward. The process needs to be member-driven, even if it is difficult to get member feedback – these are important issues and need to be fully understood
- The MOW process is seen as a way of involving SIDS and keeping them fully up to speed with the development the management framework (TRP, HCRs etc.); however there is a need to move away from an awareness and education exercise to the development of a product. It was suggested that an initial action would be to develop and refine a general framework, and the NAFO general management framework was cited as useful example.
- The initial TORs for the Management Objectives Workshop process need to be updated in light of the progress made in the first two workshops, and this should be reflected in new TORs and workplan agreed at WCPFC10.
- Future activities in the process should include looking at how MSE can be applied in general and more specifically in the case of an interim provisional TRP for SKJ.
- Development of management rules is part of a longer process, there also needs to be a means to operationalize those rules.
- The current processes (SC, TCC) should be capable of dealing with the development of a management framework. SC has a Management Issues theme and could accommodate discussion of management framework components (HCRs, TRPs etc.), noting that it already deals with LRPs. The option of an additional management forum was discussed, but concern raised that it could place an untenable burden on SIDS. A third option, ad hoc workshops, was also considered.