WCPFC
MANAGEMENT OBJECTIVES WORKSHOP

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MANAGEMENT FRAMEWORK

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Agenda 4 - Management framework

This paper describes a generic management framework, explains the key role of Management Objectives in driving this framework, issues of uncertainty, and the roles and responsibilities involved with developing each of the framework elements.

What is a management framework?

The management framework lays out, in a formal manner, all key processes involved in managing a fishery. Figure 1 provides a simplified view of the style of management framework being considered at the WCPFC MOW, and linkages between the different parts of this framework. In practice, and as the process of establishing management frameworks progresses, there will be multiple frameworks, reflecting the spatial and species circumstances of the WCPFC.

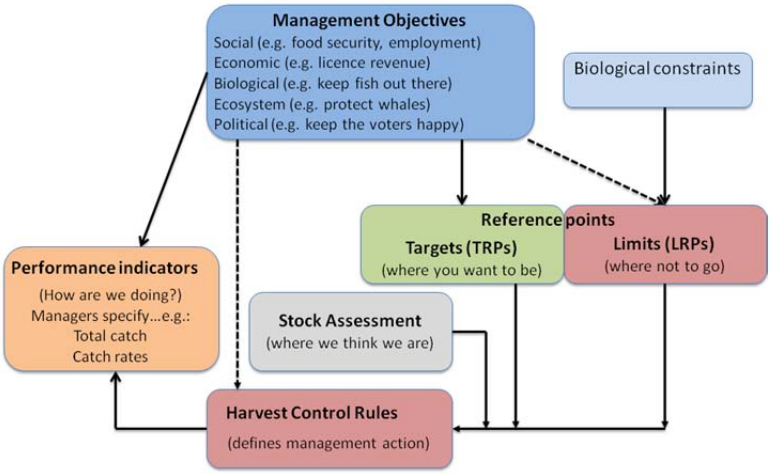

Figure 1. Influence of Management Objectives on key elements in a fishery management framework.

How do management objectives drive this framework?

The management objectives of stakeholders (including fisheries managers, the fishing industry, NGOs, etc.) sit at the top of Figure 1 because those objectives influence most elements of the management framework for a fishery. In particular, management objectives influence the target reference points (where the fishery needs to be to meet the objectives of management), and the performance indicators (which allow the performance of the fishery and its management to be measured against the agreed objectives). Combined, these elements form a 'management strategy', where the reference points, stock assessment, management decisions within the harvest control rule, and monitoring through the performance indicators aim to achieve the identified Management Objectives.

Management objectives such as those in the WCPFC Convention text: "ensuring conservation and promoting the objective of optimum utilization of highly migratory fish stocks" and "avoid adverse impacts on the marine environment, preserve biodiversity, maintain the integrity of marine ecosystems" need to be balanced, and imply that both the status of exploited stocks and any bycatch, and the economics of the fisheries themselves, need to be monitored.

Roles and responsibilities in the framework

Developing the fisheries management framework requires inputs from a variety of stakeholders at different stages:

- Fisheries managers (i.e. Commission members) and other stakeholders have a key role in identifying management objectives. As in Figure 1, these help define target reference points, performance indicators, and harvest control rules that aim to achieve those objectives. Stakeholders also define the level of risk that is acceptable within the system, for example how often are stakeholders willing to risk the exploited stock falling below a limit reference point level by chance due to natural variability, such as a series of low recruitments (see paper for Agenda item 4.2).
- Scientists help to define the limit reference point and the associated acceptable level of risk of breaching it, as this is strongly influenced by the biology of the stock. For instance, a 20% chance that a limit reference point may be breached within a certain time may not be acceptable to stakeholders (as it results in lower catches, catch rates, and potential issues of long-term stock viability) and a risk of 10% preferred. Scientists also do the stock assessments that inform stakeholders on the status of the stock relative to reference points. In turn, once stakeholder decisions on key elements of the management framework (e.g. objectives, risk levels, and candidate target reference points and harvest control rules,) have been made, scientists can test the resulting candidate management frameworks to ensure they achieve the objectives, are robust to uncertainty, and provide managers with relevant information, including the trade-offs that result through competing management objectives (see paper for Agenda item 4.3). With this information, stakeholders can select the most desirable framework for implementation.

Uncertainty within the framework

A key issue within the management of fisheries is acknowledging uncertainty within the process, and to ensure that the framework is robust and objectives are achieved despite that uncertainty. Rosenberg and Restrepo (1994) identified a number of sources of uncertainty, which are useful to reiterate here:

Uncertainty	**Description**	**WCPFC example**
Process error	Natural variation	Year-on-year variation in number of young fish produced
Measurement error	When collecting information	Species composition in purse seine catches
Estimation error	When modelling natural processes	Fitting movement models based upon tagging information
Model error	When assuming that an assessment model mimics real life	The Multifan-CL model and assumptions on spatial structure
Implementation error	Management decisions are never implemented perfectly	CMM 2008-01

These sources of uncertainty, and our ability to minimise or avoid them, brings in considerations of precaution and risk, which are discussed when focusing on other framework elements in later papers.

Further reading

Rosenberg, A. A., and Restrepo, V. R. 1994. Uncertainty and risk evaluation in stock assessment advice for U.S. marine fisheries. Canadian Journal of Fisheries and Aquatic Sciences, 51: 2715-2720.