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# Safeguarding the Stocks: A report on analytical projects to support the development of a regional MCS strategy for Pacific oceanic fisheries

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# Safeguarding the Stocks: A report on analytical projects to support the development of a regional MCS strategy for Pacific oceanic fisheries

## **Abstract**

This report sets out the results of five analytical projects undertaken to support the development of a Regional MCS Strategy for Pacific oceanic fish stocks. The overarching purpose of the Strategy is to support a management regime and associated measures that will ensure the long term sustainability of oceanic fish stocks and associated economic benefits flowing from them to Pacific Island Countries. Extensive consultation was undertaken in support of the projects including visits by the project team to 16 of the 17 FFA member nations, direct consultation with staff from key regional institutions (e.g. WCPFC, SPC, USP), as well as discussions with each of the four quadrilateral defence force providers.

## **Keywords**

strategy, mcs, regional, development, support, projects, analytical, report, stocks, safeguarding, fisheries, pacific, oceanic

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# Safeguarding the Stocks

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A report on analytical projects to support the development of a  
Regional MCS Strategy for Pacific oceanic fisheries



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## Executive Summary

This report sets out the results of five analytical projects undertaken to support the development of a Regional MCS Strategy for Pacific oceanic fish stocks. The overarching purpose of the Strategy is to support a management regime and associated measures that will ensure the long term sustainability of oceanic fish stocks and associated economic benefits flowing from them to Pacific Island Countries. Extensive consultation was undertaken in support of the projects including visits by the project team to 16 of the 17 FFA member nations, direct consultation with staff from key regional institutions (e.g. WCPFC, SPC, USP), as well as discussions with each of the four quadrilateral defence force providers.

The first project undertook an assessment of risks to oceanic fish stocks arising from fishing that undermines fisheries management frameworks and objectives. Risks were assessed for their 'residual' risk which was defined as 'the risk remaining after application of current MCS arrangements to a given threat'. Over 42 separate risks were identified and assessed, three of which were rated as 'severe' risks, and a further 20 were rated as 'high' risks. The assessment identified risks across the geographical range of stocks and throughout the supply chain. Some of the highest risks to the achievement of FFA members' regional fisheries goals occur outside the FFA region, most notably as a result of overfishing by domestic fleets in south east Asia. Unlike other parts of the world, there is a strong case to be made that the majority of IUU activity in the FFA region is associated with licensed vessels. Inadequate reporting – particularly of target species – was identified as a high risk area and there is a need to strengthen catch monitoring and validation throughout the supply chain. Notwithstanding that, unlicensed fishing remains a risk amongst some fleets and areas and may increase as fisheries become increasingly regulated. An important strategic risk is the displacement of IUU activity into the adjacent high seas as in zone MCS arrangements are strengthened. As a result there is a need to promote complementary and supportive high seas MCS arrangements through the WCPFC. Another important need is to improve the coverage and quality of information relating to risk, and to update risk assessments regularly over time as more information becomes available and the drivers influencing risk change. A range of additional MCS measures are suggested to mitigate residual risks. Possible performance indicators to monitor the efficiency and efficacy of additional responses are identified.

The second project reviewed the implementation of relevant compliance measures by each of the Pacific Island FFA members. Implementation performance for 10 key MCS components was assessed against a total of 49 indicators. The Review identified national examples of strong implementation where some members are now setting global benchmarks in MCS implementation. However, the review also identified some members that continue to struggle with MCS implementation across a number of components due to significant institutional and capacity weaknesses. Similarly, the review identified four MCS components that require significant improvement across the region: Data Management and MCS Coordination; Legislation and Management Plans; Port Controls and Inspections; and Observer Schemes. In response, the Review provides six recommendations that address these weaknesses and directly, or indirectly, improve implementation across all ten MCS components.

The third project developed a framework and policy for the collection, processing, storage and exchange of fisheries data in support of national, sub-regional and regional MCS initiatives undertaken by FFA Members. In coordination with Projects 1 and 2, the project defined current and likely future information needs and identified types of data required by MCS component. A review of the current information management capabilities in FFA member countries and associated regional agencies identified many weaknesses, but also a number of strengths that can be built upon. Most notable weaknesses include: certain types of data not being collected or not available in useful formats or quality; data not being used to generate required information; poor coordination and sharing of information amongst stakeholders and inadequate IT infrastructure and human resources. Each of these was evident to a greater or lesser degree in different member countries. Key strengths included solid national fisheries licensing systems with good databases and good regional systems, most notably the Pacific VMS, but also others within FFA, WCPFC and SPC. In order to address current gaps and maximize the value of information in supporting MCS activities, a strategy for improving information

management across the region is proposed, consisting of three main components: (a) strengthening national capacity in MCS Information Systems, including the establishment of ‘Compliance Analysis Engines’; (b) establishing a ‘Regional Information Management Facility’ to allow for the sharing of timely and accurate MCS information and support planning and targeting of MCS activities; and (c) establishing a regional ‘Information Exchange Model’ to guide information sharing within the region. Each component, together with their inter-relationships, is described in detail. A scope of work and costing for the proposed MCS regional information management system is provided.

The fourth project examined the benefits associated with MCS cooperation amongst the FFA membership and the conditions and mechanisms required to support enhanced levels of cooperation. The study identified benefits of cooperation at both the strategic and operational levels and across virtually all aspects of MCS. The study also noted that benefits existed at all levels within the FFA membership – regional, sub-regional, intra-national – and between FFA members and external States and agencies (e.g. WCPFC). Six ‘basic building blocks’ for effective cooperation were identified - effective legal frameworks, strong national MCS frameworks, standards and systems for cooperation, effective information exchange, standard operating procedures (SOPs) with integrated training and a dedicated mechanism to facilitate cooperation – their current status within the region assessed and suggestions to strengthen these measures made. The study highlighted that many of the legal (e.g. Niue Treaty) and institutional (e.g. FFA) arrangements to support cooperation already exist in the region and the most pressing future need was to ‘operationalize’ higher levels of cooperation. The study also highlighted that, while the potential benefits associated with cooperation are relatively well known, some opportunities and frameworks for cooperation are not well-understood by FFA members and that, even where there is a reasonable understanding of cooperative frameworks (e.g. Niue Treaty, VMS data sharing), many members require assistance to capitalize on the opportunities available. Given the considerable opportunities to strengthen MCS regimes across the region through improved cooperation, often at little cost, the study concludes that efforts to promote and facilitate enhanced levels of cooperation should be significantly intensified. The possible roles, functions and establishment of a mechanism to facilitate cooperation – a Regional Monitoring, Control and Surveillance Coordination Centre (RMCC) – are discussed.

The fifth project examined the existing application of surveillance aircraft and patrol vessels for MCS purposes within the WCPO, and projected levels of surveillance support in the short to medium term. In doing so it identified a number of limitations to the optimal employment of these assets, and opportunities to partially address these shortfalls within existing frameworks for cooperation such as the Niue Treaty and Ship-Rider Agreements. The project then reviewed a range of contemporary management options and surveillance technologies that might integrate with existing national programs to provide planned broad-area surveillance to inform MCS programs and short-notice intelligence-driven response for enforcement and deterrence. This analysis includes a range of options for attaining a “bluewater” surface capability, commercial aerial surveillance supplementation and the integration of satellite surveillance technologies for MCS purposes.

In addition to chapters on each of the individual projects, a synthesis chapter is presented highlighting the cross-cutting themes and key messages arising from the projects as a group. Two overarching themes were frequently highlighted both in the in country visits and in the course of the projects, namely: (a) a need to take immediate and decisive action consistent with the Vava’u Declaration and (b) a need to optimise the effectiveness of limited MCS resources. Within these overarching themes a number of high level conclusions are presented that provide context for the development of the Regional Strategy.

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- The Project Team

## Acronyms and abbreviations

ADF	Australian Defence Force
ALB	Albacore tuna
BET	Bigeye tuna
CAE	Compliance Analysis Engine
CDR	FFA Corporate Data Resource
CI	Compliance Index
CMM	Compliance and Management Measure
CSV	Comma Separated Values
EEZ	Exclusive Economic Zone
ENSO	El Niño Southern Oscillation
EPO	Eastern Pacific Ocean
E-R	Entity-Relationship Modeling Technique
ERD	Entity-Relationship Diagram
EU	European Union
EVR	Electronic Vessel Registration
FAF	French Armed Forces
FAL	Fisheries Agreements and Licenses
FFA	Pacific Islands Forum Fisheries Agency
GIS	Geographic Information System
HMTCs	Harmonized Minimum Terms and Conditions
IATTC	Inter-American Tropical Tuna Commission
IOTC	Indian Ocean Tuna Commission
IUU	Illegal, Unreported and Unregulated fishing
JCC	Joint Coordination Centre
LARS	License Information and Associated Reports Database System
LL	Longline fishing vessel
MCS	Monitoring, Control and Surveillance
MCSP	Mobile Communications Service Provider
MCSWG	MCS Working Group
MSA	Maritime Surveillance Advisor (Royal Australian Navy)
MTU	Mobile Transmitting Unit (old terminology = ALC)
EMTU	Enhanced Mobile Transceiver Unit -
MT	Metric tonnes
NPOA-IUU	National Plan of Action on Illegal, Unregulated and Unreported Fishing
NTSA	Niue Treaty Subsidiary Agreement
OPM	Observer Program Management System
OPREP	Operational Report
OPRT	Organization for the Promotion of Responsible Tuna Fisheries
PICs	Pacific Island Countries
PIF	Pacific Islands Forum
PNA	Parties to the Nauru Agreement
POD	People and Organizations
PPB	Pacific Patrol Boat
PS	Purse Seine fishing vessel
REG	Regional Register of Fishing Vessels
RFV	Record of Fishing Vessels
RIMF	Regional Information Management Facility
RMCC	Regional MCS Coordination Centre

ROP	Regional Observer Programme
SIDs	Small Island Developing States
SOLIC	Solomon Islands Licensing System
SPC-OFP	Secretariat for the Pacific Community – Oceanic Fisheries Programme
SPC-RMP	Secretariat for the Pacific Community – Regional Maritime Programme
SUR	Surveillance and Vessel Sightings System
TDW	Tuna Data Workshop
TUBS	TUFMAN Observer Module
TUFMAN	Tuna Fisheries Database Management System
UNCLOS	United Nations Convention on the Law of the Sea
UNFSA	United Nations Fish Stocks Agreement
USCG	United States Coast Guard
ULT	Ultra Low Temperature
VAP	Violations and Prosecutions System
VBI	Vessel Boarding and Inspection System
VDS	Vessel Days Scheme
VMS	Vessel Monitoring System
WCPFC	Western and Central Pacific Fisheries Commission
WCPF-CA	Western and Central Pacific Fisheries Convention Area
WCPO	Western and Central Pacific Ocean
YFT	Yellowfin tuna
XML	eXtensible Markup Language

## Chapter 1: Introduction

The continued health and productivity of oceanic fisheries resources will be central to meeting the future socio-economic well being, development and security aspirations of the Pacific Island people. Harvests in the western and central Pacific Ocean were valued at over US\$3.7 billion in 2007, and represented over 55% of the world's tuna production. While some of this catch was taken in the northern Pacific, the vast majority is taken in and around the waters of the 17 Pacific Islands Forum Fisheries Agency (FFA) members. The central role of oceanic fisheries resources to the future food security and development aspirations of Pacific Island peoples was recognized by Leaders in the 2007 Vava'u Declaration who agreed regional fisheries resources 'remain a key driver for sustainable economic growth in the region...and they must as a consequence be supported by responsible and effective stewardship'.

Illegal, unreported, unregulated (IUU) fishing and other activities that undermine fisheries management frameworks have the potential to significantly erode the benefits to Pacific Island people associated with the harvest of oceanic fisheries. Agnew et al (2009) estimated the average annual IUU catch in the WCPO at between 786,000t and 1,730,000t and US\$707million and US\$1557 million during the 2000-2003 period.<sup>1</sup> Moreover, IUU fishing and other weaknesses in catch and effort monitoring undermine the integrity of scientific and management information upon which fisheries management arrangements are based. In recognition of the need for comprehensive monitoring, control and surveillance (MCS) arrangements to ensure the integrity of fisheries management frameworks, Forum Leaders committed themselves and their governments to "the development, with the assistance of the Forum Fisheries Agency (FFA), a comprehensive regional Monitoring, Control and Surveillance strategy."

In response to the Vava'u Declaration, Fisheries Ministers considered a draft framework for the Regional MCS Strategy at FFC67. Ministers agreed a draft vision for the Strategy – "*an efficient and effective MCS framework in the western and central Pacific Ocean region which supports the sustainable management of tuna resources and maximizes the economic returns and social benefits, while minimizing environmental impact*" – as well as a number of key principles to underpin its development:

- Fisheries management as the key driver;
- Exercise of sovereignty;
- Building on existing national and regional MCS initiatives;
- Full participation;
- Integrated approach; and
- Establishing high standards of in-zone MCS.

In addition, Fisheries Ministers also agreed to commission a number of analytical projects to support the development of the Regional MCS Strategy. These projects were based on five agreed 'action areas' and included:

- an assessment of the risks to oceanic fish stocks from fishing that undermines fisheries management objectives and frameworks;
- a review of FFA members' compliance with agreed MCS measures;
- the development of a framework to allow for the collection, processing, storage and exchange of fisheries data to support regional MCS initiatives;
- an analysis of the benefits of enhanced regional MCS coordination including an examination of the methodology and functional specification for the establishment, funding and operation of a Regional MCS Coordination Centre (RMCC); and

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<sup>1</sup> Agnew DJ, Pearce J, Pramod G, Peatman T, Watson R, et al. (2009) Estimating the Worldwide Extent of Illegal Fishing. PLoS ONE 4(2): e4570. doi:10.1371/journal.pone.0004570

- an examination of the options for providing an effective surveillance and response capability by identifying more efficient ways to use MCS assets as well as other possible providers and funding options, with a view to supplementing national programmes.

This report sets out the results of those projects.

## 1.1 Structure of Report

In this report, one chapter is dedicated to each project following this introductory chapter.

Chapter 2 is dedicated to the regional oceanic fisheries risk assessment and outlines the methodology used to identify and prioritize risks, additional MCS measures suggested to mitigate residual risks as well as possible performance indicators to monitor the efficacy of additional responses.

Chapter 3 outlines the results of the regional compliance review. Key strengths and weaknesses in the national MCS regimes of each Pacific Island FFA member country are identified and recommendations for capacity building proposed.

Chapter 4 is dedicated to information management in support of MCS activities. Existing information management systems in country are reviewed and recommendations made to strengthen their analytical capability. Proposals are also outlined for the establishment of a Regional Information Management Facility as well as an information exchange framework.

Chapter 5 highlights the benefits of regional cooperation and outlines the requirements for effective MCS coordination. Possible roles, functions and funding streams for the establishment of a Regional MCS Coordination Centre are discussed.

Chapter 6 examines existing surveillance and response capability in the region and identifies ways to use existing capability more efficiently, as well as alternative capability options. Options for the development of a regional bluewater capability are outlined.

Chapter 7 synthesizes the outcomes of the five projects into a number of cross-cutting themes and key messages that provide context for the development of the Strategy.

## 1.2 Consultation

Extensive consultation was undertaken in support of these projects. In country visits were undertaken in 16 of 17 FFA member countries, with consultation with Tokelau representatives undertaken in Samoa. In country consultations focused on national fisheries and marine law enforcement agency staff, though also included representatives from other relevant government departments (Attorney General's, Foreign Affairs, Customs, Ports Authorities), the fishing industry, NGOs and relevant academics. In 11 countries, multi-stakeholder workshops were held to introduce the projects and to encourage collective discussion amongst stakeholders on national and regional MCS needs and priorities, as well as priority issues for treatment in the Regional MCS Strategy. Selected national presentations from multi-stakeholder workshops, as well as the national template, are included at Appendix 1.2.

In addition to consultation with national level agencies and stakeholders, consultation was also undertaken with key regional agencies and institutions. These included agencies directly engaged in fisheries such as WCPFC and SPC, as well as those involved in broader regional governance, maritime security and law enforcement (e.g. Pacific Islands Forum, Pacific Transnational Crime Coordination Centre). Particularly in support of Project 5, direct consultations were also undertaken with representatives of the major external surveillance providers including the Australian and New Zealand Defence Forces, the United States Coast Guard and the French Navy.



Figure 1.1: Multi-stakeholder workshops were held in 11 FFA Member countries to introduce the projects and encourage collective discussion of MCS needs and priorities.

A complete list of persons consulted during the projects is included at Appendix 1.3.

### 1.3 Key terms

A number of terms were frequently used across all projects covered in this report, most notably “monitoring, control and surveillance” and “illegal, unreported and unregulated” fishing. To ensure consistency, the project team adopted the standard definitions for these terms outlined in Appendix 1.4.

### 1.4 Project context

These projects are part of a broader suite of initiatives designed ultimately to achieve the vision of the Pacific Plan to “*enhance and stimulate economic growth, sustainable development, good governance and security for Pacific countries through regionalism*”. Figure 1.2 outlines the relationships between these projects and other important regional initiatives such as the Regional Tuna Management and Development Strategy, the Vava’u Declaration and the Pacific Plan.

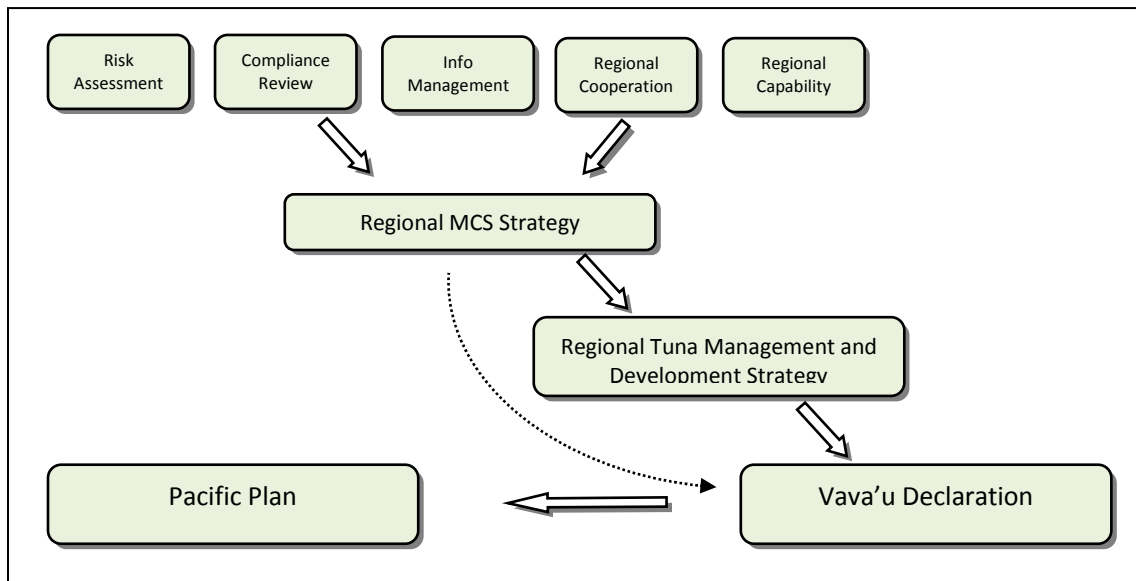


Figure 1.2: Context of the analytical projects in relation to other important Pacific regional initiatives.

## Chapter 2: Regional Oceanic Fisheries Risk Assessment

### 2.1 Introduction

The FFA region is characterized by very large EEZs, valuable and widespread tuna resources and, with few exceptions, very limited pools of resources with which to support effective MCS activities. As a result, there is a need to ensure that available MCS resources are directed at activities posing the highest risk to the achievement of regional fisheries management goals (see Box 1). In other words, MCS activities and frameworks should be seen as integral to, and delivered in support of, fisheries management.

This chapter sets out the results of Project 1: the Regional Oceanic Fisheries Risk Assessment (ROFRA). The objective of the RORFA is to “consider and categorize the risks to oceanic fisheries resources in the Pacific Islands region arising from fishing that undermine fisheries management objectives and frameworks, including those risks relating to overfishing, overcapacity and environmental impacts.” It is intended that the results of the RORFA be used in (a) more efficient and effective planning and targeting of MCS activities and resources to mitigate and resolve the residual risks identified by the risk assessment and (b) improve monitoring and performance of fisheries management frameworks and corresponding MCS initiatives.

To our knowledge this is the first time an MCS risk assessment has been undertaken across an entire ocean basin.

#### **Box 1: Fisheries Management Frameworks and Objectives**

Oceanic fisheries resources in the Pacific are managed within a multi-jurisdictional environment reflecting the complex geopolitical character of the region. Fisheries management frameworks and associated objectives have been established at a range of levels including international (e.g. UNCLOS, UNFSA), regional (e.g. WCPFC, UST), sub-regional (e.g. PNA), national (e.g. domestic legislation, national tuna management plans) and in some cases provincial (e.g. FSM, Solomon Islands).

A summary of the key frameworks, their objectives and key implementing measures is provided in Appendix 2.1. An analysis of these frameworks indicates that most, if not all, include two common, overarching goals:

- to maintain sustainability of fish stocks and ecosystems; and
- to optimise the economic benefits (to Pacific Island peoples) arising from the utilisation of oceanic fisheries resources.

A number of subsidiary goals are also frequently expressed including:

- ensuring good governance, accountability and transparency;
- increasing control of oceanic fisheries resources by Pacific Island peoples;
- protecting and enhancing the rights of artisanal and customary fishers; and
- promoting the conservation of tuna for food security.

The overarching goals outlined above are consistent with those outlined in the Regional Tuna Management and Development Strategy, namely (1) sustainable oceanic fish stocks and ecosystems, and (2) economic growth from tuna fisheries. For the purposes of assessing risk to regional fisheries frameworks, we have adopted these as representative regional goals.



## 2.2 Approach and Methodology

We approached the risk assessment using a six-step process, consistent with the approach outlined in the Draft Regional MCS Strategy agreed at FFC67. These steps included:

- identifying risks;
- scoring risks;
- assessing the adequacy of existing MCS measures;
- assessing ‘residual risk’;
- recommending measures to treat residual risks;
- monitoring and review

Risks were identified through three primary sources: (a) in country workshops and interviews with national fisheries and enforcement officials and other stakeholders, including through the use of structured surveys, (b) interviews with staff in key regional institutions (e.g. FFA, WCPFC, SPC) and (c) searches of relevant literature (e.g. FFA MCS Working Group meeting papers, WCPFC CMMs).

Each identified risk was then assigned an inherent risk rating (low, moderate, high, severe) based on a likelihood-consequence analysis. Under this process, and assuming no MCS measures were in place, each risk was assigned one of five qualitative ratings for ‘likelihood’ (rare, unlikely, moderate, likely, almost certain) based on the expected frequency of the risk occurring, and ‘consequence’ (insignificant, minor, moderate, major, serious) based on the expected impacts on the integrity of management arrangements and the achievement of regional fisheries goals if the risk occurred. The inherent risk rating for each risk was then assigned based on a function of the likelihood and consequence scores using the “inherent risk matrix” in Figure 2.1 (i.e. risks that were rare and insignificant were rated as ‘low’; risks that were almost certain and serious were rated as ‘severe’).

For each risk the key MCS measures currently being taken to mitigate the risk were identified and given a rating for adequacy (weak, moderate, strong, very strong). Adequacy ratings were assigned based on the degree to which existing MCS measures were likely to promote compliance, as well as the level of information provided about the risk. A residual risk rating was then assigned to each risk based on the inherent risk rating and the adequacy of MCS measures using the “residual risk matrix” in Figure 2.1.

Each risk was assessed either as a whole (e.g. catch discarding in the purse seine [PS] fleet), or by the most relevant sectoral breakdown where differences were evident in the likelihood, consequence or adequacy of MCS scores between sectors (e.g. unlicensed fishing by vessels on the FFA Register which was assessed separately for PS and longline [LL]). The most frequent sectoral breakdown was by gear type (PS and LL), though some risks were also broken down by species (bigeye tuna [BET]/yellowfin tuna [YFT]) and geographical area.

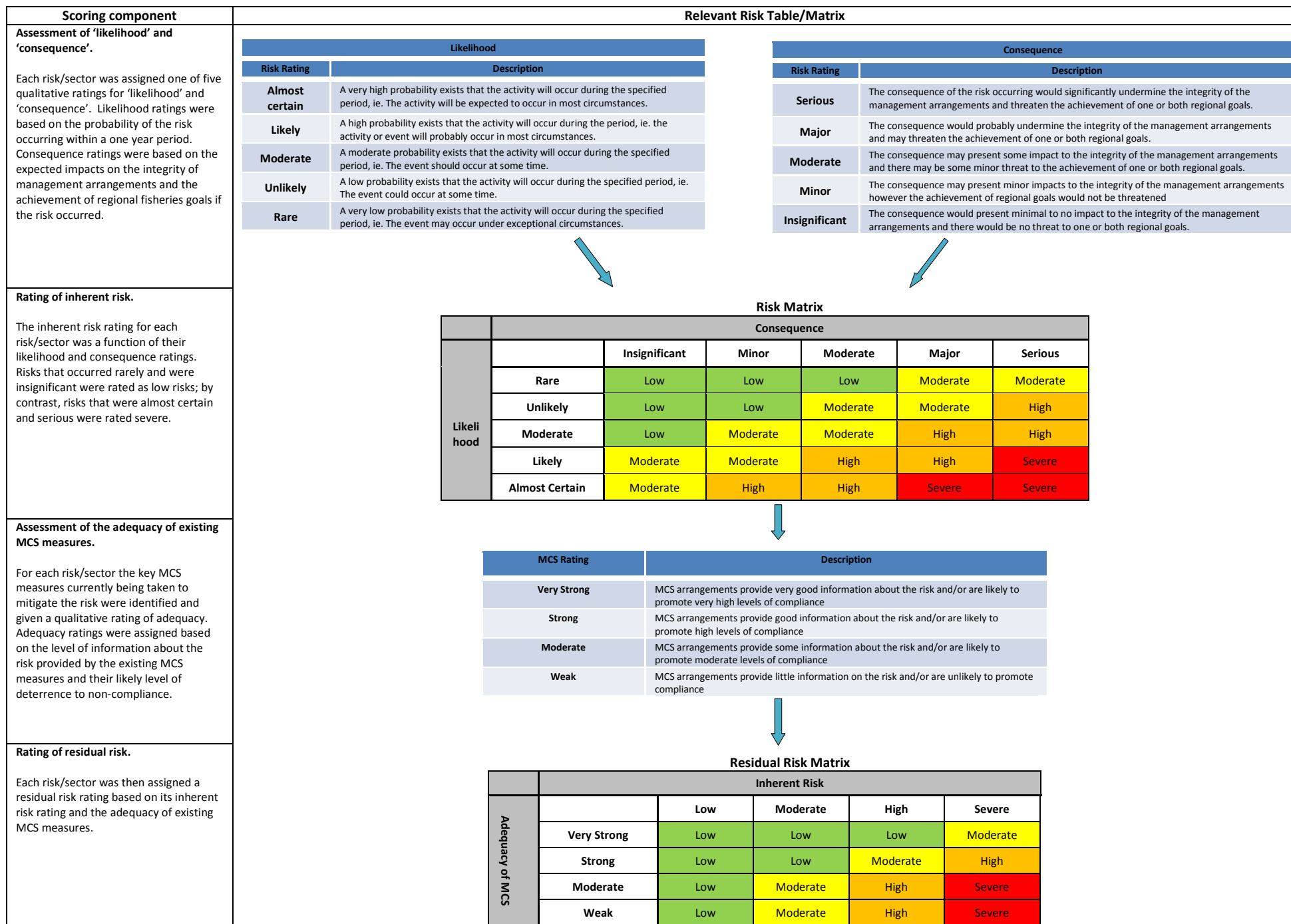


Figure 2.1: Residual risk scoring process

## 2.3 Results

A total of 42 separate risks were identified and assessed across the region. These were broadly grouped into six strategic risk areas, namely:

- risks associated with external pressure on shared stocks;
- risks associated with unlicensed/unauthorized fishing;
- risks associated with excess capacity or effort in licensed fleets;
- risks associated with non-compliance by licensed vessels;
- risks in the post-harvest supply chain;
- bycatch and ecosystem related risks.

Table 2.1 provides a summary of scoring for each risk/sector. Analytical justification for the scoring is provided at Appendix 2.2 and can be accessed in electronic versions of this report by clicking on the hyperlinks associated with each risk.

Table 2.1: Residual risk scoring summary

Strategic Risk	Risk	Risk #	Sector	Likelihood	Consequence	Risk Rating	Adequacy of Existing MCS	Residual Risk
External pressure on common stocks undermines regional fisheries management goals	<a href="#">Overfishing of YFT/BET in South East Asia undermines the sustainability of regional stocks</a>	1.1.1	YFT	Almost certain	Serious	Severe	Weak	Severe
		1.1.2	BET	Moderate	Major	High	Weak	High
	<a href="#">Inadequate catch and effort monitoring and reporting of south east Asian fleets undermines data integrity and stock assessments</a>	1.2	YFT/BET	Almost Certain	Moderate	High	Weak	High
	<a href="#">Overfishing of BET in the EPO undermines sustainable management of WCPO stocks</a>	1.3	BET	Unlikely	Moderate	Moderate	Strong	Low
Unlicensed/unauthorised fishing within the FFA region	<a href="#">Unregulated fishing in the western WCPO by small scale south east Asian vessels</a>	2.1	Western WCPO	Almost Certain	Moderate	High	Moderate	High
	<a href="#">Unlicensed/unauthorised fishing by vessels arising from the Indian Ocean</a>	2.2.1	PS	Unlikely	Minor	Low	Weak	Low
		2.2.2	LL	Unlikely	Insignificant	Low	Weak	Low
	<a href="#">Unlicensed/unauthorised fishing by vessels arising from the Eastern Pacific Ocean</a>	2.3.1	PS	Likely	Moderate	High	Weak	High
		2.3.2	LL	Moderate	Moderate	Moderate	Weak	Moderate
	<a href="#">Unlicensed/unauthorised fishing by new PS vessels</a>	2.4	PS	Unlikely	Major	Moderate	Weak	Moderate
	<a href="#">Unlicensed fishing by vessels on the FFA Register</a>	2.5.1	PS	Rare	Moderate	Low	Very Strong	Low
		2.5.2	LL	Likely	Moderate	High	Moderate	High
<a href="#">Unlicensed fishing by high seas vessels in FFA member EEZs</a>	2.6.1	PS	Rare	Minor	Low	Strong	Low	
	2.6.2	LL	Likely	Major	High	Weak	High	
Excess capacity or effort in licensed fleets undermines regional fisheries management goals	<a href="#">Excess capacity in the LL fleet</a>	3.1	LL	Likely	Major	High	Moderate	High
	<a href="#">Excess effort in the PS fishery</a>	3.2.1	BET	Almost Certain	Serious	Severe	Moderate	Severe
		3.2.2	YFT	Moderate	Major	High	Moderate	Severe
	<a href="#">Effort shift from the Indian Ocean</a>	3.3.1	PS	Likely	Moderate	High	Strong	Moderate
		3.3.2	LL	Unlikely	Moderate	Moderate	Moderate	Moderate
	<a href="#">Effort shift from the eastern Pacific Ocean</a>	3.4.1	PS	Likely	Moderate	High	Strong	Moderate
		3.4.2	LL	Moderate	Minor	Moderate	Moderate	Moderate
	<a href="#">Increasing LL catch amongst the '2000' nations</a>	3.5	LL	Unlikely	Moderate	Moderate	Moderate	Moderate
	<a href="#">Capacity caps in the Sth Albacore fishery are breached</a>	3.6	LL	Unlikely	Minor	Low	Moderate	Low
	<a href="#">Capacity and catch caps in the swordfish fishery are exceeded</a>	3.7.1	Spain	Moderate	Moderate	Moderate	Moderate	Moderate
		3.7.2	Aust/NZ	Rare	Moderate	Low	Moderate	Low
	<a href="#">Capacity caps in the striped marlin fishery are breached</a>	3.8	LL	Unlikely	Moderate	Moderate	Weak	Moderate
	<a href="#">Effort creep in the PS fishery</a>	3.9	PS	Almost certain	Moderate	High	Weak	High
	<a href="#">Effort creep in the LL fishery</a>	3.10	LL	Unlikely	Minor	Low	Weak	low
	<a href="#">Unregulated use of FADs outside closure periods</a>	3.11	PS	Moderate	Major	High	Very Strong	Moderate
Non-compliance by licensed vessels and flag states undermines regional fisheries management goals	<a href="#">Fishing in high seas pockets</a>	4.1.1	PS	Likely	Moderate	High	Very Strong	Low
		4.1.2	LL	Likely	Minor	Moderate	Moderate	Moderate
	<a href="#">Catch discarding in the PS fleet</a>	4.2	PS	Moderate	Moderate	Moderate	Strong	Low
	<a href="#">Non-compliance with VMS provisions</a>	4.3.1	PS	Rare	Major	Moderate	Very Strong	Low
		4.3.2	LL	Moderate	Major	High	Moderate	High
	<a href="#">Use of non-prescribed gear</a>	4.4.1	PS	Moderate	Insignificant	Low	Strong	Low
4.4.2		LL	Moderate	Moderate	Moderate	Moderate	Moderate	

Strategic Risk	Risk	Risk #	Sector	Likelihood	Consequence	Risk Rating	Adequacy of Existing MCS	Residual Risk
	<a href="#">Fishing inside closed waters</a>	4.5.1	PS	Rare	Moderate	Low	Very Strong	Low
		4.5.2	LL	Moderate	Moderate	Moderate	Moderate	Moderate
	<a href="#">Falsification/misuse of licence documents</a>	4.6.1	PS	Rare	Major	Moderate	Strong	Low
		4.6.2	LL	Unlikely	Major	Moderate	Moderate	Moderate
	<a href="#">Fishing on FADs during closure periods</a>	4.7	PS	Likely	Moderate	High	Strong	Moderate
	<a href="#">Vessels exceed days under VDS</a>	4.8	PS	Rare	Moderate	Low	Moderate	Low
	<a href="#">Misreporting of target species</a>	4.9.1	PS	Almost certain	Serious	Severe	Strong	High
		4.9.2	LL	Likely	Serious	Severe	Weak	Severe
	<a href="#">Misreporting of bycatch species</a>	4.10.1	PS	Almost certain	Minor	High	Strong	Moderate
		4.10.2	LL	Almost certain	Moderate (higher for sharks)	High	Weak	High
	<a href="#">Misreporting set type in the PS fishery</a>	4.11	PS	Unlikely	Major	Moderate	Very Strong	Low
	<a href="#">Misreporting catch position</a>	4.12.1	PS	Unlikely	Moderate	Moderate	Very strong	Low
		4.12.2	LL	Moderate	Moderate	Moderate	Moderate	Moderate
	<a href="#">Non-or delayed logbook submission</a>	4.13	PS & LL	Likely	Major	High	Weak	High
	<a href="#">Failure to provide prompt entry/exit/weekly reports</a>	4.14.1	PS	Unlikely	Moderate	Moderate	Very Strong	Low
4.14.2		LL	Moderate	Moderate	Moderate	Moderate	Moderate	
<a href="#">Inadequate reporting by flag states</a>	4.15	WCPFC CCMs	Moderate (but variable)	Major	High	Weak	High	
Inadequate monitoring and control of the post-harvest supply chain undermines regional fisheries management goals	<a href="#">Illegal transshipping</a>	5.1	PS	Moderate	Major	High	Strong	Moderate
		5.1.2	DW Freezer Vessels	Likely	Major	High	Weak	High
		5.1.3	Fresh product vessels	Moderate	Major	High	Weak	High
	<a href="#">Bunkering (refuelling) at sea</a>	5.2.1	PS	Moderate	Minor (highest for shark)	Low	Moderate	Low
		5.2.2	LL (DW)	Likely	Moderate (highest for shark)	High	Moderate	High
		5.2.3	LL (Domestic)	Unlikely	Moderate (highest for shark)	Moderate	Moderate	Moderate
	<a href="#">Landing of catch in foreign ports</a>	5.3.1	PS	Unlikely	Minor	Low	Strong	Low
		5.3.2	LL	Likely	Moderate	High	Moderate	High
	Fisheries in the FFA region undermine the sustainability of bycatch species and the wider ecosystem	<a href="#">Failure to adopt appropriate mitigation techniques on LL vessels undermines sea turtle conservation objectives</a>	6.1.1	Tropical Shallow LL	Moderate	Moderate	Moderate	Weak
6.1.2			Tropical Deep LL	Unlikely	Moderate	Moderate	Weak	Moderate
6.1.3			Temperate LL	Rare	Minor	Low	Weak	Low
<a href="#">Failure to adopt appropriate mitigation techniques on LL vessels undermines seabird conservation objectives</a>		6.2.1	LL (N of 30S)	Rare	Moderate (sp. dependent)	Low	Strong in AUS/NZ Weak Elsewhere	Low
		6.2.2	LL (S of 30S)	Likely	Minor	High	Weak	High
<a href="#">High bycatch rates and/or illegal targeting may lead to overfishing of shark populations</a>		6.3.1	PS	Unlikely	Minor	Low	Strong	Low
		6.3.2	LL	Likely	Major	High	Weak	High

## 2.4 Discussion

Of the risks identified three, namely (a) overfishing of YFT in south east Asian domestic fisheries, (b) excess effort in the PS fishery on BET stocks and (c) misreporting (including under-reporting) of target species in the LL fishery were rated severe residual risks. A further 20 risks were rated high residual risks. This section provides a summary of the key outcomes, conclusions and messages arising from the risk assessment results.

**Risks exist across the geographical range of stocks and throughout the supply chain.** Areas of high risk occurred in each of the six strategic risk areas identified by the assessment, including throughout the full geographical range of target stocks – for example, overfishing by south east Asian domestic fleets in the west and incursions by unlicensed purse seine vessels in the east – and throughout the supply chain – for example, under-reporting of catch at the catching vessel level to illegal transshipping and weaknesses associated with landing catches in foreign ports downstream. The broad scale and diverse nature of the risks, together with the interconnectedness of stocks within the region, argues for a comprehensive and inclusive approach to the development of regional MCS approaches.

**Some of the highest risks to stocks occur outside the FFA area of interest.** Some of the highest risks to the achievement of FFA members' regional fisheries goals occur on shared stocks harvested outside the FFA area of interest, most notably as a result of overfishing by domestic fleets in south east Asia. SPC modeling shows that the combined impact of the domestic Philippines and Indonesian (PH/ID) fleets is the single largest contributor to reduction in biomass in WCPO YFT stocks (Figure 2.2a), while in the BET fishery, the impact has expanded since the 1970s and is now second only to the combined impact of the longline fishery (Figure 2.2b). Importantly, neither of these figures includes the impact of the Vietnamese domestic fleet which also accesses the same stocks and is thought to harvest in the order of 42,500t of unspecified tuna.<sup>2</sup>

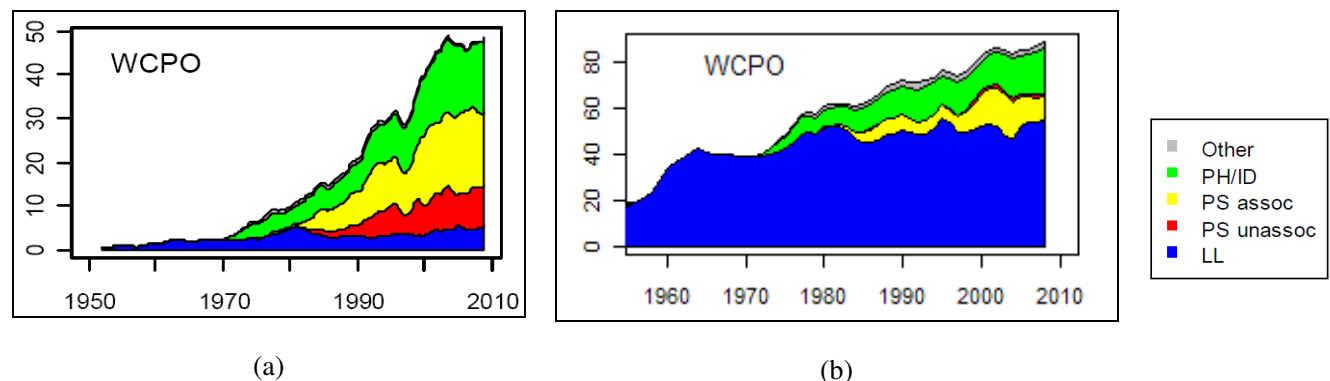


Figure 2.2: Estimates of reduction in total biomass in WCPO stocks of (a) yellowfin tuna and (b) bigeye tuna attributed by fishing sector. For yellowfin stocks, the domestic fisheries of the Philippines and Indonesia make the largest contribution to the reduction in biomass of any sector, while for bigeye the impact of the Philippines/Indonesian fisheries has increased markedly since the year 2000 and has now overtaken the PS associated fishery as the second largest region-wide impact. (Sources: [a] Langley et al, 2009<sup>3</sup>, [b] Harley et al, 2009<sup>4</sup>)

<sup>2</sup> Lewis, A. (2005). The Tuna Fisheries of Vietnam - An Overview of Available Information. Information Paper 5, 1st Meeting of the Scientific Committee of the Western and Central Pacific Fisheries Commission, Noumea, New Caledonia, 8–19 August 2005.

<sup>3</sup> Langley, A., S. Harley, S. Hoyle, N. Davies, J. Hampton and P. Kleiber. Stock assessment of yellowfin tuna in the western and central Pacific Ocean. WCPFC 5<sup>th</sup> Regular Session of the Scientific Committee. WCPFC-SC5-2005/SA- WP -03

<sup>4</sup> Harley, S., S. Hoyle, A. Langley, A., J. Hampton and P. Kleiber. Stock assessment of bigeye tuna in the western and central Pacific Ocean. WCPFC 5<sup>th</sup> Regular Session of the Scientific Committee. WCPFC-SC5-2009/SA-WP-4

**Non-compliance by licensed vessels is a key risk area.** Unlike some other parts of the world in which IUU fishing appears to be dominated by large unlicensed fleets (e.g. West Africa<sup>5</sup>), the majority of high risk areas of non-compliance identified in this assessment were associated with licensed vessels and fleets. While the state of information available to the assessment is insufficient to make definitive conclusions, when taken as a whole, there is a strong case to be made that IUU activities by licensed vessels (and in particular non-compliance with reporting obligations – see below) is likely to represent a greater risk to the achievement of regional goals than unlicensed activity.

**Inadequate reporting is a key risk area.** Of the various forms of non-compliance associated with licensed fleets, failure to comply with reporting obligations was identified as perhaps the highest risk grouping. Access to timely and accurate catch, effort and other data is central to achieving regional fisheries goals and weaknesses in current compliance were identified across the spectrum of reporting obligations.

Misreporting (including under-reporting) of target species was rated a severe inherent risk in both the PS and LL fisheries, although stronger MCS arrangements in the PS fishery (100% observer coverage, greater inspection coverage) resulted in a moderate residual risk rating. Virtually all FFA members interviewed in country identified misreporting or under-reporting of target species as a key compliance concern and their evidence is supported by observer GEN-3 form data showing that ‘not reporting catches in vessel logs or weekly reports’ and ‘not reporting catches of commercial species’ (categories ‘c’ and ‘d’ in Figure 2.3) was reported on 31% and 43% of trips respectively in the PS fishery and 24% and 39% respectively in the LL fishery. Non-compliance with catch reporting obligations in the LL fishery is of particular concern given its potential to undermine catch reduction targets specified under CMM 08-01 as well as scientific data used in stock assessments of key species.<sup>6</sup>

Misreporting (including non-reporting) of bycatch species was identified as one of the most widespread compliance problems with many in country interviewees noting that bycatch was rarely, if ever, reported unless an observer was on the vessel. Even then, GEN-3 form data shows that (except for breaches of MARPOL regulations) non-compliance with bycatch reporting obligations (categories ‘e’ and ‘f’ in Figure 2.3) were the most commonly reported offences.

As well as problems with inaccurate reporting, significant weaknesses were evident in rates of logsheet submission to relevant coastal states. While rates of submission are variable across the region, a number of FFA members reported very low coverage (e.g. less than 50%), particularly amongst the LL fleet.

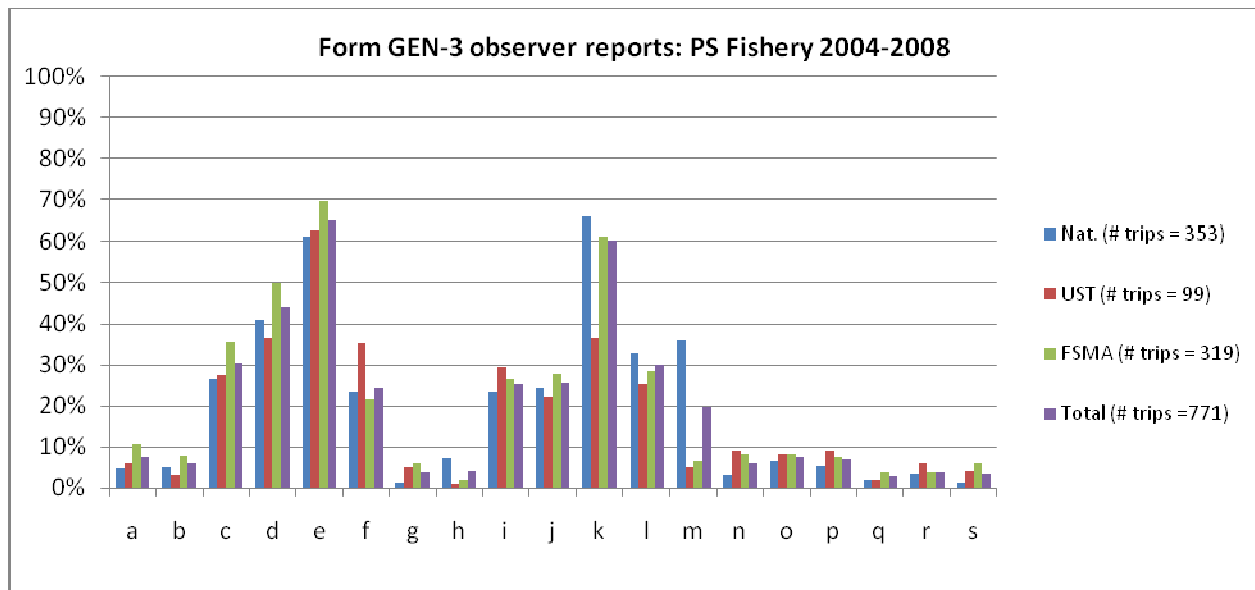
In addition to problems with reporting to coastal states, weaknesses also exist in CCM compliance with WCPFC reporting obligations. A recent review of WCPFC data gaps revealed that while compliance with aggregate catch reporting obligations is relatively good, compliance with operational level catch and effort reporting obligations is poor, with 26 of 38 entities collecting this information but not providing it to the Commission<sup>7</sup>. Gaps have also existed historically in CCM reporting required to monitor compliance with CMMs (e.g. by providing numbers of vessels to monitor compliance with capacity caps). Improving compliance with reporting obligations across the board should be an important focus of the Regional MCS Strategy.

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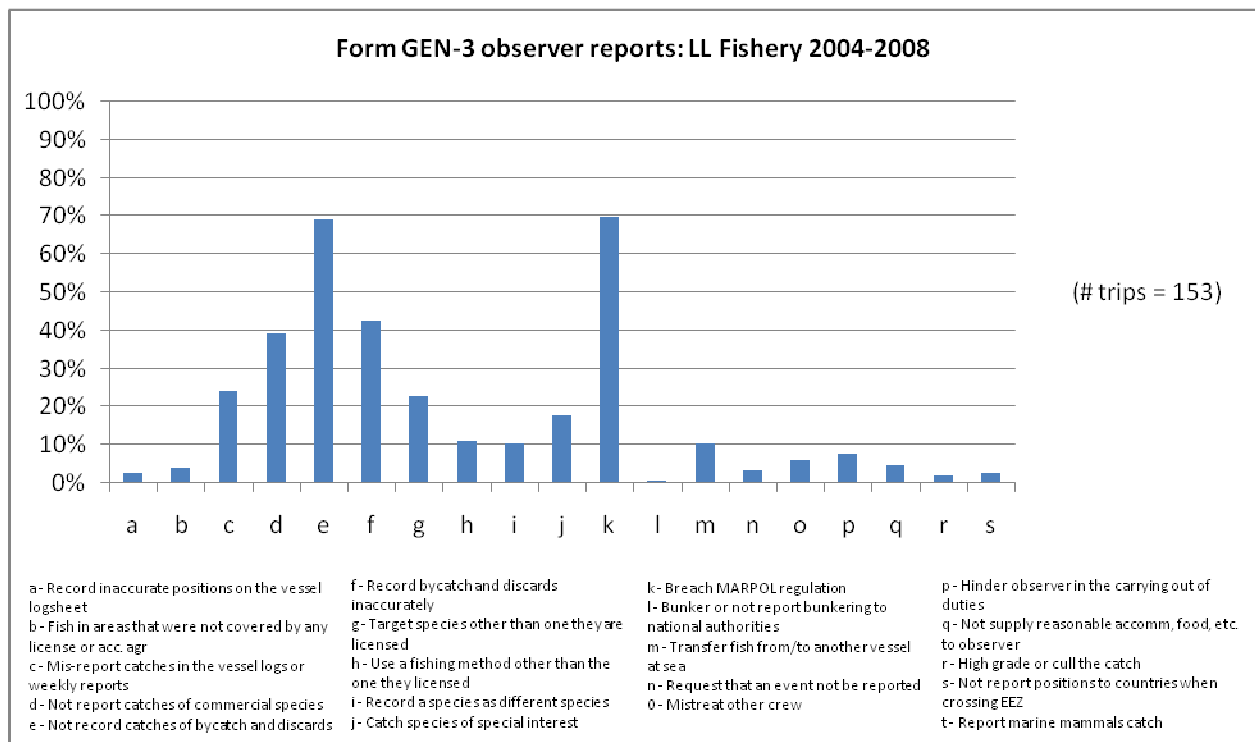
<sup>5</sup> MRAG, 2005. Review of Impacts of Illegal, Unreported and Unregulated Fishing on Developing Countries. Report for UK Department for International Development. 176pp.

<sup>6</sup> Data from the Japanese distant water LL fleet underpins YFT and BET assessments; data from the Chinese Taipei distant water LL fleet underpins ALB assessments

<sup>7</sup> Jones, M. and Shallard, B. (2008) Final report on causes of data gaps. Report to the WCPFC. 29pp. (accessed at: <http://www.wcpfc.int/doc/st-wp-02/jones-m-and-b-shallard-final-report-causes-data-gaps-fishserve-innovations-new-zealand->)



(a)



(b)

**Figure 2.3:** Incidents reported by observers on GEN-3 forms between 2004 and 2008 for trips on (a) purse seine vessels and (b) longline vessels in the WCPO. Figures are displayed as a percentage of the total number of trips in which an incident was reported. Data for UST and FSMA PS fleets were provided by FFA. Data from national observer programs on both the PS and LL fleets were provided by SPC. All trips on LL vessels were undertaken by observers from national observer programs.



**Unlicensed fishing remains a threat in some areas and fleets.** While the majority of high risk areas identified by the assessment centered on authorized fleets, unlicensed fishing remains a risk in some areas and fleets. Unlicensed incursions by small scale south east Asian vessels is a locally significant issue in the PNG and Palau EEZs, and possibly also in HSP1. Evidence provided by both fisheries and enforcement officials in PNG and Palau indicated that small scale Asian based vessels were routinely seen on surveillance patrols in areas adjacent to the ID/PH EEZ boundaries, while reports were also received from industry in PNG of pumpboats (Figure 2.4) and group seine support vessels regularly fishing illegally on anchored FADs in the Bismarck Sea. As south east Asian fisheries continue to decline while demand and prices for marine products increases, the frequency of incursions may increase substantially.



Figure 2.4: Indonesian “pumpboat”. (Photo courtesy Palau Marine Law Enforcement Division, Ministry of Justice)

The residual risk of unlicensed fishing by vessels both on the FFA register and high seas vessels reporting directly to the WCPFC VMS appears to be higher in the LL than PS fleet which is subject to comparatively stronger MCS (agreement to 100% observer coverage and, in the case of PNA licensed vessels, hourly VMS polling under the VDS). Most FFA members nominated unlicensed fishing as a key compliance concern and significant weaknesses exist in MCS arrangements for the LL fleet (very low observer coverage; less frequent VMS polling with greater numbers of non-compliant vessels; gaps in VMS data sharing coverage amongst FFA members and between FFA members and the WCPFC). The direct impacts of unlicensed LL fishing are likely to be highest on economic goals through loss of legitimate access fees and loss of future catch or effort allocation where catch is reported in a different jurisdiction. Impacts on stock sustainability are likely to be relatively minor where overall levels of effort don’t change (i.e. only the distribution of effort changes). Indirect impacts on the integrity of management data may arise where catch is unreported.

The highest risk of unlicensed fishing vessels migrating from other ocean basins appears to be PS vessels moving across from the EPO. A number of EPO PS vessels have been prosecuted in recent years<sup>8</sup> and considerable anecdotal evidence was received during in country interviews to suggest higher levels of illegal activity than that detected and prosecuted by authorities. While unlicensed fishing is a concern of itself, the consequences of unlicensed PS fishing in the central and eastern WCPO are of particular concern given the higher proportion of BET in the catch.

**Excess capacity in an environment of weak MCS is a key driver of risk.** Overcapacity is a complex issue upon which there is a range of often competing views within the FFA region. On the one hand, excess capacity may increase competition for legitimate access rights and push up access fees delivering an economic benefit for FFA members. On the other, overcapacity (a) in the absence of adequate controls to limit fishing

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<sup>8</sup> the Cook Islands has prosecuted one Venezuelan flagged and one Ecuador flagged vessel, while French Polynesia has prosecuted one Venezuelan flagged vessel

mortality may result in unsustainable impacts on stocks, and (b) in the absence of effective MCS arrangements to ensure adherence to control measures may act as a key driver of non-compliance. From an MCS point of view, both of the latter two issues have relevance for the development of the Regional MCS Strategy and were evident to some extent during this assessment.

Of the risks relating to excess capacity, one – excess effort in the PS fishery - was rated a severe residual risk and two – excess capacity in the LL fleets required to reduce catch by 30% under CMM 08-01 and effort creep in the PS fishery - were rated high. Excess effort in the PS fishery (when measured as the amount of authorized effort available against that required to achieve regional sustainability goals) was rated severe largely as a result of its probable impact on BET stocks. Recent SPC modeling has shown the number of fishing days available under the various access arrangements operating in the region is considerably higher than that required to achieve both regional sustainability goals for BET and the specific effort reduction objectives of CMM 08-01<sup>9</sup>. Excess capacity in the LL fleets required to reduce BET catch by 30% under CMM 08-01 was rated high on the basis of experience elsewhere which has shown that, in the absence of commensurate capacity and/or effort reduction, catch reduction targets of the type required under CMM 08-01 are unlikely to be met.<sup>10</sup> While a number of fleets (JP, TW, KR) have undergone some capacity reduction in response to CMM 08-01 and similar restrictions imposed by other RFMOs<sup>11</sup>, the practical impact of these on the Pacific fleet is not yet clear. In the absence of adequate catch validation measures, the existence of overcapacity may be a key driver of under-reporting in these fleets. The assessment also highlighted the need to monitor and account for other drivers of overcapacity such as effort creep.

**There is a need to strengthen catch monitoring and validation throughout the supply chain.** A number of weaknesses were evident in the monitoring and validation of catch throughout the supply chain. At the catching vessel level under- and misreporting of catch was identified as a key compliance concern in country, as was the failure to submit timely and accurate logsheets. In the post-harvest sector, illegal transshipping was rated a high residual risk based on its potential to facilitate the laundering of catches taken in contravention of conservation and management measures and the absence of strong MCS measures in the sector at present. The absence of cooperative catch monitoring where catch taken in FFA members waters was landed at foreign ports was also identified as a key weakness during in country visits (e.g. catches taken in FSM landed in Guam). Catch monitoring appears to be weakest in the LL sector which is generally subject to very low rates of observer coverage, has lower rates of logsheet return and operational catch and effort data coverage than the PS fleet and includes a large number of (mostly distant water freezer) vessels that rarely, if ever, enter FFA member ports. The need to improve catch monitoring is critical to the achievement of both FFA regional fisheries goals.

A number of possible measures to improve catch monitoring and validation are proposed in Section 2.5 below.

**A complementary high seas MCS regime is needed to support in zone arrangements.** A strategic risk exists in the development of stronger and more effective in zone MCS arrangements that IUU fishing and other activities which undermine regional goals will be pushed into adjacent areas of high seas. As a result, there is a need to ensure complementarity and support between in zone and high seas MCS arrangements. While still in its relative infancy, WCPFC has made considerable progress on establishing an effective MCS regime. Key measures include a comprehensive record of fishing vessels and process for IUU listing, a centralized VMS and a world-first high seas boarding and inspection regime. Nevertheless, opportunities remain to further develop the Commission's MCS regime including the need for a robust mechanism to review CCM compliance with CMMs and other obligations, linked to a regime of appropriate responses. We note that many of these issues have already been identified and are being addressed by FFA members.

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<sup>9</sup> Hampton, J. and Harley, S. (2009) Assessment of the Potential Implications of Application of CMM2008-01 for Bigeye and Yellowfin Tuna. WCPFC-SC5-2009/GN-WP-17

<sup>10</sup> e.g. EU hake – see <http://www.ices.dk/committe/acom/comwork/report/2009/2009/hke-soth.pdf>

<sup>11</sup> <http://www.oprt.or.jp/eng/index.html>

**A range of risks to bycatch species exist.** Based on the evidence available, the impact of the LL fishery on sharks appears to be one of the highest risk areas. Sharks regularly make up a larger proportion of the catch than target species and MCS arrangements to monitor catches are currently weak. Rates of observer coverage are generally very low and under-reporting of catch appears to be a widespread problem. Molony (2005) reported that catch rates recorded by observers (at 14.2 sharks per set) were approximately 71 times higher than that reported on vessel logsheets (0.2 sharks per set) for the same period (1990-2004)<sup>12</sup>. Available evidence indicates that current catch rates on some species may be higher than sustainable (Molony, 2008)<sup>13</sup>. Of the remaining species subject to WCPFC CMMs, the risk to seabirds appears to be higher in higher latitudes, although some risks still remain in lower latitudes<sup>14</sup>. For turtles, the residual risk was rated moderate in the tropical shallow set LL fishery, and low in temperate fisheries. Notwithstanding that, there is a pressing need to improve our understanding of bycatch rates and species compositions in the LL fishery by improving rates of observer coverage. Future MCS requirements in relation to bycatch species should be informed by the outcomes of SPC's ecological risk assessment work.

**MCS arrangements are generally stronger in the PS fishery.** Residual risk ratings for the purse seine fishery were generally scored lower than those for equivalent risks in the LL fishery. To some extent this reflected fewer vessels in the fishery, though was more frequently a result of stronger MCS measures. The stronger 'adequacy of MCS scores' particularly took into account the upcoming requirement for 100% observer coverage in the PS fishery, as well as the higher VMS polling frequency required under the VDS. While we have assumed that the presence of an independent observer on all vessels will provide a degree of deterrence to non-compliance (even though observers have no enforcement powers), we note this assumption is yet to be tested. In the LL fishery, significant weaknesses exist in the MCS regime by comparison. Observer coverage is typically very low, rates of logsheet submission are lower than PS (as is the availability of logsheet data to the WCPFC and SPC) and many vessels rarely come into FFA member ports, limiting opportunities for dockside inspections and other forms of port state enforcement. Improving opportunities for effective compliance on LL vessels should be an important focus of the Regional MCS Strategy.

**There is an urgent need to improve the coverage and quality of information relating to risks.** The amount and quality of the information available to inform risk assessments varied considerably. In relation to some risks the information available was relatively comprehensive and ratings could confidently be assigned. However, these cases were the exception and for many risks the information available was scarce. National fisheries and enforcement officials interviewed in country generally seemed to have a very good 'gut feel' for the common compliance risks arising in their region, however little 'hard data' appeared to be available upon which to base planning decisions. While this is perhaps not surprising given the secretive nature of IUU fishing, a key focus of the Regional MCS Strategy should be on continually improving the availability and quality of information accessible to national and regional officials upon which to plan MCS activities and assess relative risk. We note the establishment of the proposed Regional MCS Information Facility as well as improvements to national information management systems (see Chapter 4) should greatly assist in this regard.

**Risk assessments should be updated regularly.** Each of the risks identified during this assessment is influenced by a range of internal and external drivers affecting their prevalence and severity. Drivers operated at all levels (e.g. global – decisions taken by other RFMOs may influence effort migration into the WCPO; local – avoidance of national access and export fees may be a key driver of under-reporting) and varied in space and time (e.g. ENSO events change the inter-annual distribution of stocks and effort). The impact of some of the key drivers is outlined in Table 2.2. The practical impact of each driver, or combination of

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<sup>12</sup> Molony, B. W. 2005a. Estimates of the mortality of non-target species with an initial focus on seabirds, turtles and sharks. Working Paper EB WP-1. 1st meeting of the Scientific Committee of the Western and Central Pacific Fisheries Commission, Noumea, New Caledonia 8–19th August, 2005.

<sup>13</sup> Molony, B. (2008) Fisheries Biology and Ecology of Highly Migratory Species that Commonly Interact with Industrialized Longline and Purse Seine Fisheries in the Western and Central Pacific Ocean. 4<sup>th</sup> Regular Session of the WCPFC Scientific Committee. 228pp. (accessed at: <http://www.wcpfc.int/sc4/pdf/SC4-EB-IP6%20Molony.pdf>)

<sup>14</sup> D.S. Kirby, S. Waugh and D. Filippi (2009) Spatial risk indicators for seabird interactions with longline fisheries in the western and central Pacific. WCPFC-SC5-2009/EB-WP-06

drivers, on each risk is often likely to be complex. Continuous monitoring and analysis of the key drivers, including their likely impact on risk and therefore MCS priorities, should be a key function of the RMCC. We suggest the regional risk assessment be updated at least annually.

Table 2.2: Impacts of selected drivers on risk in WCPO fisheries.

<b>Driver</b>	<b>Impact</b>
<b>Climate variability</b>	Influences geographic distribution of stocks and fishing effort. May move fishing activity into areas of stronger or weaker MCS, or more vulnerable or more resilient stocks (e.g. El Nino events may shift PS effort eastwards)
<b>Fuel price</b>	Variable. Increased fuel price may result in lower overall fishing effort and a reduction in risk. Alternatively, increased fuel price may reduce profits from legitimate fishing and drive some operators to fish illegally. May also drive changes in operational behaviour such as increasing rates of transshipping at sea to avoid costs associated with steaming to port.
<b>Market demand</b>	Strengthened market demand may increase pressure on stocks in the absence of effective limits on fishing mortality, or where limits exist may increase the incentive for IUU fishing. Weakening demand may reduce targeting behaviour and reduce overall risk.
<b>Improvements in technology</b>	Technological improvements may significantly increase effectiveness of fishing effort. Other technological advances may assist in mitigating risk by, for example, reducing bycatch or catches of juveniles.
<b>Displacement of effort from other oceans</b>	Global overcapacity and falling catch rates in other tuna fisheries will increase pressure on IUU fishing and governments to breach effort/catch caps
<b>Internal management decisions</b>	Introduction of new management arrangements and objectives may result in new areas for potential non-compliance.
<b>Local government fees and charges</b>	Avoidance of local fees and charges can be a key driver of non-compliance – e.g. under-reporting where access fees are based on catch; illegal transshipping to avoid port charges and export fees.
<b>Changes in infrastructure</b>	May result in changes in fleet behaviour – e.g. closure of canneries in American Samoa may result in increased transshipping and changes in targeting behaviour
<b>Vulnerability of stocks</b>	Key driver of risk where regional goal is sustainability

## 2.5 Additional MCS Measures

Additional MCS measures have been suggested to assist in resolving residual risks rated moderate and above (see Appendix 2.2). These measures are summarized in Table 2.3, with additional detail on each measure provided in Appendix 2.3.

In suggesting additional measures, we have been conscious that resources with which to undertake additional MCS activities amongst FFA members are frequently limited. Particular attention has been paid to the cost effectiveness of each measure. Table 2.3 demonstrates that many of the suggested measures (e.g. further optimization of current VMS arrangements) can be taken at very little cost, although they may require new cooperative arrangements between FFA members and with regional institutions such as the WCPFC. Nevertheless, some measures – such as the establishment of improved information management systems at both national and regional levels, improved regulation of transshipment including 100% observer coverage on all carrier vessels and the establishment of a comprehensive catch documentation scheme – may require substantial investment in upfront establishment and capacity building costs, however given they address either one, or a range of, severe or high risks they are still likely to represent good value for money. An initial estimate of the resource implications associated with each measure is given in Table 2.3, based on the criteria outlined in Table 2.4.

Table 2.3: Summary of additional MCS measures

Additional MCS Measure	Risks Addressed	Purpose	Expected Resource Implications
<b>General Measures</b>			
Integrated information management systems and analytical capability	Various (e.g. 4.9.1; 4.9.2; 4.10.2; 4.12.2)	To collect, store, process and exchange fisheries MCS information for the purposes of enhancing the effectiveness of national and regional MCS activities. To support analysis of regional patterns and trends in compliance to enhance the targeting and effectiveness of national and regional MCS activities.	Major See Project 3
Standard MCS Operating Procedure Manual	Various	To strengthen and harmonize MCS operating procedures across the FFA membership.	Minimal
<b>FFA Regional Register</b>			
Compliance Indices	Various	To track the compliance history of each 'entity' on the Register (e.g. vessels, masters, owners) to support improved targeting of MCS activities.	Minimal/Moderate
Pre-fishing inspections	Various	To independently validate vessel information, generate updated photos, distribute education material, as well monitor compliance with relevant measures (e.g. vessel markings, bycatch mitigation equipment on board, etc)	Moderate
Register of fishing masters	Various	To (a) to raise awareness of regional rules, regulations and reporting requirements amongst fishing masters, (b) improve direct communication between FFA members and (c) allow for the administrative tracking of fishing masters.	Moderate
Register of vessel owners	Various	To support analysis of patterns and trends in the compliance histories of vessel owners.	Minimal
<b>VMS</b>			
RFMO Information sharing	2.3.1; 2.3.2	To allow for the tracking of movement of vessels between ocean basins.	Minimal
Reciprocal arrangements between WCPFC and FFA/members	2.6.2	To allow coastal states to view VMS polling positions of high seas vessels in near real time where they enter their EEZ.	Minimal
High Seas Buffer zones	2.6.2; 5.1; 5.2	To allow coastal states to view VMS polling position of high seas vessels in near real time up to 100nm outside their EEZ boundary.	Minimal
Enhanced VMS data sharing between FFA members	2.5.2	To allow visibility of vessels in adjacent (or other) EEZs.	Minimal
Port-to-port monitoring	2.5.2; 4.1.2; 4.3.2; 4.14.2; 5.1; 5.2; 5.4.2	To allow for the tracking of licensed vessels throughout their range for the duration of the licence by the licensing state.	Minimal
Optimised use of alerts	Various (e.g. 2.5.2; 4.3.2; 4.5.2)	To optimize the effectiveness and efficiency of VMS operations at the national level.	Minimal
Stricter manual reporting requirements	4.3.2 (and others)	To send the message that fishing should not occur unmonitored inside the FFA area and to encourage the carrying of MTU spares.	Minimal
'No-go' zones around sensitive areas (e.g. isolated communities)	4.5.2	To better protect remote and/or sensitive areas where it is difficult and/or costly to deploy an aerial or surface response asset.	Minimal
<b>Logsheets</b>			
Enhanced priority on logsheet submission	4.13; 4.9.1; 4.9.2; 4.10.1; 4.10.2	To continuously improve rates of timely and accurate logsheet submission to 100% in the near future	Minimal
EMTUs	4.13	To facilitate improved communication with fishing vessels and to improve timeliness of data submission.	Minimal (cost to industry in replacing units)
<b>Observers/remote monitoring</b>			
Regional Observer Strategy	Various	To support the implementation of the goals and objectives of the FFA Regional Observer Strategy agreed at FFC 67	Variable
Increased observer coverage on LL vessels	Various	To improve independent monitoring/validation of catch and effort information from the LL fleet, including catches of target species, bycatch/discards and SSIs.	Major
Remote monitoring techniques (e.g. LL drum monitors; on board cameras)	Various	To provide independent monitoring of vessels where opportunities to deploy an observer are limited (e.g. by space, habitability, remote operation, etc). To remotely detect and monitor fishing activity.	Moderate (costs involved in trialling and installation)
100% coverage on all domestic PS vessels	4.7	To monitor compliance with catch retention, FAD prohibition and other management measures.	Minimal (marginal additional costs)

<b>Sanctions</b>			
Administrative sanctions	Various	To provide an immediate, cost-effective and proportionate response to minor infringements. To increase level of deterrent to minor offences.	Minimal
WCPFC IUU listing	Various	To provide a cost effective method of 'long arm' enforcement where effective action is unable to be achieved through traditional methods.	Minimal
'Fleet-wide' sanctions		To strengthen deterrents to non-compliance and encourage voluntary compliance through peer pressure amongst organized fleets of fishing vessels.	Minimal
<b>Port State Measures</b>			
Port State Measures Agreement	Various	To strengthen cooperation with external ports in enforcing conservation and management measures within the FFA region.	Variable
MCS Hubs	Various	To capitalize on the MCS opportunities available at key regional ports.	Major
Cooperation with foreign ports	Various (e.g. 5.4.2)	To better monitor catches taken in FFA member waters where they are landed at external ports.	Minimal
<b>Supply Chain Monitoring</b>			
Transshipment verification, including 100% observer coverage on carrier vessels	Various (e.g. 5.1; 5.2; 4.9.1; 4.9.2)	To better monitor/validate catches through the post-harvest supply chain.	Moderate/Major
Catch Documentation Scheme	4.9.1; 4.9.2; 4.15; 5.1; 5.2	To (a) better monitor catches of key species throughout the supply chain including supporting the effective implementation of WCPFC CMMs, (e.g. CMM 08-01), (b) improve catch and effort information for scientific purposes and (c) deter IUU fishing.	Likely to be moderate/major
<b>Voluntary Compliance</b>			
Education	Various	To encourage voluntary compliance by raising awareness of relevant laws, licence conditions, best practice approaches etc	Minimal/Moderate
Participatory Planning	Various	To raise awareness of industry requirements and encourage high rates of voluntary compliance by engaging fishers in the process of developing management frameworks.	Minimal
Market-based incentives	Various	To encourage high rates of voluntary compliance using market based incentives such as eco-labels and non-IUU certification schemes.	Variable
<b>Surveillance and Response</b>			
Targeted aerial surveillance	Various (e.g. 2.3.1; 2.1; 2.5.2; 2.6.2; 4.1.2; 4.3.2)	To respond to risks that are unable to be dealt with through more cost effective measures; to improve the MCS planning and information base	Major (if air hours increased)
Increased rates of boarding and inspection	Various (e.g. 4.4.2; 4.6.2; 4.9.2; 4.10.2; 5.3.2)	To increase rates of inspections for offences where compliance inspections are best done in situ; to increase deterrence to non-compliance	Variable
Industry/community reporting	Various (e.g. 4.5.2; 2.3.1; 2.5.2)	To expand effective surveillance coverage by facilitating industry and community reporting of non-compliance	Minimal
<b>WCPFC</b>			
Harmonization of MCS regimes with other RFMOs	Various (e.g. 2.3.1)	To enhance the cost effectiveness and efficacy of MCS responses for vessels working in multiple ocean basins through improved coordination, information sharing and harmonization between RFMOs.	Variable
Strengthened compliance review process	Various (e.g. 4.15)	To better monitor CCM compliance with CMMs and other obligations (e.g. submission of scientific data).	Minimal
<b>Other measures</b>			
Institutional strengthening in SE Asia	1.1.2; 1.1.2; 1.2	To improve data collection and to enhance the capacity of SE Asian nations to effectively implement WCPFC management measures.	Major (funding already secured for WCPFC WPEA project)
Global Register of Fishing Vessels, incorporating UVIs	Various	To track and identify active fishing and support vessels, as well as trends in global fishing capacity.	Minimal
Monitoring of effort creep	3.9	To record vessel characteristics and operational patterns to support robust estimates of effort creep over time	Minimal
Resolution of maritime boundaries	Various	To facilitate effective implementation and enforcement of fisheries management frameworks (e.g. VDS).	Minimal
Closure of high seas pockets	2.6.2; 5.1; 5.2	To close potential 'havens' for IUU activity within the FFA region.	Minimal

Table 2.4: Resource implication ratings

Resource rating	Description
Minimal	Can be implemented using existing human resources; would require no, or only a small amount of, establishment/ongoing funding (<US\$50,000)
Moderate	Would require a small number of additional staff positions (<5) to establish/operate; would require moderate levels of establishment/ongoing funding (>US\$50,000-\$500,000)
Major	Would require a large number of additional staff positions (>5) to establish/operate; would require significant levels of establishment/ongoing funding (>US\$500,000)

## 2.6 Monitoring and Review

Consistent with the terms of reference, performance indicators have been suggested to monitor the efficacy and efficiency of the proposed additional MCS responses. Indicators have been structured around the strategic risk areas identified in the assessment and are outlined in Appendix 2.4. Rather than being a definitive list of indicators, the proposed measures have been suggested to outline the types of metrics that might be used to objectively monitor progress against objectives.

The final performance indicators adopted by the Regional Strategy will be dependent on, and should relate specifically to, the goals and objectives agreed. Ideally, the indicators should provide a simple, reliable and measurable basis for monitoring progress between regionally agreed baselines and targets, consistent with the relationships outlined in Figure 2.5. Performance indicators may be adopted at various levels of the Regional Strategy (e.g. goals, objectives, outcomes) and are typically used according to the following process:

- **establishing a baseline level for each indicator** at the commencement of the intervention/time period;
- **establishing a target** for each indicator relating to project outputs, outcomes and objectives etc: and
- **reporting against the indicators**, possibly, in this case at the MCSWG.

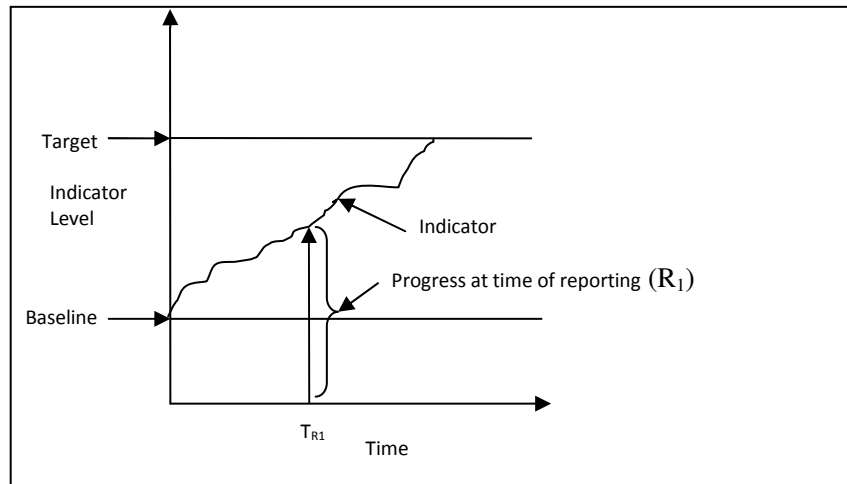


Figure 2.5: Relationship between performance indicators, baselines and targets

## Chapter 3: Compliance Review

### 3.1 Introduction

The achievement of FFA members' regional goals for their tuna fisheries depends heavily upon the effective implementation by national governments of a comprehensive range of MCS measures. In support of this, FFA members have established various regional MCS measures that provide a framework to enable effective management and control of the region's tuna fisheries. However, problematic implementation at the national level continues to undermine the ability of FFA members and the Secretariat to fully implement these initiatives and effectively monitor and control the region's tuna fisheries. While some FFA members have developed strong MCS systems with high levels of implementation, much of the FFA membership continues to suffer from inconsistent implementation of MCS measures.

Various studies have identified the need to improve MCS implementation, noting that weaknesses in MCS were critical obstacles to sustainable management and profitable development.<sup>15</sup> This is no simple task for any country – developed or developing; island or continent. In 2006, an international study assessed compliance by 53 countries (95% of global fish landings) with key provisions of the Code of Conduct for Responsible Fisheries.<sup>16</sup> The study noted that approximately 57% of the countries 'failed' on compliance with MCS related measures. Of these, 30% had particularly poor 'fail' grades, including the regionally significant countries: France, Philippines, China, Indonesia, Taiwan, and Spain.

Project Two reviews the implementation by FFA members of MCS measures and provides recommendations for improving performance and monitoring where necessary. This review focuses primarily on implementation of regional and global MCS measures that have been agreed to by the FFA membership.

### 3.2 Approach and methodology

The objective of the Compliance Review was to assess the current level of, and impediments to, implementation by FFA members of agreed MCS measures. The full report of the project (Appendix 3.1) describes the terms of reference and the project's methodology in detail. In brief, the Review aimed to:

- Identify areas where agreed MCS measures are not being implemented effectively or complied with;
- Suggest reasons for non compliance;
- Document current capability to undertake MCS operations in terms of national assets, human capacity and institutional arrangements; and
- Provide recommendations for monitoring and improving performance in complying with agreed MCS measures.

In order to undertake this assessment, the project team reviewed the MCS components of all relevant global, regional and sub-regional instruments that FFA (or PNA) members have agreed to implement. Analysis of these instruments and relevant literature identified ten MCS components that have been accepted by FFA members as fundamental to the effective management of the region's tuna fisheries:

1. Licensing;
2. Vessel Monitoring System;
3. Observer Schemes;
4. Vessel Records and Authorizations to Fish;
5. Port Inspections;
6. Prosecution;
7. Boarding and Inspection and At Sea Patrols;

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<sup>15</sup> See full report of project two in appendices for further discussion and references.

<sup>16</sup> Pitcher, Tony., Kalikoski, Daniela. And Pramod, Ganapathiraju. 2006. Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports. Vol. 14. No. 2. Fisheries Centre, University of British Columbia. While the study included no Pacific island, it did include almost all the key DWFNs (i.e. Japan, China, USA, South Korea, Taiwan) that fish within the region and key neighbours Indonesia and Philippines as well as Australia and New Zealand.



8. MCS Coordination and Data Verification and Sharing;
9. Aerial Surveillance;
10. Legislation, Regulations and Management Plans.

For each of the MCS components, the Compliance Review identified a number of performance indicators against which to assess FFA members' progress. Performance against these PIs was assessed as 'weak', 'moderate' or 'strong'. In most cases, implementation was assessed qualitatively.<sup>17</sup> Assessments also recognized that legislation or license conditions may specify implementation of a PI, but institutional factors prevent this from occurring. On the other hand, assessments also recognized that legislation or license conditions may not comply with a PI, but that agencies were doing their best to implement such requirements anyway. In such cases, assessments attempted to balance these contradictions.

Given the expected data gaps that would occur throughout the study, and the limited information sources available to assess implementation of the MCS components, the project team inserted a confidence range to inform readers of the likely accuracy of the assessment. The Review graded the quality of the information upon which the assessment was based as either: 'low', 'moderate' or 'high'. Where assessments depend upon 'low' quality information sources, it is likely that the accuracy of the assessment will be significantly affected.

Much of the Review was based upon information collected through in-country consultations with officials and stakeholders in February, March and April 2009. In July and August, the Review distributed draft assessments to all FFA members and requested comment and feedback – particularly in regard to information gaps and matters that were quickly progressing (i.e. observers in the build up to the 1 August 2009 deadline to meet the 100% observer requirement in support of the FAD closure). Most FFA members responded to these requests and assessments were correspondingly updated and re-assessed.

The Review assessed the performance of each FFA member against the PIs for each of the ten MCS components across the region. This analysis identified successes, weaknesses and key obstacles, as well as potential responses that could improve implementation of effective MCS measures. The Review then calculated the aggregate regional implementation in order to identify the priority implementation weaknesses across the region and recommend responses at a regional level.<sup>18</sup>

### 3.3 Discussion of Results: Implementation of MCS Components

In some respects, it is a difficult time to study MCS implementation as much is happening very quickly across the region – particularly in regard to the observer and VMS programmes. In that light, it is likely that some of the findings of this report will quickly date as further progress is made; this demonstrates the strong progress in MCS implementation that is being made throughout the region.

The Pacific Islands region has made strong progress in many MCS components in recent years. The compliance review identified national examples of strong implementation where some members are now setting global benchmarks in MCS implementation. Similarly, the review identified some MCS components that are implemented moderately well across the FFA membership and significant progress is being made. However, the review also identified some members that continue to struggle with MCS implementation across a number of components due to significant institutional and capacity weaknesses. Similarly, the review identified a few MCS components that require significant improvement throughout the region.

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<sup>17</sup> 'Strong' assessments recognized that the country in question had implemented key parts of a PI, if not all (i.e. implementation of HMTCs was assessed as strong if the country implemented VMS, observer, reporting, pre-licensing inspections, transshipment prohibitions). 'Moderate' assessments recognized that the country implemented much of the PI, but missed a key part (i.e. did not implement pre-fishing inspections as required under HMTCs, but did implement most other requirements). 'Weak' assessments recognized that the country was currently not implementing most or any of the key parts of a PI (i.e. country did not require VMS, observers or pre-license inspections as required by the HMTCs). Where statistical analysis could be used (i.e. against an indicator that presented a numerical value such as 20% observer coverage), then the assessments were scored as: Weak = 0 to 33%; Moderate = 34% to 66%; Strong = 67% to 100%.

<sup>18</sup> The national values for calculating the cumulative regional impact are as follows: Weak = minus 3; weak/moderate = minus 1; moderate = 0; strong/moderate = 1; strong = 3. The national scores were then added up and the cumulative regional impact was assessed on the following range of values: Weak = minus 16 and below; weak/moderate = minus 11 to minus 15; moderate = 10 to less than minus 10; strong/moderate = 11 to 15; strong = 16 and above.

The compliance review identifies four priority MCS weaknesses based on the aggregate regional assessment: Data Management and MCS Coordination; Legislation and Management Plans; Port Controls and Inspections; and Observer Schemes. It should be noted that addressing these weaknesses will also improve the other six MCS components through flow-on benefits (e.g. improving data management will have direct benefits for licensing through improvements in the quality of information upon which licensing decisions are made).

Table 3.1 summarizes the overall implementation of the MCS components for each FFA member, and presents the aggregate regional implementation in order to identify regional priorities for capacity building. This chapter then briefly discusses the key implementation challenges across the region, and proposes priority responses that would improve the effectiveness of MCS to better enable implementation of regional MCS commitments. The chapter concludes with a recommendation for future monitoring and support of MCS implementation. The full report for the compliance review (Appendix 3.1) describes the national reviews and potential responses to address the specific implementation challenges of each country.

Table 3.1: Summary of national and regional MCS implementation

<b>MCS Component</b> cumulative regional index of national implementation	<b>Cook Island</b>	<b>FSM</b>	<b>Fiji</b>	<b>Kiribati</b>	<b>Marshall Islands</b>	<b>Nauru</b>	<b>Niue</b>	<b>Palau</b>	<b>PNG</b>	<b>Samoa</b>	<b>Solomon Islands</b>	<b>Tokelau</b>	<b>Tonga</b>	<b>Tuvalu</b>	<b>Vanuatu</b>
<b>1. Licensing</b> Moderate (+6)	Moderate	Moderate	Moderate	Weak/ Moderate	Moderate	Moderate	Moderate	Moderate/ Strong	Strong	Moderate	Moderate	Moderate	Strong	Moderate	Moderate
<b>2. VMS</b> Moderate/Strong (+12)	Moderate/ Strong	Moderate	Weak/ Moderate	Weak	Weak/ Moderate	Moderate	Moderate	Moderate	Strong	Strong	Moderate	Strong	Strong	Moderate/ Strong	Strong
<b>3. Observers</b> Weak (-19)	Weak	Moderate/ Strong	Weak	Moderate	Moderate/ Strong	Moderate	Weak	Weak	Strong	Weak	Weak	Weak	Moderate	Weak	Moderate
<b>4. Vessel Record &amp; Authorization to Fish</b> Moderate (-10)	Moderate	Strong	Weak	Weak	Weak/ Moderate	Weak/ Moderate	N/A	Weak/ Moderate	Strong	Weak/ Moderate	Weak	N/A	Moderate	Weak	Moderate
<b>5. Port Controls and Monitoring</b> Weak (-16)	Weak	Moderate	Moderate	Weak	Moderate	Moderate	Moderate	Weak/ Moderate	Strong	Moderate	Weak	Weak	Moderate	Weak	Weak
<b>6. Prosecution</b> Moderate (-3)	Strong	Strong	Weak	Weak/ Moderate	Weak/ Moderate	Weak/ Moderate	Moderate	Weak	Weak/ Moderate	Moderate	Moderate	Weak	Strong	Moderate/ Strong	Moderate
<b>7. Boarding, Inspection &amp; Surface Patrols</b> Moderate (-6)	Strong	Weak/ Moderate	Moderate	Moderate	Weak/ Moderate	Weak	Weak	Moderate	Moderate/ Strong	Moderate/ Strong	Moderate	Weak	Moderate	Moderate	Moderate
<b>8. Data &amp; MCS Co-ord</b> Weak (-31)	Weak/ Moderate	Weak/ Moderate	Moderate	Weak/ Moderate	Weak	Weak	Weak	Weak	Moderate	Weak	Weak	Weak	Weak	Weak	Weak/ Moderate
<b>9. Aerial Surveillance</b> Moderate/Strong (+12)	Strong	Weak/ Moderate	Weak	Moderate	Moderate	Weak/ Moderate	Moderate/ Strong	Moderate	Moderate/ Strong	Strong	Strong	Moderate/ Strong	Strong	Weak/ Moderate	Strong
<b>10. Legislation and Management Plans</b> Weak (-22)	Moderate	Moderate	Weak	Weak	Moderate	Weak/ Moderate	Weak	Weak	Moderate	Weak	Weak	Weak	Moderate	Moderate	Moderate

### 3.3.1 Licensing

The aggregate regional implementation of licensing arrangements is **Moderate (+6)**. Licensing across the region is broadly consistent with most aspects of the HMTCs. A key weakness is the failure by most members to implement pre-fishing inspections. Significant concerns regarding enforcement of license conditions are discussed in MCS Component 6: Prosecutions. Weak enforcement of license conditions was particularly problematic in regard to late or non-submission of catch reports.

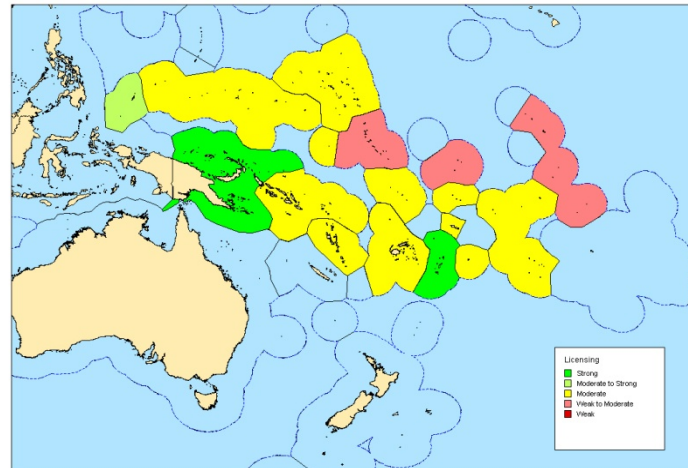


Figure 3.1: Map of FFA members' implementation of Licensing PIs

### 3.3.2 VMS

The aggregate regional implementation of VMS is **Moderate/Strong (+12)**. VMS has seen significant improvements across the region, including an increase in coverage levels, with the rollout of the Pacific VMS and regular training programmes. Ongoing concerns exist with the effectiveness of VMS monitoring at the national level and broadening the use of automated alerts (entry/exit, on/off, entry into closed zones) to improve monitoring.

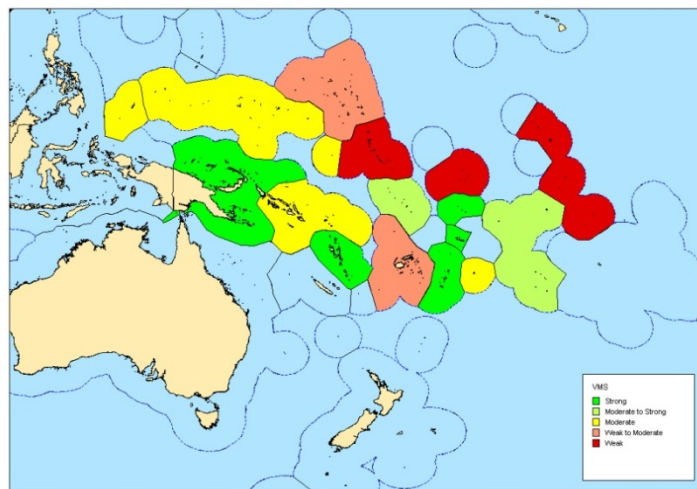


Figure 3.2 Map of FFA members' implementation of VMS PIs

### 3.3.3 Observers

The aggregate regional implementation of observer programmes is **Weak (-19)**. The demand on observer programmes across the region has grown significantly since the adoption of the PNA 3IA and CMM 08-01 100% observer coverage requirements. These developments have driven significant improvements in regional observer programmes and large increases in observer placements on purse seine vessels. These are significant achievements and will deliver important benefits to conservation and management. However, observer schemes across the region continue to fail to meet coverage targets for longline fleets, partly due to the operational characteristics of longline vessels and resistance from DWFNs to placement of observers on longline vessels.<sup>19</sup> Furthermore, national observer programs continue to suffer from poor coverage and are undermined by a shortage of observers, data management and institutional weaknesses. Similarly, weaknesses in observer debriefing and prosecution of observer reported violations continue to undermine enforcement of license conditions (weak debriefing processes, weak follow up of observer reported violations, inadequate data management). Between 1978 and 2001, the FFA fisheries violations database recorded 319 violations resulting in fines totaling USD\$12.4 million. Of these, only 6 violations (< 2%) were reported by observers.<sup>20</sup> However, a review of observer reported violations identifies regular reports of significant violations that warrant investigation and prosecution.<sup>21</sup>

These problems are exacerbated by the high turnover of observers, often caused by poor employment conditions, inconsistent and unpredictable work programs and/or lack of career development opportunities<sup>22</sup>. In many cases, observers are only employed part time or only paid on placement.

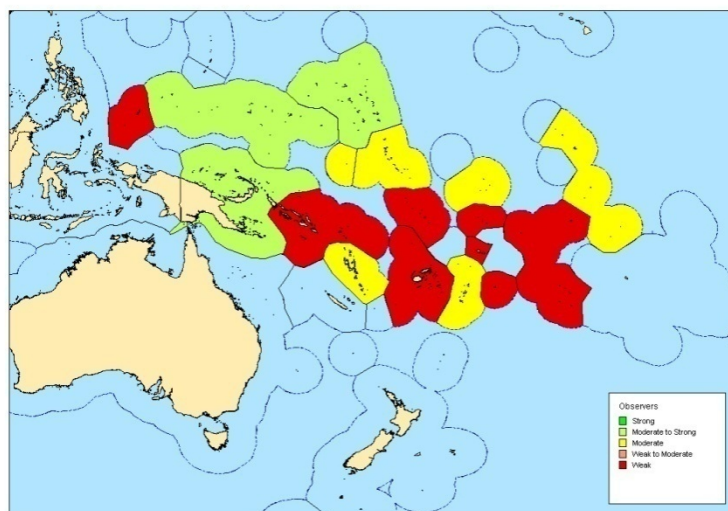


Figure 3.3: Map of FFA members' implementation of Observer PIs

<sup>19</sup> The target coverage specified by the HMTc for foreign fishing vessels is 20%. This applies to all foreign fishing vessels, including longline. However, most longline fleets worldwide do not meet 20% coverage targets.

<sup>20</sup> Gillett, 2005. Review of the FFA Observer Programme. FFA.

<sup>21</sup> Given the increasing use of observers to monitor compliance with conservation measures (e.g. 100% observer coverage during FAD closure period), the region will need to consider how to address the safety and operational questions relating to use of observer violation reports for prosecution purposes.

<sup>22</sup> Observer retention issues such as these are often experienced in observer programs and require special consideration and planning to be overcome.

### 3.3.4 Vessel Records and Authorizations to Fish

The aggregate regional implementation of Vessel Records and Authorizations to Fish is **Moderate (-10)**. Most FFA members with active vessel registries are implementing adequate processes to ensure compliance with flag state responsibilities (WCPFC/UNFSA). Some members with established but largely inactive registries do not currently have adequate flag State processes and legislation to ensure effective flag State control if industry were to start registering fishing vessels. Moreover, the legislative frameworks of some members are inadequate to allow implementation of relevant flag state controls such as prohibitions on illegal fishing in foreign EEZs.

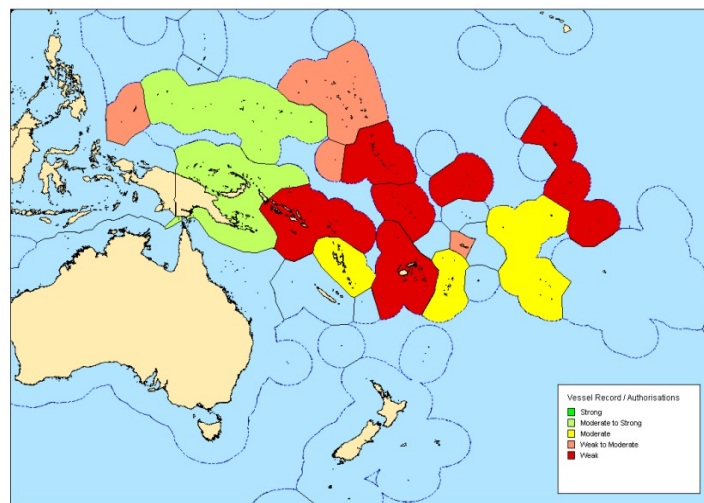


Figure 3.4: Map of FFA members' implementation of Vessel Record/Authorisations to Fish PIs

### 3.3.5 Port Controls and Monitoring

The aggregate regional implementation of port controls and monitoring is **Weak (-16)**. Port controls are becoming increasingly recognized as a critical component of an effective MCS regime. Port monitoring offers an important 'gateway' to physically check that vessels are complying with license conditions, both before licenses are issued and during fishing activities, and provide an important enforcement opportunity without the high costs of surface patrols. Developments in the FAO Port State Model, new market scheme initiatives such as the EC IUU Regulation 1005/2008<sup>23</sup>, and existing WCPFC and FFA agreements all impose responsibilities on port States to implement effective monitoring and control measures, particularly those FFA members with burgeoning onshore development projects and aspirations. However, implementation of port controls and monitoring is a concern across much of the FFA membership, partly due to weak processes in some countries and partly due to a lack of port infrastructure in some countries.

This is particularly of concern in regard to monitoring and inspection of unloadings and verifying that catch landings are consistent with logbooks. In 2006, the SPC Oceanic Fisheries Programme noted that inspections of unloadings had fallen to approximately 10% for purse seine vessels and just above 20% for longline vessels (Figure 3.5).

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<sup>23</sup> EC Regulation No. 1005/2008 'establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing.

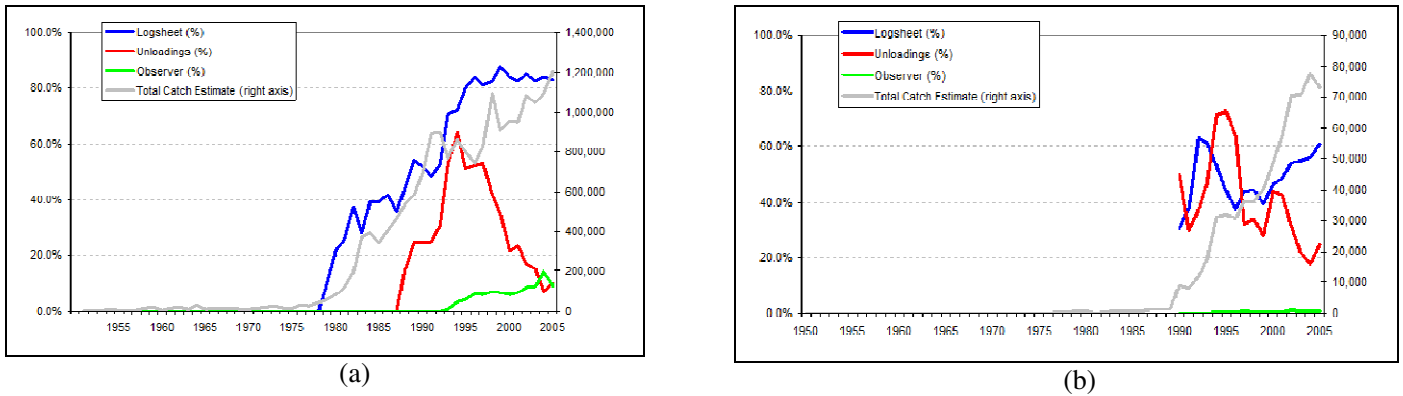


Figure 3.5: Coverage of data types available to SPC from the (a) purse seine fishery and (b) longline fishery. Unloadings coverage has fallen significantly in both fisheries since the mid-1990s. (Source: OFP-SPC Presentation to First Tuna Data Workshop, 23/27 October 2006. Noumea, New Caledonia)

The lack of all-weather ports in some countries and no cooperative arrangements with neighbouring port States, significantly undermines the ability of some FFA members to monitor and control fishing activity in their EEZ. Few members complied with the HMTIC pre-fishing inspection provisions and significant weaknesses also exist for the management and dissemination of port derived information.

The legislative framework in some members fails to provide necessary powers to effectively implement some port State controls, such as prohibitions on landing products derived from illegal fishing in foreign waters or on the high seas in breach of WCPFC conservation measures.

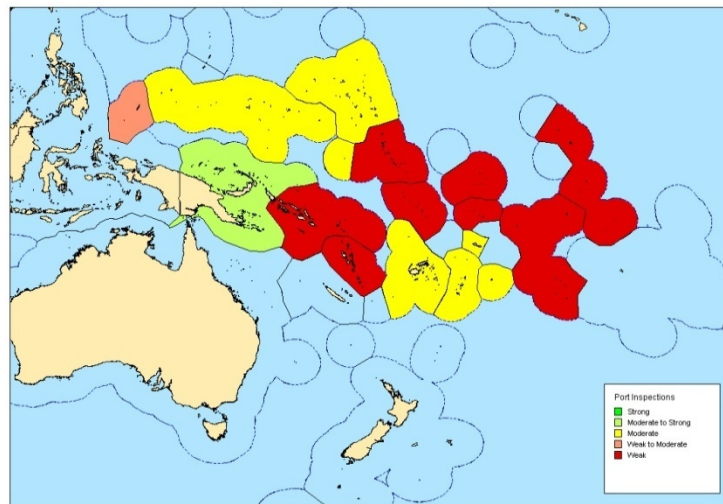


Figure 3.6: Map of FFA members' implementation of Port Controls and Monitoring PIs

### 3.3.6 Prosecutions

The aggregate regional implementation of fisheries violations is **Moderate (-3)**. A strong prosecutions capacity is important in creating a strong deterrence to IUU fishing. However, while the aggregate implementation across the region is moderate, there are a significant number of FFA members that have weak prosecution records. The regional aggregate is only graded as moderate because these members are offset by others that have very strong prosecution history and capacity.

Some FFA members appear to be very lenient on license condition violations. In many cases, no official notice or enforcement action is taken against infractions (such as non-reporting). A previous study suggested that enforcement of license conditions for foreign fishing vessels was undermined by the prevalent mindset that vessels may go elsewhere if license conditions are enforced.<sup>24</sup> Similarly, some information sources noted corruption and political intervention concerns and an ongoing lack of transparency or accountability in licensing that undermined both prosecutions and the morale of national MCS staff.

Prosecutions are further undermined by weak coordination between fisheries, police and the judiciary - and weak knowledge in some members within fisheries, police and judiciary prosecutors on relevant laws, regulations, and significance of fisheries violations. Poor compliance with license conditions is also exacerbated by the often limited communication of license conditions to vessel owners and operators regarding their specific obligations.

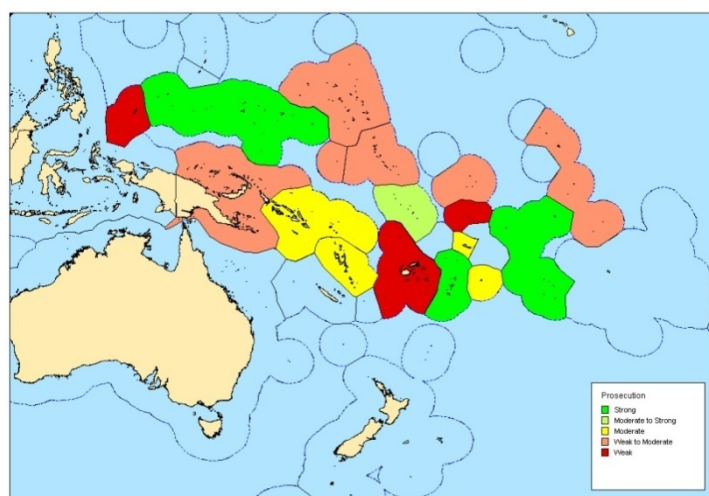


Figure 3.7: Map of FFA members' implementation of Prosecutions Pls

### 3.3.7 Boarding, Inspections and Surface Patrols

The aggregate regional implementation of boarding, inspections and surface patrols is **Moderate (-6)**. Given the absence of information on which to determine 'optimum' levels of surveillance for each EEZ, implementation was assessed against a generic benchmark of 6 days per 100,000km<sup>2</sup> of EEZ. This performance indicator does not assess whether a country is undertaking sufficient surface surveillance or not – it simply provides an index to measure relative surface patrol activity between EEZs.

The Review found that patrol boat crews are generally highly trained and motivated but limited by a lack of financial resources to undertake higher levels of patrol activity, as well as a lack of intelligence sharing and coordinated operational planning between fisheries and enforcement agencies<sup>25</sup>. For FFA member countries without any patrol vessel capability (Nauru, Niue and Tokelau), a key limitation was the lack of formal agreements with neighbouring or supporting countries to enable joint fisheries patrols.

<sup>24</sup> Hanich, Q., Teo, F. and Tsamenyi, M. 2008. Closing the Gaps: Building Capacity in Pacific Fisheries Governance Governance and Institutions. Honiara, Pacific Islands Forum Fisheries Agency.

<sup>25</sup> Projects 4 and 5 discuss these matters in greater detail.



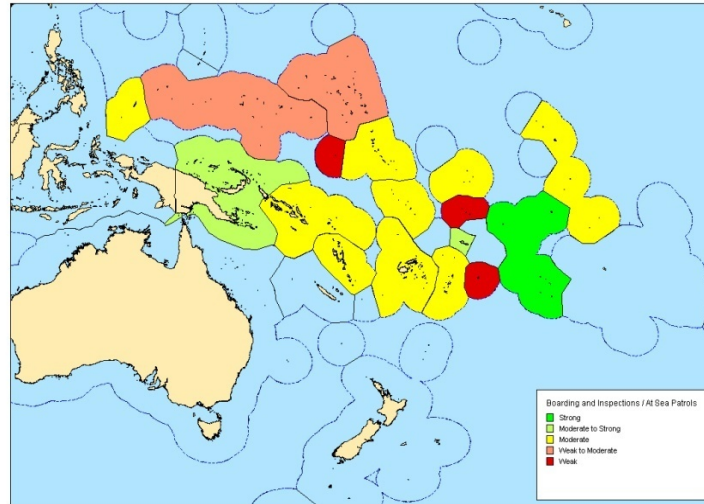


Figure 3.8: Map of FFA members' implementation of Boarding and Inspections and At Sea Patrols PIs

### 3.3.8 Data and MCS Coordination

Data management and MCS coordination are the priority weaknesses across the region. The aggregate regional implementation of data management and MCS coordination is **Weak (-31)**. This is the weakest MCS component across the region and is a serious impediment to effective MCS operations at both the national and regional levels. In 2006, the FFA MCS-WG noted that coordination and data management problems were regularly experienced during MCS operations amongst FFA Members:

“Confusion over the legitimacy of licenses, registration, VMS requirements and maritime boundaries - resulting in considerable wasted enforcement effort and unnecessary inconvenience to legitimate fishers”

These problems are also a serious concern for fisheries management more broadly as a key function of MCS is to ensure accurate and timely information is available for scientific assessments to ensure managers can make informed decisions.

MCS operations at the regional level suffer from ineffective data sharing mechanisms. These problems are exacerbated by a lack of clarity over data ownership and weaknesses in data management. Recently, there has been some improvement in VMS data sharing between FFA members. However, some officials and stakeholders continued to express concern/suspicion regarding vessels that were licensed in neighbouring EEZs, might also be fishing illegally in their own EEZ. Greater coverage of VMS data sharing arrangements amongst neighbouring FFA members would assist in addressing these concerns.

Day to day MCS operations continue to lack meaningful statistics. Previous studies have noted that much of the information being used to plan and implement surveillance and enforcement activities is anecdotal and contained within the minds of several key personalities. This is of particular concern given the high staff turnover in many FFA members, resulting in a loss of corporate memory when personnel move, and blockages in the decision making process when personnel cannot be located.”<sup>26</sup>

Such regional problems are often mirrored, and exacerbated, by poor in-country co-ordination and communication processes between fisheries and other departments. Weak consultation and communication is problematic internally within fisheries departments, and externally between fisheries and other relevant

<sup>26</sup> FFA MCSWG 2006. FFA E-Ops Room. MCS10/WP 6.1

agencies and stakeholders. Weak co-ordination and communication processes and skills (both at the institutional and individual level) are significant obstacles with negative impacts on implementation and operation of fisheries compliance programs across the region.

Furthermore, given the multi-disciplinary nature of fisheries management and MCS, poor coordination and communication often results in antagonism between the agencies responsible for implementation. This may lead to further obstacles to operations as agencies disagree on priorities or refuse to implement measures that other agencies have committed to in international fora without whole of government consultation. The conducting of multi-lateral and bilateral operations within sub-groups of FFA member countries and Australian, New Zealand, United States and French Defence Forces provide good examples of how well national agencies and countries can work together more effectively to maximize the performance of compliance operations.

Data management is also a key challenge to the effective operation of various MCS components. Almost all information collected by the various MCS components and external sources is not currently stored in a format that allows it to be effectively analyzed and cross verified without immense effort that is generally beyond the resources of national administrations (i.e. VMS, observer violation reports and vessel sightings, port inspections, catch logbooks, licensing information, boarding and inspection reports, prosecutions and violations databases, vessel registration, aerial surveillance sightings, regional vessel records, IUU lists, customs and immigration databases, etc). This information is all directly relevant to MCS and licensing officials but is not used to its full potential. Data management weaknesses occurred throughout the various MCS components and impact most heavily on MCS coordination.

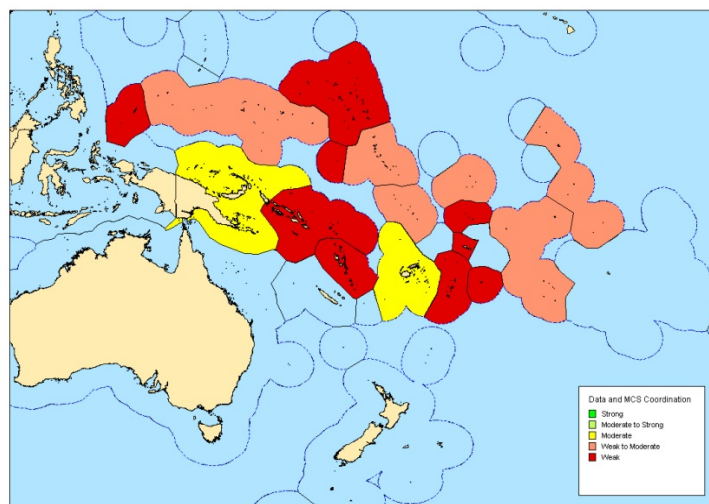


Figure 3.9: Map of FFA members' implementation of Data management and MCS Coordination PIs

### 3.3.9 Aerial Surveillance

The aggregate regional implementation of aerial surveillance is **Moderate/Strong (12)**. Implementation was assessed against performance indicators that measured each FFA members' ability to support aerial surveillance patrols where they occurred, rather than actual levels of surveillance give this was beyond the control of most, if not all, Pacific Island members.

The Review found that the current level of aerial surveillance is largely determined by the FFA member's relationship with, and proximity, to key aerial surveillance providers. Some FFA members received very high levels of aerial surveillance per 100,000km<sup>2</sup> of EEZ, while in other countries, aerial surveillance was almost non-existent. A key obstacle for much of the region was the lack of opportunity for aerial surveillance patrols

to be undertaken upon demand, or at the most strategically useful times. Ongoing problems with coordination and communication between relevant agencies were also an obstacle in some circumstances.

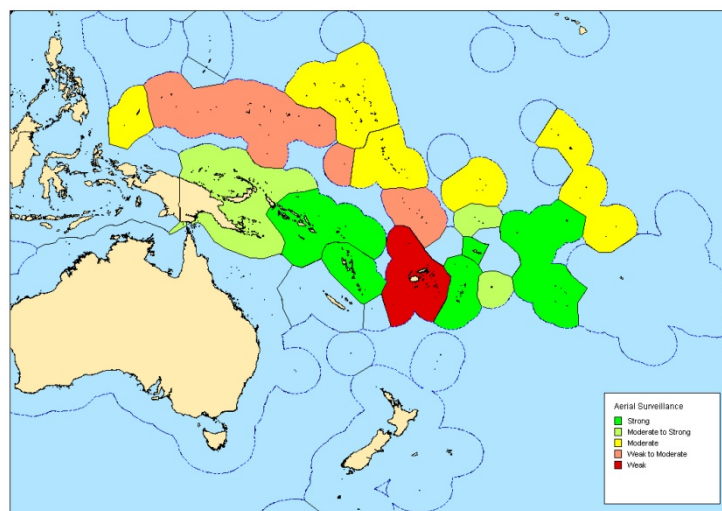


Figure 3.10: Map of FFA members' implementation of Aerial Surveillance PIs

### 3.3.10 Legislation and Management Plans

Updating legislation in response to recent developments within the WCPFC and PNA is a key priority across the FFA region. Despite ongoing efforts by the FFA Legal Division and other donor-funded legal assistance, legislation in many countries has not kept up with these developments and requires urgent review. The aggregate regional implementation of legislation and management plans is **Weak (-22)**. Effective MCS requires a comprehensive legislative framework that supports all relevant MCS components and provides for effective sanctions. Such sanctions should allow for the refusal, withdrawal or suspension of licenses and authorizations to fish in response to non-compliance by licensed fishing vessels with conservation and management measures. Sanctions for non-licensed vessels should be of adequate severity to deter illegal fishing. The Review found that MCS activities in most FFA members continue to be significantly undermined by weak and/or out of date legislation. Key flag and port State responsibilities lack adequate legislation and many WCPFC provisions are yet to be properly endorsed through legislation. Furthermore, the FFA region as a whole experiences significant weaknesses in its mechanisms to respond and endorse WCPFC conservation and management measures as they arise.

Fiji, Kiribati, Nauru, Niue, Marshall Islands, Palau, Samoa, Solomon Islands, Tokelau and Vanuatu are all currently at various stages of reviewing or updating legislation, or planning to review legislation for this purpose. However, some of these reviews have been ongoing for some years. Some FFA members - especially those with very small administrations find it very difficult to keep up with the constant demands from regional fora, particularly in regard to responding to new conservation and management requirements. The focus on participation in PNA, FFA and WCPFC meetings is a constant and significant drain on capacity.

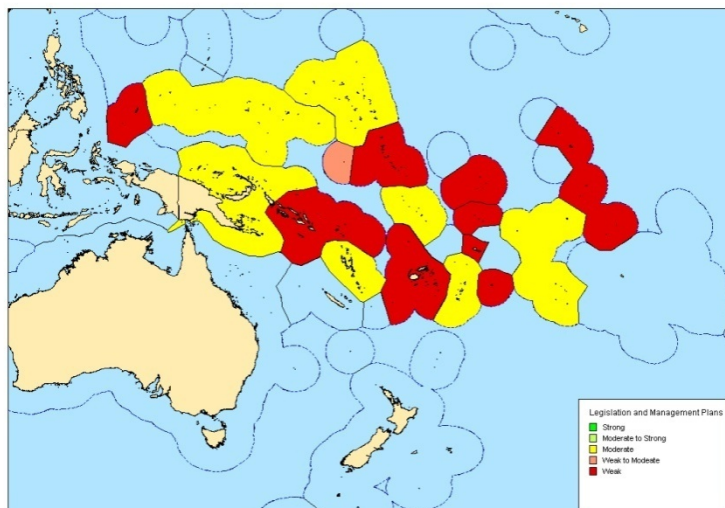


Figure 3.11: Map of FFA members' implementation of Legislation and Management Plans PIs

### 3.4 Recommendations

The challenges summarized above require two levels of responses – regional or sub-regional responses, and national responses. These two levels of responses are inherently inter-linked.

National responses should be developed within the individual national context of each FFA member and be 'owned' by the national government. It is likely that responses that impose a 'one size fits all' analysis or solution will fail due to the breadth of difference between each FFA member. Additionally, responses should recognize the significant progress that some FFA members have made in developing their MCS capacity. This rise in capacity offers an opportunity for regional (and particularly sub-regional) co-operative capacity building between members that builds upon shared interests in protecting common fisheries resources.

Within this context, the project team have made six recommendations for consideration by FFA. The recommendations span the key MCS weaknesses across the region identified by the review, which, if addressed, will enable the FFA membership to improve the monitoring and implementation of MCS activities across the region.

#### 3.4.1 Priority responses – National Focus

As global overfishing and overcapacity continue to increase pressure on the region, FFA members will require strong institutional and governance capabilities to effectively implement all the MCS components that are necessary to protect, manage and benefit from their tuna fisheries. Achieving this will require strategic and coordinated whole-of-government approaches that are capable of working across various departments and regulatory areas due to the complicated and convoluted nature of many of the management challenges.

Various studies have identified linkages between the ability of governments to implement effective fisheries management and the broader quality of national governance, or whole-of-government.<sup>27</sup> The ability of FFA members to implement effective fisheries management, monitor fishing activities in port and at sea, enforce regulations, maintain up to date legislation and comply with regional commitments - is limited or supported by the quality and effectiveness of government institutions across the whole-of-government, not just the fisheries Ministry.

<sup>27</sup> See full report of project two (Appendix 3) for further discussion and references.

The project team recommends that the FFA, and its associated agencies (PIF and SPC), focus more comprehensively on national capacity building programmes that support MCS outcomes through whole-of-government capacity building strategies (i.e. ensuring that all relevant agencies [Fisheries, Police, Attorney Generals, etc] have the necessary capacity to implement their MCS responsibilities). While much has been achieved at the regional level, the Compliance Review finds that national implementation has not kept up sufficiently to fully benefit from regional initiatives. In this light, the Compliance Review recommends that the FFA support the development of National Plans of Action on Illegal, Unreported and Unregulated Fishing (NPOA-IUU) for those countries that have not yet completed one, or need updating.<sup>28</sup> Each NPOA-IUU should include a whole-of-government capacity building strategy to support its full implementation. These strategies should be discussed with aid donor partners and drive capacity building projects to ensure they meet national priorities in the national interest.

### 3.4.2 Priority responses – Data Management and MCS Coordination

As discussed above, the key obstacles to effective MCS at the national level identified across the region are weaknesses in Data Management and MCS Coordination.

In regard to data management, the Compliance Review recommends that the FFA urgently support the development of MCS data management and analysis mechanisms that can be utilized at the national level and cooperatively at the sub-regional and regional levels. This database should focus primarily on supporting national MCS data management needs and enabling MCS data analysis and cross-verification through automatic alerts when inconsistencies in data are recognized. Ideally, the database should be established in a manner that allows for external data sources (i.e. RFMO IUU lists, WCPFC vessel records, etc) to be cross-referenced by the database to detect relevant alerts and inconsistencies. The MCS database should allow for the following data sources to be managed, cross-verified and analyzed:

- VMS;
- FFA Registry of Good Standing;
- Catch logbooks;
- Entry/exit reports;
- Licensing information;
- Prosecutions and violation databases;
- Vessels of Interest;
- Observer violation reports;
- Observer reported vessel sightings;
- Boarding and inspection reports;
- Port inspection reports;
- Port vessel lists;
- Aerial surveillance sightings;
- Industry/stakeholder sourced vessel sightings;
- Export manifests;
- WCPFC Record of Fishing Vessels;
- WCPFC IUU List;
- Other RFMO IUU lists.

The Compliance Review notes that Project Three (Information Management) is addressing these questions in detail and provides specific recommendations to implement these responses.

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<sup>28</sup> The first NPOA-IUUs were developed in 2004 and now require review. Plans are required for PNG, Vanuatu and Tokelau. Solomon Is is planned to be done Sept 2009.

In regard to MCS coordination, there is not surprisingly a direct link between the existence of national MCS coordination systems and the effectiveness of national MCS coordination. FFA member States could significantly improve their MCS effectiveness through prioritizing the development of national coordination processes through MOUs between relevant agencies, and/or the establishment of national MCS coordination committees that engage all relevant agencies at the domestic level. These processes should operate continuously with regular meetings of all relevant agencies – not just during regional operations.

### 3.4.3 Priority responses – Legislation & Management Plans

The Compliance Review notes ongoing work within the FFA and various previous studies that have identified the need for updating legislation in light of developments within the WCPFC, HMTCs and the PNA Vessel Day Scheme. This Review recommends that FFA members prioritize reviewing and updating their fisheries legislation and adopt a legislative framework approach that specifies fundamental requirements (i.e. flag and port State controls, boarding and inspection provisions on the high seas etc) while allowing for flexibility through subordinate legislation such as regulations, conditions of license and gazette notices as circumstances arise.

The Review recommends that particular attention be paid to sanctions, noting that forfeiture provisions are often not an effective deterrence or substitute for adequate sanctions given the often low value of fishing vessels throughout the region. In support of this, the Review recommends that the FFA secretariat work with national authorities to develop sanctions guidelines that reflect the severity of IUU fishing and its impact on environmental social and economic matters.

Finally, the Review recommends that FFA further support regional prosecutions workshops on an annual basis and consider the development of a unified and harmonized prosecutions manual to assist FFA members in successful prosecutions, particularly in regard to the often technical nature of fisheries prosecutions.

### 3.4.4 Priority responses – Port Controls and Monitoring

Significant weaknesses in port controls and monitoring are undermining the effectiveness of MCS in many FFA members. Furthermore, many FFA members are not maximizing the opportunities to utilize their ports to strengthen and support MCS. For example, the Review notes the weak implementation of the HMTc relating to pre-fishing inspections and recommends that FFA members priorities implementation of the HMTc relating to pre-fishing inspections. The Review suggests that the FFA implement a requirement that all vessels on the FFA Registry of Good Standing must undergo a pre-fishing inspection before listing.

Port monitoring and inspections need to be supported by effective data management processes. However, as noted earlier, this is a significant weakness across the region. In 2006, a FAO & WCPFC sponsored workshop into the feasibility of a regionally harmonized Port State Inspection Scheme for FFA Members noted the urgency of this need and concluded that:

“Information management is the most critical area of the inspection process that requires strengthening.”<sup>29</sup>

In response, the Compliance Review recommends that the FFA consider the development of an MCS database for use by FFA members, as discussed above, and ensure that it explicitly addresses the data management requirements for port inspections.

Some FFA members do not have the option to implement strong port monitoring and inspection processes as they simply lack an adequate port within reasonable steaming distance from the fishing grounds. Where it is not practicable to require a vessel to enter a coastal State’s port (in circumstances where the coastal state does

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<sup>29</sup> Brown, Colin. 2006. Field Study on Port State Measures for the FAO/FFA Regional Workshop to promote the full and effective implementation of Port State measures to combat IUU Fishing – FAO Consultant.

not have a port, or where the fishing ground is remote from the coastal State's port), then the coastal State should cooperate with relevant port States to ensure that the vessel is inspected in accordance with the coastal State requirements in a convenient foreign port (for example – Cook Islands could establish cooperative mechanisms with American Samoa to enable 100% inspections of all Cook Island license longliners through Pago Pago).

Finally, to support increased port monitoring and control, the FFA should priorities capacity building in port monitoring and consider establishing regional hubs in key ports that would enable inspections in accordance with all relevant coastal State licensing requirements – not just the port State's licensing requirements.

### **3.4.5 Priority responses – Observer Schemes**

Regional observer programmes have achieved much in the past few months in order to meet the new pressures of the two month FAD closure and the forthcoming 100% observer requirements for purse seine vessels. Whilst we note the immediate focus is on meeting PS requirements, we recommend that the FFA direct more focus to meeting observer targets on longline vessels. The Review notes that assisting members with meeting LL observer coverage targets is an important action in FFA's Regional Observer Strategy agreed at FFC67.

In recognition of the large difficulties in getting observers on to longline vessels (remote operations, length at sea, poor living conditions, DWFN opposition, etc), the Review recommends that the FFA supplement observer monitoring with electronic daily catch reporting through the VMS. The Compliance Review notes that the implementation of electronic daily catch reporting by the PNG National Fisheries Authority on both purse seine and longline fishing vessels, is utilizing the same VMS technology as operated by the FFA. There appears to be no technical reason why such a regime could not also operate throughout the FFA region. Implementation of electronic daily catch reporting would be a strong response to problematic reporting by longline vessels throughout the bigeye, albacore and swordfish fisheries.

Furthermore, the Review recommends that the FFA explore additional forms of remote monitoring (such as drum monitors, cameras etc).

### **3.4.6 Priority Responses – Regular MCS implementation reviews**

The Compliance Review provides a helpful tool to monitor and improve implementation of core MCS components, beyond the life of this one-off review. Given the highly dynamic nature of fisheries management within the FFA region, the Review recommends that the FFA update the Compliance Review (amending the performance indicators as necessary) and implement an annual or biennial review of MCS implementation utilising the methodology and performance indicators developed through this project. This review should be undertaken by national governments, reporting to the FFA MCS Working Group with assistance from the FFA secretariat. This will ensure national engagement in a regular review and maximise its benefits by building a greater understanding of MCS requirements and current levels of implementation.

The project team suggests the following schedule for implementing an annual/biennial review:

1. March 2010 – FFA Secretariat distributes draft National Compliance Review Guidelines and Forms to MCS-WG members for consideration. Guidelines and Forms are based upon methodology and national assessment tables provided in Full Project Two report provided in appendices.
2. April 2010 – MCS-WG discuss and consider adopting Compliance Review Guidelines and Forms with agreement that all members will undertake a National Compliance Review annually or biennially.
3. January/February 2011 – FFA members fill out the Compliance Review Forms in accordance with the agreed guidelines.
4. March 2011 – FFA members submit completed forms to the FFA Secretariat.
5. March/April 2011 – FFA Secretariat review and analyse National Compliance Review forms to identify regional trends in implementation and highlight priority areas for capacity building and

support. FFA Secretariat distributes an information paper reporting on National Compliance Review outcomes and analysis to MCS-WG members for consideration.

6. April 2011 – MCS-WG discusses analysis of National Compliance Review and identifies priority areas for FFA capacity building and support.
7. March 2012 – Repeat steps 1 through 6.



## Chapter 4: Information Management

### 4.1 Introduction

This chapter first provides the background on Project Three objectives and an overview of the approach and methodology used by the team in achieving these objectives. This is followed by the summary of results, including the key issues in current MCS information management and the proposed strategy for the future. Each of the three key aspects of the proposed strategy is described and discussed. The chapter concludes with a discussion of the key recommendations.

#### 4.1.1 Project Objectives

The objective of Project Three was to develop a framework and policy for the collection, processing, storage and exchange of fisheries and MCS specific data in support of national, sub-regional and regional MCS initiatives undertaken by FFA Members.

In support of the stated objective, the definition of a new and improved regional MCS information system has been documented along with enhancements to existing systems.

Project Three also provides an approach to sharing information that minimizes the likelihood of misuse through applying a formalized policy, rules and procedures for the protection, exchange and use of information for specific legitimate purposes.

#### 4.1.2 Approach and Methodology

In summary, the project team:

1. conducted a data needs analysis of the ten main MCS components identified by the Compliance Review (Project Two). Data models were developed<sup>30</sup> and have been provided for each MCS component;
2. conducted a survey as part of the in-country visits, from which an assessment of the national capability in a range of areas was formed;
3. established a picture of the gaps in data management based on our assessments and from the results of Project One and Two;
4. proposed a strategy for improved MCS data and information management that will address the current gaps, both within member countries and at the regional level; and
5. developed a draft policy and standards that will facilitate the sharing of key MCS information.

### 4.2 MCS Information Management: the Present and the Future

The landscape of MCS activities and MCS related information systems in the FFA region is in constant change. There are a number of initiatives underway that have the potential to improve how data is collected, shared and used. While many of these initiatives do not set out to directly support MCS, the data being collected can invariably contribute to the information required for effective MCS.

At present there is no cohesive approach with respect to how MCS information is treated. It is hoped that this strategy places future developments in an overall context that enhances the benefits that will be derived from collaboration.

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<sup>30</sup> The conceptual data models have been developed using Entity Relationship (E-R) methodology. Appendix 4.1 includes the data model diagrams and the corresponding data dictionary.

### 4.2.1 The Present: Weaknesses and Strengths

Already mentioned in Project Two are some significant weaknesses associated with data management and MCS coordination. More specifically, Project Three notes the following issues:

- information is not readily available for MCS practitioners;
- access within countries to raw VMS data is limited;
- data sharing and comparisons are hampered by inconsistent coding of information;
- multiple records exist of vessels, also causing problems for sharing and correlating data;
- vessel inspections data is not being systematically collected;
- records of surveillance and response effort is not being systematically collected; and
- inefficient or non-existent data exchange occurring for MCS purposes.

At the same time though, there are also tangible strengths in the existing systems that should not be overlooked and lessons have been learned from the implementation of these systems.

Fisheries Departments in almost every country have a comprehensive information system in place. Typically these systems have evolved from a basic licensing system to eventually support, to differing levels of effectiveness, the collection and analysis of data from a number of sources, including logbooks, observer forms, unloading and port sampling, etc. Such systems are generally well suited to the processes they have been designed to support. The acceptance of Information and Communications Technology (ICT) and the level of support for ICT are generally quite good and, although there are still significant gaps, it appears to be improving in most locations. In addition, the level of support provided by FFA and SPC is well regarded in most instances.

The national Fisheries Departments and Law Enforcement Agencies have also had a number of regional initiatives with the VMS system being the most successful. The VMS suffered a number of technical problems in the past when it was a truly distributed system. It was recently consolidated and moved to a managed data centre in Sydney and many of the technical issues have now been resolved.

The Tuna Fishery Data Collection Committee is a joint committee between FFA and SPC. Their stated objective is “to ensure the standardization of information collected throughout the region so that any analytical work (e.g. stock assessment) would not be compromised by missing information, as a result of differences in data collection forms”. Through this committee there is an opportunity to ensure MCS information collected in these forms is harmonized.

In most countries there is a Tuna Data Manager receiving ongoing training in the management and use of fisheries data and its importance.

### 4.2.2 The Future: Strategy for MCS Information Management

Project Three proposes a strategy to address the current gaps in MCS information management. The three main aspects of this strategy are:

1. strengthening National Capacity in MCS Information Systems;
2. establishing an MCS ‘Regional Information Management Facility’ (RIMF); and
3. establishing a Regional ‘Information Exchange Model’.

The vision is to create the desired environment by combining the strengths of existing successful systems and processes with a new set of tools that provide effective solutions to the needs and are supported by agreed practical rules, procedures and standards.

### 4.3 Strengthening National Capacity

Of the ten main MCS components, ‘MCS Coordination, Data Verification and Sharing’ has been identified as the weakest in most of the member countries and overall at the regional level. Improving national capacity for MCS data and information management is clearly an essential element in building the future environment, and one that is necessary to adequately support MCS information needs. The next four sections (4.3.1 – 4.3.4) identify the key aspects in the strengthening of national capacities.

#### 4.3.1 Building on existing National Systems

Section 4.2.1 has identified a number of strengths with respect to national capacities in managing fisheries and MCS data, and in particular the existence of database systems to support the process of licensing vessels to fish in a country’s EEZ’s. The fact that such systems collect a wide range of relevant data provides the rationale for the proposed direction of building upon the existing national data repositories.

The most commonly used system at the national level is TUFMAN, although the level of its use varies between countries. This system is promoted and supported by SPC. Under the terms of reference, the team reviewed TUFMAN and its suitability for MCS purposes<sup>31</sup>. It was determined that TUFMAN, and the supplementary TUBS observer system (newly completed), support some, but not all of the ten main MCS components. A quick overview of which components are supported is provided in the following table (without going into details on how, and to what extent a component might be supported):

Table 4.1: TUFMAN/TUBS support for main MCS components

	MCS Component	
1	Licensing	SUPPORTED
2	Vessel Monitoring System	NOT SUPPORTED
3	Observer Programmes	SUPPORTED
4	Vessel Records and Authorization to Fish	SUPPORTED
5	Port Inspections	NOT SUPPORTED
6	Prosecutions	NOT SUPPORTED
7	Boarding, Inspection & Surface Patrols	NOT SUPPORTED
8	MCS Coordination, Data Verification and Sharing	SUPPORTED
9	Aerial Surveillance	NOT SUPPORTED
10	Legislation, Regulations and Management Plans	NOT SUPPORTED

The support for MCS components within TUFMAN/TUBS is mainly by way of having a wide range of relevant data recorded within the system’s database and, to a lesser degree, by having certain reports available and certain functions for comparing data from various sources.

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<sup>31</sup> The full review of the TUFMAN system is provided in the Appendix 4.2.2.

The key finding with respect to TUFMAN/TUBS is that the use of this system for the purposes that it was designed to fulfill should continue. At the same time, it should be noted that TUFMAN/TUBS is not an ‘MCS system’ by design and should not be further developed to include any operational MCS functions (such as those identified in section 4.3.3). However, and most importantly, TUFMAN/TUBS provide an invaluable database with much potential for MCS use and should therefore be enhanced through a supplemental system, as described in the next section. This same approach applies to the other systems in use such as LARs (PNG) and SOLIC (Solomon Islands)<sup>32</sup>.

### 4.3.2 Compliance Analysis Engine

It is, and will continue to be the responsibility of each member country to monitor and analyze the compliance of the vessels within its jurisdiction. A consistent weakness however, as identified in Project Two, was the lack of capability to use available data to ensure compliance with the various MCS and fisheries regulations in place.

A new system named Compliance Analysis Engine (CAE) is formulated, as part of the proposed framework, to be developed and deployed for use in member countries in support of strengthening their national capacity. The main purpose of the CAE is to establish a comprehensive compliance history of vessels, vessel masters and vessel owners/operators by using the wealth of data that exist within the country’s licensing system augmented with the vessel position and track data from the VMS system.

One key outcome from the introduction of the CAE will be a significantly improved capability for a variety of MCS activities, including:

- detecting possible violations;
- enabling follow up investigation by the national agencies for possible actions against the master and/or owner/operator;
- planning and executing targeted MCS activities.

Another key outcome is the pooling of data that will occur from national CAE systems into the MCS Regional Information Management Facility (see 4.4 below). Compliance history records (described below) will be combined from all counties into a single regional database available to all MCS stakeholders.

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<sup>32</sup> These systems were unable to be reviewed; however given that much of the development of these systems has been shared by SPC and an ex-SPC developer we assume that the functionality is very similar.

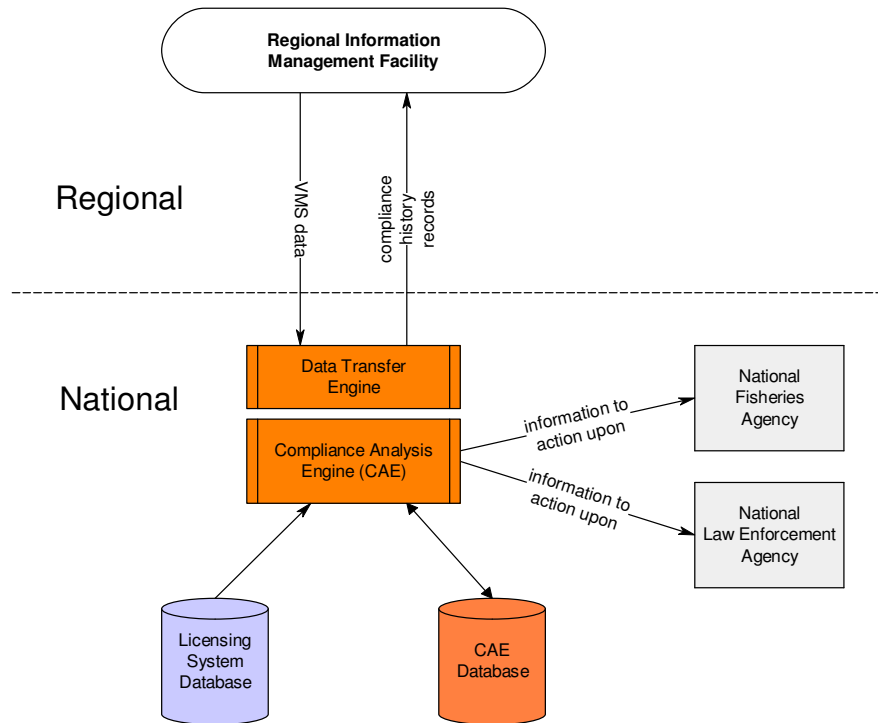


Figure 4.1: Enhancing the National Capacity of MCS through CAE

### Brief Description of the CAE

The Compliance Analysis Engine will feature automated, as well as user-assisted methods (checks) for cross referencing the same types of data which are provided by different sources. As an example, one compliance analysis method would be to verify logbook, observer and VMS position reports using a map based tool (such as Google Earth) to identify any anomalies. Another analysis method may involve comparing logsheet catch data vs. observer catch data vs. unloading data, etc. Basically, any relevant data available within the national system, plus the VMS data, will be used to execute different types of compliance checks. Information derived from these analyses will assist FFA members in addressing key risks highlighted in Project One (e.g. misreporting catch).

Resulting from each compliance analysis, the CAE system would produce and store in a database one or more 'compliance history' records that represent possible violations or an 'all-clear' result. These records will include data such as:

- the vessel involved
- the fishing master at the time
- vessel owner/operator at the time
- the scope of data covered (e.g. the specific vessel trip)
- the type of violation detected (or 'all-clear')
- when the violation occurred
- where the violation occurred (EEZ)
- additional notes specific to this violation, etc.

As a final note, all exchanges of data between the CAE and the MCS Regional Information Management Facility's database will be: a) fully secure and conforming to the policy for data sharing (described later in section 4.5.1) and, b) automated through a standard data exchange mechanism<sup>33</sup>.

### 4.3.3 Additional MCS Operational Systems

Taking into account the findings of Projects One and Two with respect to the current gaps in certain MCS components at the national level, Project Three has identified the need for additional operational MCS systems that will address these gaps.

The four operational systems envisaged are:

- Vessel Boarding and Inspection (at sea and in port)
- Surveillance (Patrols and Sightings)
- Violations and Prosecutions
- Observer Programme Management

As stated earlier, rather than developing 'add-on' modules for current licensing systems (such as TUFMAN), the required additional operational functionality would be made available to countries as tools and services provided by the MCS Regional Information Management Facility. The proposed systems are more suited to being deployed through a centralized server as secure web applications to take advantage of the benefits of a centrally managed infrastructure that is widely accessible to a range of stakeholders.

To get the flavour of how the MCS Regional Information Management Facility will incorporate and support these operational systems, a brief description of the Vessel Boarding and Inspection system is provided here. The detailed description of the functionality for all four systems is provided in Appendix 4.3.2.

#### **Brief description of the Vessel Boarding and Inspection System**

The increasingly important MCS function of vessel inspections, both at sea and in port, is not currently supported by information systems, apart from some countries recording the inspection in an ad-hoc database or more commonly a spreadsheet.

The new Vessel Boarding and Inspection system would have a 'data collection' component aimed at capturing all data recorded on the inspection report for subsequent use as required. In addition, and maybe even more importantly, the system will feature an 'active' component that would significantly enhance the inspection process by allowing the inspection officer to request and receive the vessel details, compliance history, license information and latest vessel positions directly from the MCS Regional Information Management Facility. The officer can then use this information to compare it with vessel characteristics, license information and logbooks as part of the inspection. In addition, the tool installed on a laptop could facilitate direct comparison of logbook data by including the facility to enter coordinates from the logbook and compare these with what was recorded by the VMS (this being a real-time exercise on the bridge).

Finally, the Vessel Boarding and Inspection system will enable a compliance analysis report to be generated and compliance history records be sent into the MCS Regional Information Management Facility.

### 4.3.4 Ongoing Training

In any information system implementation, an on-going training and user support function is fundamental to achieving maximal utilization of the system and its ultimate success. SPC have been providing resources to train and support TUFMAN users. Project Three country questionnaires have given us evidence that this type

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<sup>33</sup> A mechanism for standardized data exchange, named 'Data Transfer Engine', is described in the Appendix 4.3.2.3.

of support was the most appropriate and that other means, such as online training and manuals, were not as well received by stakeholder users.

Our findings reaffirm the significance of on-going training and support and recognize that appropriate training resources will be required and should be planned for the implementation and maintenance of the MCS Regional Information Management Facility.

#### 4.4 **MCS Regional Information Management Facility (RIMF)**

Strengthening national capacity is only the first element of a collaborative approach to MCS information management that will ultimately provide adequate and comprehensive support for all MCS components. The second element is derived from the fact that many benefits can be achieved only by using the ‘sum of the parts’ approach, that is, combining data from various individual sources into a comprehensive data repository and then sharing information with all stakeholders as required. To bring about the ‘sum of the parts’, and generate added value and benefits, an MCS Regional Information Management Facility (RIMF) should be established as the second key component of the proposed strategy.

##### 4.4.1 **MCS RIMF Architecture and Key Design Principles**

The MCS Regional Information Management Facility can be defined as an integrated information management environment which includes systems and databases that support national and regional MCS functions, activities and initiatives and contributes to the strengthening and improvement of the national MCS capacities. The MCS RIMF will provide effective and comprehensive functionality and will focus on maximizing the availability, timeliness, quality and usability of MCS data and information, securely shared and used in accordance with established and agreed policies.

A conceptual representation of the MCS RIMF architecture is shown in Figure 4.2 below:<sup>34</sup>

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<sup>34</sup> A detailed diagram of the MCS RIMF architecture and description of its components is provided in the Appendix 4.3.2.

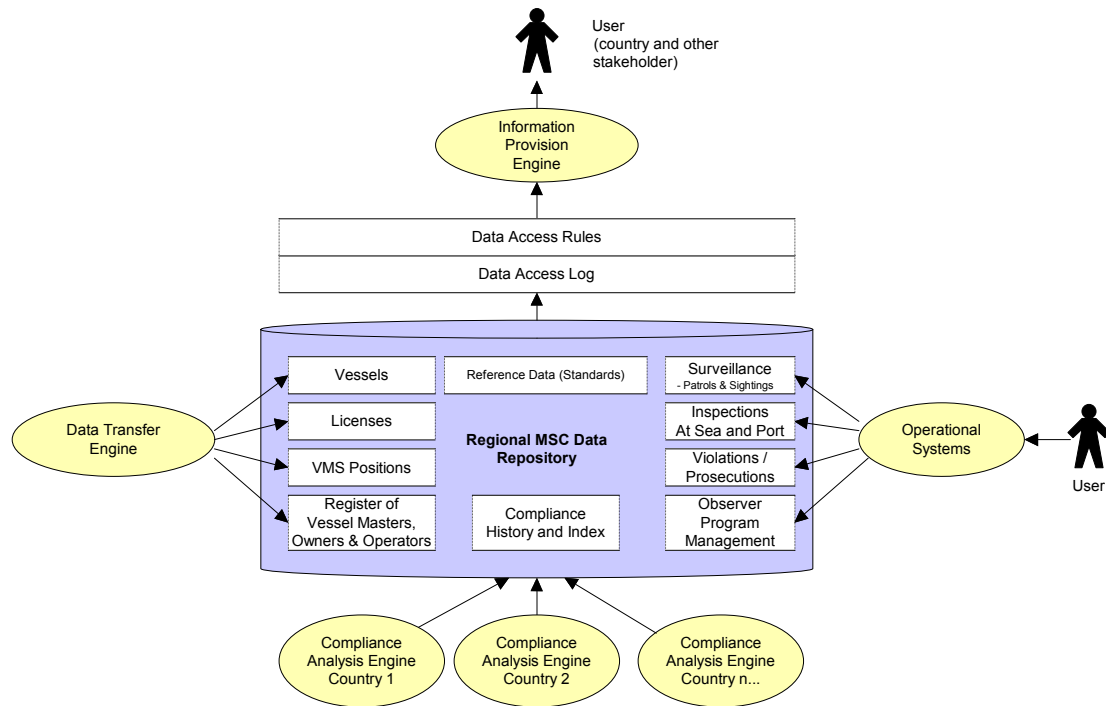


Figure 4.2: Conceptual MCS RIMF architecture

At the core of the RIMF there is a comprehensive MCS data repository, continuously updated (using secure interfaces) from multiple sources such as the national licensing systems and key regional systems. A wide-ranging functionality is provided to run on top of the repository and deliver information to stakeholders in support of MCS activities nationally and regionally.

The key design principles of the MCS RIMF include:

- Stakeholders are satisfied that the information is secure and only able to be accessed by authorized parties for legitimate MCS purposes.
- A centrally managed and supported system providing various services and tools to its users (national and regional);
- Modularity, whereby the system, once proven, can be incrementally developed taking into account priority functions;
- Founded on a well defined database architecture;
- Applying most appropriate technologies, in particular web/internet, taking into account any limiting factors and providing fault tolerance;

#### 4.4.2 MCS RIMF Benefits

One of the primary benefits of the MCS RIMF will be derived from its ability to provide compliance related information on vessels and vessel masters, including a detailed and comprehensive history of (non) compliance. Using this history, vessels and masters will be evaluated and scored on an on-going basis and assigned a Compliance Index (CI). This will, amongst other things, lead to more targeted MCS activities. Information on how vessels and masters have been complying with MCS regulations and relevant legislation will be pooled from all countries, based on analysis conducted at the operational level using the Compliance Analysis Engine (section 4.3.2). It will then be shared effectively throughout the region via the RIMF.



Other key benefits of the RIMF include: providing an improved information base to refine risk assessments, undertake surveillance and coordinate regional surveillance and other MCS activities; support for additional MCS operational level systems and associated data as defined in section 4.3.3; the sharing of up-to-date essential MCS data such as vessel attributes, licenses and authorizations to fish, details of vessel masters and owners/operators; etc.

Last, but not the least, is the support that RIMF will provide for maintaining harmonized data standards with a repository of up-to-date common reference data, such as: fishing vessel and gear types; country and port standard names and codes; standard violation types; maritime boundaries; etc.

### 4.4.3 RIMF in the context of Existing Systems

In addition to the national licensing systems discussed earlier, support for certain MCS components has also existed at the regional level with the information systems of FFA, the Pacific VMS infrastructure and more recently the WCPFC Record of Fishing Vessels.

The MCS RIMF clearly acknowledges the overall regional MCS ‘landscape’ and has its place appropriately determined within this wider context of existing national and other relevant regional systems. The MCS RIMF will not overlap with such systems in terms of functionality and will interact with, and enhance, these systems through standardized data exchange mechanisms.

Figure 4.3 provides an overview of the place the MCS RIMF has in relation to other existing systems.

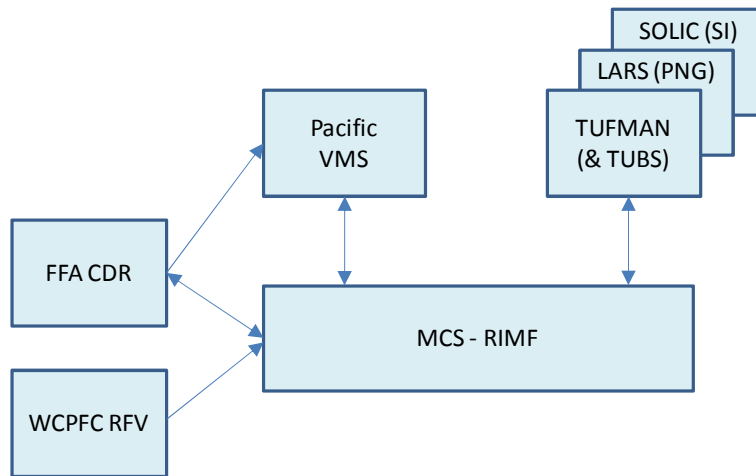


Figure 4.3 – MCS RIMF within the context of other relevant systems

Each of the external systems shown on the above diagram plays a major role in the proposed strategy as a ‘data provider’ for the RIMF data repository. Further, some of these systems will also be the ‘receivers’ of relevant data from the RIMF. A detailed description of how the RIMF interacts with each individual external system is provided in the Appendix 4.3.2.2.

## 4.5 MCS Regional Information Exchange Model

Considerable advantages have been highlighted by these projects arising from working in cooperation and collaboration to achieve MCS and fisheries management goals. Data, and information derived from it, is just another resource, and it would be hard to argue that it shouldn't be exchanged and shared between stakeholders.

Notwithstanding that, protecting highly valuable and sensitive data from possible destruction, improper alteration or misuse is paramount. This project fully acknowledges this requirement and, under the concept of the 'Information Exchange Model', provides an initial framework for effective exchange, sharing and use of information. The Information Exchange Model incorporates two equally important aspects: rules and procedures for the protection and use of information, and the harmonization of data standards.

### 4.5.1 Policy for Secure and Effective Information Sharing

The Niue Treaty provides an unqualified legislative foundation for the sharing of information. Article 5 of the Niue Treaty in particular states:

"1. Each Party shall, to the extent permitted by its national laws and regulations, provide to the South Pacific Forum Fisheries Agency, or to any other Party directly, information relevant to the purposes of this Treaty, including but not limited to information about:

- the location and movements of foreign fishing vessels;
- foreign fishing vessel licensing; and
- fisheries surveillance and law enforcement activities.

2. The Parties shall develop standard forms and procedures for reporting information provided under paragraph 1 of this Article and effective methods for communicating such information."

Building upon the above overarching statement, Project Three has suggested 'Draft Rules and Procedures for the Protection, Access to, and Use of Information held within the MCS Regional Information Management Facility'.<sup>35</sup>

The key underlying principles used for developing the Rules and Procedures are that the rules will:

- provide confidence to countries and other data providers concerning the importance placed on data confidentiality and security by the MCS RIMF
- support the purposes of cooperative and collaborative regional MCS activities
- be practical, transparent and unambiguous
- be adaptable
- reflect uses to which information may legitimately be put
- be regularly reviewed

In addition to developing the rules and procedures, the RIMF will include a system to record and enforce these rules. All data accessed from RIMF will be processed by the 'data rules engine' and a record of access to the data will be logged automatically.

### 4.5.2 Harmonized Data Standards

Harmonization of data standards applies across two levels. On one level there is a human aspect of data standards, which is to make the data consistent in meaning and interpretation by all parties. A common tool for

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<sup>35</sup> The full text of these Rules and Procedures is included in Appendix 4.5.

conveying this is the use of a data model and an associated data dictionary. The other level of data standards applies to automated electronic data exchanges and having an agreed format to facilitate such exchanges.

The data model and data dictionary are provided in the Appendices 4.1.2 and 4.1.3. They define the key data entities which are required for MCS functions and provide a clear and unambiguous description of each entity. Also, a suggested draft standard classification of violation types has been developed as a starting point in the support the consistent use and sharing of compliance data (Appendix 4.3.3.2).

## 4.6 Recommendations

This section summarizes the essence of what Project Three proposes for a comprehensive regional MCS information management system, being a strategy that is based on the following three main components:

1. Strengthening National Capacity in MCS Information Systems
2. Establishing an MCS ‘Regional Information Management Facility’
3. Establishing a Regional ‘Information Exchange Model’

The strategy could be implemented through addressing the following four ‘focus areas’.

### 4.6.1 Promote, support and enhance National Systems

Ensure that resources are planned for and made available to promote, support and enhance national systems on a continuous basis. TUFMAN/TUBS (LARs, SOLIC) are invaluable systems that provide some of the essential MCS data. Maximizing the utilization of such systems, the quality of data they capture and store and further supplementing them with the Compliance Analysis Engine will go a significant way forward in addressing and reducing the gaps that currently exist.

### 4.6.2 Establish Information Exchange Model

Establish an MCS Information Exchange Model which includes the following:

- adoption of the Rules and Procedures for information sharing and use;
- establishing standards for key MCS data types, including data definitions and data exchange formats; and
- the development of the ‘Data Rules Engine’ and the ‘Data Transfer Engine’ that will provide system support for the Information Exchange Model.<sup>36</sup>

A working party could be established in the same manner as the Tuna Fishery Data Collection Committee to continue the development and adoption of standards for MCS information systems within the region. This committee is likely to be coordinated by the MCSWG.

### 4.6.3 Implement the Core RIMF Functionality

Implement the core RIMF functionality to provide the platform for the sharing and use of the following essential MCS data in a secure and coordinated manner:

- Vessels (including masters, owners/operators)
- Licenses
- VMS data
- Compliance History and Compliance Index
- Reference data

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<sup>36</sup> Detailed description of the Data Rules Engine and Data Transfer Engine is provided in the Appendix 4.3.2.3.

To house the above core data, a well structured database will need to be designed and implemented, together with an effective user interface that best supports the specific business processes of MCS.<sup>37</sup>

#### **4.6.4 Develop additional MCS Operational Systems**

As the first step, develop a Vessel Boarding and Inspection system that integrates with the RIMF through receiving up-to-date background information needed for an inspection, recording the inspection report data, applying compliance analysis of the inspection event and transmitting the compliance history records back to the RIMF.

Once this first application is adopted and the concept of providing operational MCS functionality through centralized tools and services is proven, three additional systems should be developed to support:

- Surveillance Missions and Vessel Sightings;
- Management of Observer Programmes;
- Investigation of violations and capturing the outcomes of Violations and Prosecutions.

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<sup>37</sup> Additional details on the core RIMF functionality are provided in the Appendix 4.3.2.4.

## Chapter 5: Regional MCS Coordination

### 5.1 Introduction

Regional cooperation in fisheries management, including MCS, was formally initiated in the Pacific with the establishment of the Forum Fisheries Agency (FFA) in 1979. Over the past 30 years member countries of the agency have pioneered the development of a range of MCS initiatives in support of fisheries conservation and management. Those based on cooperation include the Regional Register, Harmonised Minimum Terms and Conditions of Access (MTCs), multi-lateral licensing, the regional Vessel Monitoring System (VMS) and the Niue Treaty providing for joint and reciprocal surveillance and enforcement.

South Pacific countries established FFA to promote and safeguard their common interest in the conservation and optimum utilization of living marine resources and in particular of the highly migratory species. In its first decade of existence, FFA members focused attention on establishing authority over their respective Exclusive Economic Zones (EEZ) and ensuring that all vessels that fished in these zones were licensed to do so. The focus of attention today is on maximizing benefits through effort limits and other measures throughout the fishery and domestic development initiatives. As part of these efforts, FFA members are seeking to exert greater control over high seas fishing activity. All these activities are being pursued under the new fisheries management environment created by the WCPFC, and will require an effective MCS system that supports fisheries management objectives.

This chapter sets out the results of Project 4: Regional MCS Coordination. The objective of the project was to “to identify the benefits and means of achieving improved MCS outcomes for FFA members by coordinating and combining national MCS assets and other resources and activities at a regional level, and examine the methodology and functional specification for the establishment, funding and operation of a Regional MCS Coordination Centre (RMCC)”.

### 5.2 Approach and Methodology

The development of this chapter has been heavily guided by the outcomes of Projects 1, 2, 3 and 5 as well as by FFA member inputs sought during an extensive program of in-country visits that included inter-agency workshops and individual stakeholder consultations. This process was augmented by a workshop and supplementary discussions at the 12<sup>th</sup> MCS Working Group Meeting in Honiara (April 2009) to discuss the proposed roles of the RMCC and other frameworks for cooperation.

This paper builds on the MCS risks and needs outlined in other projects by examining how these can be better addressed through improved cooperation as well as the conditions required to achieve effective cooperation. The paper then examines the role, function and establishment of a mechanism to support and facilitate enhanced cooperation – a Regional MCS Coordination Centre.

Throughout this chapter the term ‘cooperation’ has been used in its broadest sense and includes other forms of cooperation such as coordination and collaboration.

### 5.3 Benefits of Regional MCS Cooperation

These projects have highlighted benefits of regional cooperation at both strategic and operational levels and across all components of MCS. They have also reinforced the fact that while considerable benefits exist in cooperation at the regional level, significant benefits can also accrue through cooperation at other levels – e.g. sub-regional, bilateral and intra-national etc. In addition, the benefits of cooperation are not limited to the FFA membership. Given the transboundary nature of fish stocks and the global nature of modern fishing fleets, considerable potential benefits also exist through cooperation within external States and agencies (e.g. cooperative port State monitoring and enforcement, flag State action).

At the strategic level effective conservation and management of regionally shared tuna stocks depends on the full cooperation and active participation of individual FFA member countries responsible for the management

of distinct geographical areas through which the shared resources migrate. FFA members have found benefit in cooperating in fisheries management because of the migratory nature and value of the tuna resources, the large size of national jurisdictions and the relative lack of resources each individual country has to develop and sustainably manage their waters. By pooling their resources and developing cooperative management initiatives FFA members have together developed powerful management mechanisms such as the Regional Register to exert some control over fishers.

In more recent years, strategic cooperation amongst the FFA membership has allowed PICs to extend their influence beyond their EEZs by acting as a bloc in the WCPFC to influence the MCS arrangements on the high seas.

At the operational level, numerous examples of benefits arising from improved cooperation amongst the region exist. A summary of the benefits, together with relevant examples from within the FFA region, are outlined in Table 5.1. It is worth noting that whilst regional cooperation may facilitate these operational benefits, they are generally realized at the national level where sovereign powers and legislative frameworks permit direct enforcement activities such as boardings, inspections, apprehensions, seizures, prosecutions and the like.

Table 5.1: Benefits of Cooperation in MCS within the WCPO

Benefits of Cooperation	Examples for MCS within the FFA Membership
<b>Improved cost-effectiveness</b>	<ul style="list-style-type: none"> <li>• <u>Cooperative port State enforcement</u> - (e.g. undertaking boarding and inspection for enforcement purposes at next port of call, rather than deploying expensive at surface/aerial response assets)</li> <li>• <u>Surveillance and response asset sharing</u> – (e.g. Niue Treaty operations to share responsibility for both sides of a maritime border. Ship-rider agreements provide MCS support at no cost to FFA members).</li> <li>• <u>Observer sharing</u> - (e.g. creating regional ‘pools’ of observers – e.g. through Regional Observer Program – reduces overall training and other costs)</li> <li>• <u>Long-arm enforcement</u> - (e.g. taking action under collective MCS mechanisms such the Regional Register or WCPFC IUU list may be more cost effective than undertaking at sea apprehensions)</li> </ul>
<b>Greater MCS coverage</b>	<ul style="list-style-type: none"> <li>• <u>Cooperative port State enforcement</u> (e.g. cooperative catch monitoring and enforcement arrangements between a coastal State and port State. Particularly beneficial for members with unsuitable port facilities – e.g Nauru, Tokelau – and where vessels licensed by a member do not regularly come into their ports).</li> <li>• <u>Patrol vessel sharing</u> - (e.g. Niue Treaty operations to permit other members to patrol areas a long way from patrol bases. Ship-rider agreements to permit transiting vessels to provide MCS support).</li> <li>• <u>Observer sharing</u> - (e.g. observer sharing between members with well-developed observer programs and those without would help meet WCPFC and other coverage targets)</li> </ul>
<b>More accurate regional stock assessments</b>	<ul style="list-style-type: none"> <li>• <u>Information sharing</u> between FFA members and SPC - (e.g. logbook information sharing between FFA members allows for stock-wide resource assessments that would be impossible without regional cooperation).</li> </ul>
<b>More targeted MCS activities</b>	<ul style="list-style-type: none"> <li>• <u>Information sharing</u> – (e.g. centralization of data holdings with subsequent analysis and dissemination of intelligence).</li> </ul>
<b>Faster response times</b>	<ul style="list-style-type: none"> <li>• <u>Cooperative port State enforcement</u> (e.g. networks of cooperative port State enforcement arrangements allows for action to be taken against suspect vessels at a number of ports, rather than only those in the coastal State in which the suspect activity occurred).</li> <li>• <u>Patrol vessel sharing</u> - (eg. Niue Treaty operations to permit the closest vessel</li> </ul>

	to respond to suspected IUU activity).
<b>Improved deterrence</b>	<ul style="list-style-type: none"> <li>• <u>Cooperative port State enforcement</u> (e.g. broad scale cooperation on port State enforcement allows no 'safe havens' for suspect vessels; a strong, visible presence at ports across the FFA region encourages voluntary compliance and is a deterrent to IUU).</li> <li>• <u>Patrol vessel sharing</u> – (e.g. networks of agreements under the Niue Treaty improve the chances of an asset being 'just over the horizon'; also maintains deterrence during maintenance periods).</li> <li>• <u>Regional Register action</u> (e.g. suspension/cancellation of access to all members' waters by committing an offence in one member's waters provides enhanced deterrent through cooperation)</li> </ul>
<b>Greater operational redundancy</b>	<ul style="list-style-type: none"> <li>• <u>Patrol vessel sharing</u> – (e.g. Niue Treaty operations to provide MCS coverage when national vessels are undergoing maintenance).</li> <li>• <u>Observer sharing</u> (e.g. observer sharing better allows FFA members to meet WCPFC coverage targets where national observers are occupied/unavailable)</li> </ul>
<b>Creation of new capabilities</b>	<ul style="list-style-type: none"> <li>• <u>Integration</u> – use of patrol vessels to position and recover observers in long-line vessels.</li> </ul>

More detailed consideration of the operational benefits of cooperation, using specific examples from a range of MCS components, is provided in section 5.3 of Appendix 5.

## 5.4 Requirements for Enhancing Regional MCS Cooperation

Noting the considerable further potential to strengthen MCS arrangements through cooperation identified in section 5.3 above, this section explores the fundamental conditions and mechanisms required to significantly enhance cooperation across the region. These are: effective legal frameworks, strong national MCS frameworks, standards and systems for cooperation, effective information exchange, standard operating procedures (SOPs) with integrated training and a dedicated mechanism to facilitate cooperation - assesses their current status and makes suggestions on possible courses of action at the regional and national levels that may enhance MCS cooperation.

### 5.4.1 Effective Legal Frameworks for Cooperation

A range of treaties, conventions and MOUs already exist at both the regional and national levels to provide overarching legal frameworks for MCS cooperation (Table 5.2). Frameworks such as UN Fish Stocks Agreement and the Niue Treaty lay the foundations for structured and resilient cooperation by assigning broad powers and obligations to parties, as well as providing a platform for the development of more detailed measures under (in the case of the Niue Treaty) subsidiary agreements. More specific frameworks also exist to facilitate cooperation within individual MCS components, such as the new Port State Measures Agreement and ship-rider programs.

The key weakness in relation to legal frameworks highlighted by these projects is, arguably, not the absence of effective frameworks for cooperation, but the lack of effective 'rollout' of these frameworks amongst the membership. For example, during consultations for this project over 90% of PICs expressed a desire to expand cooperation through active participation the Niue Treaty, yet 17 years after the Treaty entered into force participation levels remain less than 20%. Additional weaknesses were also highlighted in legal arrangements at the national level that prevent parties from discharging their obligations under other cooperative frameworks (e.g. WCPFC obligations).

Table 5.2: Examples of existing legal frameworks for cooperation in the WCPO relevant to MCS

Framework	Relevance to FFA Members	Current Status
UN Fish Stocks Agreement <sup>38</sup>	International agreement to ensure the conservation and management of highly migratory fish stocks. Requires parties to “implement and enforce conservation and management measures through effective monitoring, control and surveillance.”	In force. All FFA member countries are signatories.
South Pacific Forum Fisheries Agency Convention	Founding instrument of the FFA. Provides framework for cooperation amongst FFA members, including “cooperation in surveillance and enforcement”.	In place and ongoing with no immediate opportunity for expanded participation.
The Niue Treaty	This provides an overarching “umbrella” framework for cooperation between FFA members, particularly in sharing of information, assets and personnel. Details of the actual mechanisms for cooperation are contained within subsidiary agreements.	Has been ratified by all FFA members, except Tokelau. Currently under review; PIF Leaders agreed that Australia would host a meeting in early 2010, “at which agreement is to be reached both on the form of new legal arrangements to be negotiated and on a roadmap for the negotiation process, which should conclude no later than the end of 2012” <sup>39</sup> .
Port State Measures Agreement	The new “Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing” provides a legal framework to enable a multilateral approach to port State enforcement.	Text agreed; currently undergoing the FAO approval processes prior to opening for signature in November 2009.
Ship-Rider Agreements	These legitimize cooperation through sharing of patrol vessels within a less formal framework than the Niue Treaty.	USCG has ship-rider agreements in place with 6 PICs. Further expansion may be limited by restricted capacity to exercise the agreements on a regular basis. No other ship-rider agreements appear imminent.
Inter-Agency MOUs	These enable strong cooperative relationships between agencies by agreeing on definitions, objectives, roles, responsibilities, commitments, communication processes, information sharing and cost recovery.	Embedded within the MCS frameworks of at least one FFA member.

## 5.4.2 Strong National MCS Systems

The effectiveness of regional and sub-regional frameworks for cooperation (e.g. VDS, cooperative port State enforcement, WCPFC) relies heavily upon the ability of national fisheries and enforcement agencies to implement their obligations. Strong national frameworks will generally include mature legislation, robust licensing systems, formalized frameworks for domestic cooperation such as inter-agency MCS committees and MOUs, the existence of structured MCS plan, policies and procedures and an information system to facilitate operational communication between stakeholders.

Project 2 found that while significant advances in cooperative MCS have been made at the regional level, delays in establishing complementary national frameworks have prevented FFA members from fully benefiting

<sup>38</sup> The United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks

<sup>39</sup> 40<sup>th</sup> Pacific Islands Forum, Forum Communiqué, p4.



from these initiatives. In some cases, key flag and port State responsibilities lack adequate legislation and many WCPFC provisions are yet to be properly endorsed through legislation. Project 2 subsequently recommended a comprehensive program of prioritized national capacity building activities. Section 5.5 below further considers the possible roles and functions of a coordination centre that might facilitate the implementation of these recommendations.

### 5.4.3 Standards and Systems for Cooperation

In addition to overarching legal frameworks, a range of operational standards and systems are required to provide an architecture and infrastructure for cooperation. These include clear, concise, efficiently communicated and well maintained plans, policies and procedures for cooperation, particularly with respect to the use and exchange of sensitive data (see Project 3) For more complex or larger scales of cooperation (such as within the FFA and WCPFC memberships) it is usual for an independent and centralized entity to facilitate development of these on behalf of all members. In either case, development and maintenance should be facilitated through an inclusive and collaborative forum (such as the MCS Working Group) so as to maximize ownership and acceptance by stakeholders. Where possible the status of acceptance and implementation should be measured and reported as part of an ongoing maintenance program.

The existing FFA Data Sharing Agreements (DSAs) are a good example of a functioning system for regional MCS cooperation between FFA members. Whilst not the only system for FFA members to authorize information sharing<sup>40</sup>, the utility and flexibility of the DSA has resulted in considerably improved VMS sharing (Figure 5.1). Progress in expanding cooperation through data sharing is tracked and regularly reported to stakeholders, and ongoing maintenance of FFA data sharing processes is conducted at MCS Working Group meetings. Consideration of more detailed policies and procedures to facilitate expanded data sharing are provided within Chapter 4.

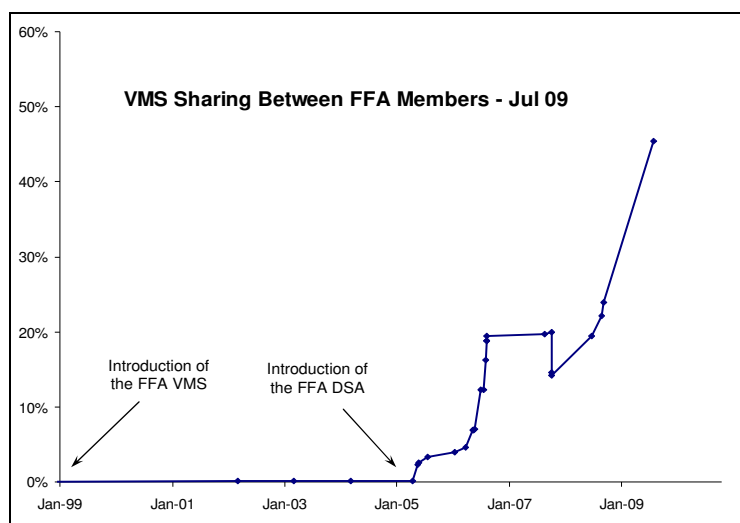


Figure 5.1: Level of VMS Data Sharing 2001- 2009, showing the FFA DSA as an example of a functional system to facilitate cooperation

<sup>40</sup> Other methods of authorising VMS sharing such as formal correspondence to FFA through diplomatic channels are also available.

#### 5.4.4 Effective Information Exchange

Timely, accurate and secure information exchange is fundamental to effective MCS cooperation. Despite some strengths, a number of significant weaknesses in information management systems at both the national and regional level were identified by these projects. In many cases information systems had been developed in isolation, data holdings were inaccurate, incomplete or inconsistent, little data validation or analysis had occurred, information was infrequently shared, information security was sub-optimal and systems for data backup did not exist.

In response, Project 3 has proposed improved information collection, storage, processing and exchange through strengthened national MCS information systems, a regional 'Information Exchange Model' to guide information sharing and the establishment of a RIMF. If fully implemented, these systems are expected to play an important role in supporting effective MCS cooperation within the FFA membership.

#### 5.4.5 Harmonized Standard Operating Procedures (SOPs) and Training

Harmonized MCS arrangements, standard operating procedures (SOPs) and integrated training facilitate effective coordination by promoting the adoption of common systems and standards. Regionally agreed SOPs promote seamless information flow and enhanced analysis by adopting standard systems for the collection and exchange of information, as well as supporting shared understandings during cooperative enforcement activity. Moreover, structured programs of regional training develop personnel who operate to an accepted best practice, and are more likely to produce outputs (and personnel) that are readily interchangeable.

These projects found that while harmonized SOPs and regional training packages existed and were working effectively for some MCS components (e.g. VMS, observer programs etc) they were lacking for critical areas such as boarding and inspection, prosecutions and surveillance planning. Improved cooperation amongst the FFA in these areas is likely to benefit from the development of integrated packages of regionally harmonized SOPs, training and advisory support. These can be adapted as necessary for national application to account for specific legislation, organizational and governance frameworks, existing MCS plans, treaties and international agreements.

#### 5.4.6 Mechanism to Facilitate Cooperation

While benefits of regional cooperation are largely recognized amongst the region and much of the legal and institutional architecture to facilitate cooperation is in place (e.g. FFA Convention, Niue Treaty) or could be relatively quickly put in place (e.g. RIMF), a considerable amount of 'cooperative potential' is yet to be realized. Consultations for these studies revealed that knowledge amongst the region of many cooperative frameworks is quite low and, even where there is recognition of the benefits of cooperation and a reasonable understanding of cooperative arrangements (e.g. Niue Treaty, VMS data sharing), many members require assistance to capitalize on the opportunities available. This need for assistance was encapsulated by one FFA member during in country consultations who, after developing a draft NTSA with a neighbor for over three years, noted we "*need assistance from FFA or other agency to provide an intermediary role in pushing the final stages of implementation through*".

This project has identified that there is a clear need for an effective facilitator to identify and promote opportunities to strengthen MCS arrangements through enhanced cooperation. Key functions provided might include facilitation of participation in cooperative frameworks, brokering information exchanges, capacity building, coordination of operational programs such as VMS, observers and maritime surveillance, and strengthening national systems to better allow members to benefit from regional cooperation. All of these services would be provided on a request basis, once the initial awareness raising of the potential benefits of cooperative MCS has been achieved.

FFA is currently performing some of these functions under the mandate provided by the FFA Convention with some success. However given the significant gap that remains between collaborative desire and participation as well as the considerable untapped potential to strengthen MCS arrangements through improved cooperation,

efforts to promote and facilitate higher rates of cooperation will need to be significantly intensified in the future. To that end, the next section outlines the possible roles and functions of a mechanism to facilitate cooperation – a RMCC - a central function of which should be to identify, promote and facilitate strengthened MCS through improved cooperation.

## 5.5 The Role, Function and Establishment of a RMCC

### 5.5.1 Introduction

These projects have highlighted considerable opportunities to strengthen MCS regimes across the region, often at little cost, through regional cooperation and reaffirmed an almost universal desire by FFA members to enhance cooperation<sup>41</sup>. It was also clear, however, that many members did not have a strong understanding of the existing cooperative frameworks, that progress in implementing cooperative measures was not meeting expectations, and that in some cases members were unclear how to remove blockages and progress development.

With many of the legal (e.g. Niue Treaty) and organizational (e.g. FFA, SPC) foundations for MCS cooperation having been in place for some time, we suggest the most pressing need now is to ‘operationalize’ greater levels of cooperation by capitalizing on opportunities available under existing frameworks and, where necessary, by developing and implementing new operational mechanisms to support effective cooperation (e.g. new information management and exchange frameworks). There is a strong case that efforts to enhance cooperation and coordination should be coordinated regionally (even if implemented at national/sub-regional levels) given the cost and regional harmonization benefits involved.

This section explores the possible roles, functions and establishment of a possible mechanism to facilitate cooperation – a Regional Monitoring, Control and Surveillance Coordination Centre (RMCC). This section has been heavily influenced by, and responds to, the needs identified in Projects 1, 2 and 3.

It should be noted upfront that many of the possible roles and functions of a RMCC outlined below are already being undertaken to some extent by FFA. The current FFA MCS program within the Fisheries Operations Division has the core responsibility of providing support and development services to national MCS systems and providing regional MCS services such as maintenance of the Regional Register, the VMS system and coordination of the Regional Observer Program. Given this background, a key initial question for FFA members is whether there is a need for a ‘new’ centre, or whether efforts should focus on augmenting and improving existing structures. An important consideration is whether the delivery of services currently being undertaken by FFA could be improved through their incorporation into a RMCC. Noting that these questions require policy direction from the FFA membership and will not be resolved prior to the completion of these studies, we have presented a range of options here for the establishment of a RMCC.

In considering the possible roles and functions of a RMCC in the future, a number of important matters have influenced the presentation of this section:

- The TORs for Project 4 are heavily focused on the benefits of cooperation at the regional level. Despite that, a key outcome of these projects is that the benefits of cooperation exist at all levels – regional, sub-regional, bi-lateral, intra-national – as well as between FFA members and external countries and agencies (e.g. WCPFC). The establishment of a centre focused solely on regional cooperation, while undoubtedly beneficial, would alone not be sufficient to capture a significant number of opportunities to strengthen regional MCS arrangements through improved cooperation at other levels. To that end, we have suggested possible functions for a RMCC at both the regional and national levels below.

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<sup>41</sup> During consultations for this project it was identified that despite approx. 90% of PICs seeking to expand NTSA and VMS sharing participation, current levels of sharing across shared FFA member boundaries remain at less than 25%.

- The TORs for Project 4 are also weighted towards ‘coordination of assets’ and seek as an outcome increased ‘regional MCS capability’. While these projects have highlighted considerable benefit in enhanced coordination of national and regional surveillance and enforcement assets, Projects 1, 2 and 3 have also highlighted significant benefits associated with cooperation between FFA members on ‘non-hardware’ assets such as human resources, information, financial resources etc. This broader interpretation of ‘assets’ has also influenced the discussion below.
- In discussing the possible roles and operation of a RMCC amongst the FFA membership, the team struck a wide arrange of views. Some interviewees appeared to have a clear idea about what the RMCC should do, others had a clear idea about what the RMCC should not do, and yet others (perhaps the majority) had no preconceived views about the centre. In the absence of a prevailing view, we have structured the possible functions of a RMCC as a ‘smorgasbord’ of options from which the FFA membership can select based on the combination of roles and functions they believe best supports the implementation of the regional MCS strategy.

### 5.5.2 Roles

FFA members’ regional fisheries goals agreed in the Regional Tuna Management and Development Strategy are:

- sustainable oceanic fish stocks and ecosystems; and
- economic growth from tuna fisheries.

The aim of any regional MCS strategy should be to support these goals by controlling and monitoring fishing operations under WCPFC MCCs and other rules and regulations, while simultaneously eradicating unlawful fishing activity. In turn, we suggest the overarching role of the RMCC should to facilitate the effective implementation of the regional MCS strategy at all levels from national to regional, in support of these goals.

Within this overarching role, three more specific roles for the RMCC have been identified:

1. providing MCS services that are best delivered at a regional level;
2. identifying and facilitating opportunities to strengthen MCS arrangements across the region through enhanced cooperation amongst the FFA membership; and
3. strengthening regional MCS arrangements by assisting members to optimize MCS arrangements at the national level.

In practice there may be considerable overlap between these roles and they should operate in a complementary manner.

The possible functions that fit within these roles are outlined below.

### 5.5.3 Functions

#### *Regional Services*

Regional Register - The maintenance and enhancement of the current Regional Register will continue to be central to future regional MCS efforts and would likely form a core component of an effective RMCC. The Regional Register would have strong linkages to the proposed RIMF (e.g. through compliance indexing of registered entities) and there may be benefit in ensuring the two functions are housed in the same facility.

VMS - The FFA VMS system is also central to national and regional MCS regimes and there is likely to be benefit in incorporating this function into the RMCC, including all existing administrative, operational and technical support duties. Given the importance of VMS information in supporting other possible functions of the RMCC – for example, surveillance and response coordination, regional risk analysis, national MCS support – there are likely to be benefits in locating these functions within the same facility.

Observers - Information collected by fishery observers plays an important, and currently rapidly expanding, role in both scientific and compliance MCS-related functions. The coordination of regional observer services may be best placed within a RMCC. This might include the current duties as coordinator of the Regional Observer Program in support of UST and FSMA fleets, as well as the wider functions envisaged under the Regional Observer Strategy agreed by FFC67 (e.g. coordination of observer placements amongst members to meet coverage targets; improve access to observer information, etc).<sup>42</sup> The incorporation of the observer role within the RMCC would likely assist in meeting important roles agreed in the Regional Observer Strategy – for example, fulfilling data collection and exchange requirements for integrated MCS, improving utilization of observer surveillance data – as well as facilitating improved use of observer data for compliance related purposes (e.g. regional risk analysis and planning, responding to critical incidents, etc), which these projects highlighted as a current weakness.

Regional Information Management - Effective systems for the collection, storage, verification, exchange and analysis of information are central to supporting effective MCS regimes. Chapter 4 outlines a proposed strategy for information management across the region including the establishment of a RIMF to allow for the sharing of timely and accurate MCS information and support planning and targeting of MCS activities. The establishment, operation and ongoing maintenance of a RIMF would form a core function of a RMCC. Having a RIMF centrally located with other MCS programs it will be expected to interact with (e.g. VMS, Regional Observer Program, surveillance and response coordination) is likely to deliver considerable operational benefits and efficiencies. An important role of the national support officers proposed below will be to assist FFA member countries in contributing information to, and receiving information from a RIMF.

Regional MCS Analysis/Planning - An important finding from Project 1 was the need to enhance MCS analytical capacity across the region. High quality analytical capability can deliver significant benefits in cost-effectiveness and better targeting of MCS activities through the provision of value added intelligence and analysis. Activities that might be performed under this section include (but are not limited to):

- updating regional risk assessments;
- provision of value added intelligence to support other MCS functions;
- provision of operational input into the design and development of key regional MCS measures (e.g. enhancements to the Regional Register, VMS, WCPFC MCS measures such as catch documentation schemes and transshipment regulation);
- compliance planning on key conservation and management measures (e.g. VDS, PNA 3<sup>rd</sup> Implementing Arrangement);
- national analytical capacity building.

Surveillance and response coordination - Noting that oceanic fisheries enforcement is the primary focus of over 70% of the maritime surveillance effort within the region and that the majority of PIC respondents (and some surveillance providers) expressed a clear preference for the centralized coordination of the multilateral surveillance operations<sup>43</sup> a RMCC may take on a formalized surveillance coordination role, if only for MCS purposes.

Management of the surveillance bidding process is a key activity within this function. A RMCC could collect surveillance bids from participating FFA members and submit them to the Quadrilateral Defence Cooperation Operations Working Group (QDCOWG)<sup>44</sup> with sufficient time to enable the QDCOWG to priorities and suggest allocations of surveillance effort. Such a service would not preclude the option of FFA members engaging bi-laterally with the QDCOWG or individual surveillance providers on a bilateral basis should this be a preferred option.

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<sup>42</sup> FFA Regional Observer Strategy, FFC67, WP32.

<sup>43</sup> In response to surveys conducted during the consultation process approximately 88% of PIC respondents, plus France, US and NZ preferred FFA or another central agency to coordinate the program for large multilateral fisheries operations.

<sup>44</sup> The QDCOWG meets biennially to coordinate activities within the region for the Defence Forces of the four Quadrilateral Partners – Australia, New Zealand, France and United States.

Hosting of Multilateral MCS Operations - A RMCC should have the capability to host and run multilateral MCS operations at the request of FFA members who wish to participate in multilateral operations, but who do not have the national capability or inclination to establish a Joint Coordination Centre (JCC) specifically for the operation. While JCCs have been historically hosted by member countries, it is unlikely that the region could expand multilateral participation without centralized hosting of the JCC<sup>45</sup> (to lessen the burden on PICs and attached MSAs), or centralized coordination of the multilateral operations timetable<sup>46</sup> (to maximize the availability of surveillance aircraft). FFA successfully hosted the JCC for Operation “Kuru Kuru 09” and considerable support was expressed during in country consultations for FFA or another central body to undertake this role.<sup>47</sup>

Exploration of New/Innovative MCS Approaches – A RMCC should maintain an active watch on emerging technologies and innovative MCS approaches including trialing and promoting those that have the potential to improve cost effectiveness of MCS amongst the region.

Regional MCS Administrative Support - An important role of any coordinating body would be to provide regional administrative support on MCS related matters. This would include coordination of, and performing secretarial duties for, MCS Working Group meetings as well as any other relevant MCS-related forums (e.g. MCS training forums; regional surveillance forums, etc). Another important, but frequently overlooked, role would be to maintain an up to date list of MCS contacts and officers (e.g. staff completing relevant MCS training certificates). The availability of a central, up to date list would promote effective information exchange, and may also assist in promoting staff and skills exchange amongst the FFA membership.

Management of Regional Capabilities - This function is only applicable should FFA seek options for regional capability supplementation (i.e. supplementation of regional surveillance aircraft, patrol vessels, satellite imagery and other potential capabilities, as considered within Project 5). The coordination and control of these capabilities could be subsumed within the “Surveillance Coordination and Planning” function above, with additional watch-keeping personnel necessary to provide operational management on a 24/7 basis. The detailed functions required to effectively manage regional capabilities will vary depending on the ownership and operational models selected (many options exist and these are discussed in detail in Project 5). Possible functions may include crew management, crew scheduling and logistics and maintenance planning.

### *Cooperation amongst the Region*

The primary function under this role would be to identify and facilitate opportunities to strengthen MCS arrangements within the region through enhanced cooperation and coordination between members. In practice cooperation may happen at all levels involving two or more members (e.g. cooperation between coastal State and port State in catch monitoring and logbook collection; facilitating bilateral NTSA's to allow surface surveillance and response patrols in areas that currently have no surface patrol capability, etc).

It should be noted that similar approaches to cooperation have been taken at the sub-regional level in recent years with some success. For example, New Zealand has worked actively with the southern Polynesian countries to strengthen sub-regional cooperation and build national capacity in support of MCS. These efforts have included a range of coordinated training initiatives (e.g. training on enforcement operations, surveillance and operational planning and high seas boarding and inspections [HSBI] in accordance with the WCPFC HSBI regime) and have led to agreement amongst the nations to work more closely on MCS. Applying the lessons learned from these successes more broadly across the region will be an important function of a RMCC.

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<sup>45</sup> 77% of PIC respondents indicated a preference for FFA or another centralized body to perform the JCC role on behalf of participating nations. Australia, NZ and United States indicated a preference for the JCC to be hosted by a participating nation. France indicated a preference for a centralized agency to be formed that would include FFA, Customs, surveillance providers and other stakeholders.

<sup>46</sup> 88% of PIC respondents, NZ, United States and France indicated a preference for FFA or another centralized body to coordinate the scheduling of the multilateral program.

<sup>47</sup> In response to surveys conducted during the consultation process 73% of respondents preferred FFA or another central agency to provide the JCC capability for multilateral operations.

## **National Services**

These projects have highlighted an urgent need to focus more resources on the development of national MCS systems. While much of the fisheries management and MCS planning is undertaken at the regional level, most of the delivery is undertaken nationally. Without strong, harmonized national MCS systems, regional MCS arrangements will fail to achieve their full potential and this could have grave implications for the attainment of regional fisheries management goals.

RMCC support to national MCS systems could extend across the whole range of MCS requirements including coordination of institutional strengthening programs to ensure that national agencies are fully functional and operate within a legal and institutional framework that is geared to support achievement of management goals at the national and international levels. Institutional support such as assistance with legislative development, MCS planning, information management and inter-agency coordination could all be based on a regional standard. The establishment of harmonized national MCS systems across the region, will allow for enhanced coordination at the sub-regional and regional levels and greatly increases the chances of achieving conservation and management goals.

To be fully effective, support to national systems requires hands on involvement at the national level in order to adapt regionally standard systems where needed and to foster cooperative relationships. One option to deliver these services is to have a number of MCS Advisers (perhaps 2-4) with dedicated responsibility for a (possibly sub-regional) group of countries. These Advisers could be physically located at a RMCC, or at proposed MCS Hubs in key ports around the region (see 'RMCC location' below). Costs associated with stationing advisers at key ports could be at least partially defrayed by housing them in the relevant national fisheries agency under a cooperative arrangement. Support to national MCS agencies could usefully include the following elements:

- Direct, ongoing support/advice to optimize MCS arrangements at the national level, including provision of ad hoc advice where necessary (e.g. on enforcement options, case building, evidence collection, etc);
- Training/capacity building/institutional strengthening support;
- Development of best practice documentation, procedures, policies (e.g. Standard Operating Procedures, best practice manual for operation of National Coordination Committees, etc);
- Assistance with satisfying WCPFC obligations;
- Maintenance of hardware and software (in cooperation with SPC);
- MCS information management support including optimization of national 'compliance analysis engines' (see Chapter 4) and assistance in contributing to, and drawing information from, the RIMF;
- Technical support in planning, law, operations and training;
- Advising on opportunities for enhanced MCS including with respect to joint and reciprocal operations and new technologies.

### **5.5.4 Establishment**

#### **Structure**

The administrative structure of the RMCC will depend heavily on the roles and functions chosen, as well as the level of resources available. While the outputs of the centre are likely to be proportional to the resources available, the inaugural structure may require little more than an administrative amalgamation of existing FFA functions plus a few important additions. Of these possible 'extras', we suggest very high priority be given to the establishment of the proposed RIMF as well as strengthening the national MCS advisory function. The outcomes of Projects 3 and 2 respectively will provide useful 'roadmaps' to guide the activities of these functions. We also suggest early priority be given to strengthening regional MCS analytical capability.

While an initial structure could be based on existing FFA functions, scope should be left to expand the RMCC based on the needs of members, the success of the centre and the level of resources available. As noted above the effectiveness of the centre is likely to be directly proportional to the amount of resources at its disposal and a well-resourced centre is likely to not only provide better support in services that could be considered ‘core’ (e.g. Regional Register, VMS, RIMF, national MCS support, etc) but also in other services (e.g. exploration and trialing of innovative MCS approaches) that may deliver members benefits in the longer term but may not be seen as immediate priorities.

We suggest the adoption of a phased approach to the development of the centre, commencing with a structure largely based on existing functions, would allow for internal systems to be bedded down while operating in familiar territory before taking on other functions that may be considered more challenging. Importantly, however, we also note that this should not preclude taking on additional services and functions immediately if an attractive business case is made and accepted, members are supportive, and resources are available.

### *RMCC Location*

#### “Head Office”

As discussed above, a RMCC, in an initial form, may be little more than reorganization and augmentation of the existing MCS section of FFA. As such, no compelling argument has been identified for establishing a RMCC in any other location than at FFA in Honiara. This is based on the fact that:

- a RMCC will retain a fisheries MCS focus;
- a considerable amount of the skills and infrastructure proposed for a RMCC already resides within the existing Fisheries Operations Division and Regional Fisheries Surveillance Centre located at FFA; and
- FFA staff currently perform many of the proposed functions.

Notwithstanding, it is likely that the current “bunker” facility will not be large enough to comfortably host all required functions and staff of the RMCC’s in its most evolved state. Future consideration may need to be given to supplementary accommodation arrangements.

#### MCS Hubs

While we suggest a RMCC should be located at FFA in Honiara, consideration should be given to delivering some services, particularly those relating to national support, through “MCS Hubs” (or RMCC Hubs) located at key ports throughout the FFA region. The concept of MCS Hubs is raised as a possible additional MCS measure by Project 1.

### *Legal Framework*

The promotion of intra-regional coordination and cooperation in surveillance and enforcement was clearly intended within FFA’s founding vision<sup>48,49</sup>. Other than a clear direction from FFC and the development of more robust protocols and agreements to enable voluntary information sharing between members (as outlined in project 3), it is not anticipated that any additional legal framework will be required in order to establish the RMCC and perform the proposed functions.

#### *Centre Name*

Although less important than the functions it will perform, consideration should be given to the name of the centre. The term “coordination” centre implies a role that may not be reflective of the full breadth of its functions. While the centre may have a coordinating role in some areas (e.g. surveillance coordination, observer placements), other functions may be acting in direct support of member nations or performing

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<sup>48</sup> 8<sup>th</sup> South Pacific Forum – Declaration on Law of the Sea and a Regional Fisheries Agency

<sup>49</sup> (South Pacific) Forum Fisheries Agency Convention – Art. 5.2.c



services that do not require ‘coordination’ (e.g. regional risk assessment). One option to reflect the broader scope of possible functions for the centre would be to remove the term ‘coordination’ from the title. The centre would then become the “Regional MCS Centre”.

### ***Estimated Costs***

Costs associated with a RMCC will obviously depend heavily on the roles and functions agreed by FFA members and the level of resources dedicated to each function. These matters will be considered by FFA members in association with the development of the regional MCS strategy. Once direction on these issues is provided, more detailed consideration of organizational structures, manning levels, development stages and associated costs to support the proposed functions can be undertaken.

Notwithstanding the above, some approximate resourcing estimates are possible based on a range of potential approaches to the development of a centre and the early priorities identified above. These are based on an understanding that many of the suggested roles and functions are already being served by the existing FFA Fisheries Operations Division, and that development of a RMCC would likely take a staged approach and be built upon this existing framework.

Internal Restructuring - (no significant additional cost; no additional staff). In the absence of significant additional funding it may be possible for FFA to perform some of the suggested roles and functions through simple restructuring of the existing Fisheries Operations Division for more operationally focused activities. These could be conducted out of the existing facilities including the Regional Fisheries Surveillance Centre. Whilst this “no cost” option will not be able to deliver all of the services identified as beneficial here (e.g. enhanced national MCS support, improved information management through a RIMF, stronger analytical capability), it may provide an appropriate platform upon which scalable and modular additions can be integrated as funding becomes available.

If additional resources become available either through new or redirected funding, possible costs associated with the some of the suggested early priority areas include:

National MCS Advisers – (approximately USD\$600K per annum; 3 additional staff). Based on the indicative personnel costs in Table 5.3 below it is estimated that an additional USD\$600K per annum might be required to support three MCS Advisers at the Professional Officer Level. This includes an additional USD\$50K per annum due to the expectation that Advisers will travel extensively amongst relevant FFA members.

Establishment and maintenance of a RIMF - (approximately USD\$400-600K to establish; USD\$100K per annum in ongoing maintenance). The development of the core components of the RIMF is estimated to cost approximately USD\$400K, while a range of additions functions (e.g. Vessel Boarding and Inspection System, Surveillance and Vessel Sightings System, Violations and Prosecutions System, Observer Management System) are possible (and recommended) for an additional USD\$200K. Ongoing maintenance and training costs may be contracted out (Contractor, USD\$100K), or undertaken internally (Professional Staff, USD\$150K).

Enhanced Analytical Capability – (USD\$400k per annum; 1 Senior Professional Officer; 1 Professional Officer; 1 Locally Engaged Staff member). Strengthening analytical capability in order to support more cost effective and targeted MCS is identified as an important early priority in section 5.5.4 above. These functions would be best supported by hiring at least one highly qualified and widely experienced MCS analyst. This analyst may require support from at least two data analysts to conduct risk modeling and to control both the quality and quantity of data being analyzed.

Additional Management Support - (Senior Professional Officer, USD\$200K per year). The existing position of Director Fisheries Operations is heavily engaged with strategic policy issues, attendance at regional forums such as FFC, WCPFC and the hosting of MCSWG meetings. The workload associated with these important roles is considerable and unlikely to abate in the near future. Development of a RMCC will introduce a

considerable operational focus and to be effective may benefit from a dedicated manager with an operational focus and limited requirement to travel away from Honiara.

Table 5.3 – Indicative personnel costs

Position	Salaries (USD\$K)	Accom. (USD\$K)	Travel (USD\$K)	Misc (USD\$K)	Total (USD\$K)
Senior Professional Officer	100	40	50	10	<b>200</b>
Professional Officer	80	30	30	10	<b>150</b>
Locally Engaged Staff	20	15	5	10	<b>50</b>
Commercial contractor	100				

Beyond those highlighted above, a number of other possible RMCC functions have been identified in section 5.5.3 (e.g. surveillance and response coordination, hosting of multi-lateral operations, etc). Each of these functions may have resourcing implications either through the need to create new capabilities or to strengthen existing FFA capabilities and require consideration amongst the FFA membership. With greater understanding of members’ preferred direction for a RMCC more detailed cost analysis and implementation planning will be possible.

### Funding Sources

A number of possible funding sources have been identified to support the operation of a RMCC:

- Regional Register Funds - Core funding for all MCS operations is currently sourced from Regional Register and VMS register fees. If all MCS functions are performed by the RMCC, registration fees should remain a major source of funding.
- An MCS Fund – preliminary consideration of the establishment of an operational fund for regional MCS activities has been undertaken by the MCSWG and FFC<sup>50</sup>. More detailed models of possible structures are considered in the ‘Funding Models’ section below. Under the suggested model a percentage of trust fund distributions would become a funding source for the recurrent operational costs of a RMCC and other regional MCS programs.
- Cost Recovery Mechanisms - FFA is currently developing options for a potential surveillance and enforcement cost recovery scheme to supplement regional and national MCS programs.<sup>51</sup>
- US Treaty Funds – The US Treaty is now in its 21st year of operation. Consideration might be given at the next round of Treaty negotiations to the use of a portion of US Treaty Funds to fund a RMCC and other MCS programs;
- NGOs and Philanthropic Organizations - There are many NGOs and philanthropic organizations, within the region and beyond, which might be able to offer financial support to regional MCS operations. Of particular note at this point in time is the offer by the Sasakawa Peace Foundation and its parent organization the Nippon Foundation to “provide comprehensive support for construction of a tri-national unified coast guard, formed between the Republic of the Marshall Islands, the Republic of Palau, and the Federated States of Micronesia”<sup>52</sup>. The foundation has provided over \$130 million to fund similar capacity strengthening in the straits of Malacca and Singapore over the past 40 years<sup>53</sup>

<sup>50</sup> MCSWG10 WP12 and FFC64 WP14

<sup>51</sup> MCSWG12/WP.19: Update on the User Pay Policy to Support National and Multilateral Operations

<sup>52</sup> Sasakawa Peace Foundation Website - <http://www.spf.org/e/newsevent/081023.html>

<sup>53</sup> Joint Communique - 8th Micronesian Presidents Summit, Pohnpei - 19 Nov 08

- Traditional Aid-based Donor Pool - The traditional donor pool of regional government and other aid agencies should also be considered as potential long term future funding sources.
- National Contributions – This option provides members with the ability to “purchase” additional support from a RMCC should they identify a need beyond regionally allocated levels. The “user pays” principle could be applied for users of the MCS operations, especially those other than fisheries related authorities.

### Funding Models

Figure 5.2 below describes one option for a regional MCS funding model to store and disperse funds for regional MCS operations such as the RMCC, VMS and observer programs. This model consists of a basic accounting structure to enable a variety of funding streams to be channeled into either a central pool or guided towards sub-accounts for more specific application. A diverse range of funding streams is recommended to dampen cash-flow and provide long term funding predictability. Examples of this type of structure already exist within FFA and would require little additional governance or management.

An optional enhancement to this structure might include an MCS investment trust to create an additional income stream (from dividends), dampen cash-flows for long-term confidence, develop financial independence for recurrent operational costs, and accumulate wealth for MCS capabilities presently beyond the reach of existing donors or FFA members;

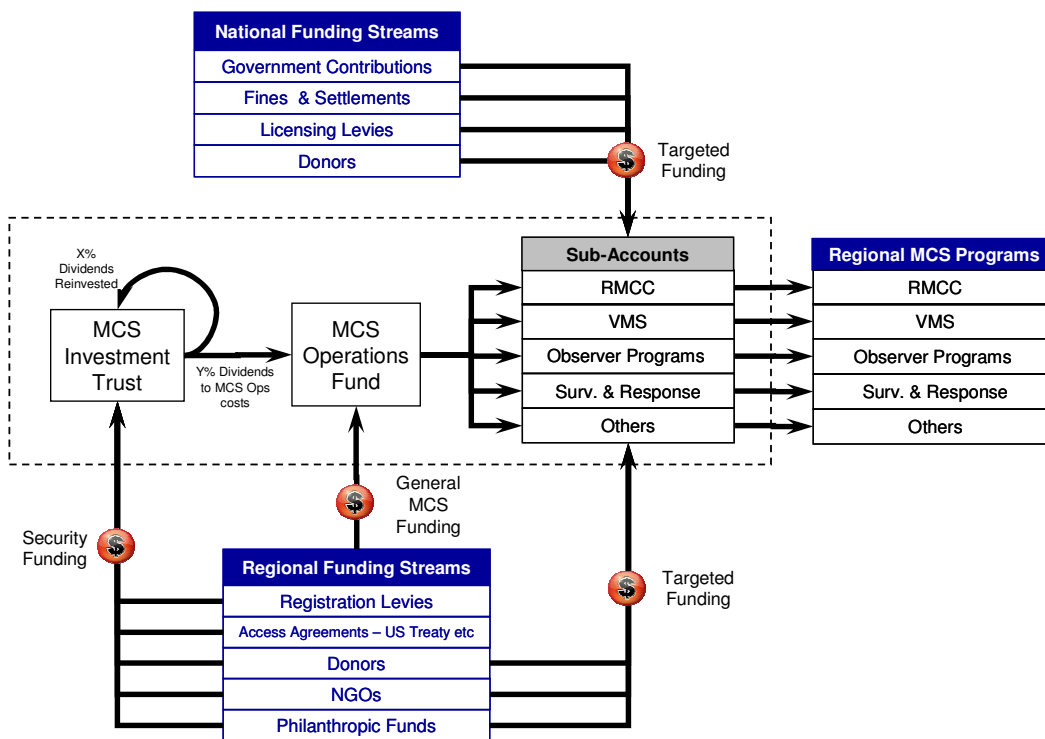


Figure 5.2: Regional MCS Funding Model with MCS Investment Trust

## Chapter 6: Regional Capability

### 6.1 Introduction

Surveillance and response assets such as aircraft and patrol vessels are important components of MCS regimes operating in the FFA region. Surveillance aircraft play a key role in detecting IUU fishing activities and improving the information base on the activities of both licensed and unlicensed vessels, while patrol vessels play a key role in enforcing fisheries laws at sea. Collectively, these assets also have considerable potential to create deterrence to non-compliance. Given the size of the Pacific Island Country (PIC) EEZs, the limited resources with which to support effective MCS and the expense of owning and operating surveillance assets, it is critical to ensure these assets are used most effectively and efficiently.

At the same time, the continuing development of alternative surveillance and response technologies – e.g. satellites – and the emergence of alternative providers – e.g. commercial aerial and surface surveillance providers – may offer FFA members improvements in a range of attributes important to an effective MCS regime (cost effectiveness, flexibility, responsiveness) and require ongoing examination.

This chapter sets out the results of Project Five: Regional Capability. The objective of the project was to “examine options for providing an effective surveillance and response capability by identifying more efficient ways to use MCS assets, other possible providers and funding options, with a view to obtaining contracted surveillance and response capabilities and supplementing national programmes.” In meeting this objective we were also requested to give “preliminary consideration to the development of a ‘bluewater capability’”. It is envisaged the outcomes of Project Five will be used by FFA members to support an integrated MCS approach that will achieve:

- a balanced capability, using patrol vessels (national and other) surveillance aircraft and other surveillance technologies; and
- an increased measurable capability which will meet national, regional and international expectations to cover current gaps in surveillance coverage.

### 6.2 Methodology

The approach to Project Five comprised:

- desk top reviews of capability: these comprised examination of current and emerging air and surface surveillance and patrol technologies;
- consultation with PICs, which was coordinated with the other four projects;
- consultation with FFA members at the 12th MCSWG meeting;
- a capability gap analysis, which considered current capability, an assessment of the level of capability required and how that level might be achieved; and
- an assessment of new and emerging technologies which may be able to contribute to MCS activities.

### 6.3 Aerial Surveillance within the WCPO

#### 6.3.1 FFA Member Aerial Surveillance

Amongst the Pacific Island FFA members only Papua New Guinea (PNG) and Tonga have national aerial surveillance capabilities. PNG has two CASA 235 aircraft which currently provide approximately 120 hours of

fisheries surveillance. Tonga operates a Beech 18 aircraft; however ongoing logistical support difficulties continue to preclude significant operational activity. Solomon Islands are also currently understood to be considering acquisition of a second-hand aircraft and equipping it for fisheries surveillance.

### 6.3.2 Regional Aerial Surveillance

Regional aerial surveillance support is provided by the four quadrilateral nations - Australia, New Zealand (NZ), United States (US) and France.

Table 6.3: Estimated aerial surveillance contributions within the WCPO<sup>54</sup>

Provider	Estimated Annual Air Hrs	Source
RAAF	94	Average of RAAF reported effort 2004-2008.
RNZAF	307	Total of individual PIC estimates.
FN	70	Total of individual PIC estimates.
USCG	250	USCG estimate of total air-hours distributed and rescaled to match PIC estimates
USN	26	Total of individual PIC estimates.
<b>Total</b>	<b>747</b>	

Figure 6.1 below illustrates the areas in which aerial surveillance is estimated to occur. These efforts tend to reflect the strategic interests of the providing countries and the range of the aircraft.

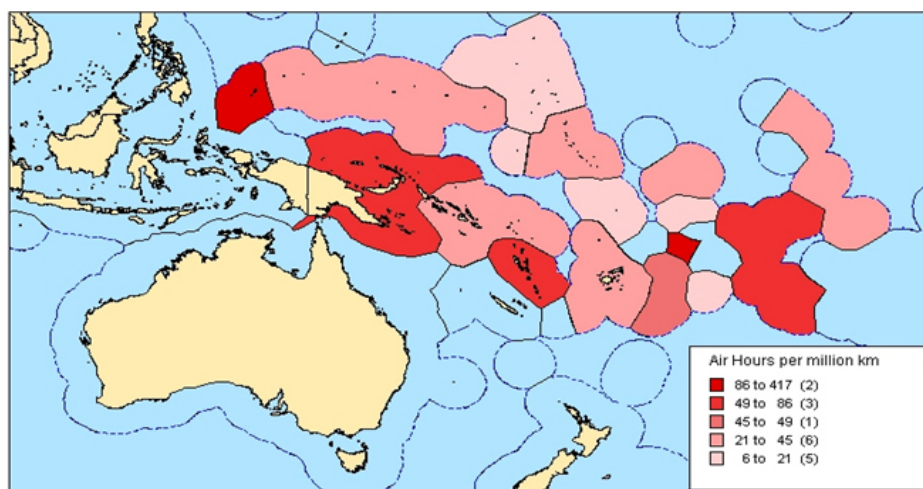


Figure 6.1: Indicative distribution of aerial surveillance effort

<sup>54</sup> Estimates are based on data provided by Quadrilateral Defence Forces where provided, and FFA member estimates where not.

### 6.3.3 Limitations to Optimal Use of Aerial Surveillance

In reviewing Figure 6.1 above consideration should be given to the three distinct zones of Kiribati. Although these are shown as having a homogenously moderate level of aerial surveillance it is likely that the Line Island Group (and to a lesser extent the Phoenix Group) receives little, if any coverage due to the logistical difficulties in operating within these zones. This is illustrated in Figure 6.2 via examination of approximate patrol ranges for the most capable surveillance aircraft (RAAF/RNZAF P3 Orion).

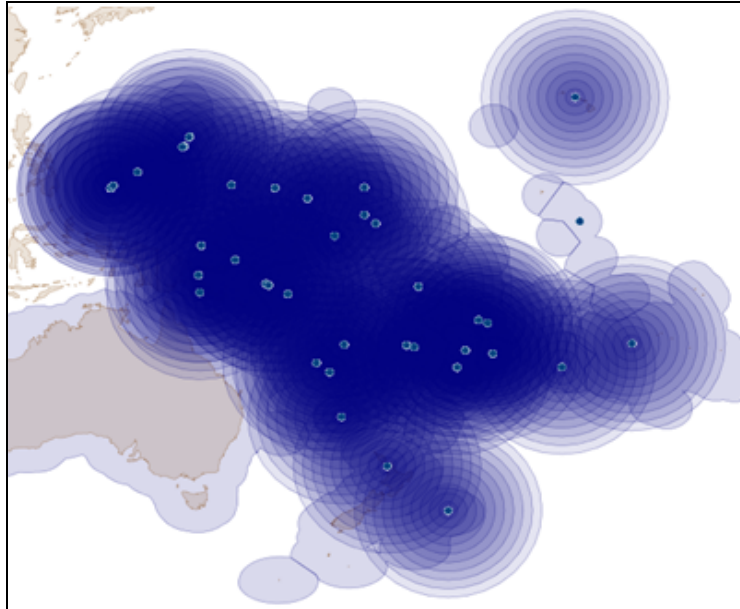


Figure 6.2: Indicative aerial surveillance coverage for the P3 aircraft<sup>55</sup>

The most commonly reported inhibitors to effective aerial surveillance identified by PICs during project consultations are outlined in Figure 6.3 below.

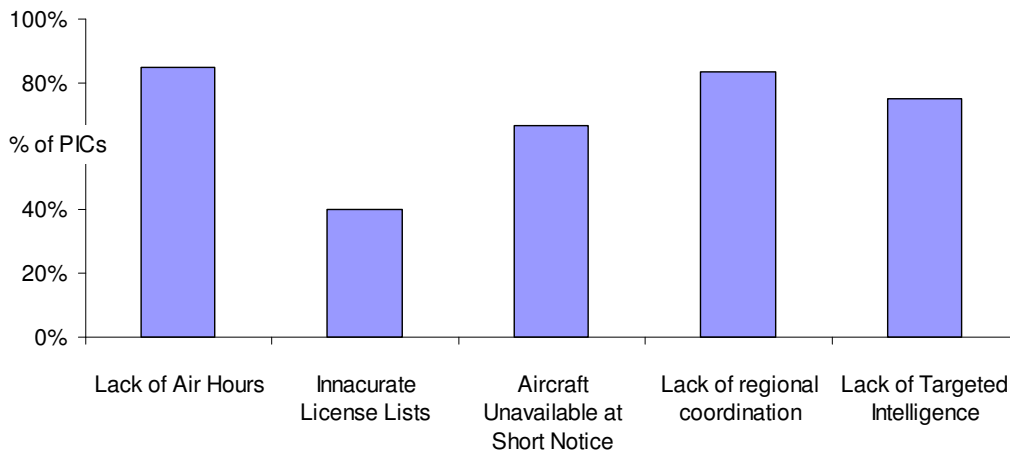


Figure 6.3: PIC perceptions of factors inhibiting effective aerial surveillance

<sup>55</sup> Each ring represents one less hour of on-task time. The outer ring represents only one hour on-task time.

Whilst it is difficult, based on the information currently available, to determine “optimum” or “adequate” levels of aerial surveillance within the WCPO, it is clear that the region would benefit from increased coverage in order to provide a stronger enforcement and deterrence presence and increase the information base upon which MCS and fisheries management decisions are made. Preliminary analysis of the quantity of aerial support provided in direct support of patrol vessels<sup>56</sup>, comparison with other mature surveillance and enforcement programs<sup>57</sup>, and PIC perceptions of levels required to address national IUU threats<sup>58</sup> all point strongly towards substantially higher rates of effort being required.

Inaccurate or non-provision of license lists, and the use of less formal licensing arrangements such “letters of comfort” remain an ongoing source of wasted surveillance effort; however, a strong sense of improvement was identified throughout consultations with FFA members.

The absence of meaningful intelligence against which aerial surveillance can be targeted also remains an inhibitor to cost-effective aerial surveillance. Outside the intelligence-driven multilateral operations it is less common for VMS data and VOI lists to be provided to aircraft prior to missions. The development of an information system with the ability to identify and communicate IUU risks from within large amounts of data is the subject of consideration in Project 3. Development of such a system would undoubtedly result in more targeted aerial surveillance (when it is allocated); however, this should not necessarily be taken to mean that the identification of IUU risks will fully drive capability response. Provision of aerial surveillance within the current framework is likely to continue on an “as available and subject to competing priorities” basis that requires long programming lead times.

No centralized process for coordinating aerial surveillance bids has existed since the cessation of the Regional Aerial Surveillance Meeting (RASM – previously hosted by FFA) in 2005. In the absence of such a system Quadrilateral partners meet biannually to allocate aerial surveillance based on the inputs received through representations from Australian Maritime Surveillance Advisers (MSAs) embedded within some FFA members. During consultations for this project most PIC national representatives (and many MSAs) were not aware of this process. This process excludes Nauru, Niue and Tokelau who do not have an MSA. Whilst there are many factors that might prevent the operational integration of aircraft and patrol vessels, it is likely that the lack of centralized coordination of bids and allocations is a contributing factor.

No significant change was forecast to projected aerial surveillance levels by any of the Quadrilateral providers. Future allocations will continue to be driven by aircraft availability after higher priority international and domestic obligations have been met. It is similarly not anticipated that the flexibility and responsiveness of provided support will be increased to a level that could permit coordinated intelligence-driven MCS responses involving multiple assets on a routine basis.

## 6.4 Surface Surveillance and Response within the WCPO

### 6.4.1 FFA Member Surface Surveillance and Response

Surface surveillance and response within 12 FFA member EEZs is primarily conducted by 22 nationally owned and operated Pacific Class Patrol Boats (PPBs). A number of less capable assets also exist throughout the region, although these are not heavily involved in fisheries enforcement. Nauru, Niue and Tokelau have no surface response assets.

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<sup>56</sup> PICs estimated (on average) that 58% of aerial surveillance missions were in partnership with one of their patrol vessels. PICs and some surveillance providers also estimated that 91 Air Patrols were conducted compared to 130 sea-patrols – 0.58x91/130 ~ 40%

<sup>57</sup> Australian surveillance intensity is estimated to be approx. 16 times the most intensely patrolled PIC and nearly 700 times the least intensely patrolled PIC.

<sup>58</sup> During consultations PICs estimated that (on average) 200 air-hours per EEZ were required to provide effective IUU enforcement and deterrence.

During consultations FFA members identified 25 primary maritime surveillance roles (Figure 6.4). Support to oceanic fisheries, coastal fisheries, search and rescue, natural disaster response and other government duties were all generally rated high priorities amongst members. Other activities such as transnational crime, border protection, maritime safety and environmental management were high priorities amongst some members with specific challenges, but were generally a medium priority as a regional average.

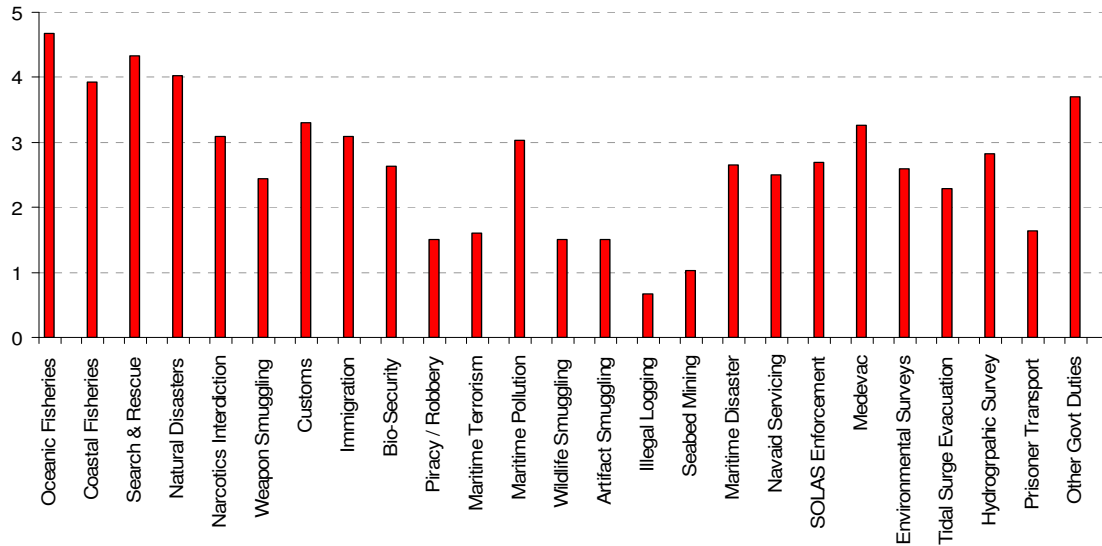


Figure 6.4: Maritime surveillance and response priorities of PIC members of FFA

Notwithstanding the above, the primary tasking of surface surveillance and response assets remained fisheries enforcement with over 70% of sea time spent dedicated to this task (Figure 6.5).

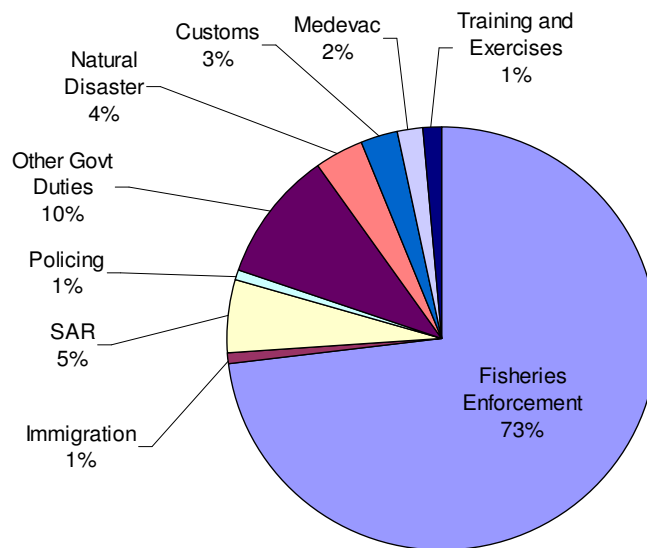


Figure 6.5: Maritime surveillance and response tasking breakdown of PIC members of FFA

Twelve of the 15 PIC members of FFA have conducted meaningful levels of surface surveillance and response in recent years. Whilst Niue has recently signed a Niue Treaty Subsidiary Agreement (NTSA) with Cook Islands, this is not believed to have been formally exercised. Nauru and Tokelau currently have no NTSA in



place to utilize patrol vessels from neighbouring countries. This effectively means there is no surface capability in approximately 5% of the total FFA member EEZ area.

The limited employment of the PPBs in MCS operations across the region creates a significant surplus surface response capability. Subject to funding availability and by using innovative crewing and logistics support modern patrol vessels are capable of operating up to 200 sea-days per year. On this basis even the most active PPBs are operating only at about 50 per cent of their potential capacity, with many vessels operating at much lower rates<sup>59</sup>.

It was clear from consultations that most PICS are unlikely to be sufficiently funded from recurrent national budgets to utilize their patrol vessels at more optimum levels. Furthermore, most stated that such high levels of activity were not always needed in order to provide an effective enforcement and deterrent capability.

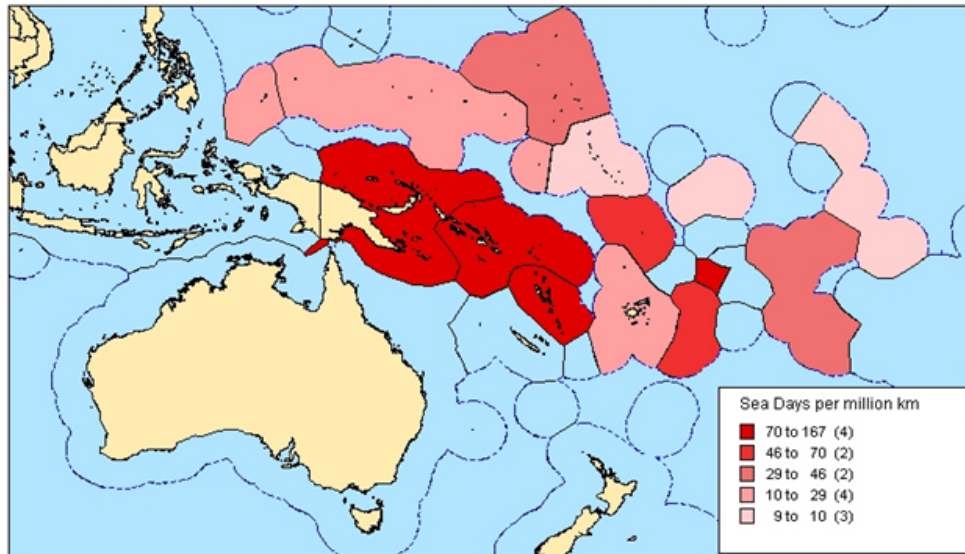


Figure 6.6: Indicative distribution of current surface surveillance effort

#### 6.4.2 Other Surface Surveillance and Response Capabilities within the WCPO

Regional patrol vessels from Australia, NZ, France, US and Greenpeace continue to transit through the region for approximately 300 days per year for regional engagement purposes. The USCG ship-rider program currently provides the only direct enforcement support. Under this program USCG vessels embark authorized officers from 6 FFA members who are then transported throughout their EEZ for enforcement duties. In the two years since commencement of the trial the program has conducted 10 joint patrols and 44 boardings that have resulted in 17 serious violations. The most significant violation resulted in the apprehension and prosecution of a bunkering vessel that yielded over USD\$5M in fines for Kiribati. This is likely to be the most efficient and effective surface surveillance and response activity ever conducted within the region. It is arguably also the most meaningful “regional engagement” that can be conducted by transiting quadrilateral patrol vessels.

The USCG has indicated that it will continue to deploy throughout the region with possible increased involvement of major cutters, and sustained effort from smaller patrol boats and buoy tenders. This will primarily be focused in areas with joint borders with US Territories to enable dual responsibility under Ship-Rider Agreements. The USCG also indicated a desire to expand the Ship-Rider program, however noted this will be matched with a realistic assessment of resource constraints and the ability to provide meaningful implementation. The USCG has also been actively promoting greater involvement of the USN for support within the WCPO, which recently resulted in a joint patrol involving USCG, USN and FSM.

<sup>59</sup> It was reported during consultations for this project that at least one PPB has not been to sea for over 12 months.



Figure 6.7: FSM, USN and USCG working together

Australian patrol vessels have recently been formally tasked by the ADF to report the position of fishing vessels within FFA member waters when possible. The ADF has further advised that it does not intend to develop Ship-Rider agreements or participate in high seas boardings and inspections as permitted under the WCPFC Framework<sup>60</sup>.

NZ is in the process of introducing a new range of very capable patrol vessels under “Project Protector”. Multi-tasking, civil agency support and opportunities for broader application within the region have been considered within the development of this program. NZ is currently discussing options for cooperation within the Niue Treaty with several FFA members, as well as other forms of cooperation.

The French Armed Forces have indicated that regional patrol levels will probably remain at current levels, but may increase if fuel prices decrease<sup>61</sup>. More detailed guidance on the long-term involvement of the French Navy within the WCPO is likely to be available upon release of the next French Defence White Paper. It is not clear from our consultations if this will consider Ship-Rider Agreements or participation in Niue Treaty style activities.

Greenpeace anticipates maintaining surveillance effort within the WCPO at approximately one patrol per annum. They have previously conducted ship-rider activities within both FSM and Kiribati; however, intend to focus on surveillance activities within the high seas for the next few years.

### 6.4.3 PPB Follow-on Capability

The 22 PPBs gifted to 12 nations in the late 1980’s are approaching the end of their service life. Australia’s Prime Minister, Kevin Rudd, indicated at the Fortieth Pacific Islands Forum Leaders’ Meeting that Australia would “undertake an assessment of a new maritime security program to replace the current program at the end of its life, in consultation with Pacific Island countries.”<sup>62</sup> While the configuration of the program is not yet clear, it may have important implications for future fisheries MCS capabilities and approaches in the Pacific. Efforts should be made to ensure the Regional MCS Strategy and any new maritime security program is integrated and complementary.

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<sup>60</sup> Official ADF consultation response.

<sup>61</sup> At the time of consultation the price of light crude oil was approx. USD\$45 per barrel. At the time of writing the price had increased nearly 60% to USD\$71 per barrel

<sup>62</sup> Fortieth Pacific Islands Forum, Cairns, 5-6 August 2009 Forum Communiqué, Art. 59.

#### 6.4.4 Limitations to Optimal Use of Surface Surveillance and Response

During consultations for this project a number of factors that inhibit effective surface surveillance and response were identified by FFA members. These are shown in Figure 6.8 below:

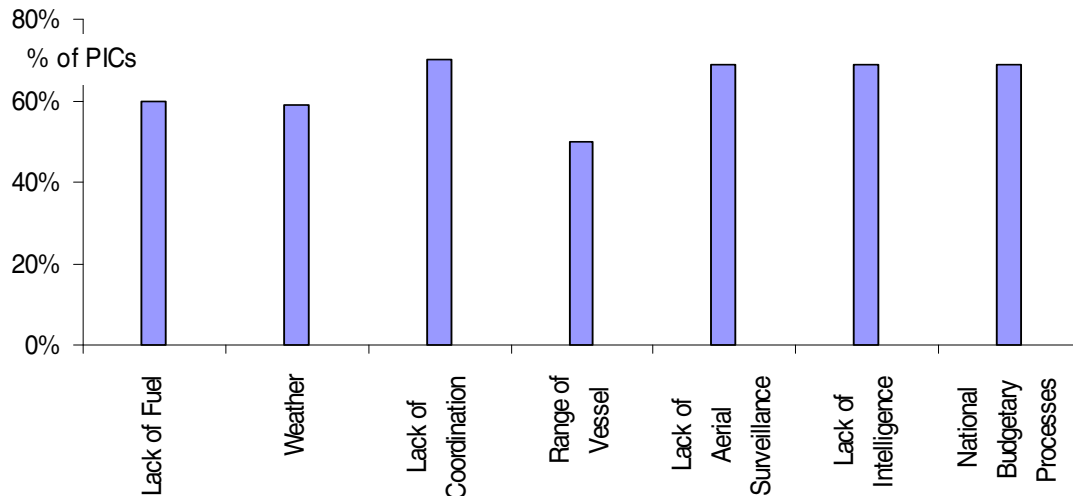


Figure 6.8: PIC perceptions of the major inhibitors to effective surface surveillance

Noting the diverse range of EEZ sizes<sup>63</sup>, patrol distances<sup>64</sup>, fishing densities<sup>65</sup> and logistical support capabilities<sup>66</sup> within the region it is considered unlikely that one single class of vessel can provide the most cost-effective capability option in all cases. The extent to which the current nationally based distribution of equally sized patrol vessels struggles to cost-effectively serve such a diverse range of requirements was clearly borne out during FFA member consultations for this project. Some FFA members believed they only had sufficient IUU risk to justify funding for 50 sea-days per year, while others acknowledged a requirement for a greatly increased level of sea-days. Some expressed doubt over the requirement to own and operate multiple vessels within small EEZs, while others expressed concern that they have no national surveillance and response capability at all. Some believed their needs could be met more cost-effectively by smaller, more responsive, capabilities, while others clearly need access to longer range capabilities to provide enforcement and deterrence in remote locations. The imbalance between need and capability is likely to be exacerbated if FFA members participate in WCPFC provisions for parties to conduct high-seas boardings and inspections.

<sup>63</sup> Kiribati's EEZ is nearly 30 times larger than Samoa's.

<sup>64</sup> Transit distances to reach patrol areas at EEZ extremities are over 10 times greater for Kiribati over Samoa.

<sup>65</sup> SPC catch data suggests that over 500 times more fish were caught in PNG compared to Tonga during 2007.

<sup>66</sup> Some FFA members have ports with shipyards, while others do not have a wharf or port.

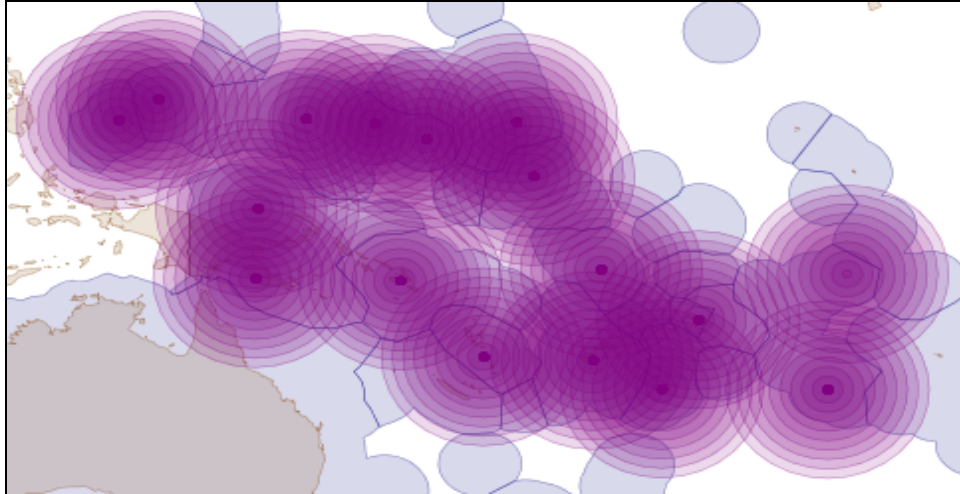


Figure 6.9: Indicative surface surveillance and response coverage based on ranges and locations of existing PPBs<sup>67</sup>

## 6.5 Alternative Surveillance and Response Options

Considerable limitations within the current surveillance and response framework were identified in earlier sections. Options for (at least partially) addressing these limitations through increased collaboration are considered within Project 4. As collaborative options are often inexpensive their implementation should be the highest priority, ahead of capability acquisition options.

Notwithstanding, there are several structural limitations within the current framework for both aerial and surface surveillance that are unlikely to be fully addressed through increased collaboration. These issues require long-term strategic level consideration, the outputs of which are unlikely to be seen in the short to medium term. In the meantime a number of options exist for the development of cost-effective regionally managed capabilities to supplement (and integrate with) national program. These may provide increased flexibility, responsiveness and redundancy to better address the (dynamically changing) IUU risks identified in Project 1.

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<sup>67</sup> Each ring represents one less day of on-task time. The outer ring represents only one day on-task time.

Table 6.4: - Indicative surveillance and response capability and cost comparison

Capability		Detection Costs (USD/km <sup>2</sup> )	Surveillance and Response Capability Offered					
			Detect Fishers	Deter IUU	Inspect			
Surveillance Aircraft	Long Range, Complex, Military <sup>68</sup>	\$0.70	Yes	Yes – threat of unannounced sighting is major deterrent	No			
	Med. Range, Complex, Commercial <sup>69</sup>	\$0.20						
	Short Range, Basic, Commercial <sup>70</sup>	\$0.15						
Patrol Vessels	Long Range, Complex, Military <sup>71</sup>	\$8.39	Yes, but less efficient	Yes – threat of unannounced inspection is major deterrent	Yes			
	Medium Range, Basic (PPB) <sup>72</sup>	\$0.55						
	Medium Range, Commercial <sup>73</sup>	\$1.14						
Satellite Surveillance	Optical Imagery – High Resolution	\$20 - \$30	Yes, but cannot determine what type of vessel, its activity or its identity	Yes, if capability is well known by good strategic communications program	No			
	Optical Imagery – Med Resolution	\$2 – \$3.00						
	Satellite Radar – High Resolution	\$2.70						
	Satellite Radar – Med Resolution	\$1.70						
Emerging Technologies	Aerostats	Not Estimated <sup>74</sup>				Yes	Yes, but less capable than crewed aircraft	No
	Coastal Radar							
	UAV – Long Range		Unproven	Yes	No			
	UAV – Ship Launched		Yes	Yes	No			
	Industry Reporting		Free	Yes	Yes	No		
	Community reporting		Free	Yes, but only close to shore	Yes	No		

### 6.5.1 Surveillance Aircraft

The primary means of performing aerial surveillance is currently fixed-wing aircraft. These combine, speed, endurance and extended search horizons to conduct surveillance over extremely large areas. Helicopters can be used in some MCS programs, and have the added benefit of being able to insert boarding parties, however extremely large transit distances and limited logistical support arrangements preclude their use in other than ship-launched modes within the WCPO. In considering the provision of aerial surveillance support to FFA members in support of MCS objectives, two distinct modes of operation are suggested.

Mode 1 as shown in Figure 6.10 is an example of a well planned, long range surveillance with the primary objective of collecting vast amounts of information that can be used to guide the development of MCS programs. The aircraft involved in this mode should be fast, have long range and endurance and have highly

<sup>68</sup> Cost is based on full recovery cost of a P3 Orion Aircraft with 45NM radar range

<sup>69</sup> Cost is based on industry estimate for a CASA 235 Aircraft with 40NM radar range

<sup>70</sup> Cost is based on industry estimate for a BN Defender 4000 Aircraft with 35NM radar range

<sup>71</sup> Cost is based on full recovery cost of a Armidale Class Patrol Boat with 12NM radar range

<sup>72</sup> Cost is based on estimated PPB ownership costs (\$2400/day) and op costs (\$3800/sea-day). Radar range of 12NM

<sup>73</sup> Cost is based on industry estimate per vessel for 2 vessels capable of carrying 20 persons with 2 RIBs for five year commitment. Includes core crew and capable of 250 days at sea per year.

<sup>74</sup> These systems are not widely in use in a maritime surveillance role at this stage.

effective radars. This mode is particularly suitable for the existing large military aircraft which generally have far superior capabilities, but lack the agility for mode 2 operations.

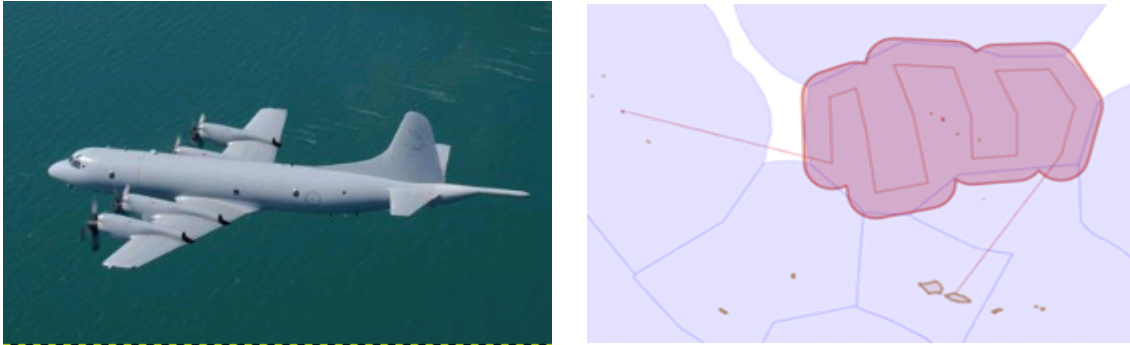


Figure 6.10 - Mode 1. Long-range aircraft departing Fiji, patrolling Tokelau and arriving in Tuvalu

Mode 2 as shown in Figure 6.11 is an example of a short notice, targeted aerial surveillance. The objective of this mode is coordinated enforcement in partnership with a patrol vessel. This requires a flexible and responsive capability at the expense of range and endurance if necessary. This mode is more suitable for smaller more responsive aircraft attained through flexible commercial programs.

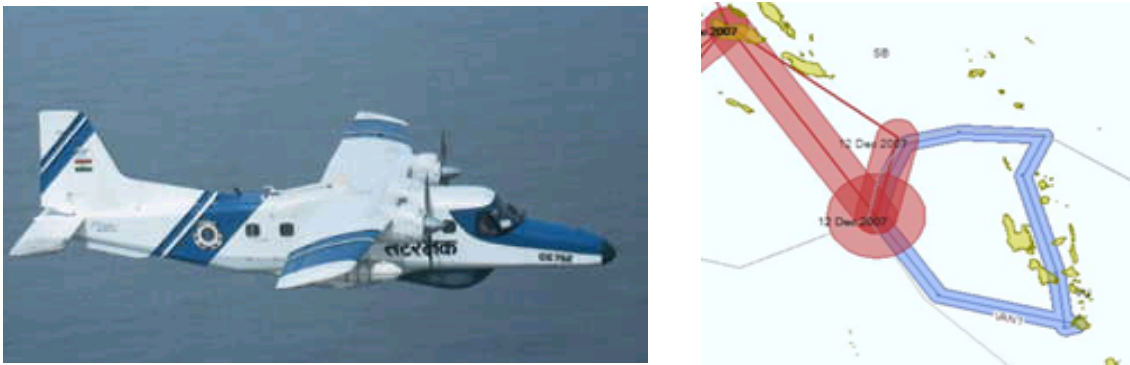


Figure 6.11 - Mode 2 - Short-Range aircraft operating out of Honiara to provide aerial surveillance support to a Vanuatu patrol vessel

The approximate capabilities<sup>75</sup> and costs<sup>76</sup> of a range of surveillance aircraft appropriate for either of these two operational modes are listed in Table 6.5 below.

<sup>75</sup> Search performance will depend on the radar performance, search altitude, target size, patrol speed and weather. Estimates are based on assumption that 20% of endurance is absorbed by transit.

<sup>76</sup> Costs are based on industry estimates for commercial programs and comparable full recovery costs of military options.

Table 6.5 - Approximate surveillance aircraft capabilities and costs

Mode	Aircraft Type	Cost per Hr (USD\$K)	Range & Endurance		Patrol Speed (kts)	Area per Hr (km <sup>2</sup> /hr)	Area per Flight (km <sup>2</sup> )	Cost per Flight (USD\$K)	Cost per Area (USD/km <sup>2</sup> )
			(NM/hrs)						
1	P3	40	3,500	12+	200	58,000	559,000	480	0.7
1	C130	30	2,200	9+	180	46,000	378,000	270	0.5
1,2	Dash-8 / CN235	9	1600 - 1800	8-10	200	50,000	300,000 - 350,000	60-80	0.15 – 0.20
2	Gardian	16.3	1,700	5	240	46,000	186,000	81	0.35
2	BN Defender	4	950	6+	125	28,000	136,000	24	0.15
2	King Air B200	6	1,000	7+	200	44,000	272,000	45	0.15

As noted in section 6.3 it is not anticipated that the availability, flexibility and responsiveness of aerial surveillance support to MCS programs will be greatly enhanced in the short to medium-term within the existing framework. This section now examines options for a regionally coordinated aerial surveillance capability to supplement, and integrate with, the existing national and quadrilateral framework.

### Option 1 – “Piggyback” off Existing Civil Maritime Surveillance (CMS) Program

Australia is presently the only country within the region that conducts CMS, however this option could equally apply to any of the quadrilateral nations should they in turn develop a CMS capability. Opportunities may exist for expansion of such programs to include regional support on a donated or cost-recovery basis as ongoing commitment to cooperation in combating IUU in the region through the Trilateral Declaration<sup>77</sup>, the Compact of Free Association or other frameworks. This could provide an immediate, scalable and flexible capability as either a short or long-term option.

### Option 2 – Dedicated Regional Capability

Whilst there are obvious advantages to national MCS programs through a politically independent capability dedicated exclusively to addressing regional IUU risks, it should be clearly understood that significant financial and organizational challenges would need to be overcome.

Industry estimates obtained for this project indicated that a single aircraft CMS program would likely cost USD\$5-10M per year and require a minimum commitment of 7-10 years. It is considered likely that economic thresholds might more realistically be achieved through the pooling of donor resources and cooperative asset sharing between a broader range of possible stakeholders.

Whilst CMS has proven cost-effective in attaining a capability, responsibility for coordination, and integration to achieve the desired outcomes ultimately remains with the client. Project 4 considers the roles of a possible Regional MCS Coordination Centre (RMCC) and finds that responsibility for coordination of regional capabilities such as surveillance aircraft is a major undertaking that should not be accepted without a comprehensive assessment of the potential costs and obligations involved. Given the probable involvement of any regional capability in broader maritime security issues, sufficient flexibility should also be left in any such

<sup>77</sup> Governments of Australia, New Zealand and France, *Joint Declaration on Cooperation on Maritime Surveillance and Combating Illegal, Unreported and Unregulated Fishing in the Pacific Islands Region*, 02 Mar 06.

arrangement to allow for the transfer responsibility to an appropriate external entity where there is benefit in doing so.

As such it is suggested that the long-term risks and costs at the operational level associated with the development of a dedicated fisheries surveillance aircraft should be considered carefully at the strategic level prior in considering this option.

## 6.5.2 Patrol Vessels

As noted in section 6.4.4 above FFA members have a broad range of operational needs depending on the size of area to be patrolled, fishing densities and national logistic support capabilities. Suitable patrol vessels to fulfill these requirements can generally be considered in 3 categories.

Coastal Patrol Vessels - These are usually up to 30m in length, have an operating range of less than 1000 NM and are intended for patrols of only a few days within limited distance from the coast or within small EEZs. They generally include a basic level of navigation and communications equipment, a radar suitable for fishing vessel detection and a single small Rigid Hull Inflatable Boat (RHIB) in order to permit the transfer of fisheries inspectors onto fishing vessels in conditions less than Sea-State 4.



Non-Military Coastal Patrol Vessel



Australian Armidale Class Patrol Boat

Inshore Patrol Vessels - These are usually 30-60m in length, have an operating range up to 2000 NM and are intended for patrols up to approximately 10 days within and beyond larger EEZs. They generally have more capable sensors and communications equipment, and two medium sized RHIBs for Boarding Party transfers up to Sea-State 4.

Offshore Patrol Vessels - These are generally greater than 60m in length, often have operating ranges beyond 10,000 NM and can conduct patrols within and beyond large EEZs for several weeks. They generally have a full suite of surveillance sensors and at least two large RHIBs for Boarding Party transfers beyond Sea-State 4. Vessels of this size will often have helicopter carrying capabilities to extend surveillance coverage, and other capabilities such as maritime pollution prevention, hospitals for natural and maritime disasters, fire-fighting and salvage.



South African Offshore Patrol Vessel – Sarah Baartman  
(Government Owned, Commercially Crewed)



Within the WCPO the challenges of attaining the most cost-effective capability to meet a broad range of operational needs are being met by the single 31m PPB. Major developed nations with large EEZs address this through an integrated capability of all three classes of vessels as shown in Table 6.6 below.

Table 6.6 - Integrated surface surveillance and response capabilities

Operator		Coastal	Inshore	Offshore
NZ	Military <sup>78</sup>	Lake Class (55m)		Protector Class (85m)
Australia		Bay Class (38m)	Armidale Class (57)	OPV TBA <sup>79</sup>
US		Island Class (36m)	Sentinel Class (47m)	Offshore Patrol Cutter (100m+)
France		P400 Patrol Boat (54m)		Floreal Class Frigate (93m)
South Africa	Civil	Lillian Ngoyi Class (47m)		MV Sarah Baartman (83m)

Whilst a range of vessels to meet a range of FFA members needs appears logical, it is unlikely that any single FFA member has the operational need and economic capabilities to justify, fund and manage such a program. Consideration of broader capabilities to service wider needs is only recommended at a regional level where risks and costs are more likely to be manageable. Even in the regional case, some form of government subsidy/recurrent support is likely to be necessary.

### Contemporary Practice in Fisheries Patrol Vessel Management

A number of contemporary management practices are progressively changing the way surface surveillance and response capabilities are acquired. Many of these are simple application of long-standing commercial practices within a military, police or fisheries enforcement context.

Table 6.7- Contemporary practises in fisheries patrol vessel management

Initiative	Example of Current Best Practice	Application within the WCPO
Intelligence driven operations	Up-front investment in intelligence permits patrol vessels to be targeted against MCS risks as opposed to random uninformed patrols.	This practice has been used to good effect in the large multilateral surveillance operations through the use of the FFA E-Ops Room software <sup>80</sup> . The development of a Regional Information Management Facility (RIMF) with outputs that might facilitate intelligence-driven surface surveillance activities is further discussed in Project 3.
Multi-tasking of patrol vessels	Patrol vessels are increasingly being designed to support a much broader range of functions (e.g. fisheries protection, maritime pollution, border protection, natural disaster response, search and rescue, transnational crime, scientific research). This is achieved through modular	This practice can be applied to the existing surface surveillance framework at the national level through the inclusion of all surface surveillance stakeholders in planning and operational activities. Consideration of multi-tasking

<sup>78</sup> Bay Class Patrol Vessels are operated by Australian Customs.

<sup>79</sup> Acquisition of an Offshore Combatant Vessel was identified as a requirement in the 2009 Defence White Paper.

<sup>80</sup> During consultations for this project the PIC members of FFA estimated that multilateral operations were either more effective or considerably more effective than normal day-to-day MCS activities.

	ship designs, flexible accommodation arrangements and collaborative operational frameworks.	at the regional level requires additional consideration at the strategic level.
Cost recovery through patrol vessel charter	When not being used for fisheries patrols these four South African vessels are commercially chartered as safety standby vessels for an oil platform. This helps to subsidise the cost of fisheries patrols <sup>81</sup> .	This process is currently being used in several national patrol vessel programs, and may also have applicability in future national and/or surface surveillance frameworks.
Ship-rider programs	In addition to the USCG ship-rider program the South African fisheries patrol vessel Sarah Baartman has also recently conducted a multilateral patrol within Mozambique, Tanzania and Kenya <sup>82</sup> .	This process is currently being used at the regional level by the USCG. Opportunity exists for application between FFA members within the provisions of the Niue Treaty.
Maximisation of vessel sea-days to minimise hulls required	Modern programs seek to minimise capital investment and ongoing maintenance costs by minimising the number of vessels required to achieve a target level of coverage. This is partly achieved by multi-crewing which reduces the impact of crew fatigue, leave and training cycles on vessel availability.	These practices are unlikely to be pertinent to the current surface surveillance framework, but may have applicability in possible future national and/or regional patrol vessel programs.
Roaming vessels	The Bay Class Patrol Boats operated by Australia have no fixed home port. They are multi-crewed with personnel changing in any convenient port. This provides operators with the ability to focus effort wherever risk is identified.	
Chartering of patrol vessels	This option is more likely to be cost effective when urgent requirements preclude long acquisition programs, long-term commitment is undesirable or more flexible ownership and operational structures are required.	
Commercial crewing	The South African Department of Environmental Affairs and Tourism (DEAT) operates a fleet of four commercially crewed patrol vessels. This relieves DEAT of responsibility of complex management and training functions that would distract it from core environmental and tourism functions.	These practices are unlikely to be pertinent to the current surface surveillance framework, but may have applicability in possible future national and/or regional patrol vessel programs.

### 6.5.3 A Regional “Bluewater” Surface Capability

Project 1 identified a number of IUU risks that might be partially addressed by increased rates of at-sea boarding and inspections. Whilst ample patrol vessels currently exist within the region it is likely that the high

<sup>81</sup> South African Parliamentary Monitoring Group question 1216, Internal Question Paper no. 21 of 2008, 01 Aug 08 – accessed at <http://www.pmg.org.za/node/14867> on 5 Aug 09.

<sup>82</sup> <http://www.southafrica.info/about/sustainable/patrolvessel-273009.htm>

cost of ownership<sup>83</sup> will continue to divert most resources from operational budgets<sup>84</sup>. This imbalance is unlikely to be addressed in the short to medium-term without a considerably different approach.

The project has been requested to give preliminary consideration to the development of a bluewater surface capability to supplement national capabilities. In considering this the project has investigated a range of options for the provision of a flexible and responsive surface capability that can move freely throughout the region as best determined by IUU risk analysis, and support national MCS activities.

In all cases vessels need to be owned by a government or a commercial entity. It is not considered legally feasible for a regional agency to be the beneficial owner of a vessel for the purposes of flag state registration; or particularly practical given the responsibilities under international law for vessels conducting maritime law enforcement duties.

Irrespective of the vessel's ownership, responsibility for compliance with international law remains with the vessel's flag State at all times. Notwithstanding, surveillance recipients may choose to indemnify surveillance providers from financial (but not legal and diplomatic) ramifications within the overarching legal instrument (NTSA, Ship-rider Agreement etc).

Noting the need for such a blue-water capability to be flexible and responsive to IUU risk, it is envisaged that an authority with detailed understanding of regional IUU risks would coordinate<sup>85</sup> regional patrol activities. The RMCC considered within project 4 could provide this service. Alternative locations may also be suitable if capable of conducting ongoing IUU risk analysis on a regional basis. Control<sup>86</sup> of the vessel should remain with the master or Commanding Officer of the vessel at all times, in consultation with delegated PIC operational authorities when operating within PIC EEZs, or delegated flag State authorities when operating on the high seas or transiting through PIC EEZs in non-enforcement modes.

Four options for a regional surveillance and response capability have been assessed.

- Option 1 - Quadrilateral Partners provide patrol vessels to conduct surveillance and response on behalf of PICs. This could be performed on a permanent, part-time or trial basis, and facilitated within the Niue Treaty or a similar equivalent for France and the US. This would require domestic legislation to be enacted to provide extra-territorial power and authority for boarding party members to conduct enforcement activities on behalf of FFA members.

This option has considerable potential; however with development of a revised Niue Treaty progressing slowly, no consideration of other agreements that could involve US and France, and commitment to implementation of the existing Niue Treaty only just beginning to emerge from Australia and NZ, this option is unlikely to address short-term needs.

- Option 2 - Quadrilateral Partners provide patrol vessels to conduct surveillance and response in partnership with PICs. This could also be on a permanent, part-time or trial basis, and executed within ship-rider agreements. In this option the Quadrilateral partner simply provides transport and ensures personnel safety, while the PIC provides detailed local knowledge and a legally authorised enforcement capability.

This option has considerable potential for short term implementation within the proven framework of ship-rider agreements.

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<sup>83</sup> Ownership cost of a PPB is estimated to be approx. USD\$2400 per day = USD\$876,000 per year.

<sup>84</sup> Operational cost of a PPB is estimated to be approx. USD\$3800 per sea-day = USD\$178,000 per year at current utilization rates.

<sup>85</sup> Coordinate - Provide operational advice as to the most efficient and effective employment of the vessel so as to best address regional IUU risks;

<sup>86</sup> Control – Direct tasking of the vessel to enable it to conduct accepted operational taskings efficiently, effectively and safely.

- **Option 3** – A PIC charters an existing patrol vessel to a regional or sub-regional surveillance and response program. This could be on a permanent, part-time or trial basis within the provisions of the Niue Treaty. Boarding parties could be provided from within the crew of the patrol vessel, or more ideally through development of a multilateral pool of authorised officers. External funding would be required to charter the vessel and compensate the PIC for acceptance of additional risk.

This option has immediate potential, particularly within the Micronesian states where significant IUU risks have been identified<sup>87</sup>, untapped patrol vessel capacity exists, a potential donor with aligned objectives exists and a strong history of cooperation exists.

- **Option 4** - A PIC accepts flag state responsibility for operation of a commercially chartered patrol vessel clearly marked for government duties on a regional or sub-regional basis. Given the economic considerations of commercial charter arrangements this option is unlikely to be cost effective on a part-time or trial basis, and less cost effective for single vessels.

### 6.5.4 Satellite-Based Surveillance

Satellite-based remote sensing can be a valuable surveillance tool, particularly when integrated with other data such as VMS, Automatic Identification System (AIS) and Long Range Identification and Tracking (LRIT). An indicative cost comparison of the two satellite-based technologies currently applicable for fisheries surveillance is shown in Table 8 below. (Comparison against other forms of surveillance and response is performed in Table 6.2 above. Prices depend primarily on resolution, acquisition urgency and other minor factors.

Table 8.6 - Indicative cost comparison for optical and radar images

Technology	Resolution (m)	Cost (USD\$/km <sup>2</sup> )	Comment
Optical Imagery	< 1.0m	\$25-80	Price depends on acquisition urgency and other factors
	1-5m	\$2-20	
Synthetic Aperture Radar	1 - 10m	\$2-3	This resolution cannot guarantee ship detection
	30m	\$0.5	

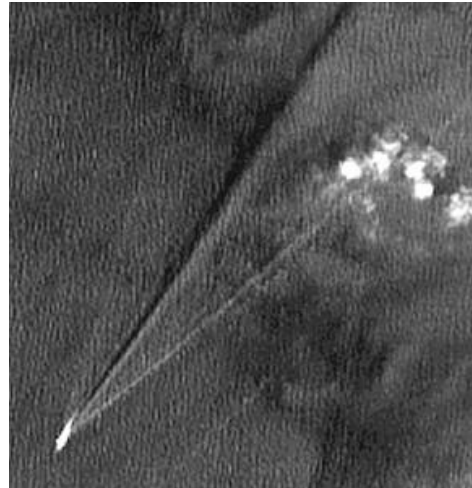
The scalable and modular nature of satellite-based capabilities present a considerable advantage over other surveillance options such as aircraft and patrol vessels which have large up-front capital costs. Small amounts of surveillance capability can be obtained for less than USD\$10,000 with no requirement for long-term commitment.

<sup>87</sup> A range of risks were identified would benefit from an increased rate of boarding and inspections. These include unlicensed fishing in the western and eastern extremities, under-reporting / by-catch related risks amongst licensed vessels.

Optical Imagery – Satellite-based optical imagery in resolutions ranging from 0.25m to 50m+ can be acquired, with timeframes as low as the next satellite pass in urgent cases. Revisit frequencies can be as low as 72 hours and delivery timeframes are generally 12-24 hours.

This capability is restricted in that images must be taken during daylight, cloud cover precludes application, and satellite passes happen at exactly the same time of the day.

Vessel identification through optical imagery is not feasible at this point in time. Without this capability there is no justification of the additional expense of optical imagery over cheaper and more flexible radar capabilities.



Example of 2.5m resolution optical imagery

Synthetic Aperture Radar (SAR) - SAR imagery of 1-100m resolutions can be obtained through a range of commercial suppliers. Ordering timeframes can be as low as the next satellite pass and revisit frequencies can be as low as several hours from providers operating a constellation of satellites, but also as high as 24 days. Delivery including post processing can be as low as 4 hours.

SAR Imagery is generally cheaper than optical imagery and can be taken at all times of the day and in all weather conditions. As such it remains the preferred technology for MCS purposes.



Example of SAR for fishing vessel detection

## Satellite Imagery for MCS Purposes within the WCPO

Even with the next generation of surveillance aircraft and patrol vessels it is likely that there will remain portions of the region that cannot be efficiently patrolled due to distances from appropriate airfields, ports and fuel supplies. This is likely to be particularly the case in the eastern regions of the WCPO. Satellite technologies may have application in these areas.

To be used effectively for MCS purposes it is necessary for satellite imagery to be compared against the known positions of legitimate fishing, merchant and yachting activity. Technologies for integrating VMS and satellite imagery have existed for some time and are currently being trialled for application within the WCPO<sup>88</sup>. An example of this process is shown in Figure 6.12 below.

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<sup>88</sup> SPC-French Navy trials underway this year to integrate Argos VMS and RadarSat data. The trial is being sponsored by EDF, facilitated by SPC and conducted by the French Navy and New Caledonia fisheries.

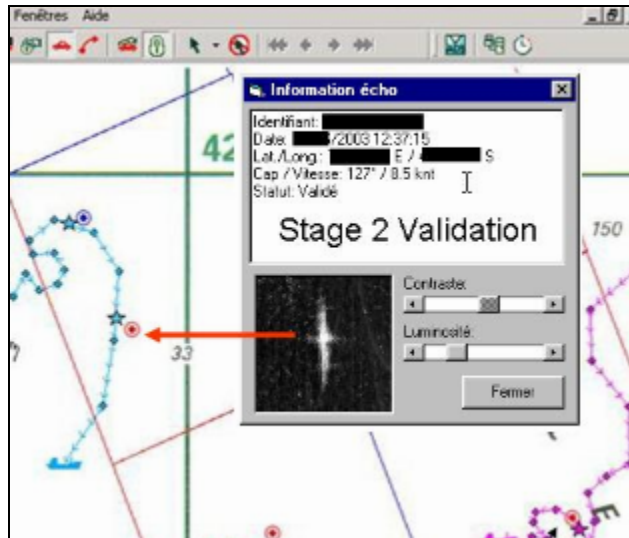


Figure 6.12: Cross-correlation of satellite imagery with VMS data<sup>89</sup>

It is important to understand that cross-correlation of VMS and satellite data is only feasible if VMS polls and image capture can be synchronized or alternatively in low vessel density areas where correlation of data of moving vessels is still possible. It is considered that SAR has beneficial application within the WCPO for MCS purposes if applied in the following 3 modes:

- Mode 1 – Information Collection. Application in remote locations where more cost-effective surveillance options (such as aircraft and patrol vessels) is not possible or economically justified. This scenario exists in the Eastern portion of the area outlined in Figure 6.13 below (in the vicinity of Kiribati’s Line Islands Group).

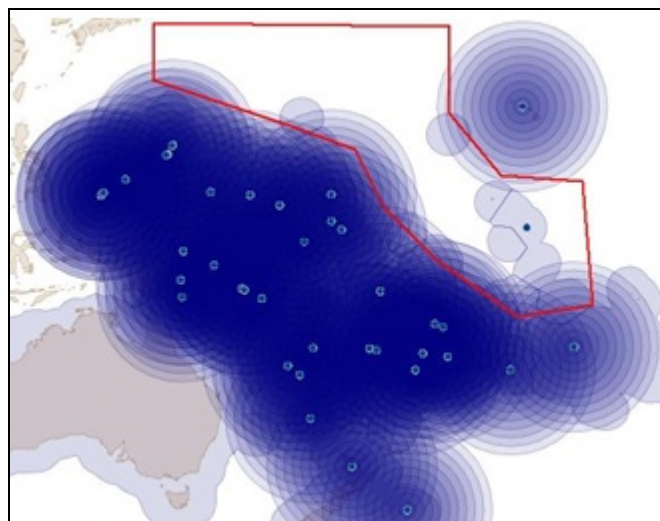


Figure 6.13: Current aerial surveillance coverage and recommended areas for satellite surveillance focus

Application in this mode has the objective of providing MCS Officers with confidence that a blank VMS screen really does indicate no fishing activity in these areas, (as opposed to trying to identify IUU activity within large groups of legitimate fishers).

<sup>89</sup> Image courtesy of CLS Argos - <http://www.cls.fr/>

- **Mode 2 – Intelligence Validation.** Whilst community and industry based reporting systems (discussed at length below) have potential to provide valuable intelligence of possible IUU activities, it would not be expected that an aircraft or ship would be dispatched on first report of a possible activity. Satellite imagery provides an option to validate intelligence at low cost (approx. USD\$5,000) before committing to more expensive response capabilities.
- **Mode 3 - IUU Deterrent.** In addition to providing a detection capability in remote locations where other options simply cannot reach, strategically communicated awareness of the existence of a satellite surveillance capability can offer considerable additional deterrent value at no additional cost.

### 6.5.5 Community-Based Surveillance

Community and industry based partnerships have become a key strategy in many sectors of law enforcement with the development of paid informant, neighbourhood watch and crimestopper programs. They also form the foundation of FAO’s guidance to fisheries managers for inclusion of “participatory management” frameworks where possible<sup>90</sup>. These concepts are progressively being incorporated in MCS programs.

Industry, charter fishing operators, NGOs and communities all indicated willingness during FFA member consultations to participate in some form of IUU vessel reporting scheme. Previous offers of support have also been received in the past from the operators of inter-island cargo vessels and domestic airlines. Such a system could be a very cost-effective and complementary means of providing additional surveillance capability, particularly in FFA member countries with established domestic fishing fleets. An industry or community based reporting system would need up-to-date lists of licensed vessels, and a reporting procedure in the event that a suspected illegal activity is detected. The system could be enhanced over time, particularly with commercial fishing operators and NGOs conducting their own independent surveillance operations at sea.

### 6.5.6 Emerging Technologies

#### Unmanned Aerial Vehicles (UAVs)

Land-based UAVs are increasingly being used in military operations. Their ability to remain on task for long periods will be of benefit in maritime surveillance roles, however they are not yet commonly used in this mode. Detailed consideration of current maritime UAVs development is provided in Appendix 6.1. Of particular interest is the development of small UAVS that can be launched and recovered from patrol vessels. It is recommended that a close watch be maintained on these capabilities as they become more technically and financially viable for MCS application in the WCPO.

#### Land-Based Radar

Consideration of options for a variety of land-based radars is provided in Appendix 6.1. Some of the short range coastal radar installations considered may have domestic application in FFA member EEZs, but lack the flexibility and mobility to address dynamically changing IUU risks at the regional level application. Long range over the horizon radars are similarly inflexible, but are also likely to be cost-prohibitive at this stage.

#### Aerostats

Aerostats (tethered radar equipped balloons) have been used to conduct radar searches from high altitudes, thereby dramatically increasing coverage. Current technologies are understood to be capable of remaining airborne for up to 30 days; however these are necessarily fixed installations that are unlikely to be able to address dynamically changing IUU risks within the WCPO.

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<sup>90</sup> Flewelling, P.; Cullinan, C.; Balton, D.; Sautter, R.P.; Reynolds, J.E. *Recent trends in monitoring, control and surveillance systems for capture fisheries*. FAO Fisheries Technical Paper. No. 415. Rome, FAO. 2002. p12, 39, 105, 111.

## 6.6 Funding Models to Support the Regional Capability Supplementation

The attainment of “bluewater” surface surveillance, commercial aerial surveillance, or a package of satellite images is likely to be a considerable financial undertaking that may require the development of a dedicated financial structure. The development of financial frameworks to support regionally managed operational capabilities is considered within Project 4 in support of the development of a proposed RMCC.



## Chapter 7: Synthesis

Each of the preceding five chapters has dealt with the individual projects, highlighted major issues requiring attention and provided options and recommendations that address these issues. This chapter provides a synthesis of the cross-cutting themes and higher level conclusions arising from the projects as a group. We have written this Chapter with the object of informing, but not unduly influencing, those responsible for developing the Regional MCS Strategy. Two overarching themes were frequently highlighted both in the in country visits and in the course of the projects:

- i) **There is a need for ‘immediate and decisive’ action.** The achievement of both regional fisheries goals – stock and ecosystem sustainability and economic growth from tuna fisheries - is currently at risk. Latest scientific assessments indicate that stocks of BET, and to a lesser extent YFT, are under significant pressure, while our understanding of fisheries impacts on a range of other non-target species remains weak. At the same time, best estimates value the IUU catch in the WCPO region somewhere in the order of US\$707 million to \$1557 million<sup>91</sup>. While a range of management arrangements (e.g. CMM 08-01, PNA VDS) have recently been adopted to address these and other important concerns, these studies have shown that – despite world-leading progress on some areas –MCS arrangements are not adequate to support effective fisheries management and a number of significant weaknesses exist. Action to strengthen existing MCS arrangements is consistent with Leaders’ recognition in the Vava’u Declaration on “the imperative need for us to take immediate and decisive collective action to ensure that, within the next three to five years, we secure our peoples’ future livelihoods, regional food security, and the environmental sustainability of our seas and their ecosystems”<sup>92</sup>.
- ii) **There is a need to optimize the effectiveness of limited MCS resources.** As noted in the risk assessment, the FFA region is characterized by very large EEZs, very valuable tuna resources and, with few exceptions, very limited resources with which to undertake MCS. As a result there is a need to ensure that available resources and opportunities are used most effectively and efficiently, while continually assessing new techniques will be important considerations for the Regional Strategy.

Within these overarching themes, a number of key messages emerged:

**There is a need to take a broad view of MCS.** The results of these projects reinforce the recognition by FFC 67 that MCS is “more than just preventing the stealing of fish from coastal States by foreign fishing vessels”<sup>93</sup>. While combating IUU is an important objective, MCS activities also play a key role in supporting effective fisheries management by generating the necessary information to support accurate stock assessments and detect changes in fishing capacity, effort, behaviour and the like. Both Projects 1 and 2 highlighted weaknesses in data collection and control measures across the region including, for example, failure to submit timely and accurate logsheets, weaknesses in CCM data submission to the WCPFC, and weaknesses in national legislation and license conditions to support agreed fisheries management arrangements. While the Strategy will seek to significantly improve performance across all aspects of MCS, strong recognition should be given to the importance of basic monitoring and control functions in supporting effective fisheries management. A number of approaches and options to strengthen these areas have been suggested.

**A focus on voluntary compliance and deterrence.** The most cost effective deployment of MCS resources is likely to be achieved where levels of voluntary compliance are high. Voluntary compliance can be achieved through either incentives or deterrents, or more frequently a combination of both. Voluntary compliance is likely to be highest where there are high levels of understanding of, and support for, fisheries management arrangements amongst industry, and a range of possible measures to engender understanding and support have

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<sup>91</sup> Ibid, Agnew et al (2009)

<sup>92</sup> The Vava’u Declaration on Pacific Fisheries Resources - “Our Fish, Our Future”; 38<sup>th</sup> Pacific Islands Forum Communiqué

<sup>93</sup> FFC67 / WP 27: Development of an integrated Regional MCS Strategy

been suggested here (use of participatory planning techniques, market based incentives, annual ‘induction’ sessions for fishing masters). Support for management arrangements will also be strengthened where arrangements are practical and able to be complied with reasonably. To this end, these projects support the importance of involving MCS practitioners in the design and development of fisheries management arrangements, and facilitating this engagement should be an important consideration for the Strategy. In other words, while MCS should, and should be seen to, be responsive to fisheries management objectives – rather than the inverse – the practical enforceability of management arrangements, the ability of industry to comply and increased operating costs to industry of various options are important considerations and should be explored in developing the Strategy.

**There is a need to take a ‘whole-of-stock’ approach.** A key outcome of the risk assessment was that some of the highest risks to the achievement of FFA members’ regional fisheries goals occur outside the FFA region. SPC modeling shows that the impact of domestic fisheries in the Philippines and Indonesia are the single largest contributor to the reduction in YFT biomass throughout the WCPO<sup>94</sup>, while the same fisheries are second only to the combined LL sector in their impacts on BET<sup>95</sup>. A key message arising from these results is the need to take a ‘whole-of-stock’ approach in supporting measures to strengthen MCS arrangements (see also ‘Leadership in the WCPFC’ below). While there may be little FFA members can do directly in strengthening MCS arrangements in external coastal states, the FFA bloc can play a key role in supporting efforts through the WCPFC (e.g. the GEF-Western Pacific East Asia project) and through other regional initiatives (e.g. the Regional Plan of Action to Promote Responsible Fishing Practices including Combating IUU Fishing in the Region<sup>96</sup>) to enhance MCS across the geographic range of key tuna stocks. FFA members can also continue their recent efforts in improving communication and coordination between the FFA membership and the Philippines and Indonesia through involvement in sub-regional WCPFC workshops and other processes.

**There is a need to improve compliance amongst licensed vessels.** An important conclusion of the risk assessment was that, unlike some other parts of the world where strategies to address IUU fishing are driven by the activities of unlicensed vessels, there is a strong case to be made that the majority of current IUU activity in the Pacific is associated with licensed fleets. Under-reporting of target and bycatch species in logsheets, for example, was widely reported by interviewees in country and GEN-3 observer data demonstrates significant levels of non-compliance across a range of areas in both PS and LL fisheries. Non-compliance is likely to be facilitated by a range of MCS weaknesses highlighted in Project 2 as well as, in some areas, a low priority given to enforcing license conditions. While individual incidents of non-compliance (e.g. under-reporting BET catch by a few fish) may be relatively minor, their cumulative impact on the achievement of regional fisheries goals can be significant by compromising scientific and management information as well as undermining economic returns to FFA members through loss of government revenue and possible future catch and effort allocations. With that in mind, we suggest an important focus of the Regional MCS Strategy should be improving levels of compliance amongst licensed fleets, and a range of possible measures to assist in this regard have been suggested.

Notwithstanding that, the risk assessment also identified high residual risks associated with some forms of unlicensed fishing and this clearly remains a concern amongst FFA members. These risks also require treatment in the Strategy, and the need for MCS measures may increase in the future as the availability of legitimate fishing opportunities is further restricted both in the Pacific and in other ocean basins.

**There is a need to address risks throughout the supply chain.** Historically much MCS focus has been at the level of the catching vessel, however increasing attention is now being paid to the role of supply chains in facilitating IUU activity. Projects 1 and 2 demonstrated that weaknesses exist throughout the supply chain (under-reporting by catching vessels, illegal transshipping, weaknesses in port monitoring and control) and highlighted the particular need to strengthen catch monitoring and validation from the catching vessel to

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<sup>94</sup> Ibid, Langley et al (2009)

<sup>95</sup> Ibid, Harley et al (2009)

<sup>96</sup> <http://www.rpoa.sec.dkp.go.id/>

market. A number of possible approaches to improve catch monitoring and validation throughout the supply chain are suggested here including, principally, the establishment of a comprehensive catch documentation scheme (CDS), strengthening of transshipment regulations including a requirement for 100% observer coverage on carrier vessels, improvements to national port inspection regimes and the establishment of national 'compliance analysis engines' to efficiently cross-verify various sources of information on catch. Potential to further strengthen compliance on catch taken from FFA members waters and landed in foreign ports also exists under the FAO Port State Measures Agreement currently being developed. Strengthening MCS throughout the supply chain will contribute to both regional goals by reducing opportunities for the laundering of illegally taken catches, while also strengthening the quality of the information upon which to base fisheries management decisions.

**Recognition of the need to optimize MCS arrangements at the national level.** While much of the planning of fisheries management frameworks in the Pacific is done at the regional level, most of the MCS delivery is undertaken nationally. Given the shared nature of stocks in the region, there is a need to promote strength across all 'links in the MCS chain'. While significant progress has been made in establishing the core components of an integrated MCS regime, these projects have highlighted that weaknesses still remain. Project 2 highlighted in particular data and MCS coordination, legislation and management plans, observers and port controls and monitoring as areas requiring further work across the region. Project 3 highlighted considerable opportunities to improve information management at the national level to support more effective MCS, and Project 4 identified a range of potential benefits from improved cooperation and coordination between agencies at the national level. Given the above, we suggest a key focus of future regional MCS efforts should be supporting FFA members in optimizing MCS arrangements at the national level to support the achievement of regional fisheries goals. In optimizing arrangements, strong recognition should be given to the uniqueness of each country's MCS needs and priorities and arrangements developed to suit its particular circumstances.

Working with each country to optimize arrangements would be a key function of a RMCC.

**Leadership in the WCPFC.** The establishment of the WCPFC has brought with it a new suite of important opportunities and obligations for FFA members. As a bloc representing over 50% of the membership, and accounting for over 70% of the catch in the Convention Area, FFA members have an unparalleled and heretofore unavailable opportunity to shape fisheries management arrangements and supporting MCS regimes in high seas areas adjacent to their EEZs. At the same time, membership of the WCPFC has brought with it a range of new compliance and reporting obligations that require resourcing and support. Given the shared nature of stocks across the region, a fully functional and effective WCPFC that includes a high seas MCS regime complementary and supportive of in zone arrangements will be critical in achieving regional fisheries goals. In light of this, we suggest an important focus of the Regional MCS Strategy should be guiding and supporting FFA members' strategic engagement in the WCPFC on MCS related matters. In particular, we suggest consideration be given to approaches aimed at:

- supporting high levels of compliance amongst the FFA membership with WCPFC CMMs and other obligations (e.g. reporting requirements);
- demonstrating strong and effective in zone MCS arrangements; and
- using the leverage generated by (a) and (b) to encourage high levels of compliance from non-FFA CCMs and drive complementary and supportive MCS arrangements on the high seas.

We note that such an approach addresses the strategic risks that (a) strengthened in zone MCS arrangements will displace IUU fishing and other activities that undermine fisheries goals into adjacent high seas waters, and (b) low levels of compliance with WCPFC obligations by FFA members will weaken their influence in the Commission.

**Considerable improvements in MCS effectiveness can be achieved through improvements in information management and analytical capability at both the national and regional levels.** Robust systems for the collection, processing, storage and exchange of information are increasingly being recognized

as fundamental to an effective, integrated MCS regime. The results of these projects have reinforced the importance of effective information management and have also highlighted scope for improvement at all levels. A key outcome of Project 1 was the urgent need to improve the coverage and quality of information to underpin future risk assessments across the region. Project 2 identified weaknesses in data management and MCS co-ordination as the key obstacle to effective implementation of MCS obligations at the national level, while both Projects 4 and 5 highlighted areas where improved information sharing and analysis could improve MCS performance (e.g. by better targeting surveillance and response assets). In light of this, we suggest an important focus of the Strategy should be on supporting measures to enhance information management and analysis at the national and regional levels.

To this end, Project 3 has made a number of recommendations to enhance information management systems, including the establishment of ‘compliance analysis engines’ at the national levels and a Regional Information Management Facility at the regional level. Improved information management systems should be supported by improved analytical capability at both levels.

**Scope exists to improve MCS effectiveness at little expense through enhanced regional cooperation and optimization of existing platforms.** A significant amount of MCS architecture already exists in the FFA region including the FFA and WCPFC vessel registers, the FFA HMTCs, the FFA and WCPFC VMS systems, the Pacific Patrol Boat program and a range of other measures. While these measures have served the region well, a key finding from these projects is that the effectiveness of existing arrangements could be significantly improved in many cases, often at little expense, through improved regional cooperation and optimization of existing assets. Project 1 for example, highlighted a range of possible measures to enhance the use of the FFA VMS system to address specific risks. Project 2 highlighted the benefits associated with improved cooperation between coastal/licensing states and key port states in undertaking port state compliance as well assisting in the collection of logbooks and other mandatory reporting requirements. Projects 4 and 5 highlighted the cost and operational benefits associated with improved cooperation and coordination in the use of surface surveillance and response assets through the expansion of Niue Treaty arrangements, Ship Rider programs and the like. Given these opportunities, consideration should be given in developing the Regional Strategy to the inclusion of a program that, as an early priority, aims to identify and assist members in implementing, measures that will significantly enhance MCS effectiveness at comparatively little cost. We note that such an approach would have the dual benefit of improving MCS effectiveness, while at the same time building and reinforcing support for regional approaches amongst FFA members (and external stakeholders such as potential funding partners) by getting early, practical results ‘on the board’. The early support generated may also lay a solid foundation for later measures that may be more challenging or costly. A list of possible low-cost measures may be generated from recommendations suggested in this report.

**Considerable benefits are likely to accrue from improved MCS support and coordination across the region.** Potential benefits arising from improved support to national MCS practitioners as well as improved coordination at all levels across the region have been highlighted by these projects. Project 1 identified the need to expand MCS analytical capability at both the national and regional levels and the need to regularly update risk assessments as risks and drivers change. Project 2 highlighted a range of national MCS capacity building needs as well as opportunities for strengthened MCS through improved coordination amongst the FFA membership. Project 3 highlighted the need to strengthen information management systems at the national level as well as the benefits associated with the establishment of a Regional Information Management Facility, while Project 5 highlighted the benefits of improved regional coordination in the risk-based deployment of regional surveillance and response assets. Each of these needs can be supported either partially, or in full, through the creation of a fisheries-focused facility to support MCS efforts at all levels (national, sub-regional and regional). Project 4 responds to these needs by outlining a range of possible roles and functions for a RMCC, as well as possible funding sources. While an ‘inaugural’ structure for an RMCC need not be much more than an administrative amalgamation of existing FFA MCS-related functions plus a few important additions, scope should be left to expand the functions of the facility based on the needs of FFA members and the level of resources available. An important early priority should be the establishment of the proposed Regional Information Management Facility.

**There is a need to optimize the use of surveillance and response assets.** As noted in Project 5, surveillance and response assets such as ships and planes are a core component of an integrated MCS regime and play an important (if often intangible) role in creating deterrence to non-compliance. At the same time, these assets are some of the region's most expensive MCS tools and, as a result, some of the biggest gains in efficiency can be made from optimizing their use. Projects 4 and 5 have identified a range of current limitations to optimal use of existing assets, many of which can be addressed at comparatively little expense through improved co-operation and coordination at both the national (improved cooperation between fisheries and surveillance agencies; provision of timely and accurate license lists; pre- and post-patrol briefings etc), sub-regional (expanded cooperation under the Niue Treaty and Ship Rider agreements) and regional (improved targeting of assets through strengthened information management and analysis) levels. Nevertheless, these projects have also highlighted that, even with these suggested improvements, existing platforms may not be able to address all risk to stocks within the FFA region. Weaknesses in particular were identified in the level and responsiveness of aerial surveillance in many areas (aerial surveillance sorties often need to be planned a year or more in advance; levels of coverage are very low in some areas), while limitations exist in the range and (endurance) of existing surface platforms. As a result, these projects explored a range of alternative options to supplement existing assets and identified those that are likely to have most utility in the region for fisheries purposes. Creating an environment that promotes the most optimal use of hardware based on risks will be an important consideration for the Strategy.

**A need to invest in people.** While technology, information and hardware assets play an important role, arguably the most important assets in any MCS regime are its people. These projects have identified a range of possible areas to strengthen national and regional MCS regimes, many of which will require capacity building initiatives. In addition, the projects have highlighted the benefits associated with regionally consistent forms of training and certification to promote the efficient use of shared resources across the region, as well as the strategic need to FFA members to demonstrate strong in zone MCS and high levels of compliance with international obligations (e.g. WCPFC obligations). Given the training and capacity building implications associated with these needs, we suggest an important consideration in developing the Strategy should be the requirement for appropriate programs to strengthen human capacity across the region. The core elements of a program could be put together based on needs highlighted in these studies.

**Need to explore cost effective and innovative MCS approaches.** Consistent with the overarching theme to ensure most effective and efficient use of limited MCS resources, there is a need for the strategy to promote the continuous exploration of cost effective and innovative MCS techniques. These projects have highlighted a range of possible approaches to strengthen MCS arrangements using cost effective techniques including further optimizing the use of VMS, greater use of 'long arm' enforcement approaches such as WCPFC IUU listing and strengthened port state controls, exploration of remote monitoring techniques for LL vessels and more flexible sanction regimes to avoid costly and lengthy legal proceedings. While not all new technologies and approaches may be applicable in the Pacific, there is a need to continually monitor new approaches that deliver cost effective MCS outcomes for FFA members. Monitoring and promotion of these approaches should be an important function of the RMCC (or FFA).

**Need for flexible, scalable and adaptive approaches.** Fisheries management frameworks upon MCS arrangements are based are constantly being refined. Likewise, risks and threats to fish stocks are influenced by a complex suite of drivers that constantly alter their nature, geographic and temporal distribution and severity. Given these dynamic conditions, there is a need for the Strategy to promote arrangements that are responsive and resilient to change. To this end, a common theme amongst the initiatives proposed in these projects has been the scalability and modularity in approach (e.g. scalability in surveillance and response options based on levels of risk; scalability of information management systems based on levels of resources available), as well as the encouragement of common systems and greater cooperation within the region to promote flexibility in MCS responses.

**There is a need for regular monitoring and review.** Given the dynamic nature of risk, MCS resourcing and capacity, and a range of other influences highlighted by these projects, an important feature of the Strategy should be a regular program of monitoring and review. At the detailed level, the regional risk assessment and

compliance reviews should be updated regularly. Given the rapidly changing nature of some risks, the significant inter-annual variability in key drivers and the importance of current risk assessments in compliance planning, consideration should be given to updating regional risk assessments at least annually. This task could be undertaken by the RMCC (or alternatively FFA), in conjunction with, and input from, the MCSWG. We note the establishment of the RIMF should greatly assist in supporting future risk assessments.

The compliance review may be undertaken biennially. This process could be led by FFA members using a process agreed by the MCSWG. The most cost effective means of undertaking the review may be by a robust form of self-assessment. A possible process and timeframe for updating the review has been suggested in Chapter 3.

At the strategic level, performance of the Strategy against agreed goals and objectives should also be regularly reviewed. Progress should be measured using objectively verifiable indicators against regionally agreed baselines and targets. Given the linkages between this Strategy and the Regional Tuna Management and Development Strategy, we suggest the timing of the reviews remain consistent (if perhaps offset to minimize administrative workload).

## Appendices

Appendix 1.1: Terms of Reference

Appendix 1.2: National Workshop Presentations and Template

Appendix 1.3: List of People Consulted

Appendix 1.4: Key Terms

Appendix 2.1: Fisheries Frameworks and Objectives

Appendix 2.2: Risk Assessment Tables

Appendix 2.3: Additional MCS Measures

Appendix 2.4: Possible Performance Indicators

Appendix 3: Compliance Review Report

Appendix 4: Information Management Report

Appendix 5: Regional Coordination Report

Appendix 6: Regional Capability Report