Intertek Moody Marine





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MSC Assessment Report for

Fiji Albacore Tuna Longline Fishery

Client: Fiji Tuna Boat Owners Association

Version: 3 Public Comment Draft Report June 2012

Certification Body:

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1 **SUMMARY**

This report provides information on the assessment for the Fiji Tuna Boat Owners Association Albacore Longline Fishery. The assessment is by Intertek Moody Marine against the Marine Stewardship Council Principles and Criteria for sustainable fishing. The assessment team used the default assessment tree contained within the Marine Stewardship Council (MSC) Fishery Assessment Methodology version 2 (FAM v2).

1.1 The Assessment team

Jo Akroyd	Lead Assessor with P3 responsibility
Kevin McLoughlin	Assessor with P1 responsibility
Tim Huntington	Assessor with P2 responsibility

1.2 Assessment timeline

Announcement of main assessment	2 June 2011	
Site visit and stakeholder consultation	9-15 October 2011	
Expected completion date	2 June 2012	

Expected completion date

Scores for each Principle 1.3

Principal 1: 81.9 Principal 2: 85.0 Principal 3: 86.4

Conditions and timescales 1.4

The assessors require seven conditions. Refer to Section 14.2 for details.

Condition 1: Reference Points, Management Outcomes: PI 1.1.2

Condition and timescale:

Target and limit reference points need to be formally agreed by management, consistent with the management objectives and scientific stock assessment.

Within four years of certification WCPFC must be in a position to demonstrate that the SG80 requirements have been met:

Condition 2: Harvest Control Rules and Tools, Harvest Strategy: PI 1.2.2

Condition and timescale:

Well-defined harvest control rules need to be proposed, tested and established through WCPFC working groups, committees and the Commission. Within four years of certification WCPFC must be in position to demonstrate that the SG80 requirements have been met:

Condition 3: Status retained non-target species. P 2.1.1

Condition and timescale

The Client should put in place a formal strategy and implementation arrangements that are designed to ensure that there are demonstrably effective management measures so that the fishery does not hinder recovery and rebuilding of vulnerable shark species.

A formal strategy and implementation plan should be developed in readiness for the first annual surveillance and there should be verifiable information that these measures are demonstrably effective within three years of certification

Condition 4: Management Strategy retained non-target species. P 2.1.2

Condition and timescale

The Client should put in place a formal strategy and implementation arrangements that are designed to ensure that there are demonstrably effective management measures so that the fishery does not hinder recovery and rebuilding of vulnerable shark species.

A formal strategy and implementation plan should be developed in readiness for the first annual surveillance and there should be verifiable evidence that these measures are demonstrably effective within three years of certification.

Condition 5: Information/monitoring retained non-target species P 2.1.3

Condition and timescale

The Client fleet, with the assistance of the Fisheries Department, should seek to improve the monitoring of both shark landings and bycatch (discards or live releases) to species level for the key shark species identified in CMM-2010-07 (blue shark, silky shark, oceanic whitetip shark, mako sharks, and thresher sharks, porbeagle shark and hammerhead sharks (winghead, scalloped, great, and smooth)).

A formal monitoring plan should be developed in readiness for the first annual surveillance and at least a year's worth of complete data available for review within three years of certification.

Condition 6: Information/monitoring ETP species P 2.3.3

Condition and timescale

A reporting system to record the occurrence and outcome of all interactions with sea turtles and seabirds should be developed at fleet level. The robustness of this reporting system should be independently verifiable.

A formal reporting system should be developed in readiness for the first annual surveillance and at least a year's worth of complete data available for review within three years of certification.

Condition 7: Compliance and Enforcement P 3.2.3

Condition and timescale

By the second surveillance audit, the fishery must provide evidence that the monitoring, control and surveillance mechanisms work together to form part of a system, and demonstrate an ability to enforce relevant management measures, strategies and/or rules.

By the second surveillance audit the fishery must also, demonstrate that sanctions are consistently applied and thought to provide effective deterrence.

By the third surveillance audit the fishery must also demonstrate that there is no evidence of systematic non-compliance.

2 INTRODUCTION

This report sets out the results of the assessment of the Fiji Tuna Boat Owners Association Albacore Longline Fishery against the MSC Principles and Criteria for Sustainable Fishing. The report aims to provide clear justification for the assessment scores that have been attributed to the fishery and identify the sources of information that have been used to support these. Background to the fishery under assessment and the context within which it operates is provided for information in the main part of the report. However, it should be noted that no primary research has been undertaken to inform this report. Source material relies on published materials, separate support data provided by researchers and management organizations, and outputs from stakeholder interviews. The report is not intended to comply with the standard editing norms expected for scientific journals.

2.1 The fishery proposed for certification

The MSC Guidelines to Certifiers specify that the unit of certification is "The fishery or fish stock (=biologically distinct unit) combined with the fishing method/gear and practice (=vessel(s) pursuing the fish of that stock)" The fishery proposed for certification is therefore defined as:

Species:	Albacore tuna, Thunnus alalunga		
Geographical Area:	Fiji's Exclusive Economic Zone, South Pacific Ocean		
(NB this UoC this includes Fiji archipelagic waters and Territoria)			
Method of Capture:	Pelagic Longline		
Management System:	Fiji Fisheries Department, Ministry of Fisheries and Forests, and the		
	Western and Central Pacific Fisheries Commission (WCPFC)		
Client Group: Fiji Tuna Boat Owners Association (FTBOA)			

In the course of the certification it is possible that further companies/vessels may join the client group. This would be in accordance with the MSC's stated desire to allow fair and equitable access to the certification.

2.2 Report Structure and Assessment Process

The aims of the assessment are to determine the degree of compliance of the fishery with the MSC Principles and Criteria for Sustainable Fishing, as outlined in Section 9 of this report.

This report sets out:

- the background to the fishery under assessment and the context within which it operates in relation to the other areas where the target species is fished;
- the qualifications and experience of the team undertaking the assessment;
- the standard used (MSC Principles and Criteria);
- stakeholder consultation carried out. Stakeholders include all those parties with an interest in the management of the fishery and include fishers, management bodies, scientists and Environmental Non-Governmental Organizations (ENGO's);
- the methodology used to assess ('score') the fishery against the MSC Standard;
- a scoring table with the scores adopted by the assessment team for each Performance Indicator, and Scoring Guideposts which aid the assessment team in allocating scores to the fishery. The commentary in this table sets out the position of the fishery in relation to these Scoring Guideposts.

Finally, as a result of the scoring, the Certification Recommendation of the assessment team is presented, together with any conditions attached to certification.

In draft form, this report is subject to critical review by appropriate, independent, scientists ('peer review'). The comments of these scientists are appended to this report. Responses are given in the

peer review texts and, where amendments are made to the report on the basis of peer review comments; these are also noted in the peer review text. Following peer review, the report is then released for public scrutiny on the MSC website.

The report, containing the recommendation of the assessment team, any further stakeholder comments and the peer review comments is then considered by the Intertek Moody Marine Governing Board (a body independent of the assessment team). The Governing Board then make the final certification determination on behalf of Intertek Moody Marine Ltd.

It should be noted that, in response to comments by peer reviewers, stakeholders and the Intertek Moody Marine Governing Board, some points of clarification may be added to the final report.

Finally, the complete report, containing the Intertek Moody Marine Ltd Determination and all amendments, will be released for further stakeholder scrutiny.

2.3 Stakeholder meetings attended

Information used in the main assessment has been obtained from interviews and correspondence with stakeholders in this fishery, notably:

Organization	Persons met	Expertise	Date
SPC	Graham Pillington	Advisor tuna fisheries (science)	3-8 Oct 2011
	Deirdre Brogan	Fisheries Monitoring	
FFA	Hugh Walton	Advisor Tuna Fisheries	9-15 Oct
		(Management)	2011
WWF	Seremaia Tuqiri	WWF Fiji	12 Oct 2011
	Jackie Thomas	WWF Fiji	
	Peter Trott	WWF Australia	
Fiji Fisheries	Anare Raiwalu	Principal Fisheries Officer	11 and 13
			Oct 2011
	Mele Raicebe	Senior Managers, for Fisheries	
	Netani Tavaga	management, compliance,	
	Jone Amoe	research, observer coverage	
	Aisake Batibasaga		
	Aspensia Sauturaga		
Asian Fisheries Society	Patricia Kailola	Asian Fisheries	12 Oct 2011
Solander Fisheries	Radhika	General Manager	10 and 13
	Tom Mao	Operations Manager	Oct 2011
Fiji Fish	Russell Durham	CEO	10 and 13
			Oct 2011
SeaQuest	Brett Haywood	Director/ Manager	10 and 13
	-	_	Oct 2011
West and Central	Viliamu Powell	Executive Assistant	12 Oct 2011
Seafood			
Haington Pacific	Hendra K Mohen	General Manager	12 Oct 2011

2.4 Other information sources

Published information and unpublished reports used during the assessment are listed below:

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Clarke, S. and S.J. Harley. (2010). A Proposal for a Research Plan to Determine the Status of the Key Shark Species. WCPFC-SC6-2010/EB-WP-01. 6th Regular Session of the WCPFC Scientific Committee, 10-19 August 2010, Nuku'alofa, Tonga. pp. 50.

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- CMM-2009-05 [Prohibiting fishing on data buoys]
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- CMM-2010-03 [Compliance Monitoring Scheme]
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3 GLOSSARY OF ACRONYMS AND ABBREVIATIONS USED IN THE REPORT

B _{current}	Average total biomass for recent years
BET	Bigeye tuna
B _{MSY}	Equilibrium total biomass at MSY
CCMs	Commission Members, Cooperating non-Members, and participating Territories
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMM	Conservation and Management Measure
CMS	Convention on Migratory Species
CNM	Cooperating Non Member
CoC	Chain of Custody
CPUE	Catch per Unit Effort
DAFF	Department of Agriculture, Forestry and Fisheries, South Africa
EAFM	Ecosystem Approach to Fisheries Management
EB SWG	Ecosystems and Bycatch Specialist Working Group
EEZ	Exclusive Economic Zone
ENGO	Environmental Non-Government Organization
EPO	Eastern Pacific Ocean
ERA	Ecological Risk Assessment
ETP	Endangered, threatened or protected species
EU	European Union
FAM.	Fisheries Assessment Methodology
FAO	Food and Agricultural Organization
Fcurrent	Average fishing mortality-at-age for recent years
FFA	Pacific Islands Forum Fisheries Agency
FFC	Forum Fisheries Committee
FL	Fork length
F _{MSY}	Fishing mortality-at-age producing the maximum sustainable yield (MSY)
FSM	Federated States of Micronesia
FTBOA	Fiji Tuna Boat Owners Association
GEF	Global Environment Facility
HBF	Hooks between floats
HMS	Highly Migratory species
IATTC	Inter American Tropical Tuna Commission
IMM	Intertek Moody Marine
IPOA	International Plan of Acton
IPCC	International Panel on Climate Change
ISC	International Scientific Committee for Tuna and Tuna like Species in the N. Pacific Ocean
ISSF	International Seafood Sustainability Foundation
IUCN	International Union for the Conservation of Nature
М	Natural Mortality
MCS	Monitoring, Control and Surveillance
MFCL	Multifan-CL (fisheries assessment software)
MSC	Marine Stewardship Council

MSE	Management Strategy Evaluation
NGO	Non-Government Organization
NMFS	National Marine Fisheries Service (USA)
NOAA	National Oceanographic and Atmospheric Administration
NPOA	National Plan of Action
OFP	Oceanic Fisheries Programme
OMP	Operational Management Procedure
PAFCO	Pacific Fishing Company
PNA	Parties to the Nauru Agreement
PSV	Productivity, Susceptibility and Vulnerability (index)
PTTP	Pacific Tuna Tagging Project
PUCL	Precautionary Upper Catch Limit
RFMO	Regional Fisheries Management Organization
RPOA	Regional Plan of Action
SB	Spawning Biomass
SC	Scientific Committee
SEAPODYM	Spatial Ecosystem and Population Dynamics Model
SECC	South Equatorial Counter-Current
SECN	South Equatorial Current (northern branch)
SECS	South Equatorial Current (southern branch)
SKJ	Skipjack Tuna
SPC	Secretariat of the Pacific Community (formerly South Pacific Commission)
SPREP	South Pacific Regional Environment Programme
SPSG	South Pacific Subtropical Gyre
SRP	Strategic Research Plan
SRR	Stock Recruitment Relationship
SSG	Shark Specialist Group (of IUCN)
TAB	Total Allowable Bycatch
TAC	Total Allowable Catch
TCC	Technical Compliance Committee of the WCPFC
TDM	Trophic Diet Matrix
UN	United nations
UNCLOS	United Nations Convention on the Law of the Sea
UNFSA	United Nations Fish Stocks Agreement
UoC	Unit of Certification
VMS	Vessel Monitoring System
WCPFC	Western and Central Pacific Fisheries Commission
WCPO	Western and Central Pacific Ocean
WPEA OFM	West Pacific East Asia Oceanic Fisheries Management Project
WPFMC	Western Pacific Fishery Management Council
WWF	World Wildlife Fund
YFT	Yellowfin tuna

4 BACKGROUND TO THE FISHERY

4.1 Introduction

This assessment covers albacore tuna (*Thunnus alalunga*) caught by pelagic longline by the client group within Fiji's Exclusive Economic Zone (EEZ).

Two other tuna species occurring in the Western Central Pacific have recently undergone MSC assessment. The New Zealand albacore troll fishery was certified as sustainable in May 2011 and the Parties to the Nauru Agreement (PNA) Western and Central Pacific Skipjack Tuna (*Katsuwonus pelamis*) unassociated and log set purse seine fishery is currently undergoing an independent objections process following its assessment.

4.2 Biology of the Target Species

Albacore tuna is a highly-migratory pelagic fish species found throughout the world's tropical and sub-tropical oceans. Albacore tuna comprise a discrete stock in the South Pacific Ocean (Murray, 1994). Hoyle (2008) provides a summary of the aspects of the biology of South Pacific albacore tuna relevant to its stock assessment. Hoyle (2011) also provides an overview of the biology of the stock. Albacore tuna are opportunistic carnivores which feed on a wide variety of small fish, planktonic crustaceans and squid (Murray, 1994).

Mature albacore (greater than 80 cm fork length, FL) spawn in tropical and sub-tropical waters between about 10°S and 25°S during the austral summer. Spawning success appears to be related to the prevailing oceanographic conditions, with stronger recruitment occurring during La Niña conditions (i.e., positive Southern Oscillation Index). Juvenile albacore recruit to surface fisheries in New Zealand coastal waters and in the vicinity of the sub-tropical convergence zone (about 40°S) in the central Pacific about one year later (at a size of 45–50 cm FL) and then appear to gradually disperse to the north but may migrate seasonally between tropical and subtropical waters (Hoyle, 2011). Catch rates in subequatorial waters peak during December–January and May–July, indicating that albacore migrate south during early summer and north during winter. Fish reach the size of first maturity (about 80 cm FL) at approximately 5 years of age and growth attenuates over the subsequent years. Maximum recorded length is about 120 cm FL.

The natural mortality rate is believed to be between 0.2 and 0.5 per year, with significant numbers of fish reaching 10 years or more (Hoyle, 2011). The 2011 assessment assumes a fixed natural mortality of 0.4 per year. The longest period at liberty for a recaptured tagged albacore in the South Pacific is currently 11 years.

4.3 History of the Fishery

The fishery for albacore in the South Pacific developed in the early 1950s and over the following decade catches increased to about 30,000 t per annum (Langley, 2006). Annual catches then fluctuated about this level until the early 1980s and were exclusively taken by longline. During the 1980s, annual catches increased due to the development of the troll fishery and, more notably, the drift net fishery in the late 1980s, with catches peaking at 22,000 t in 1989. Drift net fishing ceased in the early 1990s, while the troll fishery has continued to catch approximately 10,000 t per year.

Longline catches of albacore remained at about 30,000 t per year up to 1998 but subsequently increased to approximately 50,000 t in 2001, largely due to the development of small-scale longline fisheries in Pacific Island Countries and Territories (PICTs). The longline fishery catches albacore over a large proportion of their geographic range. However, the fishery can be clearly subdivided into three main sectors based on the spatial and temporal distribution of fishing activity and the size composition of fish caught: (1) the PICT domestic longline fisheries (approximately 10°S to 25°S, taking predominantly fish of size 80-105cm, ages 7-15), (2) the distant-water longline fisheries operating in the subequatorial waters (approximately 10°S to 25°S, 65-100cm, ages 3-10), and (3) the

distant-water longline fisheries operating in subtropical waters (south of 25°S, 50-80cm, ages 2-5) (Langley, 2006).

Distant-water longline fleets of Japan, Korea and Taiwan have historically targeted albacore and the Taiwanese fleet continues to account for a substantial component of the longline catch. These fleets generally target/targeted albacore in the more southern latitudes (south of 30°S) during late summer and autumn and operated further north in the subequatorial waters during the remainder of the year.

Since 2001, catches have exceeded 50,000 t, primarily as a result of the continued growth in several Pacific Islands domestic longline fisheries. The South Pacific albacore catch in 2010 (88,919 t) was the highest on record (12,000 t higher than the previous record in 2009 at 76,500 t) (Williams & Terawasi, 2011).

The domestic longline fisheries in the South Pacific developed from the early 1990s and rapidly expanded during the following decade. During this period, catches of albacore by PICT flagged vessels increased from a negligible level to 20–25,000 t per annum, representing approximately 40% of the total South Pacific albacore catch by all methods. The Pacific Island longline fisheries essentially operate throughout the year in waters of national jurisdiction and/or in adjacent waters. Catches from this sector are dominated by large (older) fish. For most of the domestic fleets, a high proportion (up to 80%) of the tuna catch (by volume) is comprised of albacore.

Longline is the dominant fishing method for catching tuna by Fiji licensed vessels (Figure 1). In the early 1990s, when fishing activity was relatively low, albacore accounted for about 50% of the Fiji tuna catch but then increased to around 70% - 80% from 1995 onwards (Figure 2). The catch of albacore within the Fiji EEZ (including archipelagic waters) has declined from 7470 t in 2001 to 3903 t in 2009 and 3470 t in 2010 (Source: SPC database). The majority of this catch is taken by the clients for this assessment. Yellowfin tuna catch throughout the years has remained at 15-25% of the total with the composition of bigeye tuna at around 8% (Amoe, 2011).

	Total Catch (mt)				
Species	2006	2007	2008	2009	2010
Albacore	11,689	7,076	7,609	7,166	7,279
Bigeye	764	551	667	689	532
Yellowfin	2,210	1,704	2,748	2,564	2144
Other	5,845	2,967	3,214	3,430	4,441
Total	20,508	12,298	14,238	13,849	14,396

Table 1. Annual Catches for the Fiji Domestic Longline Fleet, 2006–2010 (Amoe, 2011).

Note: Catch estimates do not include those taken in Fiji's Archipelagic waters.

Reported tuna catches by longline vessels for the period 2006-2010 show a highest tuna catch of 20,508 t in 2006, largely due to the relatively high catch of albacore that year (Table 1). Fiji flagged vessels fish significantly in waters external to their own EEZ – in international waters and the waters of other FFA members. A significant number of fishing vessels use Fiji as a base of operations for fishing undertaken elsewhere. The total reported catch by the domestic longline fleet (catches inside and outside the Fiji EEZ) for 2010 was 14,396mt (Amoe, 2011).



Figure 1. Catch of target species by gear for Fiji licensed tuna vessels (Source: SPC database)



Figure 2. Catches of tuna by vessels inside and outside the Fiji EEZ (Source: SPC database).

4.4 Fleet and Gear Description

The longline fishing method involves the setting of a main line from a large reel. As this main line is deployed, baited hooks on branch lines are attached at regular intervals. Also at regular intervals, floats and float lines are attached. These suspend the main line in the water column at a predetermined depth. The deepest hooks of each section between floats are set at around 300-400m to target albacore tuna.

The Fiji domestic longline fleet is composed of licensed vessels (inclusive of chartered vessels) plus other unlicensed Fiji-Flagged vessels that operate principally outside of Fiji waters (Amoe, 2011). Since 2005, Fiji has been only licensing vessels flagged to those entities that are party to or cooperating non-party to the WCPFC. Fiji reduced its Tuna Longline License Cap from 110 (in place from 2002) to 72 for 2005. In 2007, there were 56 longline vessels licensed to fish within the Fiji EEZ and 54 Fiji flagged vessels licensed to fish outside the EEZ (compared with 66 inside the EEZ and 14 outside the EEZ in 2006).

In recent years, majority of the longline vessels operating out of Fiji are above 21 m (Table 2). Trip lengths for these vessels are usually 20 days. The smaller vessels (<20m) operate inside Fiji archipelagic waters with average trip lengths of 9 days (Amoe, 2011).

Length (m)	2009	2010
<20m	7	8
21m-30m	43	46
>31m	42	45
Total	92	99

Table 2. Vessel Size Categories of the Fiji Domestic Longline Fleet, 2009–2010 (Amoe,2011).

Fishing effort in terms of hooks set within the Fiji EEZ peaked at around 27 million hooks in 2004 (Figure 3). Approximately 19 million hooks were set in 2010. Longline effort is distributed throughout the EEZ (Figure 4).

In 2010, Fiji exported 87% of tuna to Japan and America (Amoe, 2011). The remaining 13% was exported to other countries, namely China, Australia, New Zealand, Germany, Reunion Island, Canada and Taiwan. Albacore and skipjack tuna are either processed at the local cannery (PAFCO) or exported to Pago Pago. The Pacific Fishing Company (PAFCO) receives its raw materials directly from the domestic and foreign vessels unloading at the Levuka port or indirectly through Freezer Containers from the local fishing companies (Amoe, 2011). The raw fish material supplied to PAFCO is exported as three products i.e. as canned fish, packed tuna loins, and as fishmeal. The canned tuna is mainly exported to the American, Canadian and Japanese markets. The tuna loins are exported to America for further processing whereas the fishmeal is shipped out mainly to the Philippines and Japan. The remainder of the non-target catch and other non-export grade fish are sold locally at supermarkets, restaurants or directly to consumers (Amoe, 2011).

The clients indicated albacore catches are generally consistent throughout the year and that depths fished are predominantly to target albacore. When fishing these depths yellowfin tuna and bigeye tuna are likely to be caught only on the 1-2 hooks closest to the float. Bigeye and yellowfin may be targeted for approximately 2 months of the year in winter when good quality fish are taken. Approximately one third of the client vessels focus on fishing for fresh fish (these vessels tend to be smaller, mostly around 20m and 40-60GT, setting 2400-3000 hooks per day). Other vessels (mostly around 30m and more than 100GT, setting around 3200 hooks per day) retain a combination of fresh and frozen fish.



Figure 3. Fishing effort (million hooks set|) within the Fiji EEZ (Source: SPC database).



Figure 4. Distribution of longline effort in the Fiji EEZ (Source: SPC database).

5 STOCK ASSESSMENT

5.1 Management Unit

The management unit is the South Pacific stock of albacore. Two albacore stocks (North and South Pacific) are recognized in the Pacific Ocean based on location and seasons of spawning, low longline catch rates in equatorial waters and tag recovery information. The South Pacific albacore stock is distributed from the east coast of Australia and archipelagic waters of Papua New Guinea eastward to the coast of South America, and south of the equator to at least 49°S. Although there is some suggestion of gene flow between the North and South Pacific stocks based on an analysis of genetic population structure, migration between stocks is not thought significant enough to affect management. For assessment and management purposes, the north-south boundary between albacore stocks is considered to be the equator. There does not appear to be significant mixing across this boundary. Additionally, for assessment purposes the stock is considered to occur east of 140°E. The South Pacific albacore fishery is a large fishery with many components and sources of data.

5.2 Assessments and stock status

Overview

Stock assessments are currently conducted by the Oceanic Fisheries Programme of the Secretariat of the Pacific Community (SPC), as science provider to the WCPFC, the RFMO for the tuna and tunalike species in the region. Fishery overviews and summary information on the status of stocks are published periodically and are discussed at scientific meetings of the WCPFC. These reports are available on the WCPFC website (<u>http://www.wcpfc.int/meetings/all</u>).

All countries operating fleets in the region report catches, effort and size frequency data if sampled. In addition, considerable data are available on various oceanographic features of the fishery area and considerable research has been undertaken on the tuna habitat (e.g. Briand *et al.*, 2009), which provides background for the assessment and understanding the population dynamics, even though not all this information is used in the stock assessment. SPC, as data provider and manager to the WCPFC, also maintains a central database for the catch, effort, size frequency, tagging, biological data, observer, sampling and other data from the fishery.

The South Pacific albacore assessment data consist of fishery-specific catch, effort and lengthfrequency data and tag release-recapture data. The assessment uses the stock assessment model and computer software known as MULTIFAN-CL (or MFCL), which was developed originally to deal with length frequency rather than age data (Fournier *et al.*, 1998, Hoyle *et al.*, 2009). The assessment model includes 20 annual age classes, including a group age 20+ years old. Growth forms part of the MFCL model, as does fishing and natural mortality. A major complexity comes from the detailed breakdown of the fishing fleets, since each fleet has different selectivity and catchability parameters. The assessment is continually improved as more data become available and model structure is enhanced.

The statistical structure of MFCL is standard, with various data components contributing to a loglikelihood and various additional options for weights and penalties to allow the model to adapt to the data and fishery. The observed total catch data for each fishery are assumed to be unbiased and relatively precise. Input to the MFCL model requires total catch and effort data, which was obtained using standardised CPUE to standardised effort rather than use the CPUE itself. The probability distributions for the length-frequency proportions are assumed to be approximated by normal distributions, with the variance determined by the effective sample size and the observed lengthfrequency proportion. Adjustments are applied to down-weight this source of information from the raw estimated sample variance which is the normal procedure. Finally, there is a log-likelihood component for the tag release and return data. Age data are not routinely available. The most recent South Pacific albacore stock assessments are fully described in Hoyle (2011) and Hoyle & Davies (2009). The 2011 assessment is an update of the 2009 assessment and uses the same underlying structural assumptions as the 2009 assessment. In the 2009 assessment, many of the model's underlying structural assumptions were reviewed, resulting in major changes to model data inputs and structure in the base case (Hoyle & Davies, 2009). These changes resulted in a more realistic and credible model with a better fit to the data. Previous assessment were undertaken in 2005, 2006 and 2008 (Langley & Hampton, 2005; Langley & Hampton, 2006; Hoyle *et al*, 2008).

The stock assessment has a number of uncertainties. There is some conflict between the length frequency data and the other sources of information in the model, which may be biasing abundance estimates. Some CPUE and selectivity data need to be improved, particularly from the distant water fishing nations to allow better standardisation and stratification. Being single sex, the model does not account directly for different sex ratios in the catches. Further research has also been suggested on various areas relevant to developing the model structure, including growth and movement information. Although there are problems with not all data being provided (Jones & Shallard, 2009), data are considered adequate for the assessment.

Sensitivity analyses are conducted covering a set of uncertainties identified by the stock assessment scientists and at a pre-stock assessment workshop. These included models that permitted catchability and selectivity to vary through time, weighted sources of information differently and used alternative values for parameters that could not be estimated, which in this case was the stock recruitment relationship "steepness". As structural errors tend to dominate uncertainty, the stock assessment included an uncertainty analysis which considered all combinations of possible configurations in determining ranges of fishery performance indicators.

MFCL requires all catch and effort to be allocated to "fisheries" (Hoyle, 2011). Ideally, the fisheries are defined to have selectivity and catchability characteristics that do not vary greatly over time. For most pelagic fisheries assessments, fisheries can be defined according to gear type, fishing method and region. However, some additional stratification of longliners into national fleets was deemed necessary in order to capture the variability in albacore fishing operations. The stratification of the longline fishery was defined a separate fishery for each of the main domestic longline fisheries. These fisheries operate in relatively discrete areas and differ in magnitude and species composition of the catch. Also, the fisheries began at different times and have exhibited different seasonal and temporal trends in catch rates. The 2011 assessment maintained the fishery structure adopted in the 2008 assessment (Hoyle et al., 2008). In summary, 30 fisheries were initially defined, consisting of 26 separate longline fisheries, two driftnet fisheries, and two troll fisheries. The longline fisheries comprised: i) Japanese, Korean and Chinese Taipei longline fisheries in each of the four western and central regions (i.e. accounting for 12 fisheries), ii) domestic fleets of Fiji, French Polynesia, New Caledonia, New Zealand, Samoa and American Samoa combined, and Tonga (i.e. 6 fisheries), iii) Australia's domestic fishery in two regions (i.e. 2 fisheries), and iv) the remaining longline data from all six regions (i.e. 6 fisheries) (Hoyle, 2011). Separate troll and driftnet fisheries were defined for the south western and south central regions of the assessment area.

Catch and effort data

Catches are reported to WCPFC by vessel flag states who are responsible for the vessels fishing the stock. Catch and effort data were compiled according to the defined fisheries The catch data are thought to be reasonably accurate for the period of the assessment. All catches were expressed in numbers of fish, with the exception of the driftnet fishery, where catches were expressed in weight (metric tonnes). For longline fisheries, effort was expressed in hundreds of hooks, while for troll and driftnet fisheries, the number of vessel days of fishing activity was used.

Catch logsheets are completed by vessels and provided to the Fiji Fisheries Department as a condition of fishing license. The 2010 logsheet coverage for the Fiji domestic fleet was maintained at almost 100%. A small amount of adjustment is made to account for missing data

(Amoe, 2011). The Fisheries Department maintains a table showing months where licensed vessels were active/inactive and where logsheets have been submitted.

The regional stock assessment model for albacore uses standardised catch-per-unit-of-effort (CPUE) time series as abundance indices. There are no fishery-independent indices of abundance for the South Pacific stock. Returns from tagging programmes provide information on rates of fishing mortality, however, the return rates were very low and therefore lead to highly uncertain estimates of absolute abundance. Longline CPUE is particularly useful as it covers the entire range of the stock, and is likely to vary with stock density. Standardisation attempts to account for changes in CPUE which cannot be attributed to changes in stock size. Variables that might affect catchability include sea surface temperature and target species among others.

Length Frequency

Length frequency data form a significant part of the information available to the assessment, and the only information on the age and size structure of the stock and hence selectivity of the different fleets. Longline fleets typically catch larger albacore over a broad size range (56-105 cm FL) with variation occurring as a function of latitude and season.

Tagging

A limited amount of tagging data are available, consisting of tag releases and returns from the albacore tagging programme conducted during the austral summers of 1990–1992 and from an earlier programme in the 1980s. The majority of tag releases were made by scientific observers on board New Zealand and U.S. troll vessels fishing in New Zealand waters and in the central South Pacific (Hoyle, 2011).

2011 Assessment results

As in previous assessments, the 2011 South Pacific albacore assessment concluded that there is considerable uncertainty in the early biomass trend of the stock, but that this has negligible effect on the management parameters, or advice to managers regarding the status of the stock. In the 2009 assessment models that down-weighted the length frequency data (in order to rely on the index of abundance from the CPUE data), tended to give lower biomass relative to B_{MSY} , and higher fishing mortality relative to F_{MSY} , throughout the time series. The model with with down-weighted length frequency data was preferred as the reference case for the 2011 assessment. In recent years (particularly in 2003), declines in CPUE were observed in some Pacific island fisheries (including Fiji). Investigations have shown that these declines appear to be a consequence of changed oceanographic conditions (Langley, 2004), though high levels of localised effort may also be reducing CPUE in these fisheries. The 2011 assessment suggests that regional stock depletion has contributed to catch rate declines, but localised depletion may have also contributed (Hoyle, 2011). There is no indication that current levels of fishing are causing recruitment overfishing, particularly given the age selectivity of the fisheries (Hoyle, 2011).

The 2011 assessment indicates that fishing mortality (exploitation) rates for adult albacore are moderately low from the early 1970s to the mid-1990s, and show a large increase since that time for adult fish (Hoyle, 2011). Estimated fishing mortalities for the fully recruited age classes have reached moderate levels since 2006, averaging about 0.25 for adults in the peak year 2010, and averaging about 0.35 for fully recruited age classes.

5.3 Management advice

The current WCPFC practice is that the Scientific Committee issues an agreed statement on the current status of the stock, management advice and implications, which is forwarded to the WCPFC annual session for consideration of any management measures recommended.

The 7th regular meeting of the WCPFC Scientific Committee (WCPFC-SC, 2011) adopted the stock status of South Pacific albacore as estimated by the 2011 assessment (Hoyle, 2011). These stock

assessment results produced realistic levels of stock size and yield based on a credible model. Estimates indicate that overfishing is not occurring ($F_{2007-2009}/F_{MSY} = 0.26$) and that the stock is not in an overfished state ($SB_{2009}/SB_{MSY} = 2.25$ and $B_{2007-2009}/B_{MSY} = 1.26$). The Kobe plot below summarizes the trends in annual stock status over the period 1972-2010, and clearly demonstrates that the stock remains well within MSY reference point limits (Figure 5). The 2011 assessment also indicates that total biomass is at 80% of its unfished level and spawning biomass is at 63% of its unfished level, representing a moderate level of depletion. There is no indication that current levels of catch are unsustainable with regard to recruitment overfishing. However, longline catch rates appear to be declining and catches over the last 10 years have been at historically high levels. The WCPFC SC (WCPFC-SC, 2011) noted that depletion levels of albacore available to the longline fishery above 25°S was above 50%.

The WCPFC, while noting that current catch levels from the South Pacific albacore stock appear to be sustainable, applied a capacity limit because of the uncertainty in the assessment and potential economic effects of a declining CPUE. The Conservation and Management Measure (CMM) for South Pacific Albacore (CMM-2010-05, replacing CMM-2005-02) adopted, in accordance with the Article 10 of the WCPFC Convention,(WCPFC, 2000) that: "Commission Members, Cooperating Non- Members, and participating Territories (CCMs) shall not increase the number of their fishing vessels actively fishing for South Pacific albacore in the Convention Area south of 20°S above current (2005) levels or recent historical (2000-2004) levels." Annual catches from 2006-2008 were similar to those in 2005. The catch in 2010 (88,919 t) was the highest on record (12,000 t higher than the previous record in 2009 at 76,500 t) (Williams & Terawasi, 2011). The CMM protects the legitimate rights and obligations of South Pacific states who may wish to pursue a responsible level of development of their fisheries for South Pacific albacore.

No other controls are considered necessary at this stage, although provision exists, and there is a clear intention, to limit fishing activity as required in the WCPFC Convention, including applying the precautionary approach. Nevertheless, the effectiveness of controls to reduce fishing mortality on South Pacific albacore remains uncertain.

Reference points

WCPFC has not formally adopted target or limit reference points, but has endorsed work designed to enable the Scientific Committee to recommend provisional limit reference points to the Commission for target species (recommendations to the Commission were made by SC7). In the absence of formally adopted reference points, the Convention on the Conservation and Management of Highly Migratory in the Western and Central Pacific Ocean requires that the guidelines of the United Nations Fish Stocks Agreement (UNFSA) Annex II be applied1, constituting implicit limit and target reference points.

¹ Article 6 of the Convention requires that the guidelines of Annex II of the UNFSA be applied. The Annex requires that "the fishing mortality rate which generates the maximum sustainable yield should be regarded as the minimum standard for limit reference points. For stocks which are not overfished, fishery management strategies shall ensure that fishing mortality does not exceed that which corresponds to maximum sustainable yield, and that the biomass does not fall below a predetermined threshold".



Figure 5. Temporal trend in annual stock status, relative to SB_{MSY} (x-axis) and F_{MSY} (y-axis) reference points, for the model period (starting in 1960). The colour of the points is graduated from pale blue (1960) to blue (2009), and points are labelled at five-year intervals. The last year of the model (2010) is excluded because it is highly uncertain (from Hoyle, 2011).

Management advice (and the implications of that advice) is regularly provided with respect to indicators of fishing mortality and biomass relative to MSY levels i.e. $F_{current} / F_{MSY}$, $B_{current} / B_{MSY}$ and $SB_{current} / SB_{MSY}$. These currently serve as proxy or default limit/ target reference points for the WCPFC. The lack of formal arrangements to guard against impairment of the reproductive capacity of the stock, is a substantial weakness in the arrangements for albacore tuna management.

Harvest strategy

The FAM defines a harvest strategy as "The combination of monitoring, stock assessment, harvest control rules and management actions, which may include an MP or an MP (implicit) and be tested by MSE".

The harvest strategy for Western and Central Pacific Ocean (WCPO) albacore has several components, with WCPFC and national and archipelagic management actions, supported by a robust

stock assessment and extensive monitoring frameworks that provide the key databases for stock assessment. As noted above, the major measure applying to albacore is CMM-2010-05 (replacing CMM-2005-02), adopted in accordance with the Article 10 of the WCPFC Convention, limiting increases in the number of fishing vessels.

Harvest control rules and tools

There has been no formal development of harvest control rules for albacore in the WCPO that ensure that the exploitation rate is reduced as limit reference points are approached. All significant participants in the fisheries for WCPO albacore have agreed as Parties to the WCPFC Convention to adopt measures to apply the precautionary approach to conservation of tuna stocks. The actions adopted by WCPFC to limit exploitation on bigeye tuna support an expectation that measures would be adopted to reduce the exploitation rate for albacore if fishing mortality exceeded F_{MSY} , with such measures aimed at maintaining the stock at or above B_{MSY} and ensuring that the stock will remain well above the level that would be associated with an appreciable risk of impaired recruitment. However, the absence of formally adopted harvest control rules setting out pre-agreed rules or actions used for determining a management action in response to changes in indicators of stock status with respect to reference points represents a potential risk to the effectiveness of management of the albacore stock in future.

6 FISHERY MANAGEMENT FRAMEWORK

For the purpose of this section, the key components of the governance and fishery management framework are

- i) The Western Central Pacific Fisheries Commission (WCPFC), the tuna RFMO for the Western and Central Pacific Ocean, and
- ii) The Fiji national government is responsible for ensuring management measures applied within Fiji waters are compatible with those of the WCPFC, and fishing by Fiji flagged vessels both within and beyond the Fiji EEZ is carried out in accordance with any measures put in place by WCPFC.

Regional organizations Forum Fisheries Agency (FFA) and SPC also play significant roles in the management framework for this fishery under assessment because of the support and services they provided to both Fiji and the WCPFC.

6.1 The Western and Central Pacific Fisheries Commission

The WCPFC is the one of the newest and one of the largest RFMOs, with over half of the world's tuna catch taken within its Convention Area. The Commission has 25 Members, of which most are small island developing states (SIDSs). All major coastal and fishing states in the WCPO are Members, except for Indonesia and Vietnam. Current members are: Australia, Canada, People's Republic of China, Cook Islands, European Union (EU), Federated States of Micronesia (FSM), Fiji, France, Japan, Kiribati, Korea, Republic of the Marshall Islands (RMI), Nauru, New Zealand, Niue, Palau, Papua New Guinea (PNG), Philippines, Samoa, Solomon Islands, Chinese Taipei, Tonga, Tuvalu, United States of America (USA) and Vanuatu.

Several other states are granted cooperating non-member (CNM) status on an annual basis, agreeing to comply with WCPFC measures, participating as observers, and entitled to authorise their vessels to fish in the WCPO within set limits. At WCPFC6, the CNM status of Belize, El Salvador, Indonesia, Mexico and Senegal was renewed, and CNM status was extended to Ecuador and Vietnam (WCPFC6, 2010, paragraphs 22-49).

The WCPFC Convention (WCPFC, 2000) follows closely the provisions of the UNFSA, including in particular:

- The objective of ensuring, the long-term conservation and sustainable use of highly migratory fish stocks (Article 2)
- The general principles in Article 5 of the UNFSA including the application of the precautionary approach, incorporating the UNFSA Annex II Guidelines For The Application Of Precautionary Reference Points (Article 5)
- The application of these principles by Parties in their cooperation under the Convention, including the application of these principles in areas under national jurisdiction (Article 7)
- Compatibility of measures established for the high seas and those adopted for areas under national jurisdiction (Article 8)
- Application of the dispute settlement provisions of the UN Fish Stocks Agreement to disputes between WCPFC Members (Article 31)
- Recognition of the interests of small scale and artisanal fishers, and of communities and small island states dependent for their food and livelihoods on tuna resources. (Article 30)

The WCPFC has a consensus-based decision-making process, with provision for a two-chambered voting process requiring a 75% majority in both chambers if all efforts to reach a decision by consensus have been exhausted (WCPFC, 2004, Rule 22). In addition, there are provisions for a decision to be reviewed by a review panel at the request of a Member. (WCPFC, 2000 Article 20, paras 6-9) The subsidiary bodies of the Commission provide extensive, detailed reports to the Commission (see for example WCPFC-SC (2009), including advice and recommendations. Decision-

making is open, with the process, outcomes and basis for decisions recorded in detail in records of Commission sessions and publicly available papers.

The roles and responsibilities of WCPFC members are clearly described in the Convention, especially Articles 23 and 24, the Commission Rules of Procedure, conservation and management measures, and other Commission rules and decisions, including the Rules for Scientific Data to be Provided to the Commission, and the Rules and Procedures for Access to and Dissemination of Data Compiled by the Commission. In addition to Member participation, the WCPFC allows participation by non-members and territories, with particular opportunities for CNMs, and allows observers to participate in meetings of the Commission and its subsidiary bodies, including the Scientific Committee, the Technical and Compliance Committee and the Finance and Administration Committee. As part of the conditions for CNM status, applicants are required to provide annually a "*a commitment to cooperate fully in the implementation of conservation and management measures adopted by the Commission and to ensure that fishing vessels flying its flag and fishing in the Convention Area and, to the greatest extent possible, its nationals, comply with the provisions of the Convention and management measures adopted by the Commission and management measures adopted by the Commission." (CMM-2009-11, para 2b.).*

The records of Commission meetings show that the Commission takes a wide range of advice and inputs from its subsidiary bodies, members and observers before implementing decisions, including the adoption of conservation and management measures. Scientific advice clearly identifies the extent to which different sources of information have been taken into account.

The WCPFC Convention requires the Scientific Committee to "*recommend to the Commission a research plan*, *including specific issues and items to be addressed by the scientific experts or by other organizations or individuals, as appropriate, and identify data needs and coordinate activities that meet those needs*". The WCPFC Strategic Research Plan (SRP) 2007–2011 was adopted by the Scientific Committee and approved by consensus by the WCPFC in 2006. The Plan has subsequently been revised, with a new SRP for 2012-2016 adopted at SC7..

The Plan addresses four overall research and data collection priorities:

- collection and validation of data from the fishery
- monitoring and assessment of stocks
- monitoring and assessment of non-target associated species and the pelagic ecosystem
- evaluation of existing CMMs and potential management options.

With this structure, the Plan is substantially directed towards providing information to enable the Commission to avoid overfishing or depletion of targeted stocks and the application of an ecosystem approach. However, the implementation process in the Plan is also designed to contribute to improving governance and policy, through the development of management information tools such as Management Strategy Evaluation (MSE), and the development of relevant scientific and technical capacities in developing country Commission members, as follows:

Opportunities to involve individuals and institutions from developing countries and territories should be a strong feature of the implementation of the Plan. Promoting such involvement should be aimed at both utilising available expertise from developing countries and territories, and at providing important opportunities for building scientific and technical capacity within those countries and territories.

WCPFC measures relevant to the Fiji albacore longline fishery include:

A) 2008-03 Sea Turtles. Major features of this CMM are:

- Implement FAO Guidelines,
- Comatose turtles to be brought on board and resuscitation attempted
- Proper handling and release techniques and equipment to be applied as per WCPFC Guidelines.

B) 2009-04 Sharks. Major features of this CMM are:

- Require full utilisation through retention of carcass
- Implement 5% fin to weight ratio
- Prohibit retention, transhipment or trading in fins caught in contravention
- Encourage live release of sharks in non-target fisheries.

C) 2010-05 South Pacific Albacore. Major features of this CMM are:

• Limits of the number of fishing vessels actively fishing for South Pacific albacore in the Convention Area south of 20°S above current (2005) levels or recent historical (2000-2004) levels.

The WCPFC has not yet been subject to an external review. In this direction, the WCPFC has:

- agreed to cooperate with other RFMOs toward standardization of performance reviews (WCPFC4, 2008)
- agreed that a WCPFC4 paper working paper on a performance review should be used as basis to develop recommendations for a structure and budget for an independent performance review (WCPFC5, 2009)
- but deferred a proposed independent performance review in 2010, largely for financial reasons. (WCPFC6, 2010)

The result is that the WCPFC has committed to, but not yet undertaken, an overall external performance review, consistent with the Kobe Course of Actions for the period 2011 to 2013. An independent review (MRAG, 2009) has been conducted of the Commission's science structure and functions resulting in overhauling of the operation of the Scientific Committee, and adoption of a peer review process and other changes to the data and science functions. Completion of the performance review as anticipated in the Kobe programme is important to provide an early check on the progress on the course that WCPFC has set itself.

6.2 The Ministry of Fisheries and Forests, Fiji

Roles and responsibilities. The Department of Fisheries within the Ministry of Fisheries and Forests is responsible for portfolio leadership and policy initiatives for the conservation and sustainable management and development of the fisheries resources and the industry they support.

Major Functions.

- i) Formulation of fisheries policies and strategies
- ii) Coordinate and facilitate the implementation of Fisheries strategies and policies (including private sector development)t.
- Provide and administer the regulatory function under the department's legislation (Offshore Fisheries decree, Inshore Fisheries decree, Aquaculture decree and part of Marine Act)
- iv) Monitor and evaluate current strategies, policies and deliverables information analysis and reporting for the fisheries sector
- v) Develop and promote effective training, communication and awareness and extension services in the Fisheries sector
- vi) Develop and maintain institutional community and industry development support networks and infrastructure
- vii) Undertake applied and scientific research for sustainable fisheries management including practices including biodiversity, food security diversification of export base, value adding and market access, and
- viii) Provide overall leadership and management.

The Annual Business Plan for the Ministry of Fisheries and Fisheries describes the Ministry's outputs,

strategies, action required, key performance indicators, timelines budgets and responsibilities.

The major relevant outputs include

- Policy Advice. A review existing institutional arrangements including fisheries legislation, regulations and policies with stakeholder consultation. It also includes a review of the Tuna Fisheries management Plan.
- Research publication: production of research reports, dissemination of research reports to all concerned parties, Fisheries impact assessments, MPAs, management and conservation of endangered species.
- Awareness promotion and training sustainable fisheries management: Communication and awareness strategy. Internal reviews
- Fisheries law enforcement observer programme, inspection and enforcement, licensing and permitting, data collection reviews and training.

Fiji's tuna Management Plan 2006 -2010 has an objective to provide a set of policy decisions that will create a framework for the conduct of a stable and profitable tuna fishery in Fiji.

In preparing for these decisions, the Ministry has taken into consideration:

- The present state of the tuna resources in Fiji;
- The successes and failures of Phase I of the first Fiji Tuna Management Plan;
- The obligations of Fiji to international treaties such as the Fish Stocks Agreement and the WCPFC; and
- The present national objectives of the government of Fiji;

In addressing the objectives of stability and profitability, the Ministry of Fisheries and Forests will be using strategies to:

- Address the conservation and management of tuna resources within the Fiji waters.
- Determine the level of sustainable fishing effort and distribution of licenses within Fiji's EEZ.
- Provide policy direction to government towards new areas for development that would increase the economic gains from tuna fishing.
- Make recommendations on institutional changes that would ensure transparency, accountability and efficiency within the Fisheries Department.
- Set a fair but not restrictive set of fees paid to government in terms of licensing fees, fishing fees, port charges and export permits.

6.3 Regional Organizations (FFA and SPC)

FFA and SPC play significant roles in the management framework for the fisheries under assessment because of the support and services they provide both to Fiji Fisheries and the WCPFC.

FFA

Based in Honiara, Solomon Islands, FFA's 17 members are Australia, Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu and Vanuatu. FFA was established to help countries sustainably manage their fishery resources that fall within their 200 mile EEZs. FFA is an advisory body providing expertise, technical assistance and other support to its members who make sovereign decisions about their tuna resources and participate in regional decision making on tuna management through agencies such as the WCPFC. The joint aim of members of the Forum Fisheries Agency is captured in its Vision Statement, which states:

"We, the Member Countries of the Forum Fisheries Agency, will enjoy the highest level of economic and social benefit that is compatible with sustainable use of our tuna resources."

Approximately 50 staff at the regional FFA headquarters in Honiara support their national contact points in each member jurisdiction. FFA focuses its work on:

- Fisheries management providing policy and legal frameworks for the sustainable management of tuna
- Fisheries development developing the capacity of members to sustainably harvest, process and market tuna to create livelihoods
- Fisheries operations supporting monitoring, control and surveillance of fisheries as well as treaty administration, information technology and vessel registration and monitoring.

The founding document of the Agency is the South Pacific Forum Fisheries Agency Convention and the governing body is the Forum Fisheries Committee (FFC). The FFC meets annually in Officials and Ministerial sessions to review FFA performance, and consider regional policies and the budget and work programme of FFA. The development and operation of FFA's Annual Work Plan and Budget is driven by the Statement of Intent, which is a rolling three year bridging arrangement to ensure achievement of the longer term Strategic Plan (FFA, 2005). Performance against the Statement of Intent is through the Director-General's Annual Report. An external review of the FFA performance was undertaken in 2010 (Cartwright et al., 2010). FFA also reports annually to Pacific Island Leaders, meeting at the Pacific Islands Forum, where tuna fisheries issues are given a high priority.

In addition to providing services to FFA Members, FFA supports the WCPFC Vessel Monitoring System (VMS) through shared facilities with the FFA, providing establishment, maintenance, diagnostic and support infrastructure and services, mobile transmission unit or automatic location communicator management services and communication gateways for the Commission VMS, along with training for Commission staff (WCPFC, 2008).

SPC

With its headquarters in Noumea, New Caledonia, the SPC is an intergovernmental organization that provides technical and policy advice and assistance to its Pacific Island members. SPC was established as an international organization in 1947 and has 26 member countries and territories, including American Samoa, Australia, Cook Islands, Federated States of Micronesia, Fiji Islands, France, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, New Zealand, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn Islands, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, United States of America, Vanuatu and Wallis and Futuna.

The SPC vision for the region is a secure and prosperous Pacific Community, whose people are educated and healthy and manage their resources in an economically, environmentally and socially sustainable way.

The SPC mission is to help Pacific Island people position themselves effectively to respond to the challenges they face and make informed decisions about their future and the future they wish to leave for the generations that follow.

SPC services are provided primarily in the form of technical assistance, training and research. The governing body of SPC is the Conference of the Pacific Community, which is held every two years, with each member entitled to one vote on decisions. However, debates are usually resolved in the Pacific way by consensus. The Committee of Representatives of Governments and Administrations meets annually, and in the years that the conference does not meet, is empowered to make decisions on the governance of SPC.

The focus of SPC's work changes over time in response to evolving regional needs and regional collaborative arrangements with other organizations. In 2010, the organization has six divisions.

One of those Divisions is the **Fisheries**, **Aquaculture and Marine Ecosystems** (FAME) **Division** which includes the coastal fisheries and oceanic fisheries programmes, together with the project coordination unit of the Coral Reef Initiative for the Pacific. Within the FAME Division, the Oceanic Fisheries Programme (OFP) aims "to provide member countries with the scientific information and advice necessary to rationally manage fisheries exploiting the region's resources of tuna, billfish and related species". The OFP functions as three sections:

- i) Statistics and Monitoring, including compilation of catch and effort data, data processing and technical support for port sampling programmes and observer programmes in member countries and territories, training in fisheries statistics and database management, statistical analyses and the provision of statistical support to the WCPFC.
- ii) Tuna Ecology and Biology: including analysis of the biological parameters and environmental processes that influence the productivity of tuna and billfish populations, focusing on age and growth, movement and behaviour as observed from classical or electronic data archiving tags, and diet in a more general study devoted to the food web of the pelagic ecosystem; and development of . mathematical models to understand e environmental determinants of tuna fishery production, including impacts of climate fluctuation.
- iii) Stock Assessment and Modelling, including regional stock assessments, development of tuna movement and simulation models, bioeconomic modelling, National Fisheries Assessments and scientific input to national tuna management plans and support for national Ecosystem Approach to Fisheries Management (EAFM) analyses, tag-recapture database management.

The FAME Division Strategic Plan (2010-2013) (SPC, 2009) addresses three priority areas in ways that are designed to be closely coordinated with, and contribute to WCPFC-level research outcomes as follows:

- i) To provide high-quality scientific information and advice for regional and national fisheries management authorities on the status of, and fishery impacts on, stocks targeted or otherwise impacted by regional oceanic fisheries;
- ii) To collect and analyse accurate and comprehensive scientific data for regional and national fisheries management authorities on fisheries targeting the region's resources of tuna, billfish and other oceanic species; and
- iii) To improve understanding of pelagic ecosystems in the western and central Pacific Ocean.

The building of national capacity to monitor fisheries, manage data, provide technical support to fisheries management and participate meaningfully in regional management discussions is a cross-cutting priority. Key services include:

- i) Provision of advice on the regional status of stocks and national implications thereof.
- ii) Scientific support for the development and implementation of national fisheries management plans.
- iii) Capacity building in stock assessment interpretation.
- iv) Provision of data processing and data management services and capacity building.
- v) Capacity building in fishery monitoring, particularly in observer training, debriefer training and the development of in-country observer training capabilities.
- vi) Provision of analyses of management options being considered by FFA at the sub-regional level.

In addition to serving SPC Members, the OFP provides data and scientific services to the WCPFC, such as evaluation of management options and measures, and data management.
7 ECOSYSTEM CHARACTERISTICS

7.1 Introduction

In this assessment, one gear type / target species combination is considered, this being the albacore tuna-directed longline fishery conducted by the Fiji Tuna Boat Owners Association (FTBOA) in the Fiji EEZ. This section considers the potential ecosystem elements that may be impacted by this fishery. This is divided into five categories, (i) retained species, (ii) bycatch (discarded) species, (iii) ETP species, (iv) habitat impacts and (v) ecosystem impacts.

The main source of data used to estimate the retained, discarded and ETP catches and discards are the SPC/FFA observer records for this fleet from January 2008 until September 2011. These data are observations from about 51 trips and 502 sets (1,432,101 hooks), representing around 7.6% of total Unit of Certification (UoC) effort. These data have been cross-correlated the extensive data from company catch records and have been shown to be comparable in terms of catch composition , especially for Solander and Sea Quest who both target albacore year round. Fiji Fish have a slightly higher catch of yellowfin (31% compared to the 15-20% recorded by the other companies and observer programme) and lower albacore catch (27% compared to 55 - 65%) as they may fish shallow sets during the new moon phase for the sashimi markets (Russell Dunham, Fiji Fish, pers. comm., 19 October 2011).

In addition to the target species (albacore) considered under P1, this fishery also catches other species that are retained and thus are considered under P2.1 (retained species). Less than 5% of the catch is are treated as 'discarded' bycatch under P2.2, unless they are endangered, threatened or protected, in which case they are considered under P2.3 as ETP species.

The observed species composition of this fishery is provided in Figure 6. 'Main' species in terms of both retained and discarded bycatch are considered under the MSC FAM methodology as those species that comprise more than five percent of the total catch weight, or which has a high value to the fishery or particular vulnerability. Therefore all species with a catch composition of over 5% and all those species with a species composition of greater than 1% that have a P&S vulnerability category of either medium or high² have been considered as 'main' bycatch species. On this basis, the following species are listed for consideration under the following P2 assessment:

One key consideration is the fate of the shark catch. As will be discussed later in this section, sharks are not a targeted commercial catch - shark gear is banned on these boats, no wire traces are used, the hooks are circular hooks and the fishing depth beyond most the portion of the water column inhabited by most pelagic sharks. However there is an inevitable bycatch and the first question at this point is as to whether they could be considered as retained or bycatch (discarded) species (none are ETP in the MSC context).

An analysis of the fate of sharks in the observed catches (see table overleaf) shows that around 94% (by number) of the main shark species (blue, oceanic white tip, silky and shortfin mako) are finned and their trunks discarded. Of these the majority (71%) are blue shark with roughly equivalent numbers of the other three species. The other main elasmobranch bycatch, pelagic stingrays, are either struck off (i.e. the line cut) or discarded. Other shark species represent less than five per cent of the observed elasmobranch catch. For this reason the four main shark species have been considered as retained bycatch in this assessment.

Assessment area	Species	Justification for inclusion

² Webb et al, 2007

P2.1: Retained bycatch	Yellowfin tuna Over 5% of retained catch but low risk					
	Bigeye tuna	Over 5% of retained catch but low risk				
	Blue shark	Over 5% of the discarded	l catch and of medium risk			
	Short-finned mako	<5% of catch, but conside	ered of medium risk			
	Silky shark	<5% of catch, but conside	ered of medium risk			
	Oceanic white tip	<5% of catch, but conside	ered of medium risk			
	Opah	<5% of catch, but considered of medium risk				
	Swordfish	<5% of catch, but considered of high risk				
	Blue marlin	<5% of catch, but considered of medium risk				
P2.2: Discarded bycatch	None considered					
P2.3: ETP species	Hawksbill turtle	<0.01% of the catch	All CITES listed by Fiji.			
	Leatherback turtle	<0.01% of the catch	Also all protected under the			
	Loggerhead turtle	<0.01% of the catch	Endangered & Protected Species			
	Olive Ridley turtle	<0.01% of the catch	Act (2002)			
	Fijian petrel	Critically endangered				
	Tahiti petrel	Near threatened				

7.2 Retained non target species

As noted in Table 3, both yellowfin tuna and bigeye tuna are regarded as retained by-catch species for the purposes of the assessment. The contribution of yellowfin tuna to the retained catch is over 20% (by weight) and it clearly is regarded as a main retained species. Bigeye tuna contributes 6.7% to the retained catch. Therefore it is also considered a main retained species.

The other three teleost species considered as main retained species are the opah (spotted moonfish), swordfish and blue marlin. Although each consisting of less than 5% of the catch by weight (4.5, 4.2% and 2.0% and 1.4% respectively), they are all potentially vulnerable species and have therefore been upgraded to 'main' retained species.

In addition, four shark species are also considered as main retained species. One – blue shark – represents over 5% of the overall catch by weight. The others – short-finned mako, silky shark and oceanic white tip – are all under 5% of the catch by weight (3.0%, 2.7% and 2.5% respectively) are also considered as main species as (i) they are all of 'medium' vulnerability and (ii) their fins are considered of high economic importance. As explained above, whilst a proportion of these species may be discarded (either alive or as trunks after finning), a proportion of the fish are landed and thus they are considered as 'retained' rather than 'bycatch' species. Furthermore, as the analysis will show, as sharks they fall under a WCPFC CMM and thus are managed as a species of commercial value.

This subsection evaluates the status, management and information available on these nine species retained by the fishery but not included in the unit of certification.



Species	Observed w	veight	Observed n	umber	PSV	V Observed fate		
species	Total (t)	%	Total	%	index	Retained	Discarded	
Albacore	145.73	32.9%	8,729	35.8%	Low	\checkmark		
Yellowfin tuna	90.66	20.4%	3,393	13.9%	Low	\checkmark		
Bigeye tuna	29.72	6.7%	1,120	4.6%	Low	\checkmark		
Blue shark	28.18	6.4%	590	2.4%	Medium	√ *	\checkmark	
Mahi Mahi	20	4.5%	3,408	14.0%	Low	\checkmark		
Opah (Moonfish)	18.7	4.2%	272	1.1%	Medium	\checkmark		
Short-finned mako	13.56	3.1%	173	0.7%	Medium	√ *	\checkmark	
Silky shark	12	2.7%	244	1.0%	Medium	√ *	\checkmark	
Escolar	11.82	2.7%	667	2.7%	Low	\checkmark		
Oceanic whitetip shark	11.15	2.5%	197	0.8%	Medium	√ *	\checkmark	
Wahoo	10.4	2.3%	933	3.8%	Low	\checkmark		
Swordfish	8.8	2.0%	242	1.0%	High	\checkmark		
Blue marlin	6.17	1.4%	119	0.5%	Medium	\checkmark		
Great barracuda	5.42	1.2%	1,094	4.5%	Low	\checkmark		
Skipjack	5.28	1.2%	994	4.0%	Low	\checkmark		
Other species	25.66	5.8%	2,224	9.1%				

* Whilst sharks may be discarded alive (i.e. released), they might also be finned and the trunks either landed or in the case of the smaller fresh fish boats, discarded.

Figure 6: Observed species composition of longline catches by FTBOA vessels in the Fiji EEZ

Spacing	Fate (number of animals)							Crand	Total						
Species	DFR	DOR	DSD	DSO	DTS	DUS	ESC	RCC	RFR	RGG	ROR	RPT	RWW	Grand	Total
Blue shark	277			3			7			1				288	49%
Pelagic stingray			1	22		128	1				1		4	157	27%
Oceanic whitetip	47								1					48	8%
Silky shark	36	2					1			1				40	7%
Shortfin mako	22						3	3	4					32	5%
Bigeye thresher	4					1	1					1		7	1%
Longfin mako	6					1								7	1%
Common blacktip	2				2									4	1%
Great hammerhead	4													4	1%
Tiger shark	2													2	0%
Manta ray							1							1	0%
Hammerhead (other)	1													1	0%
Smooth hammerhead	1													1	0%
Crond Total	402	2	1	25	2	130	14	3	5	2	1	1	4	592	100%
Granu Totai	68%	0%	0%	4%	0%	22%	2%	1%	1%	0%	0%	0%	1%	100%	
Fate code DFR	Discarded	trunk, fir	ns retaine	d	DTS	Discardeo	l, too sm	all		RFR	Retained t	runk, fin	s retained		
DOR	Discarded	, reason	not specif	fied	DUS	Discardeo	d undesir	able speci	ies	RGG	Retained,	gilled an	d gutted		
DSD	Discarded Discarded	shark dar (2002-20	mage)09), strue	ck off	ESC	Escaped				ROR	Retained,	reason n	ot specifie	d	

RCC Retained, crew consumption

RPT

RWW

Retained, partial (not specified)

Retained whole

Table 4. Observed fate of sharks & rays caugh	t by Fijian longliners in the UoC.(2002-2009)
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Source: SPC Observer Database (Peter Williams, SPC, pers. comm., 25 October 2011)

DSO (line cut)

Table 5. Observed retained catch (January 2008 – September 2011)

	Catch composition Average sizes											
Species	Weight	0/2	Number	0/2	Weight	Length	CPUE	%	%	%	%	Comment
	(t)	/0	Number	/0	(kg)	(cm)		Retained	Discarded	alive	dead	
Albacore	145.7	32.9%	8,729	35.8%	16	94.8	6.10	99	1	48	51	See Principle 1
Yellowfin	90.7	20.5%	3,393	13.9%	26	111.6	2.37	97	2	51	48	>5%
Bigeye	29.7	6.7%	1,120	4.6%	26	103.8	0.78	97	3	75	25	-
Blue Shark	28.2	6.4%	590	2.4%	48	192.4	0.41	2	97	89	11	•
Mahi Mahi	20.0	4.5%	3,408	14.0%	5	105.4	2.38	99	1	71	29	<5%
Opah (Moonfish)	18.7	4.2%	272	1.1%	69	105.5	0.19	97	3	68	32	<5% but vulnerable
Short-finned mako	13.6	3.1%	173	0.7%	78	176.3	0.12	3	96	62	38	•
Silky shark	12.0	2.7%	244	1.0%	49	164.7	0.17	2	96	80	20	•
Escolar	11.8	2.7%	667	2.7%	17	92.3	0.47	99	1	91	9	<5%
Oceanic whitetip	11.2	2.5%	197	0.8%	56	150.5	0.14	2	98	71	29	<5% but vulnerable
Wahoo	10.4	2.3%	933	3.8%	11	120.9	0.65	99	1	18	82	<5%
Swordfish	8.8	2.0%	242	1.0%	34	114.3	0.17	95	5	37	63	<5% but vulnerable
Blue Marlin	6.2	1.4%	119	0.5%	51	166.1	0.08	99	-	40	60	•
Great Barracuda	5.4	1.2%	1,094	4.5%	4	87.7	0.76	99	1	78	22	<5%
Skipjack	5.3	1.2%	994	4.1%	5	66.5	0.69	99	1	13	87	<5%
Other species	25.7	5.8%	2,224	9.1%				Blue marlin	Creatharmounda Shirai	iaalr Ot	therepacies	

Species discussed in main text

TOTAL

Source: SPC Observer database (October 2011)

443.3

100%

24,399

100%

trips	51	Totals no of trips observed :
sets	502	Totals sets :
hooks	1,432,101	Total hooks :



Status

1. Yellowfin tuna

Yellowfin tuna are an important component of catches of WCPO tuna fisheries. Yellowfin are taken by a variety of gears, from small-scale-artisanal fisheries in Pacific Island and southeast Asian waters to large, distant-water longliners and purse seiners that operate widely in equatorial and tropical waters (Langley *et al.*, 2011). More than half of the WCPO catch by weight is taken by purse seine, with a wide size range of fish. Longline accounts for around 16%, taking mostly adults. Pole-and-line (4%), plus a range of gears in the domestic fisheries in Indonesia and Philippines (25-30%), take mostly smaller fish. The total WCPO yellowfin catch has been mostly between 380,000t and 440,000t since 2000, but reached a record 543,000t in 2008. The yellowfin catch for 2010 was 470,000t, approximately 50,000t higher than the 2009 catch level (Williams &Terawasi, 2011).

Yellowfin tuna stock assessments, using the MULTIFAN-CL assessment model and associated computer software, have been carried out by SPC since 1999, with the most recent assessments in 2007 (Langley *et al.*, 2007), 2009 (Langley *et al.*, 2009) and 2011 (Langley *et al.*, 2011).

The preparation of the assessments, methodology employed and reporting of the outcomes is described in section 5.2 for the principal target species. The model is a size-based, age- and spatially-structured population model, which estimates key population parameters and summarizes stock status in terms of MSY-based reference points, such as ratios of current biomass, current spawning biomass and current fishing mortality to MSY levels. The 2011 assessment used 28 age classes, 6 spatial regions, and data by quarterly time periods for 24 fisheries for 1952 through 2010. While the structure of the assessment model(s) was similar to the 2009 assessment, there were some substantial revisions to a number of key data sets, specifically the longline CPUE indices, catch and size data, purse-seine catch and size data, and the configuration of the Indonesian and Philippines domestic fisheries (Langley *et al.*, 2011).

As for albacore, management advice is framed with respect to indicators of fishing mortality and biomass relative to MSY levels i.e. $F_{current} / F_{MSY}$, and $B_{current} / B_{MSY}$. These currently serve as proxy or default reference points for the WCPFC, which has yet to develop formal reference points for the management of stocks under its care.

The 2011 assessment results are substantially different to those from the 2009 assessment, with a reduction in the overall level of biomass and the estimates of MSY, B_{current}/B_{MSY}, SB_{current}/SB_{MSY} while increasing the estimate of F_{current}/F_{MSY} (Langley et al., 2011). Overall, the 2011 assessment models represent a considerable improvement to the fit to the key data sets compared to 2009, indicating an improvement in the consistency among the main data sources. The current yellowfin assessment concludes that, for the most plausible range of models used, $F_{current} / F_{MSY}$ is estimated at 0.56 – 0.90, and both $B_{current} / B_{MSY}$ and $SB_{current} / SB_{MSY}$ are well above 1.0 (1.25-1.60, and 1.34-1.83 respectively), indicating that the WCPO yellowfin stock is neither overfished nor in an overfished state. The ratios $B_t/B_{t,F=0}$ (i.e. the total biomass at a certain time divided by the estimated biomass at that time in the absence of fishing) provide a time-series index of population depletion by the fisheries. The 2011 assessment indicates that depletion has increased steadily over time, reaching a level of about 50-55% of unexploited biomass (a fishery impact of 45-50%) in 2006-2009 (Langley et al., 2011). This represents a moderate level of stock-wide depletion. Depletion has increased steadily over time especially in region 3 (equatorial WCPO west of 170°W) where there are now 65 and 70% reductions from B_0 and SB_0 respectively. Impacts are moderate in region 4 (37%), lower (about 15-25%) in regions 1, 5, and 6 and minimal (9%) in region 2. The 2011 assessment suggests that if stock-wide over-fishing criteria were applied at the level of the modelled regions, region 3 would be regarded as fully exploited and the remaining regions as under-exploited (Langley et al., 2011).

There are strong temporal trends in the estimated recruitment series of the 2011 assessment. Initial recruitment was relatively high but declined during the 1950s and 1960s. Recruitment remained

relatively constant during the 1970s and 1980s, declined steadily from the early 1990s and then recovered somewhat over the last decade (Langley *et al.*, 2011).

Overall, the latest assessment concludes that the stock is not overfished and overfishing is not occurring. The estimates of MSY for the principal model options (480,000-580,000t) are comparable to the recent level of (estimated) catch from the fishery (550,000t). Projections to 2021 indicate that fishing mortality is projected to remain below F_{MSY} and the spawning biomass will remain above SB_{MSY} . Applying FAM 6.2.19, an LRP (B_{lim}) of 0.2B₀ is appropriate. The 2011 assessment indicates that current biomass levels are well above this value and it is therefore concluded that there is high degree of certainty that yellowfin tuna stocks in the WCPO are within biologically-based limits. However, the 2011 SC meeting recommended that there be no increase in fishing mortality in the western equatorial region.



Overfished

Figure 7: Temporal trend in annual yellowfin tuna stock status, relative to B_{MSY} (x-axis) and F_{MSY} (y-axis) reference points, for the model period (1952–2010). The color of the points is graduated from mauve (1952) to dark purple (2010) and the points are labelled at 5-year intervals (Langley *et al.*, 2011).

2. Bigeye tuna

Like yellowfin, bigeye tuna are taken by a variety of surface gears as juveniles and by longline gear as adults. The total bigeye catch for the WCPO in 2010 was estimated at 108,997t, the lowest since 1996, mainly due to a drop in provisional catch estimates for the longline fishery (58,324t) (Williams & Terawasi, 2011). In recent years, the longline fishery typically accounted for around 60-70% of the bigeye catch, however this fell to 54% in 2010.

Bigeye tuna stock assessments using MULTIFAN-CL have been conducted almost annually since 1999, with recent assessments in 2008 (Langley *et al.*, 2008), 2009 (Harley *et al.*, 2009a), (Harley *et al.*, 2010) and this year (Davies *et al.*, 2011). The assessment covers 6 spatial regions in the WCPO, with data for the period 1952-2010 grouped by quarters, for 25 defined fisheries.

The current (2011) assessment is comparable to recent assessments though there were a range of data updates and a few changed structural assumptions. The primary differences included a revised structure of the fisheries based in Indonesia and Philippines; the incorporation of recent Pacific Tuna Tagging Program data; the use of standardized longline CPUE derived from operational-level data; and revised purse seine size frequency data. Also different to the previous assessment was that outputs with an assumed steepness of 0.8 was selected as the reference or base case to represent the stock status of bigeye. Additional models based on alternate values of steepness and standardized CPUE derived from either operational or aggregate longline data were chosen to represent uncertainty.

Fishing mortality for adult and juvenile bigeye tuna is estimated to have increased continuously since the beginning of industrial tuna fishing. For all of the 2011 model runs, $F_{current} / F_{MSY}$ is considerably greater than 1, indicating that overfishing is occurring (base case 1.46; range 1.16 – 2.10). The base case indicates that a 32% reduction in fishing mortality is required from the 2006–2009 level. Considering historical levels of fishing mortality, a 39% reduction in fishing mortality from 2004 levels is required and a 28% reduction from average 2001–2004 levels (consistent with the aim of Conservation and Management Measure (CMM) CMM-2008-01) (Davies *et al.*, 2011). The Fish Aggregating Device (FAD) closure introduced in 2009 has contributed to the reduction of bigeye catches in 2009 and preliminarily in 2010, however, it is too early at this stage to evaluate whether or not fishing mortality for bigeye tuna has been reduced to the levels specified in the CMM (because the data for these years are incomplete and estimates of fishing mortality in the final year of the model (2010) are particularly uncertain).

Management advice on stock status is based on MSY-related reference points $B_{Fcurrent} / B_{MSY}$ and $SB_{Fcurrent} / SB_{MSY}$. The model predicts that biomass would be reduced to 65% and 60% of the level that supports. Current stock status compared to these reference points indicate the current total and spawning biomass are higher than the associated MSY levels ($B_{current} / B_{MSY} = 1.25$, and $SB_{current} / SB_{MSY} = 1.19$). However, two of the alternate models found $SB_{current} / SB_{MSY} < 1.0$ with a range across the six models considered of 0.86 - 1.49 indicating a possibility that bigeye tuna is currently in an overfished state.

The overall conclusion is that overfishing is occurring and bigeye tuna is approaching an overfished state. Analysis of current levels of fishing mortality and historical patterns in the mix of fishing gears indicates that MSY has been reduced to less than half its levels prior to 1970 through harvest of small juveniles. Because of that and overfishing, considerable potential yield from the bigeye tuna stock is being lost and MSY levels would rise if mortality of small fish were reduced which would allow greater overall yields to be sustainably obtained (Davies *et al.*, 2011).

The figure below tracks the time series trend in stock status, moving to overfishing since the early 1990s and to possibly an overfished state in recent years. The colour of the points is graduated from mauve (1952) to dark purple (2009) and the points are labelled at 5-year intervals. The white circle represents the average for the period 2005-09 and the black circle the 2009 values. (from Davies *et al.*, 2011).

 $B_{current}$ is estimated at 0.44 B_0 , B_{MSY}/B_0 as 0.35, and $B_{current}$ as 0.29 of the average current total biomass in the absence of fishing. Assuming an LRP (B_{lim}) of 0.2 B_0 is appropriate, the current biomass is therefore well above $B_{LIM} = 0.20B_0$ as an indicator for the point at which a bigeye tuna stock would be considered to be at risk of serious recruitment overfishing or of serious or irreversible harm. It is therefore concluded that that bigeye tuna stocks in the WCPO are highly likely³ to be within biomassbased limits.



Figure 8. Temporal trend in annual bigeye tuna stock status, relative to B_{MSY} (x-axis) and F_{MSY} (y-axis) reference points, for the period 1952–2009 (reference case)

 $^{^{3}}$ For the base case model, the probability that SB_{current}/SB_{MSY} is less than 1.0 is zero (with a 13% probability across the grid of model runs used to examine uncertainty).

3. Blue shark

UoC catches (tonnes)	2008	2009	2010
	230	244	263
Proportion of UoC catch	Fleet reports		Observer reports
(2008 - 2010 average)	Not available		6.4%

Source: UoC catches raised from observed species composition and fleet total catches. Fleet catch proportion from (i) fleet records and (ii) SPC observer data holdings. Note that a proportion of the catch is released alive.

Blue shark is known as one of the most prolific shark species (Cortés, 2002) and is distributed throughout the WCPO, including tropical waters (Clarke *et al.*, 2011b; Clarke *et al.*, 2011c). The blue shark was categorized as being at "medium" ecological risk for deep longline sets (Kirby & Hobday, 2007). Blue sharks are one of the few species for which several stock assessments have been conducted in both the Pacific and Atlantic oceans. Kleiber *et al.* (2009) presented an assessment of this species for the North Pacific based on data through 2002 which concluded that the population appeared close to the B_{MSY} reference point and fishing effort may be approaching F_{MSY} . Using a previous version of this stock assessment as a basis for comparison, Clarke *et al.* (2006) estimated based on shark fin trade quantities in 2000 that blue sharks globally were being harvested at levels close to or possibly exceeding their maximum sustainable yield. More recently, Polovina *et al.* (2009) identified a declining catch rate trend for blue sharks of 3% per year (1996-2006) in deep sets by the Hawaii-based longline fishery. While there is some evidence for similar declines in blue shark abundance for the South Pacific (nominal catch rates), standardized longline catch rates show an increasing trend since 2003. However blue shark median lengths for males show significant declines in the region (Clarke *et al.*, 2011b).

<u>Synopsis</u>: Blue shark are the most common shark species in this fishery. They are not specifically targeted, but if retrieved dead are likely to be finned and retained. Observer data suggests that 90% of blue sharks are released alive, but this may not hold true in the case of unobserved trips. The blue shark is probably the most common, but not the most vulnerable, of pelagic sharks. Stock assessments to date, including those using Pacific data through 2002, have not indicated overfishing or an overfished state. However, in the recent WCPO analyses, substantial recent catch rate declines found in four different datasets for the North Pacific, in combination with demonstrated targeting of blue shark by a large commercial fleet operating in this area, are scientific grounds for concern and suggest further declines in abundance since 2002. Therefore, the conclusion of Kleiber *et al.* (2009) that this stock is above B_{MSY} may no longer hold (Clarke, 2011)

4. Short-finned mako (Isurus oxyrinchus)

UoC catches (tonnes)	2008	2009	2010
	111	117	127
Proportion of UoC catch	Fleet reports		Observer reports
(2008 - 2010 average)	Not available		3.1%

Source: UoC catches raised from observed species composition and fleet total catches. Fleet catch proportion from (i) fleet records and (ii) SPC observer data holdings. Note that a proportion of the catch is released alive.

The shortfin mako is found over a similar range as the blue shark but at much lower abundances. The shortfin and longfin makos were categorized as being at "medium" ecological risk for both deep and shallow longline sets (Kirby & Hobday, 2007). Recent ecological risk assessments for the Atlantic longline fisheries have ranked the shortfin mako, along with the silky shark, as among the most vulnerable pelagic sharks, and along with bigeye thresher the most vulnerable of the WCPFC key species (Cortés *et al.*, 2010, Arrizabalaga *et al.*, 2011). However, research from the North Pacific suggests that shortfin makos' productivity may be higher than previously thought (Semba *et al.*, 2011). The shortfin mako is classified by the IUCN Red List as "Vulnerable" (IUCN, 2011).

<u>Synopsis</u>: Like the blue shark, short-fin makos are not specifically targeted, but if retrieved dead are likely to be finned and retained. Observer data suggests that 62% of short-finned mako sharks are released alive, but this may not hold true in the case of unobserved trips. Recent abundance indices and median size analyses for shortfin mako in the WCPO have shown no clear trends; therefore there is no apparent evidence of the impact of fishing on this species in the WCPO. Most previously published stock status studies are also inconclusive.

UoC catches (tonnes)	2008	2009	2010
	98	104	112
Proportion of UoC catch	Fleet reports		Observer reports
(2008 - 2010 average)	Not available		2.7%

5. Silky shark (Carcharinus falciformis)

Source: UoC catches raised from observed species composition and fleet total catches. Fleet catch proportion from (i) fleet records and (ii) SPC observer data holdings. Note that a proportion of the catch is released alive.

Very little is known about the population sizes or trends in abundance of silky sharks (Bonfil, 2008). A number of studies, however, have suggested overfishing and declining catch rates for the silky shark, including in the Eastern Pacific. Although it is included in Annex I of the UN Law of the Sea (UNCLOS), there is no international protection currently in place for silky sharks. Based on its wide-ranging, oceanic and trans-boundary movements, the CMS Scientific Council concluded that it qualifies for listing under the Convention on Migratory Species (CMS; Camhi *et al.*, 2009). Whilst the silky shark is not currently CITES or CMS listed, IUCN consider it to be near threatened but vulnerable in the eastern-central and south-east Pacific. Silky sharks were categorized as being at "medium" ecological risk for both deep and shallow longline sets (Kirby & Hobday, 2007). The silky shark is also recognised as a 'medium risk' species in the Republic of the Marshall Islands EAFM report (RMI, 2010). If ranked as a 'high risk species, it would trigger a 'Full Performance Report'. The Inter-American Tropical Tuna Commission (IATTC) is currently undertaking preliminary stock assessment in the Eastern Pacific.

Catch rate data (Molony, 2005) suggest that there are considerable fluctuations in local abundances. Median sizes of silky sharks captured by the purse-seine fisheries of the WCPO have been relatively stable since at least the late 1990s, at 140 cm FL and less than 100 cm FL, respectively. However, declines in median size of silky sharks have been observed in sub-equatorial areas of the western WCPO (Areas 7 and 8) and Area 14 (10–20°N, east of 170°E). This suggests that some degree of local depletion may be occurring. Preliminary stock assessment work is underway by IATTC for the Eastern Pacific Ocean (EPO).

<u>Synopsis</u>: The silky shark represents a minor shark bycatch from this fishery. The majority is discarded, and observer reports indicate that there is some level of post-discard survival (c. 80%). It appears that, based upon length-frequency information that the majority of the population is relatively stable, although there may be areas of local depletion. As such it appears highly likely that this species is within biologically-based limits, although there is an evident need to reduce fishing pressure on these potentially vulnerable species, and a number of measures have been adopted at regional level to do so. Nevertheless, declining size trends in two datasets, declining catch rates in these two datasets for the most recent years of the time series, and increasing removals all indicate a need for close, ongoing monitoring of indicators (Clarke, 2011)

6. Oceanic white tip shark (Carcharhinus longimanus)

UoC catches (tonnes)	2008	2009	2010	
	91	96	104	
Proportion of UoC catch	Fleet reports		Observer reports	
(2008 - 2010 average)	Not available		2.5%	

Source: UoC catches raised from observed species composition and fleet total catches. Fleet catch proportion from (i) fleet records and (ii) SPC observer data holdings. Note that a proportion of the catch is released alive.

Oceanic whitetip sharks were found to interact with fisheries between 30° N and S latitude with larger individuals, near or at the length at maturity, taken by the longline fishery and mainly juveniles captured by purse seine gear (Clarke *et al.*, 2011b, Clarke *et al.*, 2011c). The oceanic whitetip shark was categorized as being at "medium" ecological risk for both deep and shallow longline sets (Kirby & Hobday, 2007). Catch estimates in number based on observer data indicate removals have dropped by *c*. 70% in the past decade (Lawson, 2011) with median estimates for 2006 ranging from 48,000 to 320,000 individuals (Lawson, 2011; Clarke, 2009).

<u>Synopsis</u>: Oceanic white tip sharks are a minor bycatch in this fishery. Although there has been no stock assessment conducted for this species to date, recent analysis of four different datasets for the WCPO show clear, steep and declining trends in abundance indices. Analysis of two of these datasets for median lengths confirmed that oceanic whitetip sizes decreased significantly until samples became too scarce for analysis. Given the strong existing evidence for the depleted state of the oceanic whitetip population in the WCPO, stock assessment studies are likely to further the case for further conservation and management action (Clarke, 2011).

7. Opah (Lampris guttatus)

UoC catches (tonnes)	2008	2009	2010	Ī
	153	162	175	
Proportion of UoC catch	Fleet reports		Observer reports	
(2008 - 2010 average)	Not available		4.2%	

Source: UoC catches raised from observed species composition and fleet total catches. Fleet catch proportion from (i) fleet records and (ii) SPC observer data holdings. Note that a proportion of the catch is released alive.

Opah are a large, distinctive pelagic fish found in all major oceans, and is commonly captured in tropical and sub-tropical longline fisheries in the WCPO, on deeper set gear in the equatorial regions and in the sub-tropical albacore fisheries (Langley *et al.*, 2008). The opah was categorized as being at "medium" ecological risk for deep longline sets (Kirby & Hobday, 2007). In the WCPO, opah start being captured by longline gears at a size of approximately 50 cm FL (around one year of age). Opah appear fully recruited to longline gears in the WCPO at approximately 100 cm FL. Few opah greater than 125 cm FL are reported by observers in longline fisheries of the WCPO (Molony, 2008). Hawn et al. (2002) concluded that opah are more abundant at depths greater than 300 m, associated with bigeye and albacore habitats, although opah are rarely recorded in some surface fisheries.

There are no details available for the stock assessments for opah from any area and thus the stock status is unknown. The median size of opah captured by longline vessels in the WCPO has been relatively stable or increasing at most latitudes since the early 1990s. Overall, the median size of opah captured by WCPO longline fisheries has shown a steady increase since the late 1980s, albeit with (apparently) seasonal fluctuations. This is consistent with data from the client fleet, where there doesn't appear to be concern over the status of this species based on the time-series trends in CPUE and size at capture (Figure 9) based on observer data (Peter Williams, SPC, pers. comm., 11 October 2011).



Figure 9. Average length and CPUE trends for the client fleet (2002 - 2010)

8.	Swordfish	(Xiphias	gladius)
~		(a

UoC catches (tonnes)	2008	2009	2010
	72	76	82
Proportion of UoC catch	Fleet reports		Observer reports
(2008 - 2010 average)	1.1%		2.0%

Source: UoC catches raised from observed species composition and fleet total catches. Fleet catch proportion from (i) fleet records and (ii) SPC observer data holdings. Note that a proportion of the catch is released alive.

Kolody *et al.* (2009) conducted the most recent stock assessment for the broadbill swordfish in the Southern region of the WCPFC convention area (0-50°S; $140^{\circ}E - 130^{\circ}W$) for the period 1952-2007 (including constant catch projections to 2017). The authors considered relative biomass estimates for recent years to be the most reliable reference points as they are the most closely linked to the highest quality data. Although the data were not sufficient to estimate a stock recruitment relationship reliably, all estimates from the model ensemble suggested that biomass (total and spawning) is above levels that would sustain MSY, and fishing mortality is below F_{MSY} :

- TSB(2007)/TSB(MSY) = 1.57 (1.22 2.06)
- SSB(2007)/SSB(MSY) = 1.98 (1.20 3.46)
- F(2007)/F(MSY) = 0.44 (0.18 0.67)

9. Blue marlin (Makaira mazara)

UoC catches (tonnes)	2008	2009	2010
	50	53	58
Proportion of UoC catch	Fleet reports		Observer reports
(2008 - 2010 average)	Not available		1.39%

Source: UoC catches raised from observed species composition and fleet total catches. Fleet catch proportion from (i) fleet records and (ii) SPC observer data holdings. Note that a proportion of the catch is released alive.

Blue marlin are a large surface species of tropical waters, reaching up to 500 cm in total length and 906 kg although most blue marlin encountered in the Pacific Ocean are much smaller. It is assumed that the blue marlin form a single stock in the Pacific Ocean. Blue marlin are serial spawners and very fecund. Spawning is believed to occur year-round in equatorial waters $(10^{\circ}S-10^{\circ}N)$ and during summer periods in the southern $(10^{\circ}S-30^{\circ}S)$ and northern $(20^{\circ}N-30^{\circ}N)$ hemispheres.

Due to the limited data on biology, ecology and catches of blue marlin in the Pacific Ocean, many early stock assessments produced conflicting reports, partially due to uncertainty in some parameters of the various models (e.g. size at age, catchability). Conclusions on the status of Pacific blue marlin stocks ranged from the stock being overfished to the stock being at maximum sustainable yield (IATTC, 2004). Kleiber *et al.*, (2003), using MULTIFAN-CL, concluded that the most pessimistic status of Pacific blue marlin is that the stock is close to being fully exploited. An International Scientific Committee for Tuna and Tuna like Species in the N. Pacific Ocean (ISC) stock assessment for blue marlin is scheduled for 2012 (ISC, 2009).

Management

1. Tuna species

The main management measure applying to yellowfin and bigeye is the Commission's Conservation and Management Measure CMM-2008-01, adopted in December 2008, and replacing earlier measures in 2005 and 2006. CMM-2008-01 was developed to "*mitigate the overfishing of bigeye and yellowfin tuna and to limit the growth of fishing capacity in the WCPO*", to "*ensure through compatible measures for the high seas and EEZs that bigeye and yellowfin stocks are maintained at levels capable of producing their MSY*", in accordance with Article 5 of the Convention. CMM-2008-01 involves a package of measures to limit fishing mortality on yellowfin and bigeye tuna, including restrictions on the use of FADs and closure of some high seas areas.

In addition to the management measures in CMM-2008-01, the CMM commits CCMs to explore and evaluate mitigation measures for juvenile bigeye and yellowfin taken around FADs. Examples of work in this direction discussed at SC6 include use of acoustic methods, underwater video, behavioural studies of tuna around FADs, and the need to incentives for industry to implement such measures.

In accordance with para. 46 of CMM-2008-01, SPC carried out a technical evaluation of the measure to see if the objectives were being met during the first year of application of the measure (Hampton & Harley, 2009), with subsequent analyses since that time (SPC-OFP, 2010). Further analysis was presented at the 2011 Scientific Committee meeting (Hampton & Williams, 2011). Some key findings of this paper were:

- a) The incidence of reported activity related to use of drifting FADs was considerably lower in 2010 (5.1%) compared to 2009 (13.5%);
- b) Total catch was below average during the 2009 closure and in September of the 2010 closure, although effort remained at around normal levels throughout both closures;
- c) The catches of bigeye tuna were strongly reduced during both closure periods compared to the other months of those years;

- d) The impacts of the closures on skipjack and yellowfin catches are more moderate;
- e) The proportions of associated sets conducted during the 2010 closure were close to zero, and compliance with the measure appears to have improved somewhat;
- f) While catches were reduced during the closures, the average size of the catch was higher for all species, particularly yellowfin, during the closures because of the larger average size of fish caught in unassociated sets. These larger average sizes may offset to some extent the loss of catch that occurs as a result of the closures.

Although evaluation of the effectiveness of CMM-2008-01 as a whole is in its early days, SC7 noted that the trends demonstrated in the preliminary analysis were pleasing. Most notably that: i) incidence of reported activity related to use of drifting FADs was considerably lower in 2010 compared to 2009; ii) total catch was below average during the 2009 closure and in September of the 2010 closure; iii) catches of bigeye tuna were strongly reduced during both closure periods compared to the other months of those years; and iv) 2010 proportions of catch and effort associated with FAD usage outside the closure period had lower FAD usage than is typically the case;

A working paper presented at SC7 (Sibert *et al.*, 2011) examines the potential utility of spatial fishery management measures following the closures brought into effect by CMM-2008-01. The authors use a spatially explicit ecosystem model of tuna population dynamics, SEAPODYM, to simulate the effects of closures on stock biomass and catch of bigeye tuna by simulating the growth of the WCPO tuna fishery from 1980 to 2003, and examine the fate of the fishing effort displaced by these closures. Two different effort displacement scenarios are examined: (1) complete loss of the displaced fishing effort; and (2) redistribution of effort proportional to the historical (average) distribution of catch per unit effort (CPUE). When fishing effort is redeployed, the benefits to the stock are not detectable. The beneficial effect on stock biomass is greatest when the displaced fishing effort was completely lost. However, even in this latter case, the effects of the closures on stock size are quite small (less than 4 % averaged over the simulation period). If spatial closures are extended to longline fisheries, the biomass increase becomes greater (approximately 7%).

Considering the analyses above, SC7 concluded that (WCPFC-SC, 2011):

- a) the number of days reported with any activity related to a drifting FAD was 13.5% in 2009 and 5.1% in 2010 during the FAD closure periods. Trends in FAD usage and associated catch information indicate that the FAD closure has been effective in reducing FAD use in the purse seine fishery,
- b) the limits placed on purse seine operations have not adequately constrained total purse seine effort, with total effort in 2009 and 2010 estimated to be 25% and 32%, respectively higher than the 2001-2004 level and the total purse-seine catch of bigeye during 2010 the eleventh highest on record,
- c) Purse seine catches of bigeye tuna (in 20oN-20oS) declined in 2010 by 21% from 2009 and increased by 1.3% from the 2001-2004 average,
- d) closing areas to purse seine fishing without consideration of the fate of displaced fishing effort will not be effective for bigeye conservation,
- e) the provisional longline catch in 2010 is 30% lower than the 2001-2004 level. However, this estimate is based on incomplete data and is despite an increase in fleet size.

2. Shark species

Due to the inherent vulnerability of sharks to over-fishing and their important role at the top of the marine ecosystem, the conservation and management of sharks has become an increasingly important priority to the Commission.

Stock level: the WCPFC first adopted a Conservation and Management Measure (CMM) specific to sharks in 2006 (CMM-2006-05). This CMM was subsequently amended in 2008 (CMM-2008-06), 2009 (CMM-2009-04) and most recently in 2010 (CMM-2010-07). This current version now requires

that Commission Members, Cooperating non-Members, and participating Territories (CCMs) shall adopt the following action for key shark species⁴:

- Implement the FAO International Plan of Action for the Conservation and Management of Sharks (non-binding).
- define key shark species / shark catch & discard reporting requirements for WCPFC CCMs (non-binding);
- CCMs should support research and development of strategies for the avoidance of unwanted shark captures (e.g. chemical, magnetic and rare earth metal shark deterrents) (non-binding).
- CCMs need to take measures necessary to require that their fishers fully utilize any retained catches of sharks. This includes restrictions on the fin / shark ratio as well as other measures to reduce the incidence of finning (binding)
- CCMs shall take measures necessary to prohibit their fishing vessels from retaining on board, trans-shipping, landing, or trading any fins harvested in contravention of this CMM (binding).
- CMMs are bound to encourage the release of live sharks (binding).

The Fiji Fisheries Department is diligent in communicating these CMMs to industry, as demonstrated by the following extract from a letter to all Fijian domestic and foreign fishing operators entitled 'Shark management' (letter dated 06 June 2010):

At the same time the Conservation and Management Measure (CMM) 2009-04 on shark that was adopted by the WCPFC in December 2009 is now in force and you are reminded for its full compliance and am attaching a copy for your viewing.

In this regards and ensuring our obligations on the sustainable management of sharks globally is maintained you are hereby asked to comply with the following:

- all fishing gear rigged to catch shark are to be offloaded and remain on shore;
- all sharkfin to be offloaded from any fishing vessels berthing at any Fiji port shall be no more than 5% of the weight of sharks on board up to the first point of landing; and
- iii) all vessels, irrespective of status will be boarded for inspection prior to offloading of any catch and therefore required to advise this office of your ETA 24 hours prior to arrival.

For ensuring the sustainability and proper management of the fragile shark stocks worldwide, you are all requested to comply by advising <u>ALL</u> fishing vessels under your control of the policy that will come into force at national level from 1 August 2010.

Figure 10. Extract from a letter by the Fisheries Department to the Fiji domestic & foreign fishing operators (dated June 2010)

(Source: Letter from Sanaila Naqali, Director Fisheries (for Permanent Secretary for Fisheries and Forests) dated 6th July 2010. Provided by Sea Quest (Fiji) Limited.)

There is a Regional Plan of Action for Sharks in the Pacific (Lack & Meere, 2009). Many of the mitigation approaches advocated in this document (e.g. prohibition of wire traces, non-use of 'J' hooks, deep sets, and required release of live sharks) are all currently undertaken within the UoC (see below).

⁴ The key shark species are blue shark, silky shark, oceanic whitetip shark, mako sharks, and thresher sharks, porbeagle shark (south of 20° S, until biological data shows this or another geographic limit to be appropriate) and hammerhead sharks (winghead, scalloped, great, and smooth).

At present there is no national plan of action for sharks. However a formal Government policy paper (Note to Development of Sub-Committee (DSC (10) 27 July 2010) as seen by the assessment team formally sets out a process to seek a Decree for the prohibition of harvesting of sharks within the Fiji EEZ. It is "highly likely" that such a ban will be imposed (Anare Raiwalu, Fiji Ministry of Fisheries and Forests, pers. comm., 11th October 2011), although it may take to form of a 5 year moratorium in the first instance. It is understood that this policy paper has been signed off by the Secretary and is now before cabinet for adoption (Hugh Walton, FFA, pers. comm., 29th October 2011).

UoC level: sharks are not a targeted bycatch, but given that they are sometimes retained (mainly as a crew incentive), they are treated in this assessment as a retained bycatch. The FTBOA makes active efforts to reduce shark bycatch by utilizing monofilament traces (wire traces are banned) that results in most sharks in biting through the line and escaping before being brought alongside the boat. In additional all the client fleet uses small (size 13 - 140 'D' shaped hooks (see figure below) that tend to have lower shark catch rates. License conditions for all the UoC state that no shark gear is allowed on board these vessels.

The largest company in the UoC, Solander, has a formal written policy that "It is best if the branch line is cut whilst the shark is still in the water so it may swim away unmolested." (Lucas, 2010) as much for health and safety reasons as for shark conservation.



Figure 11. Typical longline hook as used in the UoC

As the fishery tends to operate at greater depths then at where most sharks are found, shark bycatch tends to occur only on the branch lines adjacent to the floats.

All shark catches are formally sold through the company, rather than being given to crew to sell, thus increasing transparency, record keeping and control over shark catches.

Table 6.	Summary	of shark	management	measures
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Management measure	Instrument	Application at UoC level
Implement FAO PoA on for	CMM-2010-07	There is a Regional Plan of Action for Sharks in
the Conservation and	Non-binding	the Pacific (Lack & Meere, 2009). Many of the
Management of Sharks.		mitigation approaches advocated in this
		document (e.g. prohibition of wire traces, non-
		use of 'J' hooks, deep sets, required release of
		live sharks) are all currently undertaken within
		the UoC (see below).
Define shark catch / discard	CMM-2010-07	Official catch logbooks now required shark
reporting requirements	Non-binding	landings to be recorded by species (letter from
		the Fisheries Department to Intertek, dated 08
		March 2012)
CCMs should support R&D	CMM-2010-07	UoC vessels are not permitted to carry "fishing
of strategies for the	Non-binding	gear rigged to catch shark" (see letter by the
avoidance of unwanted		Fisheries Department to the Fiji domestic &
shark captures		foreign fishing operators (dated June 2010)) and
CMMs are bound to	CMM-2010-07	"No drop line and shark line is to be carried on
encourage the release of live	Binding	<i>board</i> " (FTBOA licence conditions for 2012).
sharks		One company (Solander) has a written policy that
		<i>"It is best if the branch line is cut whilst the shark</i>
		is still in the water so it may swim away
		unmolested." (Lucas, 2010).
Measures for the full	CMM-2010-07	UoC vessels can land no more than 5% of the
utilization of retained	Binding	weight of sharks on board at the first point of
catches of sharks.		I landing (see letter by the Fisheries Department to
Prohibit fishing vessels from	CMM-2010-07	the Fiji domestic & foreign fishing operators
retaining on board, trans-	Binding	(dated June 2010) and FIBOA licence conditions
shipping, landing, or trading		for 2012).
any tins		

3. Opah

Given that opah is not considered a species of concern at either national or regional level, there are no management measures in place. This is supported by the consistent CPUE and size at capture information presented in the previous section.

4. Billfish

At present neither swordfish nor blue marlin are considered to be outside of biologically-based limits and thus, considering the low levels of bycatch from this fishery, no bycatch strategy is currently considered necessary. This said, in 2009 the WCPFC Scientific Committee recommended that there be no further increase in catch or effort of swordfish in order to keep the stock above its associated reference points (CMM-2009-03). It is also noted that blue marlin is a high risk species in terms of its susceptibility to fishing (Kirby & Hobday, 2007) and thus it is recommended that the results of the proposed ISC stock assessment for blue marlin in 2012 are reviewed and the species kept under surveillance.

Information

1. Tuna species

The science supporting research and assessment of the two retained by-catch species draws on a comprehensive range of data, including detailed historical and current operational catch and effort data⁵, aggregate catch and effort data, port sampling, unloading and transhipment data, size composition data, a large tagging dataset ⁶, oceanographic data, data from biological research undertaken by CCMs and SPC, and observer data, with most recent coverage increasing to 100% for most of the industrial purse seine fleet. These data are supplied to SPC under agreed conditions and maintained in an accessible database maintained by SPC-OFP as data manager and science provider. Williams (2011) provides the most recent summary of scientific data available to the WCPFC, and also identifies gaps and uncertainties in the data, as well as estimates of coverage. The data currently available to the WCPFC are probably the most comprehensive available to any tuna RFMO and underpin what are generally regarded as high quality stock assessments and associated analyses.

A major source of uncertainty in assessments, especially with respect to yellowfin and bigeye, has been due to a lack a breakdown of catch estimates by gear type and the lack of operational logsheet data for the Philippines (and Indonesia) domestic fisheries (Williams, 2011). Considerable progress has been made in recent years in addressing this gap, though the Indonesia Philippines Data Collection Project supported by WCPFC through extra-budgetary funding, and most recently by the successor Global Environment Faciliity (GEF) funded West Pacific East Asia Oceanic Fisheries Management Project, involving Indonesia, Philippines and Vietnam. The 2011 bigeye and yellowfin tuna assessment have incorporated improved data and there has been refinement to the Philippines and Indonesian fishery definitions, including the definition of a new fishery encompassing the Philippines and Indonesian purse-seine fleets operating west of 130° E and outside of archipelagic waters. In addition, increased observer coverage is providing an opportunity to better estimate size and species composition of the purse seine catch.

2. Shark species

<u>Science</u>: Current knowledge on sharks in the WCPO region was recently surveyed in the development of the Pacific Islands Regional Plan of Action (RPOA) for Sharks (Lack & Meere, 2009). Some steps have already been taken toward assessment of shark species through a multi-year project on ecological risk assessment conducted by SPC in collaboration with the FFA, CCMs and non-governmental organizations (NGOs), and presented to the SC in 2006 (Kirby, 2006).

In preparing to provide preliminary advice on the stock status of key shark species in 2010 as required by CMM-2008-06 (and subsequently CMM-2010-07), in 2010 the SC considered the feasibility of quantitative stock assessments for sharks given the currently available data (Manning *et al.*, 2009). It was recommended that preliminary assessments should proceed, on the understanding that this exercise would identify gaps in essential data that would need to be filled under the Shark Research Plan. In December 2009, the Commission endorsed the recommendations by the SC regarding sharks but also requested SC6 consider whether several other sharks should be added to the list of key shark species (WCPFC-SC, 2010).

In 2010 the WCPFC SC drafted a research plan for the assessment of the status of these stocks (Clarke & Harley, 2010), which was accepted by the SC's 6th Regular Session in mid-August 2010. Designed to be completed in mid-2014, funding is available through mid-2013. The Shark Research Plan has three main inter-related components:

⁵ According to standards adopted at the 2nd session of the WCPFC in December 2005

⁶ More so in the case of skipjack and yellowfin; modest amount of information available for bigeye.

- assessments to be undertaken with existing and available data;
- coordination of research efforts to supplement biological and other assessment-related information; and
- improvement of data from commercial fisheries.

Due to the historical lack of shark reporting on the logsheets of most fleets, analyses of the WCPFC and SPC-OFP data holdings conducted to date under the Shark Research Plan have been based only on observer data. Observer data have been limited to <1% coverage of the longline fishery in recent years, most of which is concentrated in Exclusive Economic Zones (EEZs), but coverage is set to rise to 5% in June 2012. It should be noted that Fiji's observer coverage is around 7.6% of total effort.

In February 2011, the WCPFC rules for "Scientific Data to be Provided to the Commission" were revised to specify provision of annual catch estimates and operational level catch and effort data from longline and troll (in number) fisheries for blue, silky, oceanic whitetip, mako, thresher, porbeagle, and hammerhead sharks (winghead, scalloped, great and smooth) sharks (WCPFC, 2011). Size data are also required for those species for which stock assessments will be undertaken, therefore size data should be provided for sharks as they are for tunas and billfishes. Clarke *et al.* (2011a) describes improvements in shark data in terms of additional ad hoc and regular data provision by WCPFC members and characterizes the current shark data holdings.

Information on the current level of shark finning is low. CMM-2010-07 requires that CCMs should advise the Commission on their implementation of the IPOA Sharks. CMM-2010-07 also requires that each CCM include both catches and discards of silky shark and oceanic whitetip⁷ to species level in their annual reports. The most recent report from Fiji (Amoe, 2011) does indeed show estimated catches for these key species. According to Meli Raicebe (Policy (Compliance / Surveillance Officer), Fiji Fisheries Department, pers. comm., 11 Oct 2011 species identification by the Regional Observer Programme is good, especially on the FTBOA vessels.

Each company is required to report both shark fin and trunk sales to the Fisheries Department. This is currently disaggregated to blue sharks, makos, threshers and 'brown sharks'. The latter category includes species such as oceanic white tip, hammerhead, tiger and black tip sharks. These reports are compiled by the Fisheries Department and placed on an Excel spreadsheet (which was viewed by the assessment team).

<u>Industry</u>: Species-specific shark catch records are historically sparse in the longline log sheet data held by SPC OFP (Clarke & Harley, 2010). Longline log sheet data held by the SPC OFP indicate that in 2000-2006 approximately 814,000 sharks were recorded but only 14% of these were recorded as being one of the key shark species (blue, silky, oceanic whitetip, "mako", "thresher"). However

Fiji is more progressive than many Pacific Island nations, with threshers included in log sheet data since 2002, makos since 2004 and blue sharks since 2006. It should be noted that under the rules for Scientific Data to be provided to the Commission there are requirements for CCMs to provide data on catch and effort of key shark species, amended in 2010 to include porbeagles and the four hammerhead species. The quantity and quality of shark data submitted to the Commission appear to be increasing over the past few years, but it will take time to build an adequate database for shark species assessments.

3. Opah

<u>Science</u>: Because it is not a major target of any fishery, very little is known about the opah's biology or population structure (Hawn *et al.*, 2002) nor to allow an assessment of stock abundance or structure. Consequently there are no estimates of biomass or optimum yield. At present, the main indications of abundance trends are inferred from catch and effort data.

⁷ As well as blue shark, mako sharks and thresher sharks

<u>Industry</u>: most companies quantifiably record catches of opah on log sheet and it is included in the Regional Observer Programme. As a result, there are good long-term data sets on catch and effort data. Much of this was made available to the assessment team and it was concluded that this information is sufficient to indicate that the fishery is not impacting upon the status of this species.

4. Billfishes

The other two key species being caught by this fishery under assessment are the swordfish and the blue marlin.

<u>Swordfish</u>: As swordfish are an important target species of shallow longline fisheries in the South Pacific, there is considerable information available on which to base stock assessments. As a precursor to a possible swordfish stock assessment in 2012, WCPFC recently reviewed the data holdings in respect to South Pacific swordfish stocks. This concluded that the main weakness was the need to utilize commercial catch rates as relative abundance indices and efforts are being made to address this.

<u>Blue marlin</u>: as with swordfish, there is considerable information available on which to base stock assessments. In particular, there is considerable commercial catch data on this species as it has been included in standard regional longline logsheets since 1996. However it is noted that blue marlin is a high risk species in terms of its susceptibility to fishing (Kirby & Hobday, 2007) and thus it is recommended that the results of the proposed ISC stock assessment for blue marlin in 2012 are reviewed and the species kept under surveillance.

7.3 Bycatch (Discarded) species

The majority of the catch is retained, with less than 5% of the total catch (by number or 1.4% by weight) discarded. This is covered in either Principle 1 (albacore) or Principle 2.1 (other main retained species). No one bycatch species exceeds 0.5% of total catch by weight and thus all can be considered as minor bycatch and are not considered further in this assessment.

	Catch composition				Averag		
Species	Weight (t)	%	Number	%	Weight (kg)	Length (cm)	CPUE
Pelagic stingray	2.16	0.49%	389	1.59%	5	44.2	0.27
Long-snouted lancet fish	1.11	0.25%	559	2.29%	1	113.8	0.39
Oilfish	0.42	0.09%	38	0.16%	10	93.5	0.03
Scalloped hammerhead	0.41	0.09%	8	0.03%	50	160.7	0.01
Slender sunfish	0.35	0.08%	23	0.09%	-	53	0.02
Barracouta (snoek)	0.24	0.05%	35	0.14%	6	99.2	0.02
Other discarded species	1.07	0.2%	136	0.6%			
Sub-total	5.98	1.4%	1,189	4.9%			
Retained species	437.3	98.6%	23,210	95.1%			
Total	443.25	100%	24,399	100%			

Tabla 7	Observed	discordad	eatch	(Ionuory	2008 5	ontombor	2011)
Table 7	. Observeu	uiscarueu	catch	(January	2000 - 5	eptember	4011)

SPC Observer database (October 2011)

In addition to the bycatch species listed above, this fishery utilizes frozen bait, mainly *Sardinops* saygax (known commonly as the 'sardine or 'South American pilchard') from South Africa. This species is therefore included in this assessment. Usage is around 6500 kg per month per vessel, based on 100gms size bait using 3000 hooks per day and 22 actual fishing days per month (Russell Dunham, Fiji Fish, pers. comm., 11 October 2011).

Status

Sardine *Sardinops sagax* (together with the anchovy *Engraulis encrasciolus* and the round herring *Etrumeus whiteheadi*) are the targets of a pelagic purse-seine fishery which has been operational off the coast of South Africa since the late 1940s. Initially targeting sardine, the industry prospered from the late 1950s with sardine dominating the escalating catches until 1964. Following rapid declines in the landings of sardine during the mid-1960s, the industry changed its fishing strategy and used smaller-meshed nets to target anchovy as they moved from the West Coast nursery grounds to the spawning grounds off the South Coast. Anchovy dominated the catches for the next two and a half decades, but a slow and steady increase in the biomass of sardine was observed during this period. Sardine catches increased substantially in the early 2000s as a consequence of exceptional sardine coincided with increased catches of anchovy and resulted in annual total pelagic fish landings in excess of 500,000 t between 2001 and 2005. A recent rapid and substantial decline in the size of the sardine stock has, however, resulted in reduced sardine catches, whilst anchovy catches have remained high.

The estimate of total sardine biomass increased slightly, though not significantly, from a very low level of 260,000 t in 2007 to 380,000 t in 2008 (see figure below). The 2009 recruit estimate of 9.2 billion fish was similar to that measured in 2006 and appreciably higher than during 2007 and 2008, and contributed to a slight increase in the sardine spawner biomass by the end of 2009. Recruitment of sardine, however, has remained below average for six consecutive years and as such growth in the abundance of the adult population remains slow. The fishery is considered to be optimally exploited (DAFF, 2010).





Source: Department of Agriculture, Forestry and Fisheries, South Africa, 2010

Management

At an RFMO level, WCPFC "Resolution on non-target bycatch species" (WCPFC2, 2005) states that CCMs' should "encourage their vessels operating in fisheries managed under the WCPFC Convention to avoid to the extent practicable, the capture of all non-target fish species that are not retained" and that "any such non-target fish species that are not to be retained, shall, to the extent practicable, be promptly released to the water unharmed".

With specific reference to the South African bait species sardine *Sardinops sagax*, current management for this species and anchovy is based on an Operational Management Procedure (OMP) consisting of agreed formulae that base the TAC on observed stock sizes. The OMP formulae have been selected with the objectives of maximising average directed sardine and anchovy catches in the medium term, subject to constraints on the extent to which TACs can vary from year to year in order to enhance industrial stability. The OMP is used to set an annual TAC for directed sardine and an annual initial and final TAC for anchovy, the latter depending on observed anchovy recruitment strength. A fixed precautionary upper catch limit (PUCL) of 100,000 t applies for round herring, irrespective of the size of this population. Juvenile sardine and juvenile horse mackerel are both taken as bycatch during anchovy-directed fishing operations, and a total allowable bycatch (TAB) limit is set for juvenile sardine and a fixed PUCL of 5,000 t is set for horse mackerel.

Information

Populations of anchovy and sardine are closely monitored by means of hydro-acoustic surveys conducted annually since 1984. Two main assessment surveys are conducted each year, including a summer spawner biomass survey that estimates the total size of the stock and a recruit survey in winter that estimates the number of fish that recruit to the population. These surveys also provide data for the estimation of a number of other key biological parameters (e.g. age structure) that are required as input for the OMP, many of which can only be estimated accurately from data collected during fishery-independent surveys. Samples for a variety of studies on aspects of the biology and ecology of small pelagic fish species are also collected during these surveys. The use of improved technology during the hydro-acoustic surveys over time has led to a major revision and improvement of the acoustic time-series of abundance estimates. Currently, the quantity and quality of information provided by these surveys is considered by the Department of Agriculture Forestry and Fisheries – South Africa (DAFF) to be among the best in the world, and corrections to account for differences between the old and new systems and to take account of new information are incorporated into the current anchovy and sardine assessment models (DAFF, 2010). Apart from these fishery-independent surveys, the management of the pelagic fishery is also highly dependent on accurate reporting of catch statistics (landed mass, catch position and date) and representative sampling of the commercial catches, in particular the length and age frequency distributions of harvested fish.

7.4 ETP species

ETP (endangered, threatened or protected) species are those recognised by national legislation and / or binding international agreements.

Status

This assessment has focused on those species which may be regularly affected by fishing activities (i.e. not including occasional interactions). An examination of fauna protected within Fiji waters by either CITES or the Endangered and Protected Species Act $(2002)^8$ shows a wide range of species that overlap with the fishery under assessment (see Table 8). This 'long list' is examined further below.

<u>Cetaceans</u>: Apart from predation of toothed whales upon fish caught on the longline, whales or cetaceans are only very occasionally caught in this fishery. Amoe (2011) reported only three interactions in the domestic longline observer programme over 2008 - 2009, in which case all three animals were released alive. The Regional Observer Programme does not report any cetacean bycatch from this fishery. The industry state that cetacean bycatch is an extremely rare event, as they are able to locate lines and hooks with their sonar and are not attracted by the bait. Similarly, there are no reports of catches of any of the CITES protected finfish (great white shark, whale shark, humphead wrasse and giant grouper) by this fishery, as it occurs outside their habitat presences or species ranges.

<u>Sea turtles</u>: The observed catches of marine turtles by these fleets are very low (Loggerhead and Leatherback turtles c. 0.004% of total catch volume by weight and Pacific Hawksbill and Olive Ridley 0.012% each). In most cases, turtles are encountered alive and are subsequently dehooked and released. Of the various factors affecting marine turtle encounter rates in longline fisheries, the depth of set appears to be the most important (Kirby, 2009). The incidence of marine turtle encounters is higher for all shallow sets than for any deep sets (>4.5% vs. <2.4%). The data for deep-setting vessels such as those within the UoC also show that encounters are likely to be on the shallowest hooks.

<u>Seabirds</u>: limited if any information exists concerning the capture of avifauna by tuna longline gear in the tropical Pacific. When assessing the situation in higher latitude fisheries e.g. Australia, New Zealand, and Hawaiian longline fisheries, seabird bycatch in the tropical Pacific is extremely miniscule in comparison (Watling, 2002; Gillett 2010).

The areas with highest likelihood of species-level population effects from longline occur in the Tasman Sea, and around the coasts of New Zealand during Spring and Summer seasons (Filippi *et al.*, 2010). The northern Pacific shows highest risk areas, around Midway Islands, Hawaii, Japan and Taiwan during the Autumn and Winter seasons. Moderate-to-high risk levels occur in the same areas but at a larger scale. Medium risk areas surround the high risk areas, mostly in the northern and southern temperate latitudes, and in addition, some area show medium risk in the central-Pacific, around Fiji and French Polynesia in Autumn and Winter. Filippi *et al.* (2010) consider the main Fijian species to be at risk are the Fijian petrel *Pseudobulweria macgillivrayi* (mainly due to its extremely low population) and the Tahiti petrel *P. rostrata*. Both these species will be included in this assessment.

⁸ This act included species within CITES and provides details of additional species that are protected outside of the CITES listings.

Table 8. ETP Species in Fiji

Spec	ies		Observed proportion of catch (08-11)	PSA (sea birds only)	CITES Listed	E&PSA (2002)
	Pygmy Sperm Whale	Kogia breviceps	-	na	\checkmark	
	Sperm Whale	Physeter macrocephalus	-	na	\checkmark	
	Short-finned Pilot Whale	Globicephala macrorhynchus	-	na	\checkmark	
	Killer Whale	Orcinus orca	-	na	\checkmark	
su	False Killer Whale	Pseudorca crassidens	-	na	\checkmark	
cea	Bridled Dolphin	Stenella attenuata	-	na	\checkmark	
etac	Rough-toothed Dolphin	Steno bredanensis	-	na	\checkmark	
Ŭ	Southern Minke Whale	Balaenoptera bonaerensis	-	na	\checkmark	
	Sei Whale	Balaenoptera borealis	-	na	\checkmark	
	Bryde's Whale	Balaenoptera edeni	-	na	✓	
	Fin Whale	Balaenoptera physalus	-	na	✓	
	Humpback Whale	Megaptera novaeangliae	-	na	✓	
ŝ	Loggerhead turtle	Caretta caretta	0.004%	na	\checkmark	
tle	Green Turtle	Chelonia mydas	-	na	\checkmark	
tur	Pacific Hawksbill Turtle	Eretmochelys imbricata	0.012%	na	\checkmark	
ea	Olive Ridley	Lepidochelys olivacea	0.012%	na	\checkmark	
S	Leatherback Turtle	Dermochelys coriacea	0.004%	na	\checkmark	
	Whale shark	Rhincodon typus	-	na	\checkmark	
ų	Great White Shark	Carcharodon carcharias	-	na	\checkmark	
Fis	Giant Humphead Wrasse	Cheilinus undulatus	-	na		✓
	Giant Grouper	Epinephalus lanceolatus	-	na		~
	Lesser frigatebird	Fregata ariel	na	-		✓
	Polynesian storm-petrel	Nesofregetta albigularis	na	-		\checkmark
	White-tailed tropic bird	Phethon lepturus	na	-		\checkmark
	Blue noddy	Procelsterna cernula	na	-		\checkmark
ds	Fiji petrel	Pseudobulweria macgillivrayi	na	High		\checkmark
bir	Tahiti petrel	Pseudobulweria rostrata	na	Med		✓
ea	Audubon's shearwater	Puffinus inherminieri	na	-		✓
Š	Masked booby	Sula dactylatra	na	-		✓
	Brown booby	Sula leucogaster	na			\checkmark
	Bridled tern	Sterna anaethetus	na			✓
	Crested tern	Sterna bergii	na			✓
	Sooty tern	Sterna fuscata	na			✓

na Not available Source: Seabird PSA, Filippi *et al.*, 2010

Table 9. Productivity

Common name	Product -ivity (Rmax)	Survival average	Threat status	Global population	Recorded bycatch	Vulnerability (theoretical probability of a species being caught per hook)
Fiji Petrel	0.094	93	Critically endangered	25	No	0.000344
Tahiti Petrel	0.094	93	Near threatened	20,000	No	0.000344

Source: Filippi et al, 2010

<u>Fiji petrel</u>: The remaining population is assumed to be tiny (<50 individuals) based on paucity of recent records (although these include eight since 1983). The main threats to this critically endangered bird is predation from feral cats and rats, especially in the breeding area of Gau Island. Feral pigs have recently become established in the forests of Gau and they may represent a serious additional threat (Birdlife International, 2011a). Having a distribution on relatively low-lying islands, this species is potentially susceptible to climate change through sea-level rise and shifts in suitable climatic condition.

<u>Tahiti petrel</u>: This species is classified as Near Threatened because, although it breeds on a relatively large number of islands, it still has a moderately small population which is declining owing to predation by introduced mammals, and, locally at least, mining (Birdlife International, 2011b).

There are no observer interactions with seabirds in Fijian waters. Several Tahiti Petrels and a Kermadec Petrel with damaged wings, perhaps caused by entanglement with long-lines, were observed off Gau in 2009 (Shirihai *et al.*, 2009), but this was not conclusively linked to fishing. In interviewing longline masters Watling (2002) concludes that:

"A local fishing operation, Fiji Fish Group, provided information that between 2003-2002 five vessels from the fleet set a total 2,395,000 hooks without a single incidence of seabird bycatch. Although, in 1992, one longline captain vaguely recalls catching a bird way to the south of Fiji, to his knowledge this is the only seabird bycatch witnessed in 11,700 days of fishing".

Given the very low levels of interaction between this fishery and seabirds, and that this particular fishery tends to be in deep oceanic waters away from nesting areas, it is considered that its effects on these two vulnerable species are highly likely to be within limits of national and international requirements for protection of ETP species. The findings that overall seabird bycatch is not significant in the tropical Pacific tuna longline fishery is also supported by numerous industry sources, government observers, and fisheries consultants (Watling, 2002).

Management

<u>Sea turtles</u>: sea turtles in Fiji are currently protected under the Fisheries Act (CAP 158) - Protection Of Turtles- Amendment, which was extended in 2010 to 2018. These Amendment Regulations prohibit people from in any molesting, taking or killing turtles of any species.

CMM-2008-03 requires that, commencing from 1 January 2010, CCMs with longline vessels that fish in a shallow-set:

1. Employ at least one of the following measures:

- Use only large circle hooks with an offset not exceeding 10 degrees.
- Use only whole finfish for bait.
- Use any other measure, mitigation plan or activity that has been reviewed by the Scientific Committee (SC) and the Technical and Compliance Committee (TCC) and approved by the Commission to be capable of reducing the interaction rate (observed numbers per hooks fished) of turtles in (swordfish) shallow-set longline fisheries.

2. record and report:

- measures applied and results
- all incidents involving sea turtles during fishing operations and report such incidents to the appropriate authorities of the CCM

3. Provide results of the reporting to the Commission as part of the reporting requirements.

CCMs with longline fisheries other than shallow-set swordfish fisheries are urged to:

- Undertake research trials of circle hooks and other mitigation methods in those longline fisheries.
- Report the results of these trials to the SC and TCC, at least 60 days in advance of the annual meetings of these subsidiary bodies.

This is a predominantly deep-set fishery (Fiji Fisheries - which represents around 25% of the UoC catch - sometimes target shallower yellowfin and bigeye over the new moon period). They all use circular hooks and whole sardines for bait, thus further reducing turtle bycatch incidence. The industry has undergone a couple of major awareness-building and training rounds, firstly by the US National Marine Fisheries Service (NMFS) in 2008 and more recently by the Fisheries Department in 2011 (FTBOA, pers. comm., 10 October 2011). This has covered awareness raising of the status of sea turtles and their potential vulnerability to longlines, mitigation approaches as well as release procedures should a turtle be hooked. All vessels have been provided with de-hooking and other tools and trained in their use.

The Fiji Sea Turtle Recovery Plan (Fiji Sea Turtle Steering Committee, 2008) provides a prioritised action plan for addressing sea turtle conservation, including a specific sub-component for 'assessing and mitigating bycatch' (Component 1b).

<u>Sea birds</u>: CMM-2007-04 requires CCMs to implement the International Plan of Action for Reducing Incidental Catches of Seabirds in Longline Fisheries (IPOA-Seabirds) if they have not already done so and report to the Commission on their implementation of the IPOA-Seabirds, including, as appropriate, the status of their National Plans of Action for Reducing Incidental Catches of Seabirds in Longline Fisheries. Fiji does not have an NPOA Seabirds as bycatch rates are so low.

CMM-2007-04 adopts that CCMs shall require their longline vessels to use at least two of the mitigation measures in Table 10, including at least one from Column A in areas south of 30 degrees South and north of 23 degrees North. In other areas, where necessary, CCMs are encouraged to employ one or more of the seabird mitigation measures listed in Table.

Column A	Column B
Side setting with a bird curtain and weighted branch lines	Tori line
Night setting with minimum deck lighting	Weighted branch lines
Tori line	Blue-dyed bait
Weighted branch lines	Deep setting line shooter
	Underwater setting chute
	Management of offal discharge

Table 10. Seabird mitigation measures from CMM-2007-04

As Fijian waters lie between 10°S to 25°S they are outside the Column A zone and thus are encouraged to utilise one or more of these measures. At present all boats in the UoC utilize a deep setting line shooter to assist the gear reach a fishing depth quickly - the very rare incidence of seabird bycatch has meant that other mitigation approached have been considered unnecessary. Most sets are commenced between the hours of 4-5 in the morning before it is light, although may continue into daylight hours.

Information

There is some information on both sea turtle and seabird bycatch from observer programmes, as well as industry discussions. However there is no comprehensive monitoring of either of these groups of animals, mainly because interaction levels are so low and it has never been considered to be necessary. Although observer coverage in the UoC is relatively high (7.6%) compared to that of the Fijian longline fleet as a whole (e.g. 3.2% when including the charter sector), it is not sufficient to quantitatively estimate the outcome status with a high degree of certainty for either species groups nor support a full strategy to manage any impacts. It is the intention of the Fisheries Department to increase observer coverage to 20% (Amoe, 2011) but this is likely to take some time and considerable additional resources to achieve.

7.5 Habitats

This longline fishery is undertaken in deep oceanic waters (at a minimum depth of 1,500 m, even when fishing over sea mount areas) and do not physically impact the seafloor during their operation.

Status

<u>Nature and distribution of habitats, particularly critical habitats:</u> Longhurst's (1998) biogeochemical classification of the World's oceans and seas defines the Western tropical Pacific Ocean as a 'warm pool'. This region is characterized by a primary production regulated by the input of macronutrients (Le Borgne *et al.*, 2002) which has boundaries in continuous motion that can be approximated by the sea surface 29°C isotherm (McPhaden & Picaut, 1990; Lehodey *et al.*, 1997). The marine environment in this region is strongly influenced by the major equatorial current systems, particularly the westward-flowing South Equatorial Current and the eastward-flowing equatorial undercurrent. The equatorial upwelling, a result of the interaction of the equatorial current and easterly trade winds, brings to the surface nutrient-rich water, which provides suitable conditions for high primary and secondary production. These conditions are thought to provide the forage base for the large stocks of tuna that occur throughout the western tropical Pacific.



Key: SEC: South Equatorial Current; NEC: North Equatorial Current; SECC: South Equatorial Counter-Current; NECC: North Equatorial Counter-Current; KUR: Kuroshio Current; EAC: East-Australian Current; HBT: Humboldt Current.

The westward flowing northern branch of the SEC (the SECN) is the strongest current in the south Pacific, and mainly affects the fishing zones north of 7°S from January to June. The westward flowing southern branch of the South Equatorial Current (SECS) is evident to the north of 20°S in each month and appears strongest from May to October. The SECC shares a northern boundary with the SECN

and a southern boundary with the SECS. The SECC is evident to the south of 10° S during November to April.

The subsurface thermal structure indicates that longline catchability may vary from area to area. From 5° to 15° S the 15° C isotherm is within 220m of the surface and the thermocline gradient is strong. At these low latitudes there is less oxygen at a given depth than at southern latitudes, with yellowfin and bigeye catchability greater compared to southern areas, due mainly to a shallower and steeper thermocline and low oxygen concentrations at depth. Subsurface isotherms were ~50-100m shallower after the strong El Niño – Southern oscillation (ENSO) event in 1982. However, recent ENSO or La Niña events did not alter the subsurface thermal structure (or the data were possibly inadequate for the detection of such changes).

The interrelationship between oceanic environment and tuna is summarised in Lehodey et al. (1997).

Effects of gear use on habitat: there is no impact of the gear on the bottom habitat during fishing. There is some gear loss, mainly in the form of lines broken off by large predators (e.g. sharks and pelagic sting rays) as well as gear failure e.g. swivel snaps or lines breaking. One company estimated that around 80 to 120 hooks were lost per fishing trip (10-14 days for a small fresh fish longliner, Russell Dunham, Fiji Fish, pers. comm., 11 Oct. 2011) and another has estimated that they replace 1.8% of their hooks per trip (Tom Mayo, Solander. pers. comm., 13 Oct. 2011). As the bait is lost within 24 hours ghost fishing is unlikely and lost hooks will accumulate in the deep oceanic benthos and will degrade in time.

Management

<u>Gear impacts</u>: given that this gear has no physical impact with the seabed beyond lost gear, no management strategy is required or in place.

<u>Gear loss</u>: any major gear losses will be managed through gear recovery efforts. Given that the buoys are well marked and can be tracked though GPS recordings, recovery rates are high. While mainline break offs are common, say once every few days, the occurrence of major gear loss is very seldom due to the following reasons.

- 1. All buoys have reflector tape and all vessels are equipped with powerful searchlights which can make searching at night just as easy as searching in daylight.
- 2. The use of strobe lights (that have light sensors that are activated by dimming light to prolong battery power), these are placed every tenth buoy and can be seen from a significant distance at night.
- 3. There is line of sight from one buoy to the next both night and day when connected to the mainline.
- 4. Use of 3 4 radio beacons, 1 at each end and 1 in the middle. These can be tracked by the vessel up to 40 miles away.
- 5. General knowledge by the captain of tides and other factors influencing the direction of drift.

As stated by one company director, "To give some perspective, the last time one of our vessels had major gear loss was about 3-4 years ago and another fishing vessel found it a week later" (Brett Hayward, Director Sea Quest Vessel Leasing Limited, pers. comm., 27th October 2011).

Information

The availability of information (to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types) is considered at two levels:

- 1. Pelagic environment in the 'warm pool' Western tropical Pacific Ocean
- 2. Gear loss

<u>Pelagic environment in the 'warm pool' Western tropical Pacific Ocean</u>: The physical, chemical and biological properties of the WCPO are regularly monitored through oceanographic buoys and by satellite remote sensing. Variables such as sea-surface temperature (SST), sea-surface height (SSH), surface wind stress and ocean currents are important physical oceanographic properties; their large-scale distribution may be measured by satellite remote sensing or derived from numerical ocean models. It is possible to derive chlorophyll concentration, a measure of phytoplankton abundance, using satellite-based ocean colour sensors. Phytoplankton is a good indicator of environmental variability, integrating vertical and horizontal forcing (i.e. upwelling and advection) and can be used to delineate water masses and features where SST gradients are small.

The physical habitats of the Pacific Ocean, especially the more vulnerable components e.g. sea mounts, coral reefs and coastal areas, are well studies throughout the Pacific. However they are not relevant to the pelagic ecosystems in which the fisheries under assessment operate.

The FTBOA vessels all operate under a VMS scheme and thus there is accurate, near real-time monitoring of the spatial extent of interaction, and the timing and location of use of the fishing gear. There is regular qualitative and quantitative monitoring of key species composition in the Pacific Ocean. Much of this is available from fisheries-dependent information (logbook information on catches, landings and observer information), as well as regular scientific investigations into the biodiversity and relative abundance of pelagic habitat constituents (e.g. at planktonic and higher life form levels.

<u>Gear loss</u>: gear loss is easily estimated through the purchases of new gear to replace losses. The impact of these lost hooks on the deep oceanic benthic environment is likely to be minimal and short-term in nature.

7.6 Ecosystem impacts

Status

The ecosystem impacts of this fishery are limited to two issues:

(i) the removal of high level predators (e.g. the retained tuna species, albacore and yellowfin and to a lesser extent, bigeye tuna) on the underlying ecosystem and (ii) the potential impact of climate change on tuna populations in the Pacific Ocean. Both issues are examined below:

Removal of large volumes of skipjack tuna: fisheries have removed at least 50 million tons of tuna and other top-level predators from the Pacific Ocean pelagic ecosystem since 1950, leading to concerns about a catastrophic reduction in population biomass and the collapse of oceanic food chains. Sibert *et al.* (2006) analysed available data⁹ from Pacific tuna fisheries for 1950–2004 to provide comprehensive estimates of fishery impacts on population biomass and size structure. Exploited western Pacific yellowfin and bigeye have declined steadily to levels near the equilibrium biomass that would produce the MSY in the fishery. Skipjack tuna and blue shark appear to have increased slightly, whereas albacore have fluctuated in both directions.

Figure 14. Trends in total biomass for eight stocks of large predators in the Pacific Ocean

Blue lines indicate the biomass estimated from the observed fishing history (the exploited population), and red lines indicate the biomass estimated in the absence of all fishing (the unexploited population). The single black dash indicates the equilibrium biomass corresponding to MSY conditions, assuming current levels of recruitment and distribution of fishing mortality among fisheries. WCPO, western central Pacific Ocean; EPO, eastern Pacific Ocean.



⁹ **Sibert** *et al* used stock assessment methods to provide estimates of fishery impacts on population biomass, size structure, and trophic status of major top-level predator stocks in the Pacific Ocean: bigeye tuna, yellowfin tuna, skipjack tuna, albacore tuna, and blue shark

At that point, current biomass ranges among species from 36 to 91% of the biomass predicted in the absence of fishing, a level consistent with or higher than standard fisheries management targets. Fish larger than 175 cm FL had decreased from 5% to approximately 1% of the total population. The trophic level of the catch had decreased slightly, but the authors concluded that there was no detectable decrease in the trophic level of the population. These results indicated substantial, though not irreversible, impacts of fisheries on these top-level predators and minor impacts on the ecosystem in the Pacific Ocean.

While the current level of the UoC may not have impacted on albacore to an extent to which there are likely to be irreversible ecosystem impacts, it should be noted that the current management system aims to reduce albacore to the biomass that will achieve the estimated MSY. Although the current assessment suggests that MSY-based indicators used by WCPFC would lead to a reduction of SSB to 0.26 SSB zero (and B to 0.53 B zero), without formal reference points and harvest strategies it is not clear what management measures might be introduced before the stock is reduced to these levels. The condition set in this report requires the development of formal reference points that may not be MSY-based and may require higher levels of biomass. It is recommended that this situation is reviewed on a periodic basis.

Allain (2010) studied the upper part of the trophic structure of four distinct regions of WCPO. In the South Pacific Subtropical Gyre (SPSG) system, where Fiji belongs, epipelagic prey species are relatively less important and the bathypelagic highly migrant prey are predominant. The vertical structure for SPSG is different compared to the other regions, having a very deep thermocline and a low thermal gradient. These conditions allow an easier access to the deep prey including molluscs. The results of these studies may indicate a potentially more extensive rather than intensive impact when removing top predators from SPSG system, involving a higher diversity of prey species and deeper oceanic layers. In consequence, the fishery is less likely to create a trophic cascade as defined in FAM para 7.6.3 a), with significant increase in abundance of one or few species and decreased diversity.

Climate change: International Panel on Climate Change's (IPCC) recent 4th assessment concluded that the "Impacts of large-scale and persistent changesare likely to include changes in marine ecosystem productivity, fisheries, ocean CO_2 uptake, oceanic oxygen concentrations and terrestrial vegetation. Changes in terrestrial and ocean CO_2 uptake may feedback on the climate system" (IPCC, 2007).

Management

The two issues described above are addressed through the following management approaches:

Removal of large volumes of bigeye and yellowfin tuna: there are comprehensive limits on effort targeting major the tuna species through CMM-2008-01 and in terms of the purse seine fishery, the VDS (Vessel Day Scheme) as well as measures such as the FAD closure intended to reduce the catch of juveniles of the retained species. CMM-2008-01 also covers bigeye and yellowfin tuna caught in longline fishing gear, requiring that bigeye tuna be subject to a phased reduction such that by 1 January 2012 the longline catch of bigeye tuna is 70% of the average annual catch in 2001-2004. The catch of yellowfin tuna is not to be increased in the longline fishery from the 2001-2004 levels.

Management of the target species, albacore, is considered under Principle 1.

Climate change: Significant movement of fish stocks due to climate change will alter the location of fishing grounds. For example, the fishery could now spend several months of the year inside the Fiji EEZ, but this could increase (or decrease) as fish move in to the High Seas. This movement has implications for access for fishing vessels and may change the current dependency on the EEZ. The current fishery governance system is able to adapt to this by monitoring and reacting to variations in annual catches, or location of fish schools.

In addition, there are a number of elements in the WCPFC Convention that provide the basis for strategy leading towards ecosystem-based management. These include:

In Art. 5 (Principles and Measures), Commission Members have agreed to:

Apply the precautionary approach in accordance with this Convention and all relevant internationally agreed standards and recommended practices and procedures;

(d) assess the impacts of fishing, other human activities and environmental factors on target stocks, non-target species, and species belonging to the same ecosystem or dependent upon or associated with the target stocks;

(e) adopt measures to minimize waste, discards, catch by lost or abandoned gear, pollution originating from fishing vessels, catch of non-target species, both fish and non-fish species, (hereinafter referred to as non-target species) and impacts on associated or dependent species, in particular endangered species and promote the development and use of selective, environmentally safe and cost-effective fishing gear and techniques;

(f) protect biodiversity in the marine environment.

In Art. 6 (Precautionary Approach), Commission Members have agreed that the Commission will:

(b) take into account, <u>inter alia</u>, uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distributions of fishing mortality and the impact of fishing activities on non-target and associated or dependent species, as well as existing and predicted oceanic, environmental and socio-economic conditions; and

(c) develop data collection and research programmes to assess the impact of fishing on nontarget and associated or dependent species and their environment, and adopt plans where necessary to ensure the conservation of such species and to protect habitats of special concern.

In Art. 10 (Functions of the Commission), Commission members have agreed that the Commission will:

"adopt, where necessary, conservation and management measures and recommendations for non-target species and species dependent on or associated with the target stocks, with a view to maintaining or restoring populations of such species above levels at which their reproduction may become seriously threatened;"

And in Art. 12 (Functions of the Scientific Committee), Commission members have agreed that the SC will:

(c) encourage and promote cooperation in scientific research, taking into account the provisions of article 246 of the 1982 Convention, in order to improve information on highly migratory fish stocks, non-target species, and species belonging to the same ecosystem or associated with or dependent upon such stocks in the Convention Area;

(d) review the results of research and analyses of target stocks or non-target or associated or dependent species in the Convention Area;

(e) report to the Commission its findings or conclusions on the status of target stocks or nontarget or associated or dependent species in the Convention Area;

(f) in consultation with the Technical and Compliance Committee, recommend to the Commission the priorities and objectives of the regional observer programme and assess the results of that programme;

(g) make reports and recommendations to the Commission as directed, or on its own initiative, on matters concerning the conservation and management of and research on target stocks or non-target or associated or dependent species in the Convention Area;

Information

Removal of large volumes of albacore tuna: SPC is currently conducting stomach content sampling to build predator-prey relationships (Trophic Diet Matrix, TDM) and, with Shane Griffiths (CSIRO) and are putting together a more developed EcoPath model (building on the 2007 preliminary EcoPath

model). As well as the TDM, there has been the incorporation of catch and discard information and this model is now being validated. The move into EcoSim provides a non-static approach (EcoPath is mainly 2005 data) to add 2005 to 2007 data series and allow cross-checking against actual catches. The model includes 5-6 fisheries, including the longline fisheries (all flags).

SEAPODYM is a model developed initially for investigating spatial tuna population dynamics under the influence of both fishing and environmental effects. The model is based on advection-diffusionreaction equations. The main features of this model are: (i) forcing by environmental data (temperature, currents, primary production and dissolved oxygen concentration), (ii) prediction of both temporal and spatial distribution of mid-trophic (micronektonic tuna forage) functional groups, (iii) prediction of both temporal and spatial distribution of age-structured predator (tuna) populations, (iv) prediction of total catch and size frequency of catch by fleet when fishing data (catch and effort) are available, and (v) parameter optimization based on fishing data assimilation techniques (see Senina et al 2008). A recent enhanced version (Lehodey et al., 2008) has been developed that includes a better definition of habitat indices, movements, and accessibility of tuna and tuna-like predators to different vertically migrant and non-migrant micronekton functional groups (Lehodey et al., 2009). Lehodey et al (2010) have more recently reviewed the progress of SEAPODYM applications in the WCPO. They ran a new series of optimization experiments with the initial conditions forced to be at the same level of biomass estimated by MULTIFAN-CL, where the results of both models were very close both considering the range of biomass and its temporal trend. They then produced a new environmental forcing data set using the physical fields of temperature and currents provided by the SODA (Simple Ocean Data Assimilation) reanalysis (Carton et al., 2000) and primary production derived from satellite data. This model converged with a good fit for fishing data, and the biomass estimates with SEAPODYM and this new configuration were in the same range than biomass estimates from MULTIFAN-CL.

There is increasing effort by a range of organizations to collect detailed data on the structure of the Pacific Ocean pelagic ecosystem. This effort occurs through observer programmes (e.g. bycatch composition and quantities), trophic analyses (e.g. stomach contents, stable isotopes), and mid-trophic level sampling (e.g. acoustics and net sampling of micronekton and zooplankton). Despite the highly valuable information they provide on the knowledge of the ecosystem structure and functioning, the collection of observer data is still relatively recent, with low coverage. Moreover, trophic analyses and mid-trophic level sampling are conducted on a project-by-project basis and are not continuous in space and time, thus limiting their use for long-term monitoring and EAFM (Allain *et al.*, 2011).

Climate change: modelling of sea temperature rise, its pattern within natural cyclical variability and the impact on the recruitment, growth and distribution of tunas has received increasing attention and is one of the main applications of SEAPODYM (see above). Results of SEAPODYM simulations allow realistic prediction of the large-scale distribution of tuna species (Lehodey, 2001; Lehodey *et al* 2008).

A NOAA-funded project (Climate and Fishing Impacts on the Spatial Population Dynamics of Tunas (Project no. 657425) is running two spatial bio-physical models for several tuna species concurrently with different long-term (up to 50 years) climate regime datasets (Weng *et al.*, 2009). It is anticipated that the models will enable researchers to evaluate potential alternative system states due to physical and anthropogenic forcing and to help determine if the impacts of natural climate variability could be anticipated in such a way as to help establish a management regime that accommodates exploitation pressures and natural variability to build sustainable tuna fisheries.
8 OTHER FISHERIES AFFECTING TARGET STOCK

Other fisheries interacting with the target species include albacore caught outside the Fiji EEZ. The South Pacific Albacore stock is distributed from the coast of Australia and archipelagic waters of Papua New Guinea eastwards to the coast of South America, south of the equator to at least 49°S. Most catches occur in longline fisheries in the EEZs of other South Pacific states and territories and in high seas area throughout the geographical range of the stock.

All South Pacific albacore fisheries are identified and monitored and include longline fisheries conducted by China, Japan, USA, Korea, Fiji, French Polynesia, Western Samoa, Vanuatu and new Zealand. Information regarding the annual landing weights of albacore from these fisheries is available from WCPFC and these data are used within the South Pacific albacore stock assessments. Total South Pacific albacore catches have fluctuated between 25 and 65,000 t since 1960. The average catch between 1990 and 2005 was about 44,000 t

Charter albacore longline boats operate from Fiji but as they fish in the distant waters they are not currently eligible for this UoC. At this stage, it is only the Fiji Tuna Boat Owners Association of New Zealand who would be eligible to join this UoC, as the assessment is for the Fiji EEZ only.

South Pacific albacore have also been the subject of MSC assessment for other fisheries – the American Albacore Fishing Association (AAFA) South Pacific albacore pole and line and jig/troll fishery, certified in August 2007; and the New Zealand albacore tuna troll fishery certified in 2010.

The AAFA fishery applied a different scoring table and MSC Fisheries Assessment Methodology to that used for the Fiji albacore longline fishery. The same methodology (FAM v2) was used for the Fiji albacore longline fishery and the New Zealand albacore troll fishery. As far as possible, this assessment was harmonised with both the AAFA fishery and the New Zealand fishery.

The New Zealand albacore assessment report identified the following differences between its assessment and that of the AAFA fishery:

"Under PI 1.1.2 and the old PI 1.1.3.1, the target reference point was defined at B_{MSY}, which was considered acceptable by the AAFA assessment team. This appears to have been estimated at around 20% B₀, which under the new scoring guidance would be considered low, but this was not considered to be so by the assessment team. No specific limit reference point was identified but this was not required under the older FAM. Under FAM v2 used for this assessment, a limit reference point is required for certification, and therefore a condition has been placed on the fishery.

In the older scoring table, decision rules were spread across a number of performance indicators (PI 1.1.3.6-8). In general, it was found that decision rules were not clear or fully documented and measures to limit exploitation were not fully tested or were incomplete. This led to a condition on harvest control rules, similar but less demanding than the one imposed on the New Zealand fishery. Meeting the Condition 2 on this fishery should also meet the requirements for Condition 1 on the AAFA fishery."

Conditions were set for both the New Zealand troll fishery and the Fiji longline fishery for performance indicators a) PI 1.1.2 and b) PI 1.2.2. The scoring against these PIs were the same for both fisheries.

A condition was set for the New Zealand albacore fishery for PI 3.2.1 (score 70) whereas there was no condition for the Fiji albacore fishery (score 80) for this issue. The difference was due to the lack of explicit objectives for the New Zealand fishery.

A condition was set for the Fiji fishery for PI 3.2.3 (score 70) whereas there was no condition for the New Zealand albacore fishery (score 90). The difference relates to differences in the implementation of sanctions for non-compliance between the two jurisdictions.

Several conditions have been set for P2 for the Fiji albacore fishery (PI 2.1.1, PI 2.1.2, PI 2.1.3 and PI 2.3.3). The differences in the scoring for these PIs result largely from the different fishing methods of the two fisheries.

The assessment team suggest that the scoring for the Fiji albacore fishery, the New Zealand troll fishery and the AAFA pole and line and jig/troll fishery are harmonised where relevant.

9 STANDARD USED

The MSC Principles and Criteria for Sustainable Fisheries form the standard against which the fishery is assessed and are organised in terms of three principles. Principle 1 addresses the need to maintain the target stock at a sustainable level; Principle 2 addresses the need to maintain the ecosystem in which the target stock exists, and Principle 3 addresses the need for an effective fishery management system to fulfil Principles 1 and 2 and ensure compliance with national and international regulations. The Principles and their supporting Criteria are presented below.

9.1 Principle 1

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.¹⁰:

The intent of this principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favour of short term interests. Thus, exploited populations would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

Criteria:

- 1. The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.
- 2. Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within a specified time frame.
- 3. Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.

9.2 Principle 2

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

The intent of this principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

Criteria:

- 1. The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.
- 2. The fishery is conducted in a manner that does not threaten biological diversity at the genetic, species or population levels and avoids or minimises mortality of, or injuries to endangered, threatened or protected species.
- 3. Where exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level within specified time frames, consistent with the precautionary approach and considering the ability of the population to produce long-term potential yields.

¹⁰ The sequence in which the Principles and Criteria appear does not represent a ranking of their significance, but is rather intended to provide a logical guide to certifiers when assessing a fishery. The criteria by which the MSC Principles will be implemented will be reviewed and revised as appropriate in light of relevant new information, technologies and additional consultations

9.3 Principle 3

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery.

A. Management System Criteria:

1. The fishery shall not be conducted under a controversial unilateral exemption to an international agreement.

The management system shall:

- 2. Demonstrate clear long-term objectives consistent with MSC Principles and Criteria and contain a consultative process that is transparent and involves all interested and affected parties so as to consider all relevant information, including local knowledge. The impact of fishery management decisions on all those who depend on the fishery for their livelihoods, including, but not confined to subsistence, artisanal, and fishing-dependent communities shall be addressed as part of this process.
- 3. Be appropriate to the cultural context, scale and intensity of the fishery reflecting specific objectives, incorporating operational criteria, containing procedures for implementation and a process for monitoring and evaluating performance and acting on findings.
- 4. Observe the legal and customary rights and long term interests of people dependent on fishing for food and livelihood, in a manner consistent with ecological sustainability.
- 5. Incorporates an appropriate mechanism for the resolution of disputes arising within the system¹¹.
- 6. Provide economic and social incentives that contribute to sustainable fishing and shall not operate with subsidies that contribute to unsustainable fishing.
- 7. Act in a timely and adaptive fashion on the basis of the best available information using a precautionary approach particularly when dealing with scientific uncertainty.
- 8. Incorporate a research plan appropriate to the scale and intensity of the fishery that addresses the information needs of management and provides for the dissemination of research results to all interested parties in a timely fashion.
- 9. Require that assessments of the biological status of the resource and impacts of the fishery have been and are periodically conducted.
- 10. Specify measures and strategies that demonstrably control the degree of exploitation of the resource, including, but not limited to:
 - a) setting catch levels that will maintain the target population and ecological community's high productivity relative to its potential productivity, and account for the non-target species (or size, age, sex) captured and landed in association with, or as a consequence of, fishing for target species;
 - b) identifying appropriate fishing methods that minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas;
 - c) providing for the recovery and rebuilding of depleted fish populations to specified levels within specified time frames;
 - d) mechanisms in place to limit or close fisheries when designated catch limits are reached;
 - e) establishing no-take zones where appropriate.
- 11. Contains appropriate procedures for effective compliance, monitoring, control, surveillance and enforcement which ensure that established limits to exploitation are not exceeded and specifies corrective actions to be taken in the event that they are.

 $^{^{11}}$ Outstanding disputes of substantial magnitude involving a significant number of interests will normally disqualify a fishery from certification.

B. Operational Criteria

Fishing operation shall:

- 12. Make use of fishing gear and practices designed to avoid the capture of non-target species (and non-target size, age, and/or sex of the target species); minimise mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive.
- 13. Implement appropriate fishing methods designed to minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas.
- 14. Not use destructive fishing practices such as fishing with poisons or explosives;
- 15. Minimise operational waste such as lost fishing gear, oil spills, on-board spoilage of catch etc.
- 16. Be conducted in compliance with the fishery management system and all legal and administrative requirements.
- 17. Assist and co-operate with management authorities in the collection of catch, discard, and other information of importance to effective management of the resources and the fishery.

10 BACKGROUND TO THE EVALUATION

10.1 Evaluation Team

Project Coordinator: Paul Knapman

Paul is the General Manager for Intertek Moody Marine. He has extensive experience of the fishing industry in North America and Europe. He was previously head of an inshore fisheries management organisation, a senior policy advisor to the UK government on fisheries and environmental issues, a fisheries officer and a fisheries consultant working in Europe and Canada.

Lead Assessor and Principle 3 Advisor: Jo Akroyd

Jo Akroyd is Director and Principal Consultant of Jo Akroyd Ltd, an International consultancy company specialising in marine fisheries policy and marine ecosystem and community based management. She has also provided services in quality system implementation and training in project management and negotiation skills. Prior to a career in consultancy, she was manager of International Projects at the Auckland University of Technology and Director of Quality and Strategic Management and Assistant Director of Marine Research at the Ministry of Agriculture & Fisheries, Wellington, New Zealand. Her specific experience relating to MSC assessments includes acting as Lead auditor and team member on the assessment of the Tosakatsuo Suisan Skipjack tuna Japan, the NZ albacore troll, Hokkaido scallops Japan, NZ southern scallop and providing specialist inputs on Principle 3 (Fisheries management), the NZ hoki fishery the Ross Sea Toothfish fishery and NZ EEZ fisheries

Expert Advisor: Principle 1 Kevin McLoughlin

Kevin McLoughlin is a specialist fisheries consultant who previously worked with the Australian Bureau of Rural Sciences as a Senior Fisheries Scientist engaged in a wide range of international and domestic fisheries issues, with close links to Government policy. Responsibilities included production of BRS Fishery Status Reports which have had a major influence on the direction of Australia's fisheries management and policy. Responsibilities required a high level of interaction with policy and industry clients, and with international organizations.

He represented BRS on many committees and groups such as the Australian Fisheries Management Authority's fishery assessment groups (including southern shark, scallop, northern prawn, western tuna), the Australian Shark Implementation Group for the National Plan of Action for Sharks and others. From 2005 to 2008 he was Chair of the Department of Environment and Heritage National Shark Recovery Group. Mr McLoughlin represented Australia on scientific issues at the Indian Ocean Tuna Commission and as Chair of their Working Party on Bycatch, and led Australia's delegation to 2006 scientific meetings of the Commission for the Conservation of Southern Bluefin Tuna

Expert advisor: Principle 2: Tim Huntington

Tim Huntington is an experienced fisheries assessor, having lead on seven fisheries assessments and participated in a number of others, mainly specializing in Principle 2 (ecosystem impacts). He has also conducted a number of pre-assessments and chain of custody assessments and also developed the MSC group chain of custody on behalf of MSC's Technical Advisory Board.

Relevant MSC experience include conducting a pre-assessment for tuna fisheries in the Western Central Pacific for FFA and he is currently lead assessor and P2 specialist on the Maldives pole and line tuna assessment. Tim also works outside of MSC, specializing in sustainability issues in fisheries and aquaculture for a wide range of clients including the EC (DG Mare and DG Env), World Bank, FAO, WorldFish Centre, GEF, Danida, as well as ENGOs such as WWF, RSPB and the UK Wildlife Trusts. Tim's experience of tuna fisheries stems from the environmental impact assessment work he did in conducting evaluations of the impacts of EU purse seine and long-line fishing fleets in Mauritius and Tanzania. More recently Tim was part of a two-person team evaluating the regional Indian Ocean tuna tagging programme and its contribution to the assessment of Indian Ocean tuna stocks. Tim has a Master's degree in Applied Fish Biology and is a Director of Poseidon Aquatic Resource Management and is based in the UK.

10.2 Previous certification evaluations

The fishery has not been previously assessed against the MSC standard.

10.3 Inspections of the Fishery

Inspection of the fishery focused on the practicalities of fishing operations, the mechanisms and effectiveness of management agencies and the scientific assessment of the fisheries.

Meetings were held as follows. Some of the key issues discussed have been identified for each meeting.

Name	Affiliation	Date	Key Issues
Ministry of	Government	October	Governance and Fisheries
Fisheries and Forest		2011	management, Consultation and
			decision making
WWF + Observers	NGO	October	See WWF submission. P1, P2 and
		2011	P3 issues
Domestic Fisheries	Local Industry fishing Fiji	October	Fisheries management and
Sector	EEZ.	2011	compliance issues; Consultation
			and decision making
FFA	Management support	October	Fisheries Management and support
	organization	2011	role provided by FFA and Observer
			coordination
SPC	Research organization	October	Stock Assessment, Bycatch and
		2011	ecosystems
Charter Boat	Fishing industry fishing	October	MSC certification process and
Operators	high seas	2011	eligibility

11 STAKEHOLDER CONSULTATION

11.1 Stakeholder Consultation

A total of 16 stakeholder groups were identified. These groups were provided with information throughout the assessment process. Information was also made publicly available at the following stages of the assessment:

Date	Purpose	Media
2 June 2011	Announcement of assessment	Direct E-mail/letter
		Notification on MSC website
		Advertisement in press
23 June 2011	Notification of Assessment Team	Direct E-mail
	nominees	Notification on MSC website
26 Aug 2011	Notification of intent to use MSC	Direct E-mail
	FAM Standard Assessment Tree	Notification on MSC website
8 Sept 2011	Notification of assessment visit and	Direct E-mail
	call for meeting requests	Notification on MSC website
9 – 15 Oct 2011	Assessment visit	Meetings
9 Feb 2012 and	Notification of Proposed Peer	Direct E-mail
3 April 2012	Reviewers	Notification on MSC website
28 June 2012	Notification of Public Draft Report	Direct E-mail
		Notification on MSC website
TBC	Notification of Final Report	Direct E-mail
		Notification on MSC website

11.2 Stakeholder Issues

Two formal submissions received by World Wildlife Fund and International Seafood Sustainability Foundation. These are presented in Appendix D.

12 OBSERVATIONS AND SCORING

12.1 Introduction to scoring methodology

The MSC Principles and Criteria set out the requirements of certified fishery. These Principles and Criteria have been developed into a standard (Fishery Assessment Methodology) assessment tree - Performance Indicators and Scoring Guideposts - by the MSC, which is used in this assessment.

The Performance Indicators (PIs) have been released on the MSC website. In order to make the assessment process as clear and transparent as possible, each PI has three associated Scoring Guideposts (SGs) which identify the level of performance necessary to achieve 100, 80 (a pass score), and 60 scores for each Performance Indicator; 100 represents a theoretically ideal level of performance and 60 a measurable shortfall.

For each PI, the performance of the fishery is assessed and given a 'score'. In order for the fishery to achieve certification, an overall weighted average score of 80 is necessary for each of the three Principles and no Indicator should score less than 60. As it is not considered possible to allocate precise scores, a scoring interval of five is used in evaluations. Average scores for each Principle are rounded to one decimal place.

Weights and scores for the Fishery are presented in the scoring table (Appendix A).

13 LIMIT OF IDENTIFICATION OF LANDINGS FROM THE FISHERY

Traceability of product from the sea to the consumer is vital to ensure that the MSC standard is maintained. There are several aspects to traceability that the MSC require to be evaluated: Traceability within the fishery; at-sea processing; at the point of landing; and subsequently the eligibility of product to enter the chain of custody. These requirements are assessed here.

13.1 Traceability within the fishery

The combination of logbooks, observer reports and practise provide a series of independent and verifiable mass-balance measures that would enable transgressions to be detected. Verifiable on board storage is based on logbook reporting and associated detailed unloading records on species numbers and weights, as well as landing declarations at the point of landing, requires that all transactions at the first point of discharge are fully recorded, allowing immediate traceability between the fishery and the first point of the chain of custody whilst the logbook provides a record of the time, location and nature (species and volumes) of the catch. All the client vessel catch is unloaded in the Port of Suva where all members of the client group are based.

13.2 At-sea processing

The fleet comprises both non-refrigerated smaller vessels using ice to keep the catch fresh and larger refrigerated vessels that use recirculating chilled seawater for fish chilling. All retained species are gilled and gutted on landing and trunks are then stored either in ice or recirculating chilled seawater.

13.3 Points of landing

The client fleet uses two points of landing with the Fiji Fish vessels unloading at their fisheries terminal in Lami on the outskirts of town and the other client vessels all unloading at the designated commercial fisheries wharf at Walu Bay in Suva.

13.4 Eligibility to enter chains of custody

The scope of this certification ends at the points of landing which are listed above. Downstream certification of the product would require appropriate certification of storage and handling facilities at these locations.

13.5 Target Eligibility date

The target eligibility date is 1st October 2012

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ASSESSMENT RESULTS

The Performance of the Fishery in relation to MSC Principles 1, 2 and 3 is summarised below:

MSC Principle	Fishery Performance
Principle 1: Sustainability of Exploited Stock	Overall : 81.9
Principle 2: Maintenance of Ecosystem	Overall: 85.0
Principle 3: Effective Management System	Overall: 86.4

The fishery attained a score of 80 or more against each of the MSC Principles and did not score less than 60 against any Indicators. It is therefore recommended that the Fiji Albacore Longline Fishery be certified according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries.

14.1 Conditions

As a standard requirement of the MSC certification methodology, the fishery shall be subject to (as a minimum) annual surveillance audits. These audits shall be publicised and reports made publicly available.

The fishery attained a score of below 80 against seven Performance Indicators. The assessment team has therefore set conditions for continuing certification that the client for certification is required to address. The conditions are applied to improve performance to at least the 80 level within a period set by the certification body but no longer than the term of the certification.

As a standard condition of certification, the client shall develop an 'Action Plan' for Meeting the Conditions for Continued Certification', to be approved by the assessment team.

The Conditions, associated timescales and relevant Scoring Indicator are set out below.

Outcome	
PI	1.1.2
SG60	• Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.
SG80	 Reference points are appropriate for the stock and can be estimated. The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity. The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome. For low trophic level species, the target reference point takes into account the ecological role of the stock.
SG100	 Reference points are appropriate for the stock and can be estimated. The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of relevant precautionary issues The target reference point is such that the stock is maintained at a level

Condition 1: Reference Points, Management Outcomes: PI 1.1.2

	consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
Scoring	Overall score: 75
Rationale	Target and limit reference points need to be formally agreed by management, consistent with the management objectives and scientific stock assessment Although management advice is given in relation to MSY-based reference points, there are no explicit limit or target points or regions defined. Explicit target and limit reference points (or regions) need to be defined meeting the MSC Principles and Criteria. In particular, a limit reference point is required which is set above the level at which there is an appreciable risk of impairing reproductive capacity.
Condition	Condition 1: Target and limit reference points need to be formally agreed by management, consistent with the management objectives and scientific stock assessment.
	 Timescale: Within four years of certification WCPFC must be in a position to demonstrate that the SG80 requirements have been met: Reference points are appropriate for the stock and can be estimated. The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity. The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome. For low trophic level species, the target reference point takes into account the ecological role of the stock. It is appropriate that stock-wide reference points be derived for albacore tuna through WCPFC processes. Some progress has been made though the WCPFC SC meetings with the presentation of working papers on potential reference points for the major tuna stocks. In particular, SC7 made specific recommendations to WCPFC in relation to the adoption of limit reference points and additional recommendations on future needs for the implementation of reference points. The client should encourage WCPFC, through the Fiji Fisheries delegation, to promote further work in the area to lead towards the development and adoption of reference points for the stock. Milestones in achieving this end require that the client provide evidence of : Year 1. Adoption of SC recommended limit reference points and evaluation by WCPFC SC. Recommendations on target reference points by SC to WCPFC. Year 3. Adoption of SC recommended target reference points by WCPFC.
Client action plan	FTBOA note the urgency of implementing stock-specific reference points and associated harvest control rules given recent increases in overall regional albacore catch levels. To support the development of appropriate reference points for the

	South Pacific albacore stock, therefore, in the respective years the client will provide
	evidence of:
	YEAR 1
	1. Engagement with the Fiji government to promote the completion and adoption of the Fiji Tuna Fishery Management Plan.
	2. Consultation with the Fiji Ministry of Fisheries and Forestry and where necessary FFA and FFA members through the Sub-Committee on South Pacific Tuna and Billfish Fisheries (SC-SPTBF) and Fiji delegates to WCPFC with the objective of establishing an agreed position on limit reference points for the stock that is consistent with the MSC SG 80 standards.
	3. The provision of any requested practical support for SPC, FFA and WCPFC analyses on limit and target reference points for albacore to support discussions at FFA SC-SPTBF meetings.
	4. Actions to raise awareness of the need for a WCPFC albacore management measure through the Pacific Island Tuna Industry Association (PITIA)
	YEAR 2
	1. The provision of any requested support for SPC, FFA and WCPFC analyses on target reference points for albacore to support any further discussions at the FFA SC-SPTBF meetings and the WCPFC Scientific Committee.
	2. Engagement with Fiji government officials, and where necessary FFA and its members, and WCPFC delegates from the other major countries fishing the stock in advance of the Commission meeting to seek their support for the adoption of appropriate target reference points by the WCPFC and appropriately drafted WCPFC Resolutions.
	3. Collaboration with other industry sectors and NGOs in order to continue to raise awareness of the need for WCPFC to adopt appropriate reference points for the South Pacific albacore stock
	4. Actions to raise awareness of the need for a WCPFC albacore management measure through the Pacific Island Tuna Industry Association (PITIA)
	VFAR 3
	1. Engagement with high-level Fiji government officials, and where necessary FFA and its members, and WCPFC delegates from the other major countries fishing the stock in advance of the Commission meeting to ensure appropriately drafted WCPFC Resolutions on the adoption of target reference points for the stock, for the WCPFC annual meeting, for consideration by the Commission.
Consultation on condition	The following organisations have committed to assist the fishery in undertaking the actions specified in the action plan: Fiji Ministry of Fisheries and Forestry, SPC, FFA

Condition 2: Harvest Control Rules and Tools, Harvest Strategy: PI 1.2.2

Outcome	
PI	1.2.2
SG60	 Generally understood harvest control rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached. There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.
SG80	• Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.

	• The selection of the harvest control rules takes into account the main uncertainties.
	• Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules
SG100	 Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. The design of the harvest control rules take into account a wide range of uncertainties. Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
Scoring	Overall score: 60
Rationale	Well-defined harvest control rules need to be proposed, tested and adopted. These control rules need to be consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. Although this is implied within the harvest strategy, it is not clear how, in practice, the fishery will achieve the target point (or region) within which management wishes to maintain the stock or that rebuilding will be achieved if needed with the current tools.
Condition	Condition 2: Well-defined harvest control rules need to be proposed, tested and established through WCPFC working groups, committees and the Commission.
	 Timescale: Within four years of certification WCPFC must be in position to demonstrate that the SG80 requirements have been met: Well defined harvest control rules shall be in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. The selection of the harvest control rules shall take into account the main uncertainties. Evidence shall be available that indicates that tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.
	The harvest control rules need to be formulated in conjunction with the agreed reference points for the stock. The WCPFC has already adopted a measure to limit expansion of the fishery and maintain the stock above the BMSY level, thereby, the default target biomass level. This measure satisfies some of the requirements of a harvest control rule as it reduces the risk of the stock declining below the target level and hence the lower limit reference point. However, there are no explicit management actions proposed (let alone adopted) for the fishery if the stock biomass limit reference point.
	Any harvest control rules would need to be applied to the entire stock and, therefore, need to be formulated by WCPFC. The client should encourage WCPFC, through the Fiji Fisheries delegation, to promote further work in formulating appropriate HCRs for the stock. Fiji Fisheries will need to appropriately implement adopted HCRs.
	Milestones in achieving this end require that the client provide evidence of:
	Year 1. Plans for the development and adoption of appropriate HCRs for albacore

		tuna should be in place by the first surveillance audit. Lobbying of WCPFC (if required) should also begin by the first surveillance audit.
		Year 2. Testing and demonstration of potential HCRs should be initiated by the second surveillance audit. This should be undertaken with consideration of any deliberations on appropriate reference points. It may require additional analyses this should be included within the work plan of the WCPFC.
		Year 3. HCRs should be in place by the third annual surveillance audit and an ongoing research plan is established to ensure the effectiveness of these HCRs.
Client plan	action	FTBOA note the urgency of implementing stock-specific reference points and associated harvest control rules given recent increases in overall regional albacore catch levels. To support the development of appropriate harvest control rules for the South Pacific albacore stock, therefore, in the respective years the client will provide evidence of:
		YEAR 1
		1. Engagement with the Fiji government to promote the completion and adoption of the Fiji Tuna Fishery Management Plan.
		2. Consultation with the Fiji Ministry of Fisheries and Forestry, and where necessary FFA and FFA members through the Sub-Committee on South Pacific Tuna and Billfish Fisheries (SC-SPTBF) and Fiji delegates to WCPFC with the objective of establishing an agreed position on harvest control rules for the stock that is consistent with the MSC SG 80 standards.
		 Support for and collaboration as requested on activities of the FFA SC-SPTBF in the analysis of harvest control rules consistent with candidate reference points. Engagement with Ministry of Fisheries and Forestry staff and Fiji delegates to WCPFC to:
		a. promote the tabling of a statement to WCPFC at its Ninth Session (December 2012), urging other members to work diligently to adopt formal harvest control rules for all tuna stocks, as required by the WCPFC Convention.
		b. engagement with high-level contacts between Fiji government officials, FFA and its members, and WCPFC delegates from the other major countries fishing the stock in advance of the Commission meeting to seek their support for the adoption of appropriate harvest control rules by the WCPFC.
		c. ensure the work plan of the WCPFC Scientific Committee and FFA SC-SPTBF in 2013 will include analyses of candidate harvest control rules for albacore.
		5. Actions to raise awareness of the need for a WCPFC albacore management measure through the Pacific Island Tuna Industry Association (PITIA)
		YEAR 2
		 Engagement with the Fiji Ministry to consolidate the Fiji position on harvest control rules for the South Pacific albacore stock at subsequent FFA and WCPFC meetings and workshops and encourage delegates from the other major countries fishing the stock to support the Fiji position. This shall be undertaken in conjunction with any deliberations on appropriate reference points. Provision of any requested support for SPC, FFA and WCPFC analyses on HCRs for albacore to support any further discussions at the FFA SC-SPTBF meetings and the WCPFC Scientific Committee.
		3. Collaboration with other industry sectors and NGOs in order to raise awareness of the need for WCPFC to adopt well-defined harvest control rules for the southern albacore stock.

 4. Support as requested for the activities of the FFA SC-SPTBF in the analysis of harvest control rules consistent with candidate reference points. 5. Actions to raise awareness of the need for a WCPFC albacore management measure through the Pacific Island Tuna Industry Association (PITIA) YEAR 3 Practical support as requested to WCPFC meetings and workshops with the objective of achieving the adoption of harvest control rules for the South Pacific albacore stock by WCPFC. Engagement with high-level Fiji government officials, and as required FFA and its members, and WCPFC delegates from the other major countries fishing the stock in advance of the Commission meeting to ensure appropriately drafted WCPFC Resolutions on well defined harvest control rules for the stock, to be tabled by Fiji and other countries fishing on the stock) at the 2014 (or 2015 if necessary) WCPFC annual meeting for consideration by the Commission. Liaison with the Fiji Ministry of Fisheries and Forestry to ensure relevant supporting research is planned both within the FFA SC-SPTBF and the WCPFC Science Committee. Actions to raise awareness of the need for a WCPFC albacore management measure through the Pacific Island Tuna Industry Association (PITIA) 			
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FFA.	condition	actions specified in the action plan: Fiji Ministry of Fisheries and Forestry, SPC,	
		FFA.	

Condition 3: Status retained non-target species. P 2.1.1

Outcome	2.1.1
PI	Status : The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species.
SG60	 Main retained species are likely to be within biologically based limits or if outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species. If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.
SG80	• Main retained species are highly likely to be within biologically based limits, or if outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.
SG100	 There is a high degree of certainty that retained species are within biologically based limits. Target reference points are defined and retained species are at or fluctuating around their target reference points.
Scoring	Overall score: 70
Rationale	This condition only affects those four shark species that are main (e.g. blue shark and short-finned mako) or minor retained bycatch (e.g. silky and oceanic white tip) species.
	2002, have not indicated overfishing or an overfished state and as such the stock is likely to be within biologically based limits. Management measures taken by the

	fishery, such as the use of small circular hooks, deep sets, a prohibition on the use of wire traces and a requirement to release live sharks suggests that the fishery has a partial strategy of demonstrably effective management measures in place that the fishery does not cause the retained species to be outside biologically based limits (70).
	<u>Short-finned mako</u> : Recent abundance indices and median size analyses for shortfin mako in the WCPO have shown no clear trends; therefore there is no apparent evidence of the impact of fishing on this species in the WCPO and as such the stock is likely to be within biologically based limits. Management measures taken by the fishery, such as the use of small circular hooks, deep sets, a prohibition on the use of wire traces and a requirement to release live sharks suggests that the fishery has a partial strategy of demonstrably effective management measures in place that the fishery does not cause the retained species to be outside biologically based limits (70).
	<u>Silky shark</u> : It appears that, based upon length-frequency information that the majority of the population is relatively stable, although there may be areas of local depletion. As such it appears high likely that this species is within biologically-based limits. Management measures taken by the fishery, such as the use of small circular hooks, deep sets, a prohibition on the use of wire traces and a requirement to release live sharks suggests that the fishery has a partial strategy of demonstrably effective management measures in place that the fishery does not cause the retained species to be outside biologically based limits (70).
	<u>Oceanic white tip shark</u> : Although there has been no stock assessment conducted for this species to date, recent analysis of four different datasets for the WCPO show clear, steep and declining trends in abundance indices. Management measures taken by the fishery, such as the use of small circular hooks, deep sets, a prohibition on the use of wire traces and a requirement to release live sharks suggests that the fishery has a partial strategy of demonstrably effective management measures in place that the fishery does not hinder stock recovery and rebuilding (60).
	In summary, the first three of these shark species are likely to be within biological limits (the status of the oceanic white tip shark is less certain). For all shark species there are measures in place (e.g. ban on wire traces, the use of circular hooks and a CMM requiring the release of all live sharks), but at present these cannot be considered to be demonstrably effective.
Condition	Condition 3 : the Client should put in place a formal strategy and implementation arrangements that are designed to ensure that there are demonstrably effective management measures so that the fishery does not hinder recovery and rebuilding of vulnerable shark species.
	Milestones in achieving this end require that the client provide evidence of:
	Year 1. A formal strategy and implementation plan should be developed in readiness for the first annual surveillance.
	Year 2. Testing and demonstration of the formal strategy and implementation plan should be initiated by the second surveillance audit.
	Year 3. There should be verifiable information that these measures are demonstrably effective by the third annual surveillance audit.
Client action	FTBOA note that stock assessments of shark are currently being performed by SPC

on condition	
Consultation	In years 2 or 3, where deemed scientifically necessary (see above), FTBOA will discuss the implementation of enhanced shark bycatch mitigation measures with the Ministry. These measures may include avoiding particular locations or periods where analyses show fishing leads to a particularly high shark bycatch rate
	YEAR 3 FTBOA will provide any requested practical assistance for the analysis of observer data to assess the effectiveness of measures to provide verifiable information that measures are demonstrably effective such that the fishery does not hinder recovery and rebuilding.
	YEAR 2 Testing the effectiveness of the implemented strategy will be with the support of Fiji Ministry of Fisheries and Forestry observer programme, which combined with the monitoring programme initiated to address Condition 5 will allow a preliminary examination of the catch rates of sharks of different species within the FTBOA fishery, and comparison with historical catch rate information.
	 The FTBOA will adopt the use of the shark by species logbook prepared by SPC to provide more detailed and accurate record keep of retained shark by species.
	YEAR 1 1. A formal strategy and implementation plan has already been developed in collaboration with the Fiji Ministry of Fisheries. The Fiji longline licence conditions for 2012 note: "No drop line and shark line is to be carried on board (section 1.3); all licensed vessels fishing in the archipelagic waters, the 12 miles territorial seas and the EEZ are to have on board fins that total no more than 5% of the weight of sharks on board" (section 1.4; consistent with WCPFC decisions).
	In the meantime, in collaboration with the Fiji Ministry of Fisheries, the FTBOA have already initiated a shark-mitigation plan to reduce the bycatch of shark during fishing. In the respective years the client will demonstrate the following to the CAB:
	It is noted that the long-lived, low fecundity life history of most shark species implies a considerable period of time may be required to quantitatively demonstrate positive impacts of mitigation measures on the wider stock status, and this time period may be beyond the period of certification for some species. Scientific advice will be sought when evaluating the direct effectiveness of FTBOA strategies to mitigate shark bycatch.
plan	on behalf of the WCPFC. These assessments focus initially on oceanic white tip and silky shark, with assessments of blue shark and mako to follow. These will give a clearer picture of the status of these species.

Condition 4: Management	Strategy retained	non-target species.	P 2	2.1	.2
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Outcome	2.1.2
PI	Management strategy: There is a strategy in place for managing retained species that
	is designed to ensure the fishery does not pose a risk of serious or irreversible harm to
	retained species.
SG60	• There are measures in place, if necessary, that are expected to maintain the main
	retained species at levels which are highly likely to be within biologically based

	 limits, or to ensure the fishery does not hinder their recovery and rebuilding. The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).
SG80	 There is a partial strategy in place, if necessary that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding. There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved. There is some evidence that the partial strategy is being implemented successfully.
SG100	 There is a strategy in place for managing retained species. The strategy is mainly based on information directly about the fishery and/or species involved, and testing supports high confidence that the strategy will work. There is clear evidence that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its overall objective.
Scoring	Overall score: 75
	This condition only affects those four shark species that are main (e.g. blue shark and short-finned mako) or minor retained bycatch (e.g silky and oceanic white tip) species.
	CMM-2006-05 (amended in 2008 (CMM-2008-06), 2009 (CMM-2009-04) and 2010 (CMM-2010-07)) is specific to shark bycatch management. It requires that CCMs take measures to (i) implement the FAO International Plan of Action for the Conservation and Management of Sharks (non-binding); (ii) define key shark species / shark catch & discard reporting requirements (non-binding); (iii) support research and development of strategies for the avoidance of unwanted shark captures (non-binding); (iv) fully utilize any retained catches of sharks (inc restrictions on finning (binding); (v) to prohibit their fishing vessels from retaining, trans-shipping, landing, or trading any fins (binding) and (vi) encourage the release of live sharks (binding). The Fiji Fisheries Department has communicated the requirements of these CMMs to the UoC and shark gear is banned on Fijian domestic vessels as a license condition.
	traces (wire traces are banned) that results in most sharks in biting through the line and escaping before being brought alongside the boat. In additional all the client fleet uses small (size 13 - 140 'D' shaped hooks that tend to have lower shark catch rates. As the fishery tends to operate at greater depths then at where most sharks are found, shark bycatch tends to occur only on the branch lines adjacent to the floats.
Rationale	There is a precautionary partial strategy in response to the potential vulnerability of shark species that is expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure the fishery does not hinder their recovery and rebuilding (80). There is an objective basis that this strategy (prohibition of wire traces, deep-set fishing and the use of small, circular hooks and the recommended release of live sharks) will work (80). However there is some evidence that this strategy is no always being adhered to (e.g. live sharks are not released and are retained) (60). Overall 70.
Condition	Condition 4 : the Client should put in place a formal strategy and implementation arrangements that are designed to ensure that there are demonstrably effective management measures so that the fishery does not hinder recovery and rebuilding of vulnerable shark species.

	Milestones in achieving this end require that the client provide evidence of:
	Year 1. A formal strategy and implementation plan should be developed in readiness for the first annual surveillance.
	Year 2. Testing and demonstration of the formal strategy and implementation plan should be initiated by the second surveillance audit.
	Year 3. There should be verifiable information that these measures are demonstrably effective by the third annual surveillance audit
Client action plan	FTBOA note that stock assessments of shark are currently being performed by SPC on behalf of the WCPFC. These assessments focus initially on oceanic white tip and silky shark, with assessments of blue shark and mako to follow. These will give a clearer picture of the status of these species.
	It is noted that the long-lived, low fecundity life history of most shark species implies a considerable period of time may be required to quantitatively demonstrate positive impacts of mitigation measures on the wider stock status, and this time period may be beyond the period of certification for some species. Scientific advice will be sought when evaluating the direct effectiveness of FTBOA strategies to mitigate shark bycatch.
	In the meantime, in collaboration with the Fiji Ministry of Fisheries, the FTBOA have already initiated a shark-mitigation plan to reduce the bycatch of shark during fishing. In the respective years the client will demonstrate the following to the CAB:
	YEAR 1 1. A formal strategy and implementation plan has already been developed in collaboration with the Fiji Ministry of Fisheries. The Fiji longline licence conditions for 2012 note: "No drop line and shark line is to be carried on board (section 1.3); all licenced vessels fishing in the archipelagic waters, the 12 miles territorial seas and the EEZ are to have on board fins that total no more than 5% of the weight of sharks on board" (section 1.4; consistent with WCPFC decisions).
	2. The FTBOA will adopt the use of the shark by species logbook prepared by SPC to provide more detailed and accurate record keep of retained shark by species.
	YEAR 2 Testing the effectiveness of the implemented strategy will be with the support of Fiji Ministry of Fisheries and Forestry observer programme, which combined with the monitoring programme initiated to address Condition 5 will allow a preliminary examination of the catch rates of sharks of different species within the FTBOA fishery, and comparison with historical catch rate information.
	YEAR 3 FTBOA will provide any requested practical assistance for the analysis of observer data to assess the effectiveness of measures to provide verifiable information that measures are demonstrably effective such that the fishery does not hinder recovery and rebuilding.
	In years 2 or 3, where deemed scientifically necessary (see above), FTBOA will discuss the implementation of enhanced shark bycatch mitigation measures with the Ministry. These measures may include avoiding particular locations or periods where

	analyses show fishing leads to a particularly high shark bycatch rate
Consultation	The following organisations have committed to assist the fishery in undertaking the
on condition	actions specified in the action plan: Fiji Ministry of Fisheries and Forestry, SPC, FFA

Condition 5 :Information/monitoring retained non-target species P 2.1.3

Outcome	2.1.3
PI	Information / monitoring : Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species
SG60	 Qualitative information is available on the amount of main retained species taken by the fishery. Information is adequate to qualitatively assess outcome status with respect to biologically based limits. Information is adequate to support measures to manage main retained species.
SG80	 Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery. Information is sufficient to estimate outcome status with respect to biologically based limits. Information is adequate to support a partial strategy to manage main retained species. Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).
SG100	 Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations. Information is sufficient to quantitatively estimate outcome status with a high degree of certainty. Information is adequate to support a comprehensive strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective. Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
Scoring	Overall score: 75
	This condition only affects those four shark species that are main (e.g. blue shark and short-finned mako) or minor retained bycatch (e.g silky and oceanic white tip) species. Some steps have already been taken toward assessment of shark species through a multi-year project on ecological risk assessment conducted by SPC in collaboration with FFA, CCMs and NGOs, and presented to the SC at each of its meetings beginning in 2006 (Kirby & Molony, 2006). In 2010 the WCPFC SC agreed a research plan for the assessment of the status of these stocks (Clarke & Harley, 2010). To date this research due to be completed in mid-2013 has a (i) provided shark data to WCPFC for use in further assessments, (ii) created a shark tagging information system (STAGIS) and a meta-database of tagging studies; and (iii) prepared a proposed approach to the upcoming silky and oceanic whitetip shark assessments. In February 2011, the WCPFC rules for "Scientific Data to be Provided to the Commission" were revised to specify provision of annual catch estimates and operational level catch and effort data from longline and troll (in number) fisheries for blue, silky, oceanic whitetip, mako, thresher, porbeagle, and hammerhead sharks (winghead, scalloped, great and smooth) sharks (WCPFC 2011). Size data are also required for those species for which stock assessments will be

	undertaken. CMM-2009-04 (and subsequently CMM-2010-07) also requires that each CCM include both catches and discards of silky shark and oceanic whitetip to species level in their annual reports (Shelley Clarke, pers. comm., 04 Aug. 2010).
Rationale	There is both qualitative and quantitative information on the amount of all the main shark bycatch species (e.g. blue shark and mako) and most of the minor shark bycatch (e.g. oceanic white tip and silky sharks) taken by this fishery (80).
	However this information is only adequate to qualitatively assess outcome status with respect to biologically based limits (60).
	This information is adequate to support a partial strategy to manage the main shark bycatch species, but not sufficient to evaluate with a high degree of certainty (i.e. recent observer information on shark finning levels) whether a strategy is achieving its objective (80).
	At present there is insufficient detail to assess ongoing mortalities to all bycatch species as observer information suggests that much of the shark catch is currently retained rather than released (60). Overall 70.
Condition	Condition 5 : the Client fleet, with the assistance of the Fisheries Department, should seek to improve the monitoring of both shark landings and bycatch (discards or live releases) to species level for the key shark species identified in CMM-2010-07 (blue shark, silky shark, oceanic whitetip shark, mako sharks, and thresher sharks, porbeagle shark and hammerhead sharks (winghead, scalloped, great, and smooth)).
	Milestones in achieving this end require that the client provide evidence of:
	Year 1. A formal monitoring plan should be developed in readiness for the first annual surveillance.
	Year 2. The formal monitoring plan should be finalised and initiated at least three months before the second surveillance audit, with initial outputs available to the surveillance team.
	Year 3. There should be verifiable information that these measures are demonstrably effective by the third annual surveillance audit
Client action plan	To address this condition the FTBOA will demonstrate the following to the CAB.
	YEAR 1 In discussion with the Fiji Ministry, FTBOA will implement a formal shark bycatch monitoring plan. This will support the planned expansion of the Fiji Ministry of Fisheries and Forestry observer programme, and ensure observers have access to FTBOA vessels. In liaison with the Fiji Ministry, FFA and SPC, FTBOA will help develop an on-board monitoring plan across all FTBOA vessels that is consistent with the quantitative data collection process of the Ministry observers. This will allow the number and fate of bycatch sharks to be assessed. This will be based on the adoption of a by species logbook to monitor shark landings.
	The monitoring will then be implemented across the FTBOA fleet where observers are not present. In liaison with the Fiji Ministry, FFA and SPC, the results of the monitoring will be collated for the second surveillance audit.
	YEAR 3

	In the third year, the data collection programme will continue, with annual review of
	the results developed in collaboration with the Fiji Ministry.
	This data collection programme will be continued in subsequent years, as required.
Consultation	The following organisations have committed to assist the fishery in undertaking the
on condition	actions specified in the action plan: Fiji Ministry of Fisheries and Forestry, SPC,
	FFA

Condition 6: Information/monitoring ETP species P 2.3.3

Outcome	2.3.3
Ы	Information / monitoring : Relevant information is collected to support the management of fishery impacts on ETP species, including (i) information for the development of the management strategy; (ii) information to assess the effectiveness of the management strategy; and (iii) information to determine the outcome status of ETP species.
SG60	 Information is adequate to broadly understand the impact of the fishery on ETP species. Information is adequate to support measures to manage the impacts on ETP species Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.
SG80	 Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a full strategy to manage impacts. Sufficient data are available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.
SG100	 Information is sufficient to quantitatively estimate outcome status with a high degree of certainty. Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives. Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species
Scoring	Overall score: 60
	The main ETP interactions of this fishery are with sea turtle and sea birds. However the level of interaction between the predominantly deep-setting longline fishery and these two species groups is considered very low.
	There is some information on the catch numbers, approximate volume, fate, and condition upon release etc through observer coverage (c. 7.6%). This is supported by robust debriefing and quality control processes that are considered adequate. Information is adequate to broadly understand the impact of the fishery on ETP species.
	This information is adequate to support measures to manage the impacts on ETP species and to qualitatively estimate the fishery related mortality of ETP species.
	However, it is not adequate to quantitatively estimate outcome status with a high degree of certainty, nor support a full strategy to manage impacts, nor the consequences for the status of ETP species because it cannot support species-

	specific stock assessments.
Rationale	Information is adequate to broadly understand the impact of the fishery on ETP species. However it is not sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a full strategy to manage impacts (60).
	Information is adequate to support measures to manage the impacts on ETP species (60)
	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species. However it is insufficient to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.
Condition	Condition 6 : A reporting system to record the occurrence and outcome of all interactions with sea turtles and seabirds should be developed at fleet level. The robustness of this reporting system should be independently verifiable.
	Milestones in achieving this end require that the client provide evidence of:
	Year 1. A formal monitoring plan should be developed in readiness for the first annual surveillance.
	Year 2. The formal monitoring plan should be finalised and initiated at least three months before the second surveillance audit, with initial outputs available to the surveillance team.
	Year 3. There should be verifiable information that these measures are demonstrably effective by the third annual surveillance audit
Client action plan	YEAR 1 In discussion with the Fiji Ministry, FTBOA will implement a formal ETP bycatch monitoring plan, consistent with the shark bycatch monitoring plan developed to address Condition 5. This will support the planned expansion of the Fiji Ministry of Fisheries and Forestry observer programme, and ensure observers have access to FTBOA vessels. In liaison with the Fiji Ministry, FFA and SPC, FTBOA will help develop an on-board monitoring plan across all FTBOA vessels that is consistent with the quantitative data collection process of the Ministry observers. This will allow the number and fate of ETP species to be assessed.
	YEAR 2 FTBOA will trial the on-board monitoring approach on a sub-set of vessels, and adjust the programme as required based on practical feedback from the crew. The monitoring will then be implemented across the FTBOA fleet where observers are not present. In liaison with the Fiji Ministry, FFA and SPC, the results of the monitoring will be collated for the second surveillance audit.
	YEAR 3 In the third year, the data collection programme will continue, with annual review of the results developed in collaboration with the Fiji Ministry.
	This data collection programme will be continued in subsequent years, as required.
Consultation on condition	The following organisations have committed to assist the fishery in undertaking the actions specified in the action plan: Fiji Ministry of Fisheries and Forestry, SPC, FFA

Outcome	3.2.3
PI	Compliance and enforcement: Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with.
SG60	 Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective. Sanctions to deal with non-compliance exist and there is some evidence that they are applied. Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.
SG80	 A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules. Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence. Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery. There is no evidence of systematic non-compliance.
SG100	 A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules. Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence. There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery. There is no evidence of systematic non-compliance.
Scoring	Overall score: 70
Rationale	 Monitoring control and surveillance mechanisms exist in this fishery both at WCPFC level and Fiji national. This includes VMS and logbooks. There is a reasonable expectation that they are effective, since similar systems in other fisheries have proved effective and been implemented in the region, enforced and complied with. Sanctions to deal with non -compliance exist (Ministry of Fisheries and Forest legislation). However, the fishery (local) is not able to demonstrate that sanctions to deal with non-compliance are consistently applied. Fishers are generally thought to comply with the management system for the client fishery however there is some evidence of some systematic noncompliance may exist (Ministry records).
Condition	Condition 7:Sanctions that deal with noncompliance are consistently applied
	Milestones in achieving this require that the client provide evidence of.Year 1. By the first surveillance audit the fishery must, demonstrate that sanctions are consistently applied and thought to provide effective deterrence.Year 2. By the second surveillance audit, the fishery must provide evidence that the

Condition 7: Compliance and Enforcement P 3.2.3

	monitoring, control and surveillance mechanisms work together to form part of a system, and demonstrate an ability to enforce relevant management measures, strategies and/or rules. Year 3. By the third surveillance audit the fishery must also demonstrate that there is no evidence of systematic non-compliance
Client action plan	The FTBOA notes that this condition requires close liaison with the Fiji Ministry of Fisheries and Forest, and the FTBOA will continue to work closely with the relevant Fiji Ministries in this regard. Where necessary, requests will be made of the FFA and/or WCPFC via the Ministry for required information.
	In the respective years the client will demonstrate the following to the CAB:
	YEAR 2 At the second audit, using available information the client will provide an audit report summarising regulatory compliance within the FTBOA fishery. This will detail any incidences of non-compliance within the fishery under certification, how non-compliance was identified (based on data generated from the logbook, observer and inspection programmes in place), and the outcomes (including sanctions applied), in order to examine both consistency and the functionality of existing MCS programmes. This will be performed in collaboration with relevant Fiji Ministries.
	The output will demonstrate whether the MCS system operating has demonstrable ability to enforce relevant management measures, strategies and/or rules, and that any sanctions applied have been consistent.
	YEAR 3 At the third annual audit the client will provide a report examining the performance of any vessels within the unit of certification subsequent to the application of any sanctions, providing evidence that regulatory measures have reduced any systematic non-compliance within the fishery under certification. Again, this will be developed in collaboration with relevant Fiji Ministries.
	If any areas of systematic non-compliance are identified, regulatory measures, based on recommendations from Managers, will be instituted in order to reduce the amount of non-compliance, and reports of performance presented at subsequent audits
Consultation on condition	Ministry of Fisheries and Forest

15 APPENDICES

15.1 Appendix A: Scoring

Scoring worksheet - MSC Fishery Assessment Methodology - Default Assessment Tree - Version 2.1 - 1 May 2009

Note: Scores are to be entered in the green-shaded cells in column K

Columns G, H and L apply in fisheries where the stock rebuilding PI (1.1.3) is NOT triggered

Columns I, J and M give the Principle 1 Outcome score contributions in fisheries where the stock rebuilding PI (1.1.3) is triggered

Prin-	Wt	Component	Wt	PI No.	Performance Indicator (PI)	Wt	Weight					
ciple	(L1)		(L2)			(L3)	in			~	Contributio	on to Principle
							Principle			Score		Score
0			0.5			<u>Either</u>		<u>Or</u>			Either	Or
One	1	Outcome	0.5	1.1.1	Stock status	0.5	0.25	0.333	0.1667	100	25.00	16.67
				1.1.2	Reference points	0.5	0.25	0.333	0.1667	75	18.75	12.50
				1.1.3	Stock rebuilding			0.333	0.1667			0.00
		Management	0.5	1.2.1	Harvest strategy	0.25	0.125			80	10.00	10.00
				1.2.2	Harvest control rules & tools	0.25	0.125			60	7.50	7.50
				1.2.3	Information & monitoring	0.25	0.125			80	10.00	10.00
				1.2.4	Assessment of stock status	0.25	0.125			85	10.63	10.63
Two	1	Retained	0.2	2.1.1	Outcome	0.333	0.0667			70	4.67	4.67
		species		2.1.2	Management	0.333	0.0667			75	5.00	5.00
				2.1.3	Information	0.333	0.0667			75	5.00	5.00
		Bycatch	0.2	2.2.1	Outcome	0.333	0.0667			80	5.33	5.33
		species		2.2.2	Management	0.333	0.0667			95	6.33	6.33
				2.2.3	Information	0.333	0.0667			100	6.67	6.67
		ETP species	0.2	2.3.1	Outcome	0.333	0.0667			85	5.33	5.33
				2.3.2	Management	0.333	0.0667			90	6.00	6.00
				2.3.3	Information	0.333	0.0667			60	4.00	4.00
		Habitats	0.2	2.4.1	Outcome	0.333	0.0667			100	6.67	6.67
				2.4.2	Management	0.333	0.0667			100	6.67	6.67
				2.4.3	Information	0.333	0.0667			100	6.67	6.67
		Ecosystem	0.2	2.5.1	Outcome	0.333	0.0667			80	5.33	5.33
				2.5.2	Management	0.333	0.0667			80	5.33	5.33
				2.5.3	Information	0.333	0.0667			85	6.33	6.33
Three	1	Governance	0.5	3.1.1	Legal & customary framework	0.25	0.125			95	11.88	
		and policy			Consultation, roles &	0.25						
				3.1.2	responsibilities		0.125			90	11.25	
				3.1.3	Long term objectives	0.25	0.125			90	11.25	

		3.1.4	Incentives for sustainable fishing	0.25	0.125	80	12.50
Fishery	0.5	3.2.1	Fishery specific objectives	0.2	0.1	80	8.00
specific		3.2.2	Decision making processes	0.2	0.1	90	8.50
management		3.2.3	Compliance & enforcement	0.2	0.1	70	7.00
system		3.2.4	Research plan	0.2	0.1	90	9.00
			Management performance	0.2			
		3.2.5	evaluation		0.1	80	8.00

Overall weighted Principle-le	vel scores	
Principle 1 - Target species	81.9	
	Stock rebuilding PI scored	
Principle 2 - Ecosystem		85.0
Principle 3 - Management		86.4

1 SCORING CRITERIA SCORING GUIDEPOST 60 SCORING GUIDEPOST 80	S
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SCORING GUIDEPOST 100

15.2 Appendix A: Scoring Table

Principle 1	A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the
	fishery must be conducted in a manner that demonstrably leads to their recovery.

1.1	Management Outcomes:			
1.1.1	Stock Status: The stock is	It is <u>likely</u> that the stock is above the point	It is <u>highly likely</u> that the stock is above the	There is a high degree of certainty that the
	at a level which maintains	where recruitment would be impaired.	point where recruitment would be impaired.	stock is above the point where recruitment
	high productivity and has a			would be impaired.
	low probability of			
	recruitment overfishing			
			The stock is at or fluctuating around its target	There is a high degree of certainty that the
			reference point.	stock has been fluctuating around its target
				reference point, or has been above its target
				reference point, over recent years.

Scoring Comments

There is a high degree of certainty that the stock is above the point where recruitment would be impaired.

The 2011 assessment of South Pacific albacore indicates that overfishing is not occurring ($F_{2007-2009}/F_{MSY} = 0.26$) and that albacore is not overfished ($SB_{2009}/SB_{MSY} = 2.25$ and $B_{2007-2009}/B_{MSY} = 1.26$). There is no indication in the 2011 assessment that current levels of catch are causing recruitment overfishing given the age selectivity of the fisheries. Other indicators suggest a moderate level of stock depletion (e.g. total biomass is estimated to be currently at 0.80 of its unfished level).

There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.

Formal reference points have not been adopted by WCPFC, however, management advice is presented in terms of MSY-based reference points and B_{MSY} is effectively a default target reference point. Although there is precautionary information on the uncertainty in aspects of the assessment, there is a high degree of certainty that the stock is well above B_{MSY} and has been over the time period used in the assessment. Given the uncertainty in the assessment, recent increases in catches, possible changes to the assessment with the inclusion of new biological information, and declining catch rates, it is important that this performance indicator be closely monitored in future assessments/audits.

Score: 100

There is a high degree of certainty that the stock is above the point where recruitment would be impaired. (100).

There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years. (100).

Audit Trace References

Hoyle and Davies, 2009; Hoyle, 2011; WCPFC-SC, 2011.

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1.1.2	Reference Points: Limit and target reference points are appropriate for the	<u>Generic</u> limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	stock.		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of relevant <u>precautionary issues</u> .
			The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, <u>or a higher level</u> , and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
			For low trophic level species, the target reference point takes into account the ecological role of the stock.	

Scoring Comments

Reference points are appropriate for the stock and can be estimated.

Formal reference points have not been adopted by WCPFC, however, the assessment provides a range of indicators that can appropriately be used as TRPs or LRPs. Management advice for South Pacific albacore is based on MSY-based indicators generated by the assessment. The available indicators are adequate for evaluating stock status and are effectively used as reference points. These generic MSY-related reference points are used by the WPCFC Scientific Committee to assess stock status, consistent with the WCPFC Convention, UNFSA and current practice in other tuna RFMOs.

The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity

There is no specific limit reference point adopted by WCPFC. F_{MSY} is effectively used as an implicit reference point, defining a fishing level to be avoided and ensuring that the exploitation rate is reduced as the level associated with appreciable risk of recruitment being impaired is approached. Article 6 of the WCPFC Convention requires that the Commission apply the guidelines of Annex II of the United Nations Fish Stocks Agreement (Guidelines for the Application of Precautionary Reference Points in Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks). Point 7 of Annex II reads as follows: "The fishing mortality rate which generates maximum sustainable yield should be regarded as a minimum standard for limit reference points. For stocks which are not overfished, fishery management strategies shall ensure that fishing mortality does not exceed that which corresponds to maximum sustainable yield, and that the biomass does not fall below a predefined threshold. For overfished stocks, the biomass which would produce maximum sustainable yield can serve as a rebuilding target."

The Scientific Committee has been conducting research aimed at establishing limit reference points for tuna stocks in the region. A technical workshop to consider suitability of MSY-based indicators and other metrics as potential default limit reference points was held in 2009. This led to a work program to identify candidate limit reference points, the outcomes of which were

1	SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100

reviewed at WCPFC SC7. SC7 recommended that the Commission adopt the hierarchical approach to identifying the key limit reference points for the key target species, based on the availability of information. This recommendation is yet to be considered by the Commission. Although there has been progress towards implementing limit reference points they are not yet in place, hence this SG80 Scoring Issue is not met.

The target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome. The implicit target reference region is to maintain biomass at, or above, that required for MSY. This is consistent with the MSC requirement at SG80, but without a clearer definition of an appropriate target level and without taking into account uncertainty, the higher guidepost is not met.

Albacore tuna is not considered a low trophic level species.

Score: 75

Reference points (MSY-based and depletion based) can be estimated and are appropriate for the stock (80). There is an implied limit reference point above the level at which there is an appreciable risk of impairing reproductive capacity. (60) The default target reference point is consistent with maintaining the stock at B_{MSY} , (80) Albacore tuna is not considered a low trophic level species hence the TRP does not need to take into account the ecological role of the stock, (80). The single scoring guidepost 60 has been met and three out of the four at SG 80 has been met. A score of 75 is awarded

Condition 1 has been generated for this PI.

Audit Trace References

Campbell, 2009; Harley & Davies, 2011; Harley et al., 2009b, Hoyle, 2011; Preece et al., 2011; Davies & Basson, 2008; WCPFC, 2000; WCPFC5, 2009; WCPFC-SC, 2008; WCPFC-SC, 2011.

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1	SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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1.1.3	Stock Rebuilding: Where	Where stocks are depleted rebuilding strategies	Where stocks are depleted rebuilding strategies	Where stocks are depleted, strategies are
	the stock is depleted, there	which have a reasonable expectation of	are in place.	demonstrated to be rebuilding stocks
	is evidence of stock	success are in place.		continuously and there is strong evidence that
	rebuilding.			rebuilding will be complete within the shortest
				practicable timeframe.
		Monitoring is in place to determine whether	There is <u>evidence</u> that they are rebuilding	
		they are effective in rebuilding the stock within	stocks, or it is highly likely based on	
		a <u>specified</u> timeframe.	simulation modelling or previous performance	
			that they will be able to rebuild the stock	
			within a specified timeframe.	

Scoring Comments				
Not applicable as the stock is not depleted.				
Score: NA				
Audit Trace References				
See 1.1.1				

SCORING GUIDEPOST 60

SCORING GUIDEPOST 80

1.2	Harvest Strategy (management)			
1.2.1	Harvest Strategy: There is a robust and precautionary harvest strategy in place	The harvest strategy is <u>expected</u> to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy <u>work together</u> towards achieving management objectives reflected in the target	The harvest strategy is responsive to the state of the stock and is <u>designed</u> to achieve stock management objectives reflected in the target and limit reference points.
		The harvest strategy is <u>likely</u> to work based on	and limit reference points. The harvest strategy may not have been fully	The performance of the harvest strategy has
		prior experience or plausible argument.	tested but monitoring is in place and <u>evidence</u> exists that it is achieving its objectives.	been <u>fully evaluated</u> and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
		<u>Monitoring</u> is in place that is expected to determine whether the harvest strategy is working.		The harvest strategy is <u>periodically reviewed</u> and improved as necessary.

Scoring Comments

The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.

Regional management of the albacore stock throughout the South Pacific is the responsibility of the WCPFC. Under this regional convention Fiji is responsible for ensuring that the management measures applied within fisheries waters of Fiji are compatible with those of the Commission. Management of tuna through such regional organizations is appropriate, given the range and distribution of the stock. The harvest strategy for WCPO albacore has several components, with WCPFC, national and archipelagic management actions, supported by a robust stock assessment and extensive monitoring frameworks, but it does not include formal harvest control rules (HCRs).

Stock assessment is carried out on a biannual or annual basis and the assessment approach has been regularly reviewed and revised. Countries responsible submit data to be used in the stock assessment. Compliance with this requirement is good. Results of the stock assessment are reported to the annual Scientific Committee meeting which then makes recommendations to the Commission, leading to conservation measures if required. Management advice is focussed largely on MSY-based reference points and although the albacore stock is not overfished nor subject to overfishing, a Conservation and management measure was passed by the WCPFC (CMM-2010-05, replacing CMM-2005-02)) stating that "Commission Members, Cooperating Non-Members, and participating Territories (CCMs) shall not increase the number of their fishing vessels actively fishing for South Pacific albacore in the Convention Area south of 20°S above current (2005) levels or recent historical (2000-2004) levels." The measure allows Pacific Island nations to pursue a responsible level of development of their domestic albacore fisheries.

The different sets of management actions across the region are not fully integrated and it is not clear that coherent management actions are applied throughout the range of the stock, limiting the score to 80.

The harvest strategy may not have been fully tested but monitoring is in place and evidence exists that it is achieving its objectives. The stock assessment provides an independent assessment of the effectiveness of management in controlling spawning stock biomass and limiting the exploitation rate. No management strategy

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100

evaluations have been conducted, and although uncertainty has been reported as part of the stock assessment, it is not clear how this is being incorporated into the decision-making process.

The robust state of the albacore stock provides evidence that the strategy is achieving its objectives. Management measures are being put in place to curb expansion of the fishery, however, there have been high catches of albacore in 2009 and 2010 and the effectiveness of CMM-2010-05 will need to be monitored.

Score: 80

The fishery meets the 80 guideposts, however, the various management actions are not fully integrated, and it is not clear that coherent management actions are applied throughout the range of the stock. (80)

The harvest strategy has not been fully tested. There is adequate monitoring is in place. The robust state of the albacore stock provides evidence that the strategy is achieving its objectives. (80)

Audit Trace References

CMM-2005-02; CMM-2010-05; WCPFC-SC, 2010; Preece et al., 2011; MRAG, 2009; WCPFC-SC, 2011; Campbell, 2009; WWF, 2011.

1 SCORING CRITERIA SCORING GUIDEPOST 60 SCORING GUIDEPOST 80 SCO	ORING GUIDEPOST 100
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1.2.2	Harvest control rules and tools: There are well defined and effective harvest control rules in place	<u>Generally understood</u> harvest control rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	<u>Well defined</u> harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
		There is <u>some evidence</u> that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	The <u>selection</u> of the harvest control rules takes into account the <u>main</u> uncertainties.	The <u>design</u> of the harvest control rules take into account a <u>wide</u> range of uncertainties.
			<u>Available evidence indicates</u> that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules	<u>Evidence clearly shows</u> that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.

Scoring Comments

Generally understood harvest control rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached. There is a generally understood harvest control rule that harvest rates are reduced as the stock approaches or falls below the MSY point. There is no formally agreed point at which action will be taken, nor is there a clear definition of what action will be taken. Potential actions and controls are proposed for consideration of the Commission based on the advice of the Scientific Committee. The current Conservation and Management Measure for albacore seeks to control fishing effort and capacity. An example of more stringent measures having been introduced is that for big-eye tuna which is more heavily exploited. Fiji Fisheries implements controls through limiting the number of licences it issues.

The scientific basis for decision making is well established and documented. The harvest control rules are currently based on B/B_{MSY} and F/F_{MSY} benchmarks. The overarching harvest control rule to maintain stocks at or above MSY has been established by the WCPFC in accordance with the Convention provision and the application of the precautionary approach.

There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.

Conservation and Management Measures have been introduced to prevent increases of fishing effort on albacore. The assessment indicates that current levels of biomass and fishing mortality are at acceptable levels. WCPFC has shown a willingness to introduce more stringent measures if required (such as for yellowfin and bigeye tuna). In the case of bigeye tuna, where fishing mortality is considered to be above the MSY level, fishing mortality is being reduced at best only slowly and the lack of a well-defined harvest control rule is apparent. A Fish Aggregating Device closure (introduced in CMM-2008-01) has reduced the amount of juvenile bigeye taken in purse seine nets, however the effectiveness of overall required reduction in bigeye fishing mortality is not yet evident. CMM-2010-05 seeks to limit the number of vessels actively fishing for South Pacific albacore in the Convention Area south of 20°S to 2005 levels. Catches of South Pacific albacore tuna in 2007 and 2008 were below the 2005 levels, however, 2009 and 2010 catches were at record levels. The effectiveness of the current CMM will need to be evaluated. This will be a high priority if future assessments suggest the stock and/or exploitation levels are nearing reference levels.

SCORING GUIDEPOST 60

Score: 60

There are generally understood harvest control rules in place that are consistent with the aims of the harvest strategy indicating that the exploitation rate will be reduced as limit reference points are approached or as the stock moves below the target level. However, the lack of a well-defined harvest control rule prevents assessment of how precautionary it is or whether current tools are adequate in applying the rule, so the performance indicator is unable to meet the 80 guidepost requirements. (60).

There is some evidence that tools used by WCPFC can control exploitation levels, however the effectiveness of these tools in relation to albacore tuna is not yet evident. (60).

Condition 2 has been generated for this PI.

Audit Trace References

Hoyle, 2011; Davies and Basson, 2008; Preece et al., 2011; Langley & Reid, 2004; Hoyle et al., 2008; WCPFC5, 2009; Campbell, 2009; Preece et al., 2009; WCPFC-SC, 2010.
	1 SCORING CRITERIA SCORING GUIDEPOST 60 SCORING GUIDEPOST 80 SCORING GUIDEPOST 100
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1.2.3	Information /	Some relevant information related to stock	Sufficient relevant information related to stock	A comprehensive range of information (on
	monitoring: Relevant	structure, stock productivity and fleet	structure, stock productivity, fleet composition	stock structure, stock productivity, fleet
	information is collected to	composition is available to support the harvest	and other data is available to support the	composition, stock abundance, fishery
	support the harvest	strategy.	harvest strategy.	removals and other information such as
	strategy			environmental information), including some
				that may not be directly relevant to the current
				harvest strategy, is available.
		Stock abundance and fishery removals are	Stock abundance and fishery removals are	All information required by the harvest control
		monitored and at least one indicator is	regularly monitored at a level of accuracy and	rule is monitored with high frequency and a
		available and monitored with sufficient	coverage consistent with the harvest control	high degree of certainty, and there is a good
		frequency to support the harvest control rule.	rule, and one or more indicators are available	understanding of the inherent uncertainties in
			and monitored with sufficient frequency to	the information [data] and the robustness of
			support the harvest control rule.	assessment and management to this
			support the har test condition rates	uncertainty
				difectuality.
			There is good information on all other fishery	
			removals from the stock	
			iemovais nom me stock.	

Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.

There is an extensive range of information available on albacore tuna biology and catches (WCPFC and FFA vessel registers, logsheets, observer data, biological sampling, good catch removals data, all monitored at high frequency). There is a regional register of all vessels actively fishing in the region as well as domestic records of fishing vessels with EEZs held locally. Information, while largely complete, is not comprehensive across all vessels, but adequate to allow stratification of vessels into fleets with similar operational characteristics. A total of 30 "fleets" were defined for the assessment based on nationality, spatial location and time, with additional groupings based on temporal changes. Catch, effort and size composition data are largely complete for the fleets in the assessment. A limited amount of tag data are also available, but there are insufficient data to support the explicit spatial modelling available in Multifan-CL. There is generally good information on fishery removals from the stock across the range of participants in the fishery. (80)

Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.

Catch data across all fleets taking albacore is relatively complete and sufficient for the stock assessment. Abundance indices are primarily obtained from catch and effort data, particularly from the longline fleets operating across the region, giving relatively long time series of information. Length composition data from these fleets provides information on mortality rates, selectivity and stock structure. Regular stock assessment provides information on abundance and estimates a number of indicators to monitor stock status. (80)

There is good information on all other fishery removals from the stock.

Catches appear to be reported at an acceptable level of accuracy for the stock assessment across all fleets taking albacore. Data have been identified as missing, but these are generally related to operational data (fishing gear, target species and fishing activity) rather than catch. Recent longline catches within the Fiji EEZ represent approximately 5% of the total catch from the south

1	SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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Pacific stock. Discards, incidental mortality and recreational catch are not generally reported. As long as these sources of mortality remain constant and/or negligible, this lack of recording should not present a problem to the stock assessment. (80).

Score: 80

Data collection and monitoring are sufficient to support the stock assessment and harvest strategy, meeting all of the 80 scoring issues. Information is not comprehensive, however, preventing a higher score under this performance indicator.

Audit Trace References

Amoe, 2011; Hoyle, 2011; Hoyle *et al.*, 2008; Hoyle & Davies, 2009; Bigelow & Hoyle, 2008; Hoyle, 2008; Langley & Hoyle, 2008; Williams & Terawasi, 2011; MRAG, 2009; Jones & Shallard, 2009; WWF, 2011.

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1.2.4	Assessment of stock	The assessment estimates stock status relative	The assessment is appropriate for the stock and	The assessment is appropriate for the stock and
	status: There is an	to reference points.	for the harvest control rule, and is evaluating	for the harvest control rule and takes into
	adequate assessment of the		stock status relative to reference points.	account the major features relevant to the
	stock status		-	biology of the species and the nature of the
				fishery.
		The assessment identifies major sources of	The assessment takes uncertainty into account.	The assessment takes into account uncertainty
		uncertainty.	•	and is evaluating stock status relative to
		2		reference points in a probabilistic way.
				The assessment has been tested and shown to
				be robust. Alternative hypotheses and
				assessment approaches have been rigorously
				explored.
				A Contraction of the second se
			The assessment of stock status is subject to	The assessment has been internally and
			peer review.	externally peer reviewed.
			•	

The assessment is appropriate for the stock and for the harvest control rule, and is evaluating stock status relative to reference points.

The assessment methodology has been developed using the software MULTIFAN-CL (MFCL), which is software that implements a size-based, age- and spatially-structured population model. This is a robust and internationally acknowledged approach. MFCL was specifically developed to take advantage of the tuna fishery data available from the region. The assessment method estimates stock status in relation to a number of indicators and management advice is presented in terms of MSY-based reference points and harvest control rules (see PI 1.1.2 and 1.2.2).). The assessment has been revised and improved through several iterations over the last 5 years and many problems identified previously have been solved through an improved model and treatment of the data.

Difference in growth rates between male and female albacore are apparent but are not modelled directly in the assessment. The assessment uses an assumed level of steepness to model stock-recruitment (fixed at 0,.75 in the latest assessment) and estimated MSY-based reference points are sensitive to this parameter. Recent research has shown spatial variation in fish size within regions and future assessment should consider accounting for this. (80).

The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.

Parameters of the assessment model are estimated by maximizing an objective function consisting of likelihood (data) and "prior" information. While not claiming to be fully Bayesian (probabilistic), the model does include "priors" and penalties to improve estimation and produce likelihood profiles for estimated values of interest. A relatively large number of sensitivity analyses have typically been conducted on the stock assessments for this species (though not in the 2011 assessment as this was an update of the 2009 assessment). In the 2009 assessment, an "uncertainty analysis" which modelled all possible combinations of a set of factors was used to consider both individual uncertainties and their interactions. This allows a broad assessment of structural uncertainty, although it still relies on expert judgement and model diagnostics to identify the set of factors to include in the analysis. (100).

SCORING CRI

The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been explored.

Underlying structural assumptions of the model have been progressively reviewed and the assessment model and/or data have been adjusted to match research findings and changes in expert opinion and judgement. The open documentation and model review process increases confidence in the robustness of the assessment. One outcome of the changes in the 2009 assessment was to reduce the biomass estimates and raise the fishing mortality estimates compared to previous assessments. Model diagnostics indicate that some sources of bias have been removed, but that some problems remain.

There has been examination of alternative approaches to assessment have been explored, however this has not been rigorous. For example, the assessment has not been tested through management strategy evaluation or development of an operational model of the stock to simulate data to test alternative approaches and configurations of the assessment. Research is being used to improve understanding of the stock ecology and different approaches to modelling the stock have been developed which could form the basis for testing hypotheses and provision of a more rigorous approach to testing robustness of the assessment and management advice in future. Projections are not reported for this assessment and retrospective analysis has not been conducted. While considerable work has been conducted, it is not sufficient yet to meet this indicator at SG100. (80).

The stock assessment is subject to peer review.

The assessment is subject to internal peer review through the WCPFC SC. The WCPFC is also beginning to apply an external peer review process but this has not been applied to this assessment. The assessment method has been well-documented and published in peer-review journals. (80).

Score: 85

The stock assessment method is appropriate for the stock biology and data, and is peer reviewed, meeting the 80 guidepost. In addition, the assessment takes uncertainty into account well, meeting one of the 100 guidepost requirements.

Audit Trace References

Bromhead et al., 2009; Fournier et al., 1998; Harley et al., 2009; Hoyle, 2011; Hoyle et al., 2009; Hoyle et al., 2008; Hoyle & Davies, 2009; SPC-OFP, 2011a.

1	SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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Principle 2	Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends						
2.1	Retained non-target specie	25					
	PI	SG60	SG80	SG100			
2.1.1	<i>Status:</i> The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species.	Main retained species are <u>likely</u> to be within biologically based limits or if outside the limits there are <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	Main retained species are <u>highly likely</u> to be within biologically based limits, or if outside the limits there is a <u>partial strategy</u> of <u>demonstrably</u> <u>effective</u> management measures in place such that the fishery does not hinder recovery and rebuilding.	There is a <u>high degree of certainty</u> that retained species are within biologically based limits.			
		If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically		Target reference points are defined and retained species are at or fluctuating around their target reference points.			

Both yellowfin (20% of species composition by weight) and bigeye tuna (6.7%) are retained bycatch in this fishery. Three other teleost species considered as main retained species are the opah (spotted moonfish), swordfish and blue marlin. Although each consisting of less than 5% of the catch by weight (4.5, 4.2% and 2.0% and 1.4% respectively), they are all potentially vulnerable species. In addition, four shark species are also considered as main retained species. One – blue shark – represents over 5% of the overall catch by weight. The others - short-finned mako, silky shark and oceanic white tip – are all under 5% of the catch by weight (3.0%, 2.7% and 2.5% respectively) are also considered as main species as (i) they are all of 'medium' vulnerability and (ii) their fins are considered of high economic importance.

<u>Yellowfin tuna</u>: Not overfished, within biological based limits (FAM 7.1.11/7.1.12). $B_{current} / B_{MSY} = 1.25 - 1.60$. Depletion has increased steadily over time, reaching a level of about 50-55% of unexploited biomass (a fishery impact of 45-50%) in 2006-2009 ($B_{current} / B_{current,F=0} = 0.50 - 0.55$). This represents a moderate level of stock-wide depletion. The stock remains considerably higher than the equivalent equilibrium-based reference point (B_{MSY}/B_0 of approximately 0.35-0.40). The assessment indicates that it is highly likely that $B/B_{MSY} > 1.0$. Biomass is therefore estimated to be currently above $B_{LIM} = 0.2B_0$, with a high degree of certainty.

<u>Bigeye tuna</u>: Not overfished, within biologically based limits (FAM 7.11/7.11.12). $B_{current} / B_{MSY} = 1.25$; $B_{current} / B_0 = 0.44$. Biomass is therefore likely, with a high degree of certainty, to be currently above $B_{lim} = 0.20 B_0$.

<u>Blue shark</u>: Stock assessments to date, including those using Pacific data through 2002, have not indicated overfishing or an overfished state.

based limits or hindering recovery.

Short-finned mako: Recent abundance indices and median size analyses for shortfin mako in the WCPO have shown no clear trends; therefore there is no apparent evidence of the impact of fishing on this species in the WCPO

<u>Silky shark</u>: It appears that, based upon length-frequency information that the majority of the population is relatively stable, although there may be areas of local depletion. As such it appears high likely that this species is within biologically-based limits, although there is an evident need to reduce fishing pressure on these potentially vulnerable species. Preliminary stock assessment work is underway by IATTC.

<u>Oceanic white tip shark</u>: Although there has been no stock assessment conducted for this species to date, recent analysis of four different datasets for the WCPO show clear, steep and declining trends in abundance indices. Given the strong existing evidence for the depleted state of the oceanic whitetip population in the WCPO, stock assessment studies are likely to further the case for further conservation and management action.

<u>Opah</u>: Overall, the median size of opah captured by WCPO longline fisheries has shown a steady increase since the late 1980s, albeit with (apparently) seasonal fluctuations. This is also reflected in observation data from the client fleet, where there doesn't appear to be any concern for these species based on the time-series trends in CPUE and size at capture based on observer data

<u>Swordfish</u>: The most recent stock assessment for the broadbill in the Southern region of the WCPFC convention area (0-50°S; 140°E -130°W) for the period 1952-2007 showed that although the data were not sufficient to estimate a stock recruitment relationship reliably, all estimates from the model ensemble suggested that biomass (total and spawning) is above levels that would sustain MSY, and fishing mortality is below F_{MSY} .

<u>Blue marlin</u>: Although the stock is likely to be fully exploited, it is likely to be within biological limits and this fishery contributes a very small part of overall fishing mortality. An ISC stock assessment for blue marlin is scheduled 2012 (ISC, 2009).

Score: 70

<u>Yellowfin tuna</u>: There is a high degree of certainty that yellowfin tuna stocks in the WCPO are within biologically-based limits (i.e. above $B_{LIM} = 0.20$ B0). The 2011 assessment indicates that current biomass levels are well above this value and it is therefore concluded that there is high degree of certainty that yellowfin tuna stocks in the WCPO are within biologically-based limits. Default target reference points (i.e. B_{MSY} & F_{MSY}) are defined (but not adopted) and yellowfin tuna has never dropped below these TRPs. Thereby meeting all the scoring issues under the 80SG

<u>Bigeye tuna</u>: There is a high degree of certainty that bigeye tuna stocks in the WCPO are within biologically-based limits (i.e. above $B_{lim} = 0.20 B_0$). The structural uncertainty analysis in the 2011 assessment shows there is a 13% probability of spawning biomass being below the target value of 1.0 (SB_{current} < SB_{MSY}) across the grid examined and a zero probability for the reference case (where steepness is assumed to be 0.8). Two of the alternate models in the 2011 assessment found that SB_{current} / SB_{MSY} < 1.0 with a range across the six models considered of 0.86 – 1.49. Overfishing is occurring with very high probability that F_{current}/F_{MSY} is much greater than 1.0. The SC recommends a minimum of 32% reduction in fishing mortality from the average levels for 2006–2009 and concluded that it is too early to quantitatively conclude whether CMM2008-01 has reduced fishing mortality for bigeye tuna to the levels specified in the CMM. Thereby meeting all the scoring issues under the 80SG.

<u>Blue shark</u>: Stock assessments to date, including those using Pacific data through 2002, have not indicated overfishing or an overfished state and as such the stock is likely to be within biologically based limits (60). Management measures taken by the fishery, such as the use of small circular hooks, deep sets, a prohibition on the use of wire traces and a requirement to release live sharks suggests that the fishery has a partial strategy of demonstrably effective management measures in place that the fishery does not cause the retained species to be outside biologically based limits (80). Thereby meeting all the scoring issues under the 60 SG and has an overall score of 70 but not 80 as blue shark are only likely to be within biological limits

<u>Short-finned mako</u>: Recent abundance indices and median size analyses for shortfin mako in the WCPO have shown no clear trends; therefore there is no apparent evidence of the impact of fishing on this species in the WCPO and as such the stock is likely to be within biologically based limits (60). Management measures taken by the fishery, such as the use of small circular hooks, deep sets, a prohibition on the use of wire traces and a requirement to release live sharks suggests that the fishery has a partial strategy of demonstrably effective management measures in place that the fishery does not cause the retained species to be outside biologically based limits (80). Thereby meeting all the scoring issues under the 60 SG with an overall score of 70.

<u>Silky shark</u>: It appears that, based upon length-frequency information that the majority of the population is relatively stable, although there may be areas of local depletion. As such it appears

high likely that this species is within biologically-based limits (60). Management measures taken by the fishery, such as the use of small circular hooks, deep sets, a prohibition on the use of wire traces and a requirement to release live sharks suggests that the fishery has a partial strategy of demonstrably effective management measures in place that the fishery does not cause the retained species to be outside biologically based limits (80). Thereby meeting all the scoring issues under the 60 SG with an overall score of 70.

<u>Oceanic white tip shark:</u> Although there has been no stock assessment conducted for this species to date and the status is poorly known, recent analysis of four different datasets for the WCPO show clear, steep and declining trends in abundance indices. Management measures taken by the fishery, such as the use of small circular hooks, deep sets, a prohibition on the use of wire traces and a requirement to release live sharks suggests that the fishery has a partial strategy of demonstrably effective management measures in place that the fishery does not hinder stock recovery and rebuilding. Thereby meeting all the scoring issues under the 60 SG.

<u>Opah</u>: Based on improving or constant catch at age and CPUE tends respectively, it is highly likely that this species is being fished within biologically-based limits. Thereby meeting all the scoring issues under the 80 SG.

Swordfish: Current biomass (total and spawning) is above levels that would sustain MSY, and fishing mortality is below F_{MSY}. Thereby meeting all the scoring issues under the 80 SG.

Blue marlin: assessments indicate stock highly likely to be within biological limits, although these need to be updated. Thereby meeting all the scoring issues under the 80 SG.

Condition 3 has been set to address this short-coming.

Audit Trace References

FAM ref for B_{lim} & serious / irreversible harm (7.1.11 & 7.1.12 respectively) and measurement of impact on stock recovery (7.1.14), FAM 6.2.19 (d)

Davies et al., 2011; Langley et al., 2011; Kirby & Hobday, 2007; Kleiber et al., 2003; Kleiber et al., 2009; Clarke et al., 2006; Polovina et al., 2009; Clarke, 2011; Clarke et al., 2011b; Clarke et al., 2011c; Cortés et al., 2010; Arrizabalaga et al., 2011; Semba et al., 2011; Bonfil, 2008; Camhi et al., 2009; Molony, 2005; Lawson, 2011; Kolody et al., 2009; IATTC, 2004; Peter Williams, SPC, pers. comm., 11 October 2011

	PI	SG60	SG80	SG100
2.1.2	<i>Management strategy:</i> There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or	There are <u>measures</u> in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a <u>partial strategy</u> in place, if necessary that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a <u>strategy</u> in place for managing retained species.
	retained species.	The measures are considered <u>likely</u> to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some <u>objective basis for confidence</u> that the partial strategy will work, based on some information directly about the fishery and/or species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and <u>testing</u> supports <u>high confidence</u> that the strategy will work.
				There is <u>clear evidence</u> that the strategy is being <u>implemented successfully</u> , and intended changes are occurring.
			There is <u>some evidence</u> that the partial strategy is being <u>implemented successfully</u> .	There is some evidence that the strategy is <u>achieving its overall objective</u> .

Scoring Comments

<u>Yellowfin</u>: there is a partial strategy in place based on the various elements of CMM-2008-01 to control the overall level of purse seine effort and the impact of associated sets. Projections show that these measures will maintain the stock within biologically-based limits over time. Overfishing is not occurring and the stock is not overfished. Projections to 2021 indicate that fishing mortality is projected to remain below F_{MSY} and the spawning biomass will remain above SB_{MSY}.

<u>Bigeye</u>: Overfishing is occurring. There is a partial strategy in place based on the various elements of CMM-2008-01 to control the overall level of purse seine effort and the impact of associated sets. Projections to 2021 indicate that fishing mortality would be reduced to close to the F_{MSY} level, and the stock would move to a slightly overfished state. However, these conclusions should be treated with caution because projections are based on incomplete data and the assumption that catch and effort levels in 2010 will be maintained. The 2011 SC recommended a minimum of 32% reduction in fishing mortality from the average levels for 2006–2009. There are positive signs that CMM-2008-01 has reduced fishing mortality, however, it is too early to quantitatively conclude the effectiveness of CMM-2008-01 in bringing about reductions to sustainable levels.

Sharks: CMM-2006-05 (amended in 2008 (CMM-2008-06), 2009 (CMM-2009-04) and 2010 (CMM-2010-07)) is specific to shark bycatch management. It requires that CCMs take measures to (i) implement the FAO International Plan of Action for the Conservation and Management of Sharks (non-binding); (ii) define key shark species / shark catch & discard reporting requirements (non-binding); (iii) support research and development of strategies for the avoidance of unwanted shark captures (non-binding); (iv) fully utilize any retained catches of sharks (inc restrictions on finning (binding); (v) to prohibit their fishing vessels from retaining, trans-shipping, landing, or trading any fins (binding) and (vi) encourage the release of live sharks (binding). The Fiji Fisheries Department has diligently communicated the requirements of these CMMs to the UoC and shark gear is banned on Fijian domestic vessels as a license condition. The FTBOA makes active efforts to reduce shark bycatch by utilizing monofilament traces (wire traces are banned) that results in most sharks in biting through the line and escaping before being brought alongside

the boat. In additional all the client fleet uses small (size 13 - 14 'D' shaped hooks that tend to have lower shark catch rates. As the fishery tends to operate at greater depths then at where most sharks are found, shark bycatch tends to occur only on the branch lines adjacent to the floats.

<u>Opah</u>: Given that opah is not considered a species of concern at either national or regional level, there are no management measures in place. This is supported by the consistent CPUE and size at capture information

<u>Billfish</u>: At present neither swordfish nor blue marlin are considered to be outside of biologically-based limits and thus, considering the low levels of bycatch from this fishery, no bycatch strategy is currently considered necessary.

75

<u>Yellowfin tuna</u>: there are measures and a partial strategy in place to constrain effort. Projections of stock status accounting for the measures of this partial strategy suggest that the stock will be maintained at levels which are highly likely to be within biologically based limits. There is some evidence that effort restrictions are being implemented successfully. Thereby meeting all the scoring issues under the 80 SG.

<u>Bigeye tuna</u>: there are measures and a partial strategy in place to constrain effort and reduce juvenile bigeye mortality from FAD use. There is some evidence that the FAD closure and effort restrictions are being implemented successfully. Although evaluation of the effectiveness of CMM-2008-01 as a whole is in its early days, SC7 noted that trends the preliminary analysis demonstrated that: i) incidence of reported activity related to use of drifting FADs was considerably lower in 2010 compared to 2009; ii) total catch was below average during the 2009 closure and in September of the 2010 closure; iii) catches of bigeye tuna were strongly reduced during both closure periods compared to the other months of those years; and iv) 2010 proportions of catch and effort associated with FAD usage outside the closure period had lower FAD usage than is typically the case. Continued evaluation of the effectiveness of CMM-2008-01 will be required and additional measures adopted if required. Thereby meeting all the scoring issues under the 80 SG.

Sharks: there is a precautionary partial strategy in response to the potential vulnerability of shark species that is expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure the fishery does not hinder their recovery and rebuilding (80). There is an objective basis that this strategy (prohibition of wire traces, deep-set fishing and the use of small, circular hooks and the recommended release of live sharks) will work (80). However there is some evidence that this strategy is no always being adhered to (e.g. live sharks are not released and are retained) (60). Thereby meeting all the scoring issues under the 60 SG with an overall score of 70.

Condition 4 has been set to address this short-coming.

References

WCPFC-SC, 2011; SPC-OFP, 2011b; Davies *et al.*, 2011; Langley *et al.*, 2011; Hampton & Harley, 2009; Hampton & Harley, 2010; SPC, 2009; CMM-2008-01; CMM-2010-07; Lack & Meere, 2009; Lucas, 2010; Kirby & Hobday, 2007.

	PI	SG60	SG80	SG100
2.1.3	<i>Information / monitoring:</i> Information on the nature and extent of retained species is adequate to determine the risk posed	<u>Qualitative information</u> is available on the amount of main retained species taken by the fishery.	<u>Qualitative information</u> and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	by the fishery and the effectiveness of the strategy to manage	Information is <u>adequate</u> to <u>qualitatively</u> assess outcome status with respect to biologically based limits.	Information is <u>sufficient</u> to estimate outcome status with respect to biologically based limits.	Information is <u>sufficient</u> to <u>quantitatively</u> estimate outcome status with a <u>high degree of</u> <u>certainty</u> .
	retained species.	Information is adequate to support <u>measures</u> to manage <u>main</u> retained species.	Information is adequate to support a <u>partial</u> <u>strategy</u> to manage <u>main</u> retained species.	Information is adequate to support a <u>comprehensive strategy</u> to manage retained species, and evaluate with a <u>high degree of certainty</u> whether the strategy is achieving its objective.
			Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.

Scoring Comments

This assessment includes information on the catches of other fleets outside the assessment, including those from Indonesia and the Philippines. This takes a precautionary approach given the FAM guidance on the scope of P2 (FAM v2, 7.1.14)

<u>Tunas</u>: Accurate and verifiable information is available on the catch of both yellowfin and bigeye tuna from the fleets under assessment. This is incorporated in the regular stock assessments. Information has been lacking from some fishery regions (notably Indonesia and the Philippines), however projects have been undertaken to improve these data for inclusion in the assessment). Information is sufficient to estimate outcome status with respect to biologically based limits. Information is available from a cross-section of data sources which are continually being monitored and improved as the need arises. This includes the observer programme, on-board & port sampling strategies and VMS.

Sharks: Some steps have already been taken toward assessment of shark species through a multi-year project on ecological risk assessment conducted by SPC in collaboration with FFA, CCMs and non-governmental organizations (NGOs), and presented to the SC at each of its meetings beginning in 2006. In 2010 the WCPFC SC agreed a research plan for the assessment of the status of these stocks (Clarke & Harley, 2010). To date this research due to be completed in mid-2013 has a (i) provided shark data to WCPFC for use in further assessments, (ii) created a shark tagging information system and a meta-database of tagging studies; and (iii) prepared a proposed approach to the upcoming silky and oceanic whitetip shark assessments. In February 2011, the WCPFC rules for "Scientific Data to be Provided to the Commission" were revised to specify provision of annual catch estimates and operational level catch and effort data from longline and troll (in number) fisheries for blue, silky, oceanic whitetip, mako, thresher, porbeagle, and hammerhead sharks (winghead, scalloped, great and smooth) sharks. Size data are also required for those species for which stock assessments will be undertaken. CMM-2009-04 (and subsequently CMM-2010-07) also requires that each CCM include both catches and discards of silky shark

and oceanic whitetip (as well as blue shark, mako shark and thresher shark) to species level in their annual reports (Shelley Clarke, pers. comm., 04 Aug. 2010).

<u>Opah</u>: most companies quantifiably record catches of opah on log sheet and it is included in the Regional Observer Programme. As a result, there are good long-term data sets on catch and effort data of this species. Much of this was made available to the assessment team and it was concluded that this information is sufficient to indicate that the fishery is not impact the status of this species.

<u>Swordfish</u>: As swordfish are an important target species of other, shallow-set longline fisheries in the South Pacific, there is considerable information available on which to base stock assessments. As a precursor to a possible swordfish stock assessment in 2012, WCPFC recently reviewed the data holdings in respect to South Pacific swordfish stocks. This concluded that the main weakness was the need to utilize commercial catch rates as relative abundance indices and efforts are being made to address this.

<u>Blue marlin</u>: as with swordfish, there is considerable information available on which to base stock assessments. In particular, there is considerable commercial catch data on this species as it has been included in standard regional longline logsheets since 1996.

Score: 75

Tunas: Accurate and verifiable information is available on the catch of both yellowfin and bigeye tuna from the fleets under assessment. This is incorporated in the regular stock assessments. Information has been lacking from some fishery regions (notably Indonesia and the Philippines), however projects have been undertaken to improve these data for inclusion in the assessment. (80). The information is sufficient to use in sophisticated stock assessments that estimate outcome status with respect to biologically based limits (80). There are management strategies in place for bigeye and yellowfin tuna and information is adequate to support these partial strategies (80). A high level of information is available from the assessed fleets. This information is available from a cross-section of verifiable data sources, which are continually being monitored and improved as the need arises. This includes the observer programme, on-board & port sampling strategies and VMS (80). Sufficient data is being collected to detect a change in risk level but there is not yet information to assess whether the management strategy is achieving its objective with a high degree of certainty (80). Thereby meeting all the scoring issues under the 80 SG.

<u>Sharks</u>: there is both qualitative and quantitative information on the amount of all the main shark bycatch species (e.g. blue shark and mako) and most of the minor shark bycatch (e.g. oceanic white tip and silky sharks) taken by this fishery (80). However this information is only adequate to qualitatively assess outcome status with respect to biologically based limits (60). This information is adequate to support a <u>partial strategy</u> to manage the main shark bycatch species, but not sufficient to evaluate with a high degree of certainty (i.e. recent observer information on shark finning levels) whether a strategy is achieving its objective (80). At present there is insufficient detail to assess ongoing mortalities to all bycatch species as observer information suggests that much of the shark catch is currently retained rather than released (60). Thereby meeting all the scoring issues under the 60 SG with an overall score of 70.

<u>Other finfish</u>: there is both qualitative and quantitative information on most of the minor bycatch (e.g. opah, swordfish and blue marlin) taken by this fishery as all are recorded in commercial log sheets and observer records (80). This fisheries-dependent information is sufficient to qualitatively assess outcome status with respect to biologically based limits (80). This information is adequate to support a <u>partial strategy</u> to manages the minor bycatch species where necessary, but the relatively low observer levels suggest this is not sufficient to evaluate with a high degree of certainty whether a strategy is achieving its objective (80). There is sufficient detail to assess ongoing mortalities to these minor bycatch species to detect any increase in risk level (80). Thereby meeting all the scoring issues under the 80 SG.

Condition 5 has been set to address this short-coming.

Audit Trace References

Williams, 2010; Lawson, 2011, 2nd session of the WCPFC in December 2005; GEF-funded West Pacific East Asia Oceanic Fisheries Management Project (WPEA OFM); Kirby & Molony 2006; Manning *et al.*, 2009; WCPFC-SC, 2010; Clarke & Harley, 2010; CMM-2010-07; Amoe, 2011; Hawn *et al.*, 2002; WCPFC-SC, 2011.

2.2	Discarded species (also known as "bycatch" or "discards")
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	PI	SG60	SG80	SG100
2.2.1	Status The fishery does	Main bycatch species are likely to be within	Main bycatch species are highly likely to be	There is a high degree of certainty that
	not pose a risk of serious	biologically based limits, or if outside such	within biologically based limits or if outside	bycatch species are within biologically based
	or irreversible harm to the	limits there are mitigation measures in place	such limits there is a <u>partial strategy</u> of	limits.
	bycatch species or species	that are <u>expected</u> to ensure that the fishery	demonstrably effective mitigation measures in	
	groups and does not hinder	does not hinder recovery and rebuilding.	place such that the fishery does not hinder	
	recovery of depleted		recovery and rebuilding.	
	bycatch species or species	If the status is poorly known there are		
	groups.	measures or practices in place that are		
		expected to result in the fishery not causing		
		the bycatch species to be outside biologically		
		based limits or hindering recovery.		

The majority of the catch is retained, with less than 5% of the total catch (by number or 1.4% by weight) discarded. This is covered in either Principle 1 (albacore) or Principle 2.1 (other retained species). No one bycatch species exceeds 0.5% of total catch by weight and thus all can be considered as minor bycatch and are not considered further in this assessment. In addition to the bycatch species listed above, this fishery utilizes frozen bait, mainly *Sardinops saygax* (known commonly as the 'sardine or 'South American pilchard') from South Africa. This species is therefore included in this assessment.

The estimate of total sardine biomass increased slightly, though not significantly, from a very low level of 260,000 t in 2007 to 380,000 t in 2008. The 2009 recruit estimate of 9.2 billion fish was similar to that measured in 2006 and appreciably higher than during 2007 and 2008, and contributed to a slight increase in the sardine spawner biomass by the end of 2009. Recruitment of sardine, however, has remained below average for six consecutive years and as such growth in the abundance of the adult population remains slow. The fishery is considered to be optimally exploited (DAFF, 2010).

Score: 80

Sardinops saygax: this species is currently considered are to be highly likely to be within biologically-based limits. Thereby meeting all the scoring issues under the 80 SG.

Although not currently outside these limits, concern over recent low recruitment has resulted in a reduction of the annually set TAC to a precautionary low level of 100,000 t since 2008. This has resulted in increase of the total sardine biomass from 260,000 t in 2007 to 380,000 t in 2008. Thereby meeting all the scoring issues under the 80 SG.

Audit Trace References DAFF, 2010

SCORING GUIDEPOST 100

	PI	SG60	SG80	SG100
2.2.2	PI <i>Management strategy:</i> There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch	SG60 There are <u>measures</u> in place, if necessary, which are expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery. The measures are considered likely to work,	SG80 There is a <u>partial strategy</u> in place, if necessary, for managing bycatch that is expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery. There is some objective basis for confidence	SG100 There is a <u>strategy</u> in place for managing and minimising bycatch. The strategy is mainly based on information
	populations.	based on plausible argument (e.g. general	that the partial strategy will work, based on	directly about the fishery and/or species
		fisheries/species).	and/or the species involved.	that the strategy will work.
				There is some <u>evidence</u> that the strategy is achieving its objective.
			There is <u>some evidence</u> that the partial strategy is being implemented successfully.	There is <u>clear evidence</u> that the strategy is being implemented successfully, and intended changes are occurring.

Scoring Comments

<u>Sardinops saygax</u>: is part of a multispecies (it includes the anchovy *Engraulis encrasciolus* and the round herring *Etrumeus whiteheadi*) Operational Management Procedure (OMP) consisting of agreed formulae that base the TAC on observed stock sizes. The OMP formulae have been selected with the objectives of maximising average directed sardine and anchovy catches in the medium term, subject to constraints on the extent to which TACs can vary from year to year to enhance industrial stability. The OMP is used to set an annual TAC for directed sardine and an annual initial and final TAC for anchovy, the latter depending on observed anchovy recruitment strength. A fixed precautionary upper catch limit (PUCL) of 100,000 t applies for round herring, irrespective of the population size. Juvenile sardine and juvenile horse mackerel are both taken as bycatch during anchovy-directed fishing operations; a total allowable bycatch (TAB) limit is set for juvenile sardine and a fixed PUCL of 5,000 t is set for horse mackerel.

Score 95

There is a clear strategy for managing this species in the form of the OMP. Thereby meeting all the scoring issues under the 100 SG.

This is based on annual hydro-acoustic surveys that have been conducted since 1984 which has allowed the setting of annual TACs for the stocks of this dynamic species. DAFF considers that the quantity and quality of information provided by these surveys to be "among the best in the world", suggeting high confidence that the strategy will work. Thereby meeting all the scoring issues under the 100 SG.

Based on the patterns of stock recovery following TAC implementation, there is some evidence that the strategy is achieving its objective. Thereby meeting all the scoring issues under the 100 SG.

Likewise based on the two stock assessments undertaken each year (summer spawner biomass survey and a recruit survey in winter), there is clear evidence that the strategy is being implemented successfully and intended changes are occurring. However recruitment of sardine has remained below average for six consecutive years and as such growth in the abundance of the adult population remains slow (80). Thereby meeting all the scoring issues under the 80 SG.

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Audit Trace References	
DAFF, 2010	

	PI	SG60	SG80	SG100
2.2.3	Information / monitoring	Qualitative information is available on the	Qualitative information and some quantitative	Accurate and verifiable information is
	Information on the nature	amount of main bycatch species affected by	information are available on the amount of main	available on the amount of all bycatch and the
	and amount of bycatch is	the fishery.	bycatch species affected by the fishery.	consequences for the status of affected
	adequate to determine the			populations.
	risk posed by the fishery	Information is adequate to broadly understand	Information is sufficient to estimate outcome	Information is sufficient to quantitatively
	and the effectiveness of the	outcome status with respect to biologically	status with respect to biologically based limits.	estimate outcome status with respect to
	strategy to manage	based limits.		biologically based limits with a high degree of
	bycatch.			<u>certainty</u> .
		Information is adequate to support measures	Information is adequate to support a partial	Information is adequate to support a
		to manage bycatch.	strategy to manage main bycatch species.	comprehensive strategy to manage bycatch,
				and evaluate with a high degree of certainty
				whether a strategy is achieving its objective.
			Sufficient data continue to be collected to detect	Monitoring of bycatch data is conducted in
			any increase in risk to main bycatch species	sufficient detail to assess ongoing mortalities
			(e.g. due to changes in the outcome indicator	to all bycatch species.
			scores or the operation of the fishery or the	
			effectiveness of the strategy).	

Populations of anchovy and sardine have been closely monitored through hydro-acoustic surveys conducted annually since 1984. Two main assessment surveys are conducted each year, including a summer spawner biomass survey that estimates the total size of the stock and a recruit survey in winter that estimates the number of fish that recruit to the population. These surveys also provide data for the estimation of a number of other key biological parameters (e.g. age structure) that are required as input for the OMP, many of which can only be estimated accurately from data collected during fishery-independent surveys. Samples for a variety of studies on aspects of the biology and ecology of small pelagic fish species are also collected during these surveys. The use of improved technology during the hydro-acoustic surveys over time has led to a major revision and improvement of the acoustic time-series of abundance estimates. Currently, the quantity and quality of information provided by these surveys is considered by DAFF among the best in the world, and corrections to account for differences between the old and new systems and to take account of new information are incorporated into the current anchovy and sardine assessment models (DAFF, 2010). Apart from these fishery-independent surveys, the management of the pelagic fishery is also highly dependent on accurate reporting of catch statistics (landed mass, catch position and date) and representative sampling of the commercial catches, in particular the length and age frequency distributions of harvested fish.

Score: 100

<u>Sardinops saygax</u>: Through annual hydro-acoustic surveys there is accurate and verifiable information is available on the catch of this species and the consequences for the status its stock. This information, which is the main basis for an Operational Management Procedure (OMP) and is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty (100). Information is adequate to support a comprehensive strategy, in the form of the OMP (and associated TACs and TAB's) to manage bycatch, and evaluate with a high degree of certainty whether a strategy is achieving its objective. Monitoring of bycatch data (e.g. stock assessment of *Sardinops saygax*) is conducted in sufficient detail to assess ongoing mortalities to all bycatch species (100). Thereby meeting all the scoring issues under the 100 SG.

Audit Trace References

DAFF, 2010

2.3	Endangered, Threatened a	and Protected (ETP) species		
	PI	SG60	SG80	SG100
2.3.1	<i>Status:</i> The fishery meets	Known effects of the fishery are likely to be	The effects of the fishery are known and are	There is a high degree of certainty t

2.3.1	Status: The fishery meets	Known effects of the fishery are <u>likely</u> to be	The effects of the fishery are known and are	There is a <u>high degree of certainty</u> that the
	national and international	within limits of national and international	highly likely to be within limits of national and	effects of the fishery are within limits of
	requirements for protection	requirements for protection of ETP species.	international requirements for protection of ETP	national and international requirements for
	of ETP species.		species.	protection of ETP species.
		Known direct effects are unlikely to create	Direct effects are highly unlikely to create	There is a <u>high degree of confidence</u> that there
	The fishery does not pose a	unacceptable impacts to ETP species.	unacceptable impacts to ETP species.	are no significant detrimental effects (direct
	risk of serious or			and indirect) of the fishery on ETP species.
	irreversible harm to ETP		Indirect effects have been considered and are	
	species and does not		thought to be unlikely to create unacceptable	
	hinder recovery of ETP		impacts.	
	species.			

Sea Turtles: this assessment has focused on the four key ETP species, as discussed in Section 7.4 (Hawksbill turtle, Leatherback turtle, Loggerhead turtle, Olive Ridley turtle, each of which have less than 0.01% of the catch by weight). The Fiji national observer records showed a higher level of interaction with turtles in 2009 (2 loggerhead sea turtles, 1 Hawksbill, 1 Leatherback, 2 Olive Ridley Turtles) compared to the previous years. This is attributed to the improved reporting by the national observer programme. All four species are CITES Appendix I listed by Fiji and are also all protected under the Endangered & Protected Species Act (2002).

Interactions are rare as the gear is deep set, so incidental capture tends to be limited to accidental entanglement or hooking (e.g. around the flippers) as the gear is retrieved. All crew are trained (NMFS / McCoy (2009) & Fisheries Department (2011)) and equipped (de-hooking tools / line cutters) to release any hooked turtles.

As stated above, the incidence of capture is very low. Of the five sea turtles individuals observed by the ROP to have been caught in the fishery, four were released alive, with only one (a Hawksbill) retrieved dead. As a result, due to depth of gear deployment, actual mortality caused to this species by the unassociated unit of certification is very low. As a result, it is not considered that the fishery causes unacceptable impacts to this species.

Cetaceans: There are a number of whale species protected by CITES in Fiji, including include false killer whales *Pseudorca crassidens*, and short-finned pilot whales *Globicephala macrorhynchus* but other cetacean species including killer whales *Orcinus orca* that are known to predate tuna. No cetaceans are caught or killed by this fishery. Toothed whale depredation on hooked tuna is a significant problem, but as all forms of fire arms and explosive devices are banned on Fijian vessels, no proactive measures are currently undertaken, although various devices to reduce post-hooking depredation (e.g. monofilament mesh, chains and steel rings deployed in repose to a tuna being hooked) are currently under investigation.

Sea birds: A number of seabirds are protected by Fiji's Endangered and Protected Species Act 2002, including the Polynesian storm-petrel *Nesofregetta albigularis*, white-tailed tropicbird *Phethon lepturus*, the Fiji petrel *Pseudobulweria macgillivrayi* and the Tahiti petrel *Pseudobulweria rostrata*. In general, seabird bycatch rates in tropical longline fisheries are believed to be lower than those found in high latitudes. The species of seabird most commonly associated with longline bycatch, albatrosses and large petrels, are infrequently encountered over tropical waters in the West Pacific. However, several species of shearwater and smaller petrel are found in the tropical latitudes of the Pacific, and are considered likely to be susceptible to bycatch. To date, data available indicate low seabird bycatch rates, but that seabird bycatch may occur. However industry sources suggest that this is extremely rate in Fijian waters.

Score: 85

Sea turtles: given the very low interactions (c. 0.01% of catch volume) there is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of sea turtles (80). Given the observed live condition of released sea turtles of 80%, it is unlikely that there are significant detrimental effects (direct and indirect) of

the fishery on sea turtle populations (80). Thereby meeting all the scoring issues under the 80 SG.

Cetaceans: given that mortality resulting from this fishery on cetaceans is extremely unlikely, there is a high degree of certainty that the effects of the fishery are within limits of national and international requirements and that there is a high degree of confidence that there are no significant detrimental effects (direct and indirect) of the fishery on cetaceans. Thereby meeting all the scoring issues under the 100 SG.

Seabirds: The effects of the fishery are highly likely to be within limits of national and international requirements for protection of seabird species (80). Direct effects are highly unlikely to create unacceptable impacts to seabird species (80). The indirect effects have been considered and are thought to be unlikely to create unacceptable impacts (80). Thereby meeting all the scoring issues under the 80 SG.

Audit Trace References

SPC Catch database (Peter Williams, pers. comm., 2011).

2.3.2	Management strategy	There are measures in place that minimise	There is a strategy in place for managing the	There is a <u>comprehensive strategy</u> in place for
	The fishery has in place	mortality, and are expected to be highly likely	fishery's impact on ETP species, including	managing the fishery's impact on ETP
	precautionary management	to achieve national and international	measures to minimise mortality that is designed	species, including measures to minimise
	strategies designed to:	requirements for the protection of ETP	to be highly likely to achieve national and	mortality that is designed to achieve above
	- meet national and	species.	international requirements for the protection of	national and international requirements for the
	international requirements;		ETP species.	protection of ETP species.
	- ensure the fishery does	The measures are considered likely to work,	There is an objective basis for confidence that	The strategy is mainly based on information
	not pose a risk of serious	based on plausible argument (e.g. general	the strategy will work, based on information	directly about the fishery and/or species
	or irreversible harm to	experience, theory or comparison with similar	directly about the fishery and/or the species	involved, and a quantitative analysis supports
	ETP species;	fisheries/species).	involved.	high confidence that the strategy will work.
	- ensure the fishery does			
	not hinder recovery of ETP		There is evidence that the strategy is being	There is <u>clear evidence</u> that the strategy is
	species; and		implemented successfully.	being implemented successfully, and intended
	- minimise mortality of			changes are occurring. There is evidence that
	ETP species.			the strategy is achieving its objective.

There are a number of specific management actions taken by the CCMs to protect iconic and vulnerable species. The objective of the WCPFC is to: "...to ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stocks in the western and central Pacific Ocean...". The WCPFC's management mandate relates to highly migratory fish species and extends to the management of non-target species taken in fisheries for target stocks, in particular through the WCPFC2 Resolution on Non-Target Fish Species. Mechanisms to reduce interactions with non-target species, including ETPs, includes the preparation of risk assessments at regional level (e.g. Kirby, 2006; Kirby and Hobday, 2007) as well as within the PICT EAFM reports that allow the identification of management measures if deemed necessary by the Ecosystems and Bycatch Specialist Working Group (EB SWG).

Sea turtles: CMM-2008-03 is applied to turtles but is aimed primarily at shallow-set longlines, rather than deep-set albacore fisheries like the one under assessment. At a national level, the 'Fiji Sea Turtle Recovery Plan' provides a prioritised action plan for addressing sea turtle conservation, including a specific sub-component for 'assessing and mitigating bycatch' (Component 1b). At an industry level there have been regular efforts to mitigate sea turtle mortality by ensuring that de-hooking and other tools are both available on vessels and that crew are sensitised and trained in their use. The low level of turtle bycatch – and the high level of successful release of sea turtles alive (80% of observed cases) - suggests that the strategy is being implemented successfully.

Cetaceans: As mentioned above, a number of whale species are protected by CITES in Fijian waters, thus restricting (but not stopping) trade of this animals in Fiji. At present, given the types of interaction of this fishery with cetaceans (e.g. depredation of caught tuna), there are no specific management measures in place to protect these species.

Sea birds: CMM-2007-04 requires CCMs to implement the International Plan of Action for Reducing Incidental Catches of Seabirds in Longline Fisheries (IPOA-Seabirds) if they have not already done so and report to the Commission on their implementation of the IPOA-Seabirds, including, as appropriate, the status of their National Plans of Action for Reducing Incidental Catches of Seabirds in Longline Fisheries. CMM-2007-04 adopts that CCMs should encourage their longline vessels fishing in areas north of 30°S to employ one or more of a number of listed seabird mitigation measures; one of these - a deep setting line shooter - is employed by the fleet under assessment and most sets are commenced between the hours of 4-5 in the morning before it is light, although setting may continue into daylight hours.

Score: 90

Sea turtles: Through the Fiji Sea Turtle Recovery Plan there is a strategy in place for managing the fishery's impact on sea turtle species, including measures to minimise mortality that is designed to be highly likely to achieve national and international requirements for the protection of ETP species. This plan is detailed and reflects international best practise that provides an

objective basis for confidence that the strategy will work, based on information directly about the fishery and species involved. The low level of turtle bycatch – and the high level of successful release of sea turtles alive (80% of observed cases) - suggests that the strategy is being implemented successfully but it is less clear that intended changes are occurring. Thereby meeting all the scoring issues under the 80 SG.

Cetaceans: Key legislation for vulnerable whale species includes the Endangered and Protected Species Act, which includes the establishment of the Fiji Islands CITES Management Authority and the Fiji Islands CITES Scientific Council. An Environmental Risk Assessment process has been performed at a regional level that aims at identifying those species most at risk from fisheries from additional mortality above natural levels. Given that negative interactions with whales are limited to their very rare entanglement, no specific conservation strategy (beyond the nature of the fishing operation which minimizes cetacean bycatch) is required. Thus the operational methodology of the deep-set long line fishing method appears appropriate to eliminate ETP interactions. Thereby meeting all the scoring issues under the 100 SG.

Seabirds: The operational methodology of the deep-set long line fishing method appears appropriate to reduce potential interactions to very low levels and there is a high degree of confidence that there are no significant detrimental effects (direct or indirect). Thereby meeting all the scoring issues under the 100 SG.

Audit Trace References

WCPFC2 Resolution on non-target fish species; Kirby, 2006; Kirby & Hobday, 2007; Lack & Meere, 2009

SCORING GUIDEPOST 80

SCORING GUIDEPOST 100

	PI	SG60	SG80	SG100
2.3.3	Information / monitoring	Information is <u>adequate</u> to <u>broadly understand</u>	Information is sufficient to determine whether	Information is sufficient to quantitatively
	Relevant information is	the impact of the fishery on ETP species.	the fishery may be a threat to protection and	estimate outcome status with a high degree of
	collected to support the		recovery of the ETP species, and if so, to	certainty.
	management of fishery		measure trends and support a <u>full strategy</u> to	
	impacts on ETP species,		manage impacts.	
	including:	Information is adequate to support measures		Information is adequate to support a
	- information for the	to manage the impacts on ETP species		comprehensive strategy to manage impacts,
	development of the			minimize mortality and injury of ETP species,
	management strategy;			and evaluate with a high degree of certainty
	- information to assess the			whether a strategy is achieving its objectives.
	effectiveness of the	Information is sufficient to qualitatively	Sufficient data are available to allow fishery	Accurate and verifiable information is
	management strategy; and	estimate the fishery related mortality of ETP	related mortality and the impact of fishing to be	available on the magnitude of all impacts,
	- information to determine	species.	quantitatively estimated for ETP species.	mortalities and injuries and the consequences
	the outcome status of ETP			for the status of ETP species
	species.			-

Scoring Comments

There is some information on the catch numbers, approximate volume, fate, and condition upon release etc through observer coverage (c. 7.6%). This is supported by robust debriefing and quality control processes that are considered adequate. Information is adequate to broadly understand the impact of the fishery on ETP species.

This information is adequate to support measures to manage the impacts on ETP species and to qualitatively estimate the fishery related mortality of ETP species.

However, it is not adequate to quantitatively estimate outcome status with a high degree of certainty, nor support a full strategy to manage impacts, nor the consequences for the status of ETP species because it cannot support species-specific stock assessments.

Score: 60

Information is adequate to broadly understand the impact of the fishery on ETP species. Thereby meeting all the scoring issues under the 60 SG.

Information is adequate to support measures to manage the impacts on ETP species. Thereby meeting all the scoring issues under the 60 SG.

Information is sufficient to qualitatively estimate the fishery related mortality of ETP species. Thereby meeting all the scoring issues under the 60 SG.

Condition 6 has been set to address this shortcoming.

Audit Trace References

SPC Catch database (Peter Williams, pers. comm., 4 August 2010); Watling, 2002; Gillett, 2010.

SCORING (CRITERIA
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2.4 Habitat		
	2.4	Habitat

	PI	SG60	SG80	SG100	
2.4.1	Status The fishery does	The fishery is <u>unlikely</u> to reduce habitat	The fishery is highly unlikely to red	uce habitat	There is evidence that the fishery is highly
	not cause serious or	structure and function to a point where there	structure and function to a point whe	ere there	unlikely to reduce habitat structure and
	irreversible harm to habitat	would be serious or irreversible harm.	would be serious or irreversible harr	n.	function to a point where there would be
	structure, considered on a				serious or irreversible harm.
	regional or bioregional				
	basis, and function.				

Scoring Comments

The benthic habitat will not be impacted by the pelagic and open-ocean nature of the albacore longline fishery and the light gear type used. Impacts will, therefore, be limited to the pelagic habitat, and are expected to be both transient and negligible. As a result, the fishery is highly unlikely to reduce any habitat structure and function to a point where there would be serious or irreversible harm.

Score 100

The fishery has no impact on habitats that would reduce habitat structure and function to a point where there would be serious or irreversible harm thereby meeting all the scoring issues under the 100 SG. (FAM 7.5.5).

Audit Trace References

Le Borgne et al., 2002; McPhaden & Picaut, 1990; Lehodey et al., 1997; Leroy et al., 2010

SCORING GUIDEPOST 80

SCORING GUIDEPOST 100

	PI	SG60	SG80	SG100
2.4.2	Management strategy	There are measures in place, if necessary, that	There is a <u>partial strategy</u> in place, if necessary,	There is a strategy in place for managing the
	There is a strategy in place	are expected to achieve the Habitat Outcome	that is expected to achieve the Habitat Outcome	impact of the fishery on habitat types.
	that is designed to ensure	80 level of performance.	80 level of performance or above.	
	the fishery does not pose a	The measures are considered likely to work,	There is some objective basis for confidence	The strategy is mainly based on information
	risk of serious or	based on plausible argument (e.g. general	that the partial strategy will work, based on	directly about the fishery and/or habitats
	irreversible harm to habitat	experience, theory or comparison with similar	information directly about the fishery and/or	involved, and testing supports high confidence
	types.	fisheries/habitats).	habitats involved.	that the strategy will work.
			There is some evidence that the partial strategy	There is <u>clear evidence</u> that the strategy is
			is being implemented successfully.	being implemented successfully, and intended
				changes are occurring. There is some evidence
				that the strategy is achieving its objective.

Scoring Comments

Given the pelagic nature of this fishery, which takes place in very deep oceanic water even within the archipelagic waters, it is not necessary to have a strategy for managing the impact of the fishery on habitat types. Whilst some gear losses takes place (when tangled or when live sharks and other bycatch is released with the hooks still in place), the mortality rate from lost demersal longlines is usually low (ICES, 2000; Huse *et al*, 2002) as they stop fishing when bait is lost.

Score: 100

No strategy beyond operational limits (e.g. fishing depths) is required due to the lack of contact with physical habitats. Thereby meeting all the scoring issues under the 100 SG.

Audit Trace References

Le Borgne et al., 2002; McPhaden & Picaut, 1990; Lehodey et al., 1997; Leroy et al., 2010

	PI	SG60	SG80	SG100
2.4.3	Information / monitoring	There is a basic understanding of the types	The nature, distribution and vulnerability of all	The distribution of habitat types is known over
	Information is adequate to	and distribution of main habitats in the area of	main habitat types in the fishery area are known	their range, with particular attention to the
	determine the risk posed to	the fishery.	at a level of detail relevant to the scale and	occurrence of vulnerable habitat types.
	habitat types by the fishery		intensity of the fishery.	
	and the effectiveness of the			
	strategy to manage impacts	Information is adequate to broadly understand	Sufficient data are available to allow the nature	Changes in habitat distributions over time are
	on habitat types.	the nature of the main impacts of gear use on	of the impacts of the fishery on habitat types to	measured.
		the main habitats, including spatial overlap of	be identified and there is reliable information on	
		habitat with fishing gear	the spatial extent of interaction, and the timing	
			and location of use of the fishing gear.	
			Sufficient data continue to be collected to detect	The physical impacts of the gear on the habitat
			any increase in risk to habitat (e.g. due to	types have been quantified fully.
			changes in the outcome indicator scores or the	
			operation of the fishery or the effectiveness of	
			the measures).	

The habitat under consideration is the pelagic water column, where any impacts would be transient and negligible. In this case there is no hard substrate involved as the fishery takes place on the surface in deep oceanic waters. The physical, chemical and biological properties of the WCPO water column are regularly monitored. The FTBOA all operate under a VMS scheme and thus there is accurate, near real-time monitoring of the spatial extent of interaction, and the timing and location of use of the fishing gear. There is regular qualitative and quantitative monitoring of key species composition in the Pacific Ocean.

Score: 100

The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types; the habitats are entirely pelagic, and so are well known. There are no vulnerable habitats. Thereby meeting all the scoring issues under the 100 SG.

Changes in habitat distributions over time are measured. Not applicable as fishery is entirely pelagic. Thereby meeting all the scoring issues under the 100 SG.

The physical impacts of the gear on the habitat types have been quantified fully; observer data would quantify any impacts on habitat, should this occur. Thereby meeting all the scoring issues under the 100 SG.

Audit Trace References

Le Borgne et al., 2002; McPhaden & Picaut, 1990; Lehodey et al., 1997; Leroy et al., 2010

structure and function.

SCORING GUIDEPOST 60

irreversible harm.

2.5	Ecosystem			
	PI	SG60	SG80	SG100
2.5.1	Status The fishery does	The fishery is unlikely to disrupt the key	The fishery is highly unlikely to disrupt the key	There is evidence that the fishery is highly
	not cause serious or	elements underlying ecosystem structure and	elements underlying ecosystem structure and	unlikely to disrupt the key elements
	irreversible harm to the	function to a point where there would be a	function to a point where there would be a	underlying ecosystem structure and function
	key elements of ecosystem	serious or irreversible harm.	serious or irreversible harm.	to a point where there would be a serious or

Scoring Comments

Albacore is an 'apex' or 'top' predator. Their diet is well understood across their life history stages, while their predators when in their juvenile stages are also reasonably well known. Apex predators play a crucial role in maintaining the health of an ecosystem, exerting substantial control over the population sizes of many species at lower levels of the food web. Consequently, they may contribute to the stability of marine ecosystems, and maintain biodiversity. Albacore stocks in the region appear to be above B_{MSY} . At these levels, there would be a sizeable proportion of biomass remaining in the ecosystem, and removals at this level are unlikely to lead to serious harm.

Sibert *et al* (2006) analysed available data from Pacific tuna fisheries for 1950–2004 to provide comprehensive estimates of fishery impacts on population biomass and size structure. Exploited western Pacific yellowfin and bigeye have declined steadily to levels near the equilibrium biomass that would produce the maximum sustainable yield in the fishery. Skipjack tuna and blue shark appear to have increased slightly, whereas albacore have fluctuated in both directions. At that point, current biomass ranges among species from 36 to 91% of the biomass predicted in the absence of fishing, a level consistent with or higher than standard fisheries management targets. Fish larger than 175 cm FL had decreased from 5% to approximately 1% of the total population. The trophic level of the catch had decreased slightly, but the authors concluded that there was no detectable decrease in the trophic level of the population. These results indicated substantial, though not irreversible, impacts of fisheries on these top-level predators and minor impacts on the ecosystem in the Pacific Ocean.

WWF's submission to this assessment cites studies that indicate a potentially more extensive rather than intensive impact when removing top predators from South Pacific Subtropical Gyre system, where Fiji belongs. In consequence, the fishery is less likely to create a trophic cascade as defined in FAM para 7.6.3 a), with significant increase in abundance of one or few species and decreased diversity (WWF, WWF Submission to Intertek Moody Marine Ltd, October 2011).

Score: 80

The role of albacore within the ecosystem of the western central Pacific is understood. The status of juvenile and adult albacore populations suggests their ecosystem role is being maintained, and hence impacts of the fishery on the ecosystem will be minor. There is some evidence in the form of results from ecosystem models and because there has been no major change in trophic structure then the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. Thereby meeting all the scoring issues under the 80 SG.

Direct studies of current fishery removal impacts at the ecosystem level would improve the score further.

Audit Trace References

Sibert et al., 2006; Allain, 2010; WWF Submission to Intertek Moody Marine Ltd, October 2011

1	SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100

2.5.2	<i>Management strategy</i> There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function.	There are <u>measures</u> in place, if necessary, that take into account potential impacts of the fishery on key elements of the ecosystem.	There is a <u>partial strategy</u> in place, if necessary, that takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a <u>strategy</u> that consists of a <u>plan</u> , containing measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well- understood functional relationships between the fishery and the Components and elements of the ecosystem.
		The measures are considered likely to work, based on <u>plausible argument</u> (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).	The partial strategy is considered likely to work, based on <u>plausible argument</u> (e.g., general experience, theory or comparison with similar fisheries/ ecosystems). There is <u>some evidence</u> that the measures comprising the partial strategy are being implemented successfully.	This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm. The measures are considered likely to work based on <u>prior experience</u> , plausible argument or <u>information</u> directly from the fishery/ecosystems involved. There is <u>evidence</u> that the measures are being implemented successfully.

The objective of the WCPFC is to: "...to ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stocks in the western and central Pacific Ocean...". The WCPFC's management mandate relates to highly migratory fish species and extends to the management of non-target species taken in fisheries for target stocks, in particular through the WCPFC2 Resolution on Non-Target Fish Species. The ecosystem role of albacore as an apex predator is not explicitly considered within management. Mechanisms to reduce interactions with both target and non-target species includes the preparation of Ecological Risk Assessments at regional level (e.g. Kirby, 2006; Kirby & Hobday, 2007) as well as within the PICT EAFM reports that allow the identification of management measures if deemed necessary by the EB SWG. The major potential impacts are associated with the reducing the removal of target and main retained species and the stock assessment and scientific advice performed under the auspices of the Commission leads to conservation and management measures where appropriate.

There are also specific Articles in the WCPFC Convention text that make provisions for an ecosystem based approach to fisheries.

Score: 80

There is a partial strategy in place based on effort controls (both at regional level and more particularly at national level through license limits) that takes into account available information (e.g. stock assessments, catch and landing records, VMS) and is expected to restrain impacts of the fishery. The partial strategy is represented by the WCPFC regional management of this species that has maintained populations above B_{MSY} . This contributes to a partial plan for ecosystem maintenance, and evidence is available directly from the fishery through the fisheries management and monitoring process. A higher score is achievable given an improved strategy, including, for example, by defining and monitoring key ecosystem health indicator species and defining possible approaches to address potential concerns about ecosystem impacts. Thereby meeting all the scoring issues under the 80 SG.

The partial strategy based in effort control (measures) is considered likely to work, based upon previous experience with effort restricted fisheries and information obtained directly from biological and fisheries-dependent sources. Thereby meeting all the scoring issues under the 80 SG.

There is some evidence from the relative stability of the trophic structure that the measures are being implemented successfully. Thereby meeting all the scoring issues under the 80 SG.

Audit Trace References Kirby, 2006; Kirby & Hobday, 2007; WCPFC2, 2005

I been				
2.5.3	Information / monitoring	Information is adequate to <u>identify</u> the key	Information is adequate to broadly understand	Information is adequate to broadly understand
	There is adequate	elements of the ecosystem (e.g. trophic	the key elements of the ecosystem.	the key elements of the ecosystem.
	knowledge of the impacts	structure and function, community		
	of the fishery on the	composition, productivity pattern and		
	ecosystem.	biodiversity).		
		Main impacts of the fishery on these key	Main impacts of the fishery on these key	Main <u>interactions</u> between the fishery and
		ecosystem elements can be inferred from	ecosystem elements can be inferred from	these ecosystem elements can be inferred from
		existing information, but have not been	existing information, but may not have been	existing information, and have been
		investigated in detail.	investigated in detail.	investigated.
			The main functions of the Components (I.e.	The impacts of the fishery on target, Bycatch,
			target, Bycatch, Retained and ETP species and	Retained and ETP species and Habitats are
			Habitats) in the ecosystem are known.	identified and the main functions of these
				Components in the ecosystem are <u>understood</u> .
			Sufficient information is available on the	Sufficient information is available on the
			impacts of the fishery on these Components to	impacts of the fishery on the Components and
			allow some of the main consequences for the	elements to allow the main consequences for
			ecosystem to be inferred.	the ecosystem to be inferred.
			Sufficient data continue to be collected to detect	Information is sufficient to support the
			any increase in risk level (e.g. due to changes in	development of strategies to manage
			the outcome indicator scores or the operation of	ecosystem impacts.
			the fishery or the effectiveness of the measures).	

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Scoring Comments

SCODINC CDITEDIA

SPC is developing existing EcoPath models by incorporating Trophic Diet Matrix (TDM) analyses to build predator-prey relationships. As well as the TDM, there has been the incorporation of catch and discard information and this model has now being validated. The move into EcoSim provides a non-static approach (EcoPath is mainly 2005 data) to add 2005 – 2007 data series and allow cross-checking against actual catches. The model includes 5-6 fisheries, but is limited to the Western and Central Pacific Ocean warm pool pelagic ecosystem and thus focuses on yellowfin, skipjack and bigeye tunas rather than albacore.

SEAPODYM is a model developed initially for investigating spatial tuna population dynamics under the influence of both fishing and environmental effects. The main features of this model are: (i) forcing by environmental data (temperature, currents, primary production and dissolved oxygen concentration), (ii) prediction of both temporal and spatial distribution of mid-trophic functional groups, (iii) prediction of both temporal and spatial distribution of age-structured predator (tuna) populations, (iv) prediction of total catch and size frequency of catch by fleet when fishing data (catch and effort) are available, and (v) parameter optimization based on fishing data assimilation techniques (see Senina *et al.*, 2008). A recent enhanced version (Lehodey *et al.*, 2008) has been developed that includes a better definition of habitat indices, movements, and accessibility of tuna and tuna-like predators to different vertically migrant and non-migrant micronekton functional groups (Lehodey *et al.*, 2009). The associated modelling of sea temperature rise, its pattern within natural cyclical variability and the impact on the recruitment, growth and distribution of tunas has received increasing attention and is one of the main applications of SEAPODYM. Results of SEAPODYM simulations allow realistic prediction of the large-scale distribution of tuna species (Lehodey, 2001; Lehodey *et al.*, 2008).), including albacore and yellowfin (Lehodey *et al.*, 2010).

More recently WCPFC has been examining the potential of SEAPODYM as management tool specifically for albacore in the South Pacific Ocean (Jurado-Molina *et al.*, 2011) that suggest that SEAPODYM is a complementary and useful tool in the ecosystem approach to fisheries management, providing additional information to assure sustainable exploitation of tuna populations and

SCORING CUIDEPOST 100

avoiding pelagic ecosystem degradation.

A NOAA-funded project (Climate and Fishing Impacts on the Spatial Population Dynamics of Tunas (Project no. 657425) is running two spatial bio-physical models for several tuna species concurrently with different long-term (up to 50 years) climate regime datasets (Weng *et al.*, 2009). It is anticipated that the models will enable researchers to evaluate potential alternative system states due to physical and anthropogenic forcing and to help determine if the impacts of natural climate variability could be anticipated in such a way as to help establish a management regime that accommodates exploitation pressures and natural variability to build sustainable tuna fisheries.

Score: 85

Information is adequate to broadly understand the key elements of the ecosystem. Thereby meeting all the scoring issues under the 100 SG.

Main interactions between the fishery and these ecosystem elements including impacts of removals, large scale oceanographic events, change of variability, climate change can be inferred from existing information, and have been investigated. Thereby meeting all the scoring issues under the 100 SG.

The main functions of the Components (i.e. target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are well known, but not yet fully understood. Thereby meeting all the scoring issues under the 80 SG.

Sufficient information is available from ecosystem modelling and analysis on the impacts of the fishery on the Components (esp. retained tuna and non-tuna discarded components) to allow the main consequences for the ecosystem to be inferred. However, due to the preliminary nature of some of the modelling, this cannot be said of the more detailed elements (eg. trophic structure). Thereby meeting all the scoring issues under the 80 SG.

Information on removals, especially keystone tuna species and from ecosystem modelling and analysis is sufficient to detect any increase in risk level. Thereby meeting all the scoring issues under the 80 SG.

Audit Trace References

V Allain, pers. comm., 3 August 2010; Lehodey et al., 2009; Lehodey, 2001; Lehodey et al., 2008 ; Lehodey et al., 2010 ; Weng et al., 2009; Senina et al., 2008 ; Jurado-Molina et al., 2011

Principle 3	3 The fishery is subject to an	effective management system that respects loca	ll, national and international laws and standard	ls and incorporates institutional and
	operational frameworks th	at require use of the resource to be responsible.	and sustainable	
3.1	Governance and Policy			
3.1.1 La fr: Th wi effi fra - su a: 1 - c: b o a a - c: b o a - c: d	egal and/or customary amework he management system exists ithin an appropriate and fective legal and/or customary amework which ensures that it: Is capable of delivering ustainable fisheries in ccordance with MSC Principles and 2; Observes the legal rights reated explicitly or established by custom of people dependent in fishing for food or livelihood; nd Incorporates an appropriate ispute resolution framework.	The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2. The management system incorporates or is subject by law to a <u>mechanism</u> for the resolution of legal disputes arising within the system. Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for	The management system incorporates or is subject by law to a <u>transparent mechanism</u> for the resolution of legal disputes which is <u>considered to be effective</u> in dealing with most issues and that is appropriate to the context of the fishery. The management system or fishery is attempting to comply in a timely fashion with binding judicial decisions arising from any legal challenges.	The management system incorporates or is subject by law to a <u>transparent mechanism</u> for the resolution of legal disputes that is appropriate to the context of the fishery and has been <u>tested and proven to be effective</u> . The management system or fishery acts proactively to avoid legal disputes or rapidly implements binding judicial decisions arising from legal challenges.
u	ispute resolution framework.	The management system has a mechanism to <u>generally respect</u> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to <u>observe</u> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to <u>formally commit</u> to the legal rights created explicitly or established by custom on people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.

WCPFC

The WCPFC Convention, FFA Convention, and associated arrangements are consistent with the principles and provisions of the United Nations Convention on the Law of the Sea (UNCLOS), United Nations Fish Stock Agreement (UNFSA), and Highly migratory species (HMS) as well as a range of other relevant international and regional fisheries instruments. These reflect current international laws and standards relevant to management of migratory species and the ecosystem, including specific reference to the precautionary approach. The Commission seeks input from recognized international law experts to ensure that its decision-making is informed in relation to compliance with international law and protocols. All WCPFC Members (including Fiji) are legally bound to apply the precautionary approach as parties to the WCPFC Convention (with its Art. 5 & 7).

The WCPFC dispute mechanism is set out in Article 31 of the Convention. The WCPFC has a consensus-based decision-making process, with provision for a two-chambered voting process requiring a 75% majority in both chambers if all efforts to reach a decision by consensus have been exhausted56, (Rule 22). However, this has never been formerly tested.

No evidence can be found of avoidance of legal responsibilities, or of any failure to comply with binding judicial decisions. Processes are in place to allow such challenges to take place, but the system has a record of acting appropriately to avoid legal disputes.

The WCPFC Convention provides for recognition of the interests of small scale and artisanal fishers within the overall framework for sustainability in the WCPFC Convention. The Convention explicitly recognizes the rights of artisanal and subsistence fishers and the dependence of coastal States and States fishing on the high seas on the stocks concerned. The Convention identifies as a function of the WCPFC the development of criteria for the allocation of catch or effort. To date, the Commission has not allocated fishing rights but has sought and received external advice on allocation mechanisms and options.

Fiji

Fiji has ratified or acceded to both the United Nations Convention on the Law of the Sea (UNCLOS) and the United Nations Fish Stock Agreement (UNFSA).

The Fisheries Act 1941 and subsequent regulations is currently the principal legislation for the regulation of fishing activity. The Act applies to "Fiji fisheries waters" which includes internal waters, archipelagic waters, territorial seas and all waters within the exclusive economic zone.

The Marine Spaces Act 1978 makes provision to "regulate the exploitation of the resources thereof and other activities therein and to make further provision for the regulation of fishing". The Act sets out the boundaries and rights pertaining to internal waters, archipelagic waters, territorial seas, exclusive economic zone, and the continental shelf in relation to Fiji's rights. The Act enables regulations pertaining to the management of fisheries to be determined by the Minister, including: allowable catches by Fijian and foreign vessels; licensing of fishing vessels; and the appointment of fisheries officers.

The management system incorporates a mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues. There have been several successful court cases. No evidence can be found of avoidance of legal responsibilities, or of any failure to comply with binding judicial decisions. Processes are in place to allow such challenges to take place, but the system has a record of acting appropriately to avoid legal disputes.

The Fisheries Act contains provisions for the regulation of most types of fishing activity in these coastal areas (including customary fishing rights areas), and fishing activity in the archipelagic waters and territorial sea for Fiji fishing vessels and foreign fish vessels.

The national fisheries legislation is under review and the Fiji Offshore Fisheries Management decree is in draft form. This was reviewed by lawyers based in New Zealand and is expected to be enacted in a few months (pers. comm. Principal Fisheries officer).

Score: 95

The management system is generally consistent with local, national, regional (FFA & WCPFC) and international agreements (e.g. UNCLOS, UNFSA, HMS) all standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2 (100).

The system includes specific provision for dispute settlement at the WCPFC level and appropriate legal recourses at national level which are considered to be effective and transparent in dealing with most issues and appropriate to the context of the fishery, but have not been tested (80).

No evidence can be found of avoidance of legal responsibilities, or of any failure to comply with binding judicial decisions. Processes are in place to allow such challenges to take place, but the system has a record of acting appropriately to avoid legal disputes. (100).

The WCPFC Convention and measures, and national laws, strategies and plans have mechanisms to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2 (100).

Audit Trace References

UNCLOS (Part V), UNFSA, WCPFC Convention, FFA Convention, , national plans and laws Western and Central Pacific Fisheries Commission website <u>http://www.wcpfc.int/</u> Fiji Tuna Management Plan Fiji Offshore Fish Management Decree-2010-v2 Fisheries legislation legal opinion Fisheries Act 1941 Marine Spaces Act 1978

I SCORI	IG CRITERIA	SCORING GUIDEI USI 00	SCORING GUIDEI OST 80	SCOKING GUIDEI UST 100
3.1.2	Consultation, roles and	Organizations and individuals involved in the	Organizations and individuals involved in the	Organizations and individuals involved in the
	responsibilities	management process have been identified.	management process have been identified.	management process have been identified.
	The management system	Functions, roles and responsibilities are	Functions, roles and responsibilities are	Functions, roles and responsibilities are
	has effective consultation	generally understood.	explicitly defined and well understood for key	explicitly defined and well understood for all
	processes that are open to		areas of responsibility and interaction.	areas of responsibility and interaction.
	interested and affected			
	parties.	The management system includes consultation	The management system includes consultation	The management system includes consultation
		processes that obtain relevant information from	processes that regularly seek and accept	processes that regularly seek and accept
	The roles and	the main affected parties, including local	relevant information, including local	relevant information, including local
	responsibilities of	knowledge, to inform the management system.	knowledge. The management system	knowledge. The management system
	organizations and		demonstrates consideration of the information	demonstrates consideration of the information
	individuals who are		obtained.	and explains how it is used or not used.
	involved in the			
	management process are		The consultation process provides opportunity	The consultation process provides opportunity
	clear and understood by all		for all interested and affected parties to be	and encouragement for all interested and
	relevant parties.		involved.	affected parties to be involved, and facilitates
				their effective engagement.

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Scoring Comments

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WCPFC

WCPFC management roles and responsibilities are clearly defined and well understood for all areas of responsibility and interaction at the WCPFC and national level as well as support organizations FFA and SPC.

There are extensive, regular formal and informal consultation processes at the WCPFC, FFA and other regional & international fora and national levels, including consultation with bilateral partners and domestic stakeholders. These processes seek and accept information, and demonstrate consideration of the information but while the WCPFC process explains how information is used or not used, other components of the management system do not.

The views of Members and CNMs are considered in the adoption of operational procedures and CMMs.

The consultation process provides opportunity for involvement and no information was found indicating difficulties for parties wishing to be involved. A particular shortfall is demonstrating how information is used or not used.

The WCPFC has a comprehensive governance structure in which participation by Members and CNMs is encouraged. The mechanisms for participation include meetings of the Commission, Scientific Committee, Technical and Compliance Committee and Finance and Administration Committee. Each group has well defined terms of reference and the roles and responsibilities of members and non-members are well defined in the Convention, in the Rules of Procedure and in relevant CMMs.

Regular consultation meetings (SC, TCC, Commission) and where necessary ad-hoc meetings to be held (e.g. 2012 meeting planned on reference points). Meeting minutes demonstrate that all parties can be involved within the process.

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The views of Members and CNMs are considered in the adoption of operational procedures and CMMs. The WCPFC facilitates the participation of relevant non-members and encourages eventual membership. Observer participation is encouraged and facilitated in line with the Rules of Procedure and observers are permitted to make oral submissions to the Commission and its subsidiary bodies. Written documents prepared by observers can also be tabled at meetings as information documents in line with the Rules of Procedure.

Fiji

The Fisheries Act 1941 is currently the principal legislation for the regulation of fishing activity within Fiji, and outlines the Department of Fisheries responsibilities including the sustainable development and enforcement of Fiji's fisheries sector in pursuing growth and securing food security through sustainable marine resources management. The organizations and individuals involved in the management system are clearly identified. There is a Fisheries Advisory Council in place with appointees including non-government organizations with an interest in fisheries

Nationally, responsibilities are well understood, and activities through the recently established 'offshore fisheries taskforce' has involved stakeholders in discussions on the management of the fisheries. The legislation provides a clear indication of roles and responsibilities as does the Annual Business Plan.

The Department actively seeks to encourage participation by sending out an advisory and an invitation to stakeholders to attend meetings such as the ones on the Offshore Fisheries Decree, and has with WWF, demonstrated an open agenda in terms of receiving position papers on various Directives and measures, including CMMs. National roles and responsibilities are clearly defined within the 2010 Decree.

The Ministry has an organizational chart and all staff have job descriptions.

Score: 90

Organizations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction, (100).

There are extensive, regular formal and informal consultation processes at the WCPFC, FFA and other regional & international fora and national Fiji, levels, including consultation with bilateral partners and domestic stakeholders. These processes seek and accept information, and demonstrate consideration of the information but while the WCPFC process explains how information is used or not used, other components of the management system do not. (80)

The management systems provide opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement. (100) There are formal and informal consultations including consultation with bilateral partners and domestic stakeholders. Other organizations have access to all the main management bodies as formal observers or informally (80).

Audit Trace References

WCPFC meeting records, WCPFC Rules of Procedure, Western and Central Pacific Fisheries Commission website <u>http://www.wcpfc.int/</u> WCPFC-TCC, 2010; FFA Fact Sheet 3Decision Making in WCPFC; Fiji-Offshore Fish Management Decree-2010-v2

3.1.3	Long term objectives	Long-term objectives to guide decision-	Clear long-term objectives that guide decision-	Clear long-term objectives that guide decision-
	The management policy	making, consistent with MSC Principles and	making, consistent with MSC Principles and	making, consistent with MSC Principles and
	has clear long-term	Criteria and the precautionary approach, are	Criteria and the precautionary approach, are	Criteria and the precautionary approach, are
	objectives to guide	implicit within management policy.	explicit within management policy.	explicit within and required by management
	decision-making that are			policy.
	consistent with MSC			
	Principles and Criteria, and			
	incorporates the			
	precautionary approach.			

WCPFC System

There are clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, and these are explicit within applicable WCPFC CMMs. The WCPFC convention specifies its objective as: "to ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stocks in the Western and Central Pacific Ocean in accordance with the 1982 Convention and Agreement [UNCLOS and UNFSA respectively]". This objective is elaborated upon in the Convention by the specification of principles and measures for conservation and management. Article 5 of the Convention specifically requires that the WCPFC apply the precautionary approach and Article 6 elaborates upon how this shall be done.

Long term objectives spelt out in WCPFC Convention text. CMM on albacore effort developed. SIDS development aspirations to be noted. FFA Sub-committee also has specific objectives for members.

Fiji

The Ministry of Fisheries and Forestry has a Tuna Fisheries Plan (2006-2010). Explicit long term objectives are defined and are consistent with MSC principles and criteria however no mention is made of the precautionary approach to fisheries management of the ecosystem approach to fisheries management. The Tuna management Plan is currently being updated and does include long term objectives the precautionary approach and EBM.

The Fisheries Act does include clear long term objectives concerning the sustainable development and enforcement of Fiji's fisheries sector in pursuing growth and securing food security through sustainable marine resources management and these are explicit within management policy.

The draft Offshore Fisheries Management Decree, 2010 has a set of clearly defined long term objectives, which as referenced earlier, include adherence to the precautionary approach and environmental factors on target stocks, non-target species, and species belonging to the same ecosystem.

Score: 90

Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within management policy, of the WCPFC. This is also the case for the Offshore Fisheries management Decree for Fiji however the current long term objectives that are explicit in management policy but do not specify the precautionary approach

1 SCORING CRITERIA SCORING GUIDEPOST 60 SCORING GUIDEPOST 80 SCORING GUIDEPOST 100
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Audit Trace References
Western and Central Pacific Fisheries Commission website http://www.wcpfc.int/
WCPFC7, 2011, Summary Report.
WCPFC-TCC, 2010. Technical and Compliance committee Sixth Regular Session - Summary Report.
Fiji-Offshore Fish Management Decree-2010-v2
FJ_NTFSR_2003
Fiji Fisheries Act

1 SCORING CRITERIA SCORING GUIDEPOST 60 SCORING GUIDEPOST 80 SCORING GU

3.1.4	Incentives for sustainable	The management system provides for	The management system provides for	The management system provides for
	fishing	incentives that are consistent with achieving	incentives that are consistent with achieving	incentives that are consistent with achieving
	The management system	the outcomes expressed by MSC Principles 1	the outcomes expressed by MSC Principles 1	the outcomes expressed by MSC Principles 1
	provides economic and	and 2.	and 2, and seeks to ensure that perverse	and 2, and explicitly considers incentives in a
	social incentives for		incentives do not arise.	regular review of management policy or
	sustainable fishing and			procedures to ensure that they do not
	does not operate with			contribute to unsustainable fishing practices.
	subsidies that contribute to			
	unsustainable fishing.			
	_			

WCPC

WCPFC SC, TCC and Commission meeting outcomes, combined with CMMs, and FFA SC-SPTBF meetings provide incentives for sustainable fishing. These supported by IUU vessel listing and port state controls (see WCPFC website). The WCPFC Convention provides for the allocation of total allowable catch or effort although such allocations have not yet been made. Fiji's own management plan makes reference to a global TAC, but which is nowhere close to being fished. The WCPFC provides subsidies to Pacific Island nations to facilitate their participation in Commission activities and their implementation of CMMs. However, it might be argued that these subsidies are in fact consistent with the pursuit of sustainability. A number of WCPFC CMMs exclude the Small Island Developing States (SIDS) from their provisions.

Fiji

There are some aspects of the management system that provide economic incentives to sustainable fishing. Fijian vessel owners reportedly have access to a series of input subsidies (fuel, bait and other inputs – boat and engine parts). However these subsidies are unlikely to contribute to an increase in fishing effort, and is used to specifically address disparities that may exist as a result of Fiji's locational disadvantageous. There is evidence that these subsidies are considered, sometimes explicitly, within the management system to ensure that they do not undermine sustainability.

A cap on licences which is regularly reviewed provides an incentive for sustainable fishing. There is evidence that only those with a good record will have their licences renewed.

Score: 80

Overall the management system, provides for the creation of incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise, but falls short of <u>ensuring</u> that subsidies do not contribute to unsustainable fishing practices in future and these are regularly reviewed (80).

Audit Trace References

CMM-2010-06 [Establish_a_List_of_IUU_Vessels_for_the_WCPFC]_04112011 CMM-2010-03 [Compliance_Monitoring_Scheme] CMM-2009-01 [RFV_and_Authorization_to_Fish] CMM-2007-02 [Commission_Vessel_Monitoring_System] CMM-2007-01 [Regional_Observer_Programme]
Fishery, specific management system

SCORING GUIDEPOST 60

e.=	Tisherj speeme managem	leile systelli		
3.2.1	Fishery- specific	Objectives, which are broadly consistent with	Short and long term objectives, which are	Well defined and measurable short and long
	objectives	achieving the outcomes expressed by MSC's	consistent with achieving the outcomes	term objectives, which are demonstrably
	The fishery has clear,	Principles 1 and 2, are implicit within the	expressed by MSC's Principles 1 and 2, are	consistent with achieving the outcomes
	specific objectives	fishery's management system.	explicit within the fishery's management	expressed by MSC's Principles 1 and 2, are
	designed to achieve the		system.	explicit within the fishery's management
	outcomes expressed by			system.
	MSC's Principles 1 and 2.			

Scoring Comments

WCPFC

32

Objectives stated in WCPFC Convention text, Convention on Conservation & Management of HMS in WCPO, CMMs for reduction of incidental mortalities of non-target and other species. In turn, FFA SC-SPTBF also has aims for conservation.

The long term objectives of WCPFC are clearly articulated as described above. Short-term objectives for specific stocks and ecosystem impacts are identified in relevant CMMs and through default reference points for target stocks. The fishery's objectives can be identified and are consistent with the MSC's Principles 1 and 2. However, many of the CMMs are not specified in terms of measurable targets or outcomes. Objectives relating to P1 and P2 Outcomes are set out in various WCPFC CMMs, especially 2008-01 (bigeye and yellowfin), and CMMs relating to shark and sea turtle turtles as well as national plans. These include short and long term objectives, but the objectives are not all well defined and measurable, especially for the CMMs related to P2 outcomes

Fiji

The Fiji Fisheries Department had in place a designated fishery management plan (2006-2010).

Explicit long term and short term objectives are defined but no reference is made to the precautionary approach to fisheries management or the ecosystem approach to fisheries management. An updated national fisheries legislation is being developed presently, to be accompanied by a new tuna fisheries management plan and NTFSR. The new legislation and plan has references to outcomes which relate directly to MSC Principles 1 and 2. Measurable workplan objectives.

Score: 80

Short and long term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system. (80) for both WCPFC and Fiji.

Audit Trace References

Western and Central Pacific Fisheries Commission website http://www.wcpfc.int/ WCPFC7, 2011, Summary Report. WCPFC, 2006, Strategic Research Plan 2007-2011. 1

Fiji-Offshore Fish Management Decree-2010-v2 Fiji Tuna and Development Fisheries Management Plan 2002 Ministry of Fisheries and Forest Annual Business Plan 2011

322	Decision-making	There are informal decision-making processes	There are established decision-making	There are established decision-making
	progossos	that result in measures and strategies to	processes that result in measures and strategies	processes that result in measures and
	The Contract of Co	that result in measures and strategies to	processes that result in measures and strategies	processes that result in measures and
	The fishery-specific	achieve the fishery-specific objectives.	to achieve the fishery-specific objectives.	strategies to achieve the fishery-specific
	management system			objectives.
	includes effective	Decision-making processes respond to serious	Decision-making processes respond to serious	
	decision-making processes	issues identified in relevant research.	and other important issues identified in relevant	Decision-making processes respond to all
	that result in measures and	monitoring evaluation and consultation in a	research, monitoring, evaluation and	issues identified in relevant research
	strategies to achieve the	transparent timely and adaptive manner and	consultation in a transparent timely and	monitoring evaluation and consultation in a
	objectives	talsparent, timery and adaptive manner and	adaptive manner and take account of the wider	monitoring, evaluation and consultation, in a
	objectives.	take <u>some</u> account of the wider implications of	adaptive manner and take account of the wider	transparent, timely and adaptive manner and
		decisions.	implications of decisions.	take account of the wider implications of
				decisions.
			Decision-making processes use the	
			precautionary approach and are based on best	
			available information.	Decision-making processes use the
				precautionary approach and are based on best
			Explanations are provided for any actions or	available information
			<u>Explanations</u> are provided for any actions of	available information.
			lack of action associated with findings and	
			relevant recommendations emerging from	Formal reporting to all interested stakeholders
			research, monitoring, evaluation and review	describes how the management system
			activity.	responded to findings and relevant
				recommendations emerging from research.
				monitoring evaluation and review activity
				monitoring, evaluation and review activity.

Scoring Comments

WCPFC

At the WCPFC level, there are established decision-making processes in the Convention and these are operationalised in the processes of the SC, the TCC and the Commission itself.

WCPFC decision-making processes are open, use the precautionary approach and best available information and are well documented. Consensus is the general rule for decision-making by Commission Members during their annual meetings. If consensus cannot be reached, voting, grounds for appealing decisions, conciliation and review are all part of the decision-making process, as described in Article 20 of the Convention. The application of the precautionary approach and the use of the best available scientific advice is required by the WCPFC Convention. There is some evidence that the application of these requirements by the Commission has been tested through CMM-2005-02, but to date only applied South of 60°S. There are well-established procedures for reporting of material considered by and outcomes of the Commission and its subsidiary working committees.

Fiji

The Fiji 'offshore fisheries taskforce' and process for updating the Fiji fisheries legislation has demonstrated established decision making processes, and allow responses to issues to be developed. This task force is feeding into the new draft legislation. Annual tuna management activities are influenced by the outputs from WCPFC Scientific Committee and Technical and

Compliance Committee, as well as the Commission.

Fiji 'awareness team' contact industry to inform them of new regulations and requirements (e.g. shark fin measure of WCPFC)

The decision-making process for the Fiji Department of Fisheries is laid out in the draft Offshore Fisheries Management Decree.

Research, monitoring and evaluation is carried out by SPC not locally. Fiji makes decision on licensing based on SPC and FFA information and uses a precautionary approach based on sustainability issues.

Explanations for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activities are passed on to industry and stakeholder groups via meetings and letters.

Score: 90

- 1. There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives (100).
- 2. Decision-making processes respond to serious and other important issues, *but not all issues*, identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions (80).
- 3. At the WCPFC level it is clear that the precautionary approach is used, and decisions are based on the best available information. There are no significant requirements for this fishery from CMM 2008-01. At the Fiji level it is clear that the best available information is used for decision-making. In the 2006-2010 Plan the licence limit is based on bioeconomic analysis, apparently using the best scientific information available at that time. (100)
- 4. Explanations are provided at the WCPFC level and at the Fiji level for actions, or lack of action associated with relevant findings and recommendations (80).

Audit Trace References

Western and Central Pacific Fisheries Commission website http://www.wcpfc.int/ http://www.wpcouncil.org/hot/ WCPFC7, 2011, Summary Report WCPFC, 2006, Strategic Research Plan 2007-2011. FFA Fact Sheet 3Decision Making in WCPFC

3.2.3 Compliance and enforcement Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective. A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules. A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules. A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules. Sanctions to deal with non-compliance exist, and there is some evidence that they are Sanctions to deal with non-compliance exist, are consistently applied and thought to provide Sanctions to deal with non-compliance exist, are consistently applied and demonstrably
3.2.3Compliance and enforcement Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with.Monitoring, control and surveillance and there is an echanisms exist, are implemented in the fishery under assessment and there is a management measures are enforced and complied with.A monitoring, control and surveillance system has been implemented in the fishery under assessment and there is a reasonable expectation that they are effective.A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.Sanctions to deal with non-compliance exist, and there is some evidence that they areSanctions to deal with non-compliance exist, are consistently applied and thought to provideSanctions to deal with non-compliance exist, are consistently applied and thought to provide
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surveillance mechanisms ensure the fishery's management measures are enforced and complied with. Sanctions to deal with non-compliance exist, and there is some evidence that they are are evidence that they are are consistently applied and thought to provide are consistently applied and thought to provide are consistently applied and thought to provide
ensure management measures are enforced and complied with.ensure compliance with in the measures is some evidence that they arestrategies and/or rules.relevant management measures, strategies and/or rules.Sanctions to deal with non-compliance exist, and there is some evidence that they areSanctions to deal with non-compliance exist, are consistently applied and thought to provideSanctions to deal with non-compliance exist, are consistently applied and thought to provide
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enforced and complied with. Sanctions to deal with non-compliance exist and there is some evidence that they are <u>are consistently applied</u> and thought to provide are consistently applied and <u>demonstrably</u>
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and there is some evidence that they are <u>are consistently applied</u> and thought to provide are consistently applied and <u>demonstrably</u>
applied. effective deterrence. provide effective deterrence.
Fishers are <u>generally thought</u> to comply with <u>Some evidence exists</u> to demonstrate fishers There is a <u>high degree of confidence</u> that
the management system for the fishery under comply with the management system under fishers comply with the management system
assessment, including, when required, assessment, including, when required, under assessment, including, providing
providing information of importance to the providing information of importance to the information of importance to the effective
effective management of the fishery.
There is no evidence of systematic non-
compliance.

SCODINC CUIDEDOST 80

Scoring Comments

SCODINC CDITEDIA

WCPFC

WCPFC aims to ensure compliance through VMS, IUU vessel list, port state controls, observers, logbooks, transhipment monitoring.

SCODINC CUIDEDOST 60

The WCPFC's Technical and Compliance Committee is also continuing consideration of port State measures, chartering arrangements, catch/statistical documentation, the control of nationals, and compliance monitoring and reporting.

The WCPFC relies largely on the IUU vessel listing process as an incentive for compliance. There are no other sanctions in place for non-compliance by members with CMMs. In 2009, the Commission agreed to terms of reference to establish a Compliance with Conservation and Management Measures Working Group.

The combination of MCS and compliance mechanisms at WCPFC, level creates a system that has been demonstrated to be comprehensive and effective in the longline fisheries. Penalties are appropriate and applied, and are an effective deterrent. There are generally good levels of compliance by fishers.

Fiji

Fiji has access to VMS, logbooks and observer records (see Fiji's annual reports to Scientific Committee, for example). Monitoring also occurs on departure and landing to ensure compliance – e.g. of the shark fin measure, involving the removal of banned gears.

Fiji licensing committee monitors compliance with licensing requirements during the annual re-licensing process, and will ensure compliance with regulations prior to re-licensing. Ultimate

SCODINC CUIDEDOST 100

sanction would be non-renewal of licence.

Duties, powers and sanctions are laid down in the Fisheries legislation. This also makes provision for the implementation of the Observer scheme, which places independent data collectors on board fishing vessels; Sanctions to deal with non-compliance exist, but <u>do not appear to be consistently applied</u>. Evidence was found of breaches but these had not always been followed up.

The FFA has developed a regional monitoring, control and surveillance strategy which includes regional cooperation to control fishing in the region. The strategy was endorsed by Forum Fisheries Committee Ministers in July 2010.

The client vessels currently have a 7.6% observer coverage. It is intended that this be increased. There is evidence of regular non-compliance both with shark gear and hook numbers. However it does not appear that detected violations are always investigated.

Current financial penalties are inadequate and low by regional standards, although penalties do allow for forfeiture of vessels and catch. This is being reviewed by the Ministry.

Score: 70

A monitoring, control and surveillance system has been implemented in the fishery under assessment by WCPFC and by Fiji government (80)

Sanctions to deal with non-compliance exist, there is some evidence that they are applied.(60)

Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery. (80).

Condition 7 has been raised to address this.

Audit Trace References

WCPFC-TCC, 2010, Technical and Compliance committee Sixth Regular Session - Summary Report. See also: http://www.wcpfc.int/vessel-monitoring-system
CMM-2010-03 [Compliance_Monitoring_Scheme]
CMM-2010-06 [Establish_a_List_of_IUU_Vessels_for_the_WCPFC]_04112011
CMM-2009-01 [RFV_and_Authorization_to_Fish]
CMM-2007-01 [Regional_Observer_Programme]
CMM-2007-02 [Commission_Vessel_Monitoring_System]
CMM-2007-03 [IUU_Listing_Procedure]
Ministry of Fisheries compliance reports

1 SCORING CRITERIA SCORING GUIDEPOST 60 SCORING GUIDEPOST 80 SCO	ORING GUIDEPOST 100
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3.2.4	Research plan	<u>Research</u> is undertaken, as required, to achieve	A research plan provides the management	A comprehensive research plan provides the
	The fishery has a research	the objectives consistent with MSC's	system with a strategic approach to research	management system with a coherent and
	plan that addresses the	Principles 1 and 2.	and reliable and timely information sufficient	strategic approach to research across P1, P2
	information needs of		to achieve the objectives consistent with	and P3, and reliable and timely information
	management.		MSC's Principles 1 and 2.	sufficient to achieve the objectives consistent
				with MSC's Principles 1 and 2.
		Research results are available to interested	Research results are disseminated to all	Research plan and results are disseminated to
		parties.	interested parties in a <u>timely</u> fashion.	all interested parties in a timely fashion and are
				widely and publicly available.

Scoring Comments

WCPFC

The WCPFC Strategic Research Plan addresses four overall research and data collection priorities - collection and validation of data from the fishery, monitoring and assessment of stocks, monitoring and assessment of the ecosystem, and evaluation of management options. The WCPFC Strategic Research Plan is supplemented by the SPC, FFA and national Strategic Plans to provide a comprehensive research plan for the fisheries under assessment across P1. P2 and P3. The WCPFC and SPC Plans and results are widely and publicly available, but the FFA and national research results are not all fully accessible.

WCPFC research plans developed through Science Committee. Strategic research plan is being updated (see SC7 summary report, Appendix J). Sub-regional research plan agreed at FFA SC-SPTBF meetings. Reporting of results demonstrated through papers at WCPFC SC and SC-SPTBF meeting notes.

The WCPFC has a Strategic Research Plan 2007-2011 in place which identifies four overall research and data collection priorities: collection and validation of data from the fishery

monitoring and assessment of stocks

monitoring and assessment of the ecosystem

evaluation of management options.

The research plan relates largely to scientific and ecosystem research, i.e. to Principles 1 and 2. While governance issues are not addressed directly by the research plan, the WCPFC has commissioned a number of research projects that inform aspects of governance, for example the institutional arrangements for provision of scientific advice and options for allocation of participatory rights. Research reports are made available on the WCPFC's web site in a timely fashion. Page 49

In response to regional and global concerns about the status of shark populations, a Shark Research Plan (SRP)58 was developed by the Secretariat of the Pacific Community-Oceanic Fisheries Programme (SCP-OFP) was approved by the Commission in December 2010 (WCPFC7, 2011). WWF believes that outputs from the research work will provide effective input in support of this assessment.

Fiji

SCORING C	RITERIA
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Fiji department of Fisheries can perform research to underpin new legislation (e.g. the shark mitigation measures), as well as work with University of the South Pacific, NGOs (e.g. WWF, PEW), local fishing industry, SPC and FFA

The Department of Fisheries, within its draft Decree also makes provision for Research Plans. It is however acknowledged that SPC forms the service provider for Fijian offshore fisheries research.

Score:90

A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2 (100)

Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available at WCPFC level but not at Fiji level. The score is 90

Audit Trace References

WCPFC, 2006, Strategic Research Plan 2007-2011. WCPFC-SC, 2011. SPC Division of Fisheries, Aquaculture and Marine Ecosystems (FAME): Strategic Plan 2010-2013S PC 2010; FFA Strategic Plan 2005 – 2020, FFA Secretariat, 2005

1 SCORING CRITERIA SCORING G	UIDEPOST 60 SCORING GUIDEPOST	SCORING GUIDEPOST 100
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3.2.5	Monitoring and	The fishery has in place mechanisms to	The fishery has in place mechanisms to	The fishery has in place mechanisms to
	management	evaluate some parts of the management system	evaluate key parts of the management system	evaluate <u>all</u> parts of the management system
	performance evaluation	and is subject to occasional internal review.	and is subject to regular internal and	and is subject to regular internal and external
	There is a system for		occasional external review.	review.
	monitoring and evaluating			
	the performance of the			
	fishery-specific			
	management system			
	against its objectives.			
	<i>c s</i>			
	There is effective and			
	timely review of the			
	fishery-specific			
	management system.			

Scoring Comments

WCPFC

WCPFC has not undertaken an external review. However It has committed and agreed to an independent performance review, consistent with the Kobe Course of Actions for the period 2011 to 2013. Stock assessments conducted by the SPC are subject to internal peer review by other members of the Scientific Committee. A recent Independent Review of the Commission's Transitional Science Structure and Functions suggested periodic external review of the stock assessments. This has been adopted by the WCPFC. An annual report is provided to the Commission by the Secretariat on compliance of members with the reporting provisions of the Commission. Progress with implementation of CMMs is monitored through the reporting provisions within the CMMs themselves or the Annual Reports by members to the Commission.

Commission meetings provide an overall review of processes and outcomes.

Fiji

Review of Fiji fisheries legislation currently is underway, involving stakeholder inputs. This legislation was reviewed by NZ lawyers on request. An audit of Fiji fisheries is currently occurring through a GEF/PASAI project. The observer processes used by the Ministry were recently audited and certified.

Score: 80

The fishery has in place mechanisms to evaluate key parts of the management system and is subject to regular internal and occasional external review.

Audit Trace References

WCPFC Records, (WCPFC4-6) WCPFC-SC, 2011. Fiji Fisheries Legislation legal opinion

15.3 Appendix B: Peer Review Reports

Peer Reviewer A

Overall Opinion

Has the assessment team arrived at an	Probably	Conformity Assessment Body
appropriate conclusion based on the evidence		Response
presented in the assessment report?		
Given the importance of Component 2.1 issues for t	his fishery,	We presume these comments pertain to
I would need to see clarification of the status of Fiji	measures	2.1.2 (management) rather than 2.1.1
relating to shark management before being able to	conclude	(status). An additional table (Table 6)
that the team arrived at an appropriate conclusion,	in	has been added to the report clarifying
particular because of the importance of this informa	ation for	the extent and manner of application of
the determination that the fishery meets SG60 for P	I 2.1.1,	these shark management measures.
though I acknowledge that this is probably a matter	of	Essentially many of the CMM 2009-04
presentation of information in the report, rather that	n a lack of	requirements are captured in the 2012
the necessary measures being in place.		license conditions, including (i) a ban on
In addition, I would note the importance of the draf	t Decree	shark gear (incl. wire traces) and (ii) that
and new legislation to the fishery meeting SG60 for PI 3.1.1,		vessels can land fins no more than 5% of
given that these instruments are apparently not yet	in force.	the weight of sharks on board at the first
		point of landing. Furthermore officially-
		required logbooks now record sharks
		down to species level.
		We agree the importance of the draft
		decree and new legislation to the fishery.
		However we do not agree that it
		currently does not meet SG 60. The
		rationale is included in the scoring table

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?	Yes	Conformity Assessment Body Response
Within the limits that flow from the need for action broader group of countries that are Members of the in order to meet the conditions raised for PIs 1.1.2 the Conditions are appropriately written to achieve		
outcomes., The Conditions on PIs 1.1.2 and 1.2.2 reflect well e with setting of Conditions on RPs and HCRs for WC fisheries. I see the Conditions on Component 2.1 as particularly important outcome of this assessment, consider them to be well formulated		
I note that the Conditions on PIs 1.1.2 and 3.2.3 we adequately address the additional issues I have rais respect to the scoring of those 2 PIs.		

1	SCORING CRITERIA	SCORING GUIDEPOST 60	

If included:		
Do you think the client action plan is sufficient	Conformity Assessment Body	
to close the conditions raised?	Response	
I consider the CAP is sufficient to close the condition	ons, noting	In the CAP, the words "a WCPFC
again that achieving this outcome depends in part of	albacore management measure" have	
broader membership of the WCPFC.	been replaced with ""WCPFC action on	
I would note that the references in the CAP to the n	eed for a	this issue"
WCPFC albacore management measure do not acc		
reflect the existence of CMM 2010-05.		

General Comments on the Assessment Report (optional)

Unit of certification: the fishery proposed for certification is defined as the fishery for Albacore tuna, in "*Fiji's Exclusive Economic Zone*". However, there is some ambiguity about the area of the fishery in the report. Legally, the EEZ does not include archipelagic waters, nor the territorial sea – Part V, Article 55 of UNCLOS describes the EEZ as "*an area beyond and adjacent to the territorial sea*", and so outside of the territorial seas and archipelagic waters. Fiji is an archipelagic state, and as stated, the unit of certification would not include catches from the archipelagic waters. However, in Section 4.3, p 21, the report refers to *The catch of albacore within the Fiji EEZ (including archipelagic waters)*, which, it has to be said, is fairly common usage of the term, including by SPC, and the catch data in the report generally seems to cover catches in archipelagic waters.

IMM comment. The UoC has been clarified in the report to include Fiji archipelagic waters and Fiji Territorial Sea

In addition, the Fiji fleet fishes to some degree outside of Fiji waters in high seas and EEZs of other states.

IMM comment: Albacore longline fish caught outside Fiji waters in high seas will NOT be eligible for certification. NB only the fish caught by Fiji Tuna Boat Owners Association are under assessment. Chain of Custody requirements will involve clear traceability requirements.

If the vessels in the fishery of certification are only authorised to fish, and only fish, in the Fiji EEZ, and not in archipelagic waters or outside of Fiji waters, then there should be no issues. But if the vessels operate outside the Fiji EEZ then complexities arise in the assessment in that most of the WCPFC CMMs don't apply in archipelagic waters, and it is not clear from the report how Fiji laws apply to its vessels outside Fiji waters. And if the vessels fish outside the EEZ, but the certification is only to apply to EEZ fishing, then complexities arise with respect to determining that catches are indeed from the EEZ, since observer coverage is low.

IMM comment: Most CMMs require Fiji legislation to enact them. The Fiji offshore fisheries management decree provides indication that licences must be issued for fishing by vessels >10m in archipelagic waters, territorial seas, EEZ, high seas, etc. If the conditions of licence are consistent across this area, and are the primary tool for enacting Fiji fisheries legislation, CMMs might apply to all areas within the EEZ boundary.

Some clarification of these UoC-related issues would be helpful.

IMM comment: Clarification has been provided in the report

Harmonization with Overlapping Fisheries: Section 8 of the Report discusses other fisheries

Document: Peer Reviewer Template

Date of issue: 19 January, 2011 File: TAB_D_031_peer_reviewer_template_v1.doc

1 SCORING CRITERIA SCORING GUIDEPOST 60 SCORING GUIDEPOST

targeting South Pacific albacore, and notes that two of these fisheries are MSC certified. However, there is no systematic consideration of the extent to which the results of the assessment are harmonized with the assessments of these overlapping fisheries? On a quick analysis, the results of the evaluation, scoring and conditions seem consistent with respect to the New Zealand Albacore assessment, with the exception of the results for PI 3.1.4. A brief analysis of the extent of harmonization of appropriate results with assessments of overlapping fisheries would seem to be useful.

Section 8 has been amended to include comments on harmonization.

Document: Peer Reviewer Template

Date of issue: 19 January, 2011 File: TAB_D_031_peer_reviewer_template_v1.doc

Performance Indicator Review Please complete the table below for each Performance Indicator which are listed in the Conformity Assessment Body's Public Certification Draft Report.

PI	Has all relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.1	Yes	Yes	NA	The score accurately reflects the available information on stock status, and is harmonised with the scoring in the NZ Albacore assessment.	
1.1.2	Yes	no	Yes	The certifier appears to have generally applied appropriately the MSC Guidance when reference points are stated explicitly, including determining that SG80 is not met for the 2 nd scoring issue. An apparent gap is a response to the phrase "set by management" in CB 2.3.1, This would require more than determining that appropriate LRPs and TRPs are used by the SC in providing advice to meet SG80 for the 2 nd and 3 rd scoring issues. To meet SG80, there should be some evidence of the Commission and other management levels actually using the default/implicit TRPs and LRPs. This aspect is redundant in respect of the 2 nd scoring issue which is already scored at 60, and Condition 1 appropriately raises performance on that scoring issue, and the 3 rd issue, if it becomes relevant, to SG80. However, there needs to be some evidence of the management/Commission using MSY-based indicators as TRPs to justify scoring on the 3 rd issue at SG80. The final sentence in the report section on reference points appears to be incomplete and is important for this scoring.	The condition for this PI will address the scoring issue raised. The assessment team feels that scoring on the 3 rd issue at SG80 is justified. The general observed strategy of the WCPFC managing regional tuna stocks is to reduce the exploitation rate when F exceeds FMSY. This is not yet the case for albacore tuna, but WCPFC has shown preparedness to satisfy this requirement for other tuna species.
1.1.3	NA	NA	NA	NA	

PI	Has all relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.1	No	No	NA	On available information, information on i) The work of the SC-SPTBF ii) The changes in the Fiji Tuna Plan over time and licence nos could inform scoring on this issue. On scoring, SG80 requires not just that the HS elements (monitoring, stock assessment, harvest control rules and management actions) exist but that they are "working together". The extent to which the elements "are working together" is not adequately addressed. It may be that in the revision of CMM 2005-02 by the Commission, the work of the FFA Sub-Committee on South Pacific tuna and Billfish (SC-SPTBF), and/or the revisions to Fiji's tuna plans and licensing arrangements, evidence can be found of this "working together". An important element of this consideration could be the extent to which the limit of 60 vessels in the Fiji EEZ in the Plan based on bioeconomic analysis was implemented. Without evidence that the HS elemeents are "working together" SG80 requirements are not met. The recent large increase in regional effort might have been taken as contradicting other evidence that the HS is achieving its objectives, but this is appropriately taken into account under PI 1.2.2.	The assessment report indicates that management actions across the fishery are not fully integrated. However, the assessment team feels there is sufficient evidence that there is responsiveness to the state of the stock and those elements of the harvest strategy work together towards achieving management objectives. WCPFC decisions are supported by extensive monitoring and robust stock assessment. The decisions of WCPFC are implemented by regional bodies and archipelagic nations. Fiji has shown cooperation with WCPFC.
1.2.2	Yes	Yes	Yes	The scoring reflects appropriately the shortfall in meeting SG80 requirements and the condition is appropriate to raise the fishery's performance.	

P	Has a inforr availa used t Indica (Yes/	all relevant rmation lable been l to score this cator? s/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.	2.3 no		no	NA	I find the information on this PI supports a higher score. I am not sure that the lack of data to support the explicit spatial modelling available in MULTIFAN-CL, largely because of the difficulties in tagging albacore, justifies concluding that SG100 is not met for the 1 st scoring issue. I see no information in the report to support the conclusion that SG100 Is not met for the 2 nd and 3 rd scoring issues. There has been substantial improvement in addressing the data gaps identified in 2008 by Jones & Shallard as reflected in the most recent Data Gaps report (WCPFC-SC7-2011/ST WP-1. Increasing the score would result in a higher score for this PI than for the New Zealand albacore fishery, justifiable by the improved quality of information available since that assessment.	The assessment team agrees that there has been substantial improvement in information available and that the fishery is potentially stronger on this issue than NZ albacore. However, the uncertainties on stock structure and in the stock assessment make it difficult to agree that "a comprehensive range of information" is available.
1.	2.4 yes		probably	NA	I am not a scientist, and certainly not an assessment specialist, so I defer to others on this PI, but I would have been prepared to support a higher evaluation of the appropriateness of the assessment for the stock and the (implicit) HCRs and a score of 90 for the PI, with the understanding that the lack of formal is HCRs taken into account in PI 1.2.2	There have been improvements to the assessment that suggest a score of 80 is strongly met. However, as the latest assessment states, there is no accounting in the model for different growth curves by sex and that recent work suggests males grow considerably larger than females. This may be very significant as the model is strongly influenced by estimates of asymptotic length. This suggests that a score of 100 is not justified at this stage.

P	Has all release information available b used to sco Indicator? (Yes/No)	evant n een ore this	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2	.1.1 Probably this is not from the Report, ar should be clarified.	, but clear nd	Yes	Yes	 There is some apparent ambiguity in the extent and manner of application of the management measures (use of small circular hooks, deep sets, a prohibition on the use of wire traces and a requirement to release live sharks) said to be in place. Some of these appear to be practices of the industry or decisions by the Association, others may be licence requirements, but this is not clear. Information relevant to this issue includes: The apparent systematic finning indicated by Table 4 although it is not clear what period the data in this table is drawn from. The letter of 6 June in figure 10, which is interesting but is not evidence that the provisions of CMM 2009-04 have been applied to the fishery. WCPFC CMMs generally bind Member governments to take action, not vessel owners. The letter of 6 June does not appear to have statutory force. However there is a note in the CAP for Condition 3 that the requirements of CMM 2009-04 relating to fins are a 2012 licence condition The reference to a ban/prohibition on wire traces, but it is not clear whether this is a licence condition or a measure or practice applied by the Association or individual companies. 	We presume these comments pertain to SG 2.1.2 (management) (rather than 2.1.1, status). An additional table Sec 7.2) has been added to the report clarifying the extent and manner of application of these shark management measures. Essentially many of the CMM 2009-04 requirements are captured in the 2012 licence conditions, including (i) a ban on shark gear (incl. wire traces) and (ii) that vessels can land fins no more than 5% of the weight of sharks on board at the first point of landing. Furthermore officially-required logbooks now record sharks down to species level. The data in Table 4 Summary of shark management measures are from 2002-2009 (Peter Williams, pers. comm, 2011)
$ \mathbf{F} $	N 0205/2 VI			1	Page 100	

PI	Has all relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.1.2	Probably, but there may be updated projections, available	Yes	Yes	The projections referred to are presumably those in WCPFC-SC7-2011/MI-WP-02 rev1. These projections were subsequently updated, and if the updated version was available within the assessment timeframe, it could usefully be considered as evidence as to whether bigeye tuna is highly likely to be maintained within biological limits.	The document referred to appears to be the latest available on the WCPFC website.
2.1.3	Yes	Yes	Yes		
2.2.1	Yes	Yes	NA	My agreement with the 2.2 Component scores is based on	
2.2.2	Yes	Yes	NA	I) the certifier has correctly determined other	
2.2.3	Yes	Yes	NA	 considered under Components 2.1 and 2.3. ii) The bait species is appropriately considered under Component 2.2, although I am not sure that this is clear from CB 3.5.5. Incidentally, I doubt that the reference in Table 6 to Barracouta (snoek) is correct. 	This information was provided by Peter Nichols of SPC as an output from their observed discarded catch database
2.3.1	Yes	Yes	NA		

PI	Has all relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.3.2	Yes	Yes	NA	I find the information and rationale for scoring convincing, including in relation to the important case of the impact on the Fiji petrel. If the same rationale was used for scoring this PI as appeared to be used for 2.3.2 (which is 2 PIs at SG80, 1 at SG100, score 85), this PI might have been scored at 95 (1 PI at SG80, 2 at SG100)	Regarding the second point, there seems to be some error (does the peer reviewer mean to refer to 2.3.1?). As the third PI of 2.3.2 scores 100 (with the others 80 & 100, thus averaging 90), it scores higher than 2.3.1 (80 + 100 $+$ 80 = 85).
2.3.3	Yes	Yes	Yes	It seems an unusual result that the fishery should meet SG 80 on the Status and Management Strategy Outcomes and not on the Information Outcome. However, I consider the determination that the fishery does not meet the SG80 requirements for measuring trends, supporting a full strategy and allowing qualitative estimates to be accurate, although I am not sure that any of the SGs require the standard for the information to support species-specific stock assessments proposed in the scoring comments.	
2.4.1	Yes	Yes	NA	The scoring of the Habitat Component appropriately reflects the operation of this fishery in deep oceanic	
2.4.2	Yes	Yes	NA	waters with no impact on the seafloor.	
2.4.3	Yes	Yes	NA		
2.5.1	Yes	Yes	NA	I consider the scoring of this Component to reflect the	

PI	Has all relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.5.2	Yes	Yes	NA	available information on the impact of the fishery on the key elements of ecosystem structure and function, including the strong information element	
2.3.3					
3.1.1	yes	probably	NA	The information provided generally supports the conclusions and scoring but the scoring of the 1 st scoring issue depends heavily on the inclusion of appropriate standards for sustainable fisheries in the draft Offshore Fisheries Management Decree which has not yet been endorsed and/or the new legislation which is still apparently also in draft. Fiji legislation is otherwise markedly lacking inclusion of appropriate standards for sustainable offshore fisheries. Without the draft Decree and/or the new legislation, I doubt that the fishery would meet SG60 on the first scoring issue.	We agree the importance of the draft decree and new legislation being endorsed and enacted .However we do not agree that it currently does not meet PI 3.1.1 SG 60. The rationale is included in the scoring table
3.1.2	yes	yes	NA	The information provided supports the conclusions and scoring.	

P	Has all releva information available beer used to score Indicator? (Yes/No)	nt Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.	1.3 Not clear	Probably	NA	There is a lack of clarity about the extent of consideration given to the 2006-2010 Fiji Tuna Plan in the report. The scoring panel for this PI and PI 3.2.1 seem to be the only place where this Plan is mentioned and it is not included in the list of references. A fuller treatment of the role of the Plan and its strengths and weaknesses would be useful in Section 6.2. That Plan does include a reference to precautionary approach, contrary to the information in the scoring panel, although it is in the form of an acknowledgement of the obligation on the Fiji Government to apply the PA, rather than a more specific integration of the PA into the Plan. And while the Plan does not explicitly refer to the ecosystem approach, it does acknowledge the obligation of Fiji to apply most of the elements of an ecosystem approach as they are set out in the WCPFC Convention and the Fish Stocks Agreement, including assessing the impacts of fishing, other human activities and environmental factors, adopting measures to minimize waste and pollution, and protect biodiversity in the marine environment. In one way, consideration of the Plan fits more correctly under Component 3.2, since it is a fishery-specific instrument. The information on the WCPFC and long term objectives meets SG100 for the WCPFC management level. However, at present the Fiji management system falls woefully short of requiring long term objectives consistent with sustainable fisheries	The Peer Reviewer has made some valuable points. These have been taken into account and the scoring panel and in section 6.2 have been rewritten to make sure that the 2006-2010 Fiji Tuna Plan strengths and weaknesses is taken into account. This plan is referenced in the list of references

PI	Has all relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.3 cont				More generally, the Fiji management system is currently woefully short of requiring the application of long term objectives consistent with sustainable fisheries. However with Fiji as a Party to the WCPFC Convention the principles in Article 5 of the Convention are required to be applied by Fiji in the Fiji EEZ under Article 7 of the Convention, including the PA and the ecosystem approach, meeting the requirement for SG100 in respect of the Fiji management system. In addition, the draft Offshore Decree, apparently close to endorsement, and the new Plan, will very explicitly provide the basis for considering SG100 to be met for the Fiji management level. On balance, I consider the score of 90 to be appropriate but the certifier may want to take into account the comments above.	These comments are valuable and account has been taken in the report
3.1.4	yes	no	NA	There seems to be a mistake in scoring this PI. The scoring rationale clearly indicates that the fishery "falls short of <u>ensuring</u> that subsidies do not contribute to unsustainable fishing practices in future and these are regularly reviewed', as required for SG100, but a score of 100 is still awarded. On the information provided, the score should be 80.	Agree. The score has been changed to 80 to reflect this. The total score for P3 has been revised

I	PI	Has all relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
	3.2.1				This is where the 2006-2010 Tuna Plan is particularly relevant. It does include long term objectives, including reference to the PA, though not very integrally, and the major elements of the ecosystem approach. It is also explicitly based on estimates of MEY derived from a bioeconomic analysis of the effects of local depletion. In general, the analysis in the report does not reflect the apparent role of MEY-based standards and bioeconomic analysis in Fiji's management decisions for this fishery, and the provision of some information in the report on this work would seem useful to explain the approach used by Fiji, including Figure 1 from the Plan	As the reviewer says the 2006-2010 Tuna Plan does include long term objectives including the use of the precautionary approach and the major elements of an ecosystem approach. As MEY is not part of the MSC is not part of the MSC guidelines we haven't commented on this
3	3.2.2	No	No	NA	I agree with the scoring of the 1 st , 2 nd and 4 th scoring issues. For the 3 rd scoring issue, there are no significant requirements for this fishery from CMM 2008-01. It is hard to fault the decision in the 2006-2010 Plan to set a licence limit based on bioeconomic analysis, apparently using the best scientific information available at that time. In my view, the fishery meets SG100 for the 3 rd scoring issue on this basis, and the score should be increased to 90.	We agree with the Peer Reviewer's comments. The decision in the 2006-2010 Plan to set a licence limit based on bioeconomic analysis, using the best scientific information available at that time means the SG 100c is met. The report has been reworded and scored accordingly.

PI	Has all relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.3	Probably, but this is not evident from the Report	no	Probably	I expect that the information available to the certifier supports the scoring, particularly on the 1 st scoring issue, but this is not clear to me from the report. I do not think the information supports scoring of 100 for the 1 st scoring issue, and it may not support scoring of 80. I think a brief analysis of the strengths and weaknesses of the Fiji MCS system under section 6.2 would be appropriate to meet this gap. It seems a weakness of the MSC assessment process for shared stocks that assessment of the compliance element focuses on fisher compliance and does not deal with the compliance of the state(s) involved as Parties to the relevant Conventions.	A condition has been raised for this performance Indicator. Monitoring control and surveillance mechanisms exist in this fishery both at WCPFC level and Fiji national. This includes VMS and logbooks. There is a reasonable expectation that they are effective, since similar systems in other fisheries have proved effective and been implemented in the region, enforced and complied with. Sanctions to deal with non-compliance exist (Ministry of Fisheries and Forest legislation). However, the fishery (local) is not able to demonstrate that sanctions to deal with non- compliance are consistently applied. Fishers are generally thought to comply with the management system for the client fishery however there is some evidence of some systematic non-compliance may exist (Ministry records).

PI	Has all releva information available beer used to score Indicator? (Yes/No)	nt Does the information and/or n rationale used to this score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.	2.4 Probably not	No	NA	It may be the case that there is in place a Fiji national Strategic Plan for this specific fishery sufficient to provide the Fiji component of <i>a comprehensive research</i> <i>plan for the fisheries under assessment across P1 and P2</i> , required by SG100, but this is not clear from the Report. As an example the bio-economic analysis reported would seem to fit as part of this requirement. However, the information in the scoring Panel that <i>the FFA and</i> <i>national research results are not all fully accessible</i> seems to indicate clearly that the fishery does not meet SG100 for the 2 nd scoring issue. On this basis, I consider that this score should be reduced to 90, or to 80 if satisfactory information cannot be found in relation to the Fiji component of the research plan for this fishery.	For the WCPFC the SG 100 is met however as s the Peer reviewer says it is not so clear with the Fiji situation. The draft degree does provide for a research plan. There is the 'Joint country strategy' (JCS) between SPC , FFA and the Government of Fiji which provides research. However we do agree with the Peer reviewer that the score should be reduced to 90. This has been changed in the report
3.	2.5 No	Probably	NA	The information in the scoring comments is not up to date. The WCPFC has completed an external review (WCPFC8-2011/12). The Review Report was not available until WCPFC8 outside the assessment timeframe, but work on the Review began around July 2011, and should therefore be reflected within the information available for this assessment. The certifier should re-assess the score in the light of this information, but in my view, a score of 80 is likely to remain appropriate.	As the peer reviewer states the external review was not available at the time of the site visit. However we have updated the report to reflect that work was being carried out on the review at this time. The score has been reassessed but remains at 80.

Any Other Comments

Comments NIL Conformity Assessment Body Response FN 82052 v1 168 Page 168

Peer Reviewer B

Overall Opinion

Has the as appropriate presented	sessment team arrived at an e conclusion based on the evidence in the assessment report?	Νο	Conformity Assessment Body Response
lustification			λ
The seese	<u>''</u> month to one concluded that the fisher was	o.t. the o	" The second plat 4.0 and
The assess	ment team concluded that the lishery m	et the	The assessors have scored PTT.T.2 and
minimum st	andard for certification (score >80) for a	ll three	PI 1.2.2 at less than 80 and conditions
principles.	On review of this assessment and my kn	owledge of	have been set for them for this reason.
tropical long	nline fisheries, and albacore in particular	- I	The assessors recognize the difficulty in
concluded t	hat the scores for a number of performa	nco critorio	achieving the requirements of these
	A and Dringing O ware not fully watting		achieving the requirements of these
for Principle	and Principle 3 were not fully justified	or based	conditions through the WCPFC,
on expectat	ion of future developments/actions in the	e fishery,	however, this is what will be required to
which canno	ot reasonably be expected to be achieve	ed by the	satisfy the PIs and gain ongoing
proponent			certification Similar conditions have
proponent.			been get for other certified fishering
			been set for other certified fisheries,
in particular	,		Including the New Zealand albacore troll
i)	It is not appropriate to score 80 when c	entral	fishery.
	components of principle 1, such as agree	eed limit	
	reference points and effective harvest s	trategies	ii)
	are not in place and are not within the	conc of the	The Team has reviewed Pl's 251 252
	are not in place and are not within the s	cope of the	
	proponent nor the national regulatory a	uthority to	and 2.5.3 which pertain to this comment.
	unilaterally commit to delivering.		Some additional material has been
ii)	The assessment of the potential ecosys	stem	included in the information part of
,	impacts of fishing is weak. It appears to	Section 7.6 (Ecosystem Impacts) of the	
	heavily on the outcomes of initial ecosy	rony	main report, as well as the scoring
	neavily on the outcomes of initial ecosy	SIGIN	main report, as well as the sconing
	modeling studies, which were, necessa	riiy,	comments of PI 2.5.3. We have also
	parameterized with limited south pacific	data and	reviewed the scoring in 2.5.3 and have
	equilibrium assumptions (which are unl	ikely to	concluded that whilst the last two
	hold). A stronger justification for the sco	ores	scoring elements meet SG80, it is
	against a number of PIs for this principl	Ais	difficult to justify that they meet SG 100
	against a number of 1 is for this principi	6 13	As a result the swerell DL seers has been
	needed.		As a result the overall PT score has been
III)	In the case of principles 1 and 3, the as	sessment	reduced from 95 to 85.
	relies heavily on the provisions of the W	/CPFC	
	convention and the monitoring, decision	n-making	
	and compliance arrangements available	e to the	iii)
	Commission However as noted by the		the commente chove against item i) are
	Commission. However, as noted by the		the comments above against item i) are
	assessors, while there are provisions/in	stitutional	relevant. It is important to the
	arrangements for many of the requirem	ents within	certification of tuna fisheries in the
	the WCPFC governance arrangements	. they are	region that WCPFC is an effective body
	vet to be implemented in a manner con	sistent with	in implementing the provisions indicated
	the requirements for partification under		by the reviewer and that the client
	the requirements for certification under	principies	by the reviewer and that the client
	1 and 3.		group, through the Fiji government
			representation as a member of the
			Commission, seeks to achieve the
			necessary outcomes
			noocodiry outcomod.

D		NL -	Or a farmation to a second sect Day to
Do you ti appropria outcome	hink the condition(s) raised are ately written to achieve the SG80 within the specified timeframe?	Νο	Conformity Assessment Body Response
<i>Justificatio</i> As curren i) ii) With resp impose a a position commitmet this case, likely to ha certificatio With resp Fijian fish supporting there is no Hence it is are reason proposed. Requires other part	<i>on:</i> <i>Con:</i> The proponent successfully lobbying a parties, who are not party to this agreer develop, adopt and implement two core requirements of Principle 1 and a numb for Principle 3; A number of parties (specifically, Fijian and SPC) committing substantial resou development and implementation of me meet the current conditions ect to i), in my view it does not appear real condition for certification that the propone to significantly contribute to/or meet without ent and cooperation of a number of key pathis this includes the members of the WCPFC ave a diversity of views and commitments on. ect to ii), the certifier notes in the condition eries department, SPC and FFA have cond g the proponent in meeting the conditions. o indication of the nature or scale of this conditions is difficult to assess the extent to which the nable or can be realistically met in the time. further detail on resourcing and commitment ies.	number of ment, to ber of PIs Govt, FFA rces to the easures to sonable to nt is not in but the urties. In whom are to this as, that the nmitted to However, ommitment. conditions eframe ents of	See comments above. The assessors acknowledge the difficulty in achieving the necessary outcomes. There has been progress towards the development of reference points at WCPFC and further consultation is planned for the coming year. Several tuna fisheries in the region have sought or are seeking MSC certification. By working together the interested parties can exert influence towards achieving meeting requirements. The Director of Fisheries from the Fijian Fisheries department has provided a letter saying that the Ministry had reviewed the Client Action Plan (CAP) prepared by the Fiji Tuna Boat Owners Association (FTBOA) in response to the MSC assessment. He said they were aware of the matters raised in the CAP that will require the support of the Ministry and that he was writing to assure us of the Ministry's commitment to working closely with the FTBOA in support of implementing the CAP. He also said he was aware of the importance of moving towards a harvest control for the albacore fishery as a whole and could assure us that Fiji would be widely promoting this within the WCPFC framework. SPC and FFA have both committed to supporting the client in meeting the conditions. SPC have responded saying that "Support for the FTBOA MSC certification is part of the 'Joint country strategy' (JCS) between SPC and the Government of Fiji. A JCS is an official document which is signed by the parties. So our support is as official as it gets. FFA has an analogous process to SPC,JCS in terms of Service Level Agreements with countries. FFA has
If included	1:		
Do you th to close t	hink the client action plan is sufficient the conditions raised?	No	Conformity Assessment Body Response
Justificatio	<u>on:</u>		
See respo	onse to conditions above.		See response above.
Requires other part	further detail on resourcing and commitme	ents of	

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Performance Indicator Review

Please complete the table below for each Performance Indicator which are listed in the Conformity Assessment Body's Public Certification Draft Report.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.1	Yes	Yes	N/A	I agree with the rationale given to support the score, "The 2011 assessment of South Pacific albacore indicates that overfishing is not occurring ($F_{2007-2009}/F_{MSY} = 0.26$) and that albacore is not overfished ($SB_{2009}/SB_{MSY} = 2.25$ and $B_{2007-2009}/B_{MSY} = 1.26$)". However, given: a) the structural uncertainty in the assessment, b) the lack of any substantial fisheries indpendent data inputs, c) the conflict between the two primary data series (CPUE and size) and the issues associated with the complex fleet structure, I think a more moderate score above 80 would be more appropriate, as this would be more consistent with what is still a developmental assessment. I recommend consulting with the primary stock assessment scientist (s) at SPC to gain a clearer understandning of the current issues with the assessment, as it appears this has not been done.	The assessment team has reviewed the scoring on this issue and acknowledges the uncertainty highlighted by the reviewer. The current assessment is accepted by the WCPFC scientific committee as sufficiently robust to provide management advice that the fishery is not overfished and not subject to overfishing. The team feels that it is reasonable to retain the current scoring for the elements of this PI. However, given the uncertainty in the assessment, recent increases in catches, possible changes to the assessment with the inclusion of new biological information, and declining catch rates, it is important that this performance indicator be closely monitored in future assessments/audits. Note that the New Zealand albacore troll fishery scored 100 on this item.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.2	No	Yes	Yes, but see latter comment.	The certifier gave a score of 75 for this PI, based on the fact that the SPC and WCPFC- SC provide advice on stock status to the WCPFC based on commonly used MSY limit reference points specified in the UNFSAThere are, however, no target or limit reference pionts formally defined or agreed for the WCPFC fishery, nor the UoC. Hence a score of ~70 would seem more appropriate.As noted by the certifier, there is a process underway within the WCPFC to address the issue of defining and agreeing target and limit reference points, however, given the progress to date (see Davies and Polacheck 2007; Davies and Basson 2008; Campbell 2009, Norris 2009, WCPFC-SC 2011), it would appear somewhat unrealistic that this process can be completed for Albacore in the timeframes proposed, when substantive deliberations by the Commission are yet to be initiated for big eye and yellowfin tuna. (see additional notes re: appropriateness of MSY based Reference points and Davies and Basson 2008 and Preece et al. 2011 for further rationale for using depletion-based reference oints for stocks such as Albacore).	The lack of a limit reference point results in a score of 60 against the 2 nd scoring element, leading to an overall score of 75. This score leads to a condition on the introduction of target and limit reference points, hence the assessment team feels that this sufficiently addresses the shortcoming. The lack of target and limit reference points has been identified as a shortcoming in the assessment of a number of tuna fisheries in the region seeking certification and it is hoped that the stakeholders for these fisheries will raise the profile on this issue to achieve the necessary outcomes.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.3	NA	NA	NA		
1.2.1	No	No	NA	The certifier gave a score of 80 for this PI. Accoding to the guidelines this means: "The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy <u>work together</u> towards achieving management objectives reflected in the target and limit reference points." The management arrangements for albacore currently in place in the WCPFC are not what would generally be considered a formal harvest strategy. That is, a formally speicifed and agreed set of monitoring, analysis, assessment and harvest control/decision rules to meet specified objectives. While the monitoring and assessment components are in place, there are currently no formally agreed reference points/operational objectives or harvest control rules, as noted by the certifiers. Given this, and the general nature of the management measures currently in force and under consideration, I consider a score of 60 to be more consistent with the guideposts and the current management system.	The assessment team feels that there is some confusion in the comments raised here. Several of the points relate to subsequent PIs. The lack of well defined harvest control rules led to a score of 60 for PI 1.2.2 and a condition has been set that is intended to address this issue.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.2	Yes	Yes	Yes, but see comment	The condition proposed by the certifier requires the development, agreement and implementation of a formal harvest strategy by the WCPFC. As such, successfully meeting this condition will require significant contributions and agreements from several entities not party to this proposal, not the least being the members of the WCPFC. The certifier notes a number of parties have agreed to support this process (notably SPC and FFA), however, the nature of this agreement and the degree of support is unclear. This needs to be formalised to assess the degree to which this condition can realistically be met. (See additional notes re alternative approaches to harvest strategy development and implementation.)	The assessors recognize the difficulty in achieving the requirements of these conditions through the WCPFC, however, this is what will be required to satisfy the PIs and gain ongoing certification. Similar conditions have been set for other certified fisheries, including the New Zealand albacore troll fishery.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.3	No	Yes	NA	The certifier provides the following rationale for the score of 80 against this PI: "Data collection and monitoring are sufficient to support the stock assessment and harvest strategy, meeting all of the 80 scoring issues. Information is not comprehensive, however, preventing a higher score under this performance indicator." I don't agree with this assessment for two reasons: i) A formal HS is not in place. However, assuming one was in place, the sensitivity analysis conducted for the 2009 assessment (Hoyle at al 2009) and referred to in the discussion of the 2011 assessment (Hoyle 2011) indicate that the MSY reference points, which would presumably be included in the harvest control rule, are hingly sensitive to assumptions about stock productivity (steepness and natural mortality) and fleet selectivity and that these quantities cannot be estimated with reasonable precision by the assessment model. (see Preece et al 2011 for guidance on appropriate reference points and additional notes re: size, cpue and tagging data)	Scoring re the existence of the harvest strategy and reference points is considered at other PIs. Despite the uncertainty in the assessment and the problems with MSY- based reference points, the assessment team suggests that, as required in the 1 st scoring element, "sufficient" information is available to support the current harvest strategy. The team notes that the same score was given for this PI for the New Zealand albacore troll fishery. Further consideration of information/monitoring requirements will be necessary with the development of formal reference points and harvest control rules. Note that Peer Reviewer A suggests the possibility of a higher score for this item.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.4	Yes	Yes	NA	As noted by the certifier, formal external peer review of the assessment has been identified as desirable and should be priority. To my knowledge, alternative assessment approaches (i.e. Non-MULTIFAN assessment models) have not been pursued for albacore and may warrant investigation to faciliate simulation evaluation of harvest strategies (i.e. MSE) and explore the relative robustness and sensativity of different assessment approaches.	Agreed. Note that Hoyle and Langley (2007, WCPFC-SC3-ME SWG/WP-6) provides a comparison of outcomes between the use of MULTIFAN and Stock Synethesis software.
2.1.1	Yes	Yes	Yes	The action plan for this condition should include the requirement for a formal statistical design of the observer and monitoring program as part of the development of the strategy. This will help ensure that the review identified in the 2 nd and 3 rd years of implementation will be well placed to make definititve conclusions.	

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.1.2	Yes	Yes	Yes	As for 2.1.1 there should be a formal statistical design study as part of the development of the strategy to ensure objectives assessment of effectiveness can be conducted in year 3.	
2.1.3	Yes	Yes	Yes	As per 2.1.1 require a formal statistical design study. Also, the Client Action Plan for this PI states at the end: "This data collection programme will be continued in subsequent years, as required." Given the likely lag times for response and/or recovery of these species to the measures put in place, it is not clear why this monitoring program, if successfully designed and implemented, would not be ongoing. Recommend amending CAP accordingly.	
2.2.1	Yes	Yes	NA		
2.2.2	Yes	Yes	NA		
2.2.3	Yes	Yes	NA		

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Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.3.1	Yes	Yes	NA		
2.3.2	Yes	Yes	NA		
2.3.3	Yes	Yes	Yes	See earlier comment re: design of the observer program and need to ensure that appropriate statistical design study is included in development of program and assessment of effectiveness.	
2.4.1	Yes	Yes	NA		
2.4.2	Yes	Yes	NA		
2.4.3	Yes	Yes	NA	Monitoring system should required recording of gear loss and retrieval events.	

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.5.1	No	No	NA	The certifier provided a score of 80 for this PI based on the statement: "The status of juvenile and adult albacore populations suggests their ecosystem role is being maintained, and hence impacts of the fishery on the ecosystem will be minor." However, the guidance for this score states "The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm." While the current level of the UoC may not have impacted on albacore to an extent to which there are likely to be irreversible ecosystem impacts, it should be noted that the current management system aims to reduce albacore to 0.26 SSB zero. The certifiers assessment, and the associated modelling studies referred to, do not appear to have taken this into account. Further consideration of this issue and justification of scores is warranted for the other PIs under 2.5.	-Although the current assessment suggests that MSY-based indicators used by WCPFC would lead to a reduction of SSB to 0.26 SSB zero (and B to 0.53 B zero), without formal reference points and harvest strategies it is not clear what management measures might be introduced before the stock is reduced to these levels. The condition set in this report requires the development of formal reference points that may not be MSY-based and may require higher levels of biomass. It is recommended that this situation is reviewed at each annual surveillance. Text to this effect has been added to the main report.
2.5.2	Yes	Yes	NA	But see response to 1.1.	

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.5.3	No	No	N/A	In summarising the justification for a score of 95 for this PI the certifier notes: "Information on removals, especially keystone tuna species and from ecosystem modelling and analysis is sufficient to support the development of strategies to manage ecosystem impacts. Thereby meeting all the scoring issues under the 100 SG". There appears to have been little consideration of the quality and times-series nature (or lack of) data inputs to the ecosystem models and, therefore, the likely robustness of the inferences made from their results. While significant advances have been made over the past 10 years in the understanding of the structure and function of pelagic ecosystems in the South Pacific, it is reasonable to say that we are some way from the sort of understanding that is implied by the scoring for this PI. A major reason for this is the lack of systematic, long-term data series for the majority of the components of this doc). Given this, I consider a score of 80 more appropriate. Some broader consideration of the issues associated with ecosystem impacts and their attribution would be valuable in this context.	Some additional material has been included in the information part of Section 7.6 (Ecosystem Impacts) of the main report, as well as the scoring comments of PI 2.5.3. We have also reviewed the scoring in 2.5.3 and have concluded that whilst the last two scoring elements meet SG80, it is difficult to justify that they meet SG 100. As a result the overall PI score has been reduced from 95 to 85.
Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
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3.1.1	Yes	Yes	NA		
3.1.2	Yes	Yes	NA		
3.1.3	Yes	Yes	NA	The lack of reference to the precautionary approach in Fiji fisheries legislation suggests this score is higher than it should be to be consistent with MSC principles.	The 2006-2010 Fiji Tuna Plan does include reference to the precautionary approach. The draft the Offshore Fisheries management Decree for Fiji also includes the preacautionary approach.
3.1.4	Yes	Yes	NA		
3.2.1	Yes	Yes	NA	Note comment for 3.1.4	See above

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.2	Yes	No	NA	The certifier provided a score of 85 for this PI. In doing so, they stated "At the WCPFC level it is clear that the precautionary approach is used, and decisions are based on the best available information." Further justification for this conclusion is required. While it is clear that the WCPFC Convention includes the relevant objectives and provisions for the application of the precaitionary approach, it is also clear that in practice the Commission has had some challenges with practical implementation, particularly with respect to the CMM for bigeye tuna. A more substantial justification for why this should be expected to be different in the case of albacore is required.	As the Peer reviewer says at WCPFC level there are relevant objectives and provisions for the application of the precautionary approach. We persume the peer reviewer is concerned about the 3 rd scoring issue, however there are no significant requirements for this fishery from CMM 2008-01.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.3	Yes	No	NA	The certifier gave a score of 70 for this PI. The justification included the statement: "A <u>comprehensive</u> monitoring, control and surveillance system has been implemented in the fishery under assessment by WCPFC and by Fiji government (100)". It is not clear from the documentation or the justification the extent to which the general provisions/measures required by the WCPFC apply to longline vessels targetting albacore in the Fijian EEZ (i.e. the UoC). Furthermore, this statement: "The WCPFC's Technical and Compliance Committee is also continuing consideration of port State measures, chartering arrangements, catch/statistical documentation, the control of nationals, and compliance monitoring and reporting" suggests that there are still elements of a "comprehensive MCS system that are yet to be agreed and implemented. This needs to be clarified.	A condition has been raised for this performance Indicator. Monitoring control and surveillance mechanisms exist in this fishery both at WCPFC level and Fiji national. This includes VMS and logbooks. There is a reasonable expectation that they are effective, since similar systems in other fisheries have proved effective and been implemented in the region, enforced and complied with. We agree with the peer reviewer that a "comprehensive" system is not in place and have changed this score (80)and comment in the table to reflect this.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.4	Yes	No	NA	The certifier scored this PI as 100. This implies that the current research plan "provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and <u>reliable and</u> <u>timely information</u> sufficient to achieve the objectives consistent with MSC's Principles 1 and 2". The primary justification for this score is the WCPFC strategic research plan. While this plan is comprehensive in it's coverage, it does not provide priorities for research for albacore nor commitments to finding to resource the major uncertainities in the current assessment and management of the fishery. A score of 80- would seem more appropriate. (see additional notes). It may be that commitments for the relevant components of the fishery have been made by SPC and FFA. If so, these need to be provided in more detail.	The WCPFC Strategic Research Plan addresses four overall research and data collection priorities - collection and validation of data from the fishery, monitoring and assessment of stocks, monitoring and assessment of the ecosystem, and evaluation of management options. The WCPFC Strategic Research Plan is supplemented by the SPC, FFA and national Strategic Plans to provide a comprehensive research plan for the fisheries under assessment across P1. P2 and P3. The WCPFC and SPC Plans and results are widely and publicly available, but the FFA and national research results are not all fully accessible. In line with the peer reviewer's comments we have downgraded the score to 90. A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2 (100) Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available (80)

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.5	Yes	Yes	NA	The score for this PI is justified on the basis that "The fishery has in place mechanisms to evaluate key parts of the management system and is subject to regular internal and occasional external review." This conclusion is not completely justified given scores for other criteria and the fact noted in response to this PI that "WCPFC has not undertaken an external review." It is noted that an external review of the bigeye assessment has recently been completed consistent with the recommendation from the MRAG review. This is a significant positive step, which will improve the rigour and transparency of the advisory process. I am not aware of a similar review being proposed for the assessment or management of the albacore fishery.	The WCPFC has completed an external review (WCPFC8-2011/12). The Review Report was not available until WCPFC8 outside the assessment timeframe, but work on the Review began around July 2011, and should therefore be reflected within the information available for this assessment. We have updated the report to reflect the work that has been carried out on the review at this time. The score has been reassessed but remains at 80

Any Other Comments

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Additional notes - Review of MSC assessment report Fijian Albacore longline fishery

Appropriateness of MSY based reference points

Previous work commissioned by the WCPFC and noted in the assessment (Davies and Polacheck 2007; Davies and Basson, 2008; Preece et al 2011), recommends the use of "depletion" based reference points for stocks such as albacore, where there is significant uncertainty in natural mortality, selectivity and size/age at maturity. An additional advantage of using depletion-based reference points is that they can potentially be meaningfully applied at a sub-regional level (see Davies et al., 2008; Kolody et al 2011).

While parameter estimates from the recently completed population biology project on South Pacific Albacore (Farley et al., 2011, 2012; Williams et al., 2011) will assist in this regard for maturity schedules and size at age relationships, the structural uncertainty relating to steepness and selectivity is likely to remain, particularly in the absence of fisheries independent data for albacore.

IMM comment: IMM acknowledges the work that has been undertaken on this issue as indicated by the reviewer and note that Hoyle (2011) does present depletion-based estimates in the latest albacore assessment. At this stage, however, WCPFC focuses on the use of MSY-based values in its management approaches, hence it is important to focus on these in evaluating the fishery. This does not imply that further development of reference points should not consider alternatives.

Alternative approaches to Harvest Strategies

Second, while the focus on stock wide status and management measures is important; this should not be to the exclusion of consideration of subregional, EEZ or fleet scale harvest-strategies that could be designed to have a high probability of ensuring that harvest rates by the UoC are consistent with the objectives of the WCPFC (see Davies et al., 2008, Davies and Basson, 2008; Prince et al., 2011, Kolody et al., 2011).

Such an approach would have a number of distinct advantages: a harvest strategy could be designed and evaluated to be precautionary with respect to uncertainties in stock structure and connectivity for the wider WCPO stock, ii) operational and implementation considerations could be tailored to the UoC, and still be consistent with the objectives of the Convention and CMMs of WCPFC; iii) negotiating final agreement would be less complicated and more likely to be achieved in the timeframes stipulated for the current conditions, and iv) successful implementation would provide practical demonstration for other components of the wider fishery.

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IMM comment: Fiji is a member of the Forum Fisheries Agency, one of the objectives of which is to implement national and subregional arrangements consistent with WCPFC decisions. The assessment team agrees that harvest strategies could be developed as suggested by the reviewer, however the design and evaluation of this approach would require further research, the timeframe of which is likely to be outside the current conditions.

Information Monitoring

The other significant source of uncertainty in the assessment is the conflict between the length frequency data, which is neither comprehensive nor consistent over time, and the CPUE data: the two primary abundance indices in the model, as the tagging data is uninformative from an assessment perspective (Hoyle 2011). These statements from the primary assessment document indicate that current monitoring is not sufficient to provide a robust assessment of the stock status and productivity, even if the current estimates indicate that the stock is not overfished and overfishing is not occurring.

Hoyle (2011) identifies a number of sources of information that have either recently become available or would substantially improve the assessment if available. These include model independent estimates of growth and size-at-age, sex specific growth and indications of regional variation in growth and size at maturity (Williams et al., 2012; Farley et al 2011, 2012). This suggests that the the information currently available for assessing the stock and the sustainability of harvest is the minimum generally available (i.e. catch, effort and length data from the fishery) and is not sufficient to provide a robust assessment of the sustainability of the fishery or, potentially, implementation of a harvest strategy. As such, I consider a score in the order of 70-75 would be a more appropriate reflection of the current monitoring systems. This is not to say that this could not be significantly and relatively easily improved, through targeted research and improved systematic biological sampling of catches for length, age and sex data, to meet the information needs identified by Hoyle (2011).

IMM comment: There have been recent improvements in the information available and these are likely to strengthen future assessment and support the development of a robust harvest strategy. The 7th meeting of the WCPFC Scientific Committee accepts the current assessment and acknowledges the status of South Pacific albacore as not overfished and not subject to overfishing. There are inadequacies in the information and monitoring as indicated in the scoring for PI 1.2.3. However, the assessment team feels that the criteria for scoring guidepost 80 are met. This is consistent with the certification of the New Zealand albacore troll fishery.

Strategic Research Plan

The certifier score this PI as 100. This implies that the current research plan "provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and <u>reliable and timely information</u> sufficient to achieve the objectives consistent with MSC's Principles 1 and 2". The primary justification for this score is the WCPFC strategic research plan. While the WCPFC strategic research plan is comprehensive in it's coverage, it does not provide priorities for research for albacore, nor commitments to resource the major uncertainties in the current assessment and management of the fishery. In this regard, the proposal relies heavily on research and monitoring activities that are outside the direct influence of the applicant and subject to priorities of other fisheries and member priorities.

Prior to the recently completed collaborative study between SPC and CSIRO (Farley et al 2012), the majority of the biological inputs to the stock assessment were either assumed, or based on stocks from other oceans. The results of this work have significantly revised the basis for the stock assessment of albacore and identified a number of areas for further research and monitoring. Contributions to this research and monitoring should be a priority for the applicant. SPC and the Fijian observers have already contributed directly to the sampling for this recently completed project. Ongoing monitoring could provide the basis for in-zone harvest strategies. This would provide a more active role for the applicant in improving the monitoring information available for the fishery at the appropriate scale.

IMM comment: The WCPFC Strategic Research Plan addresses four overall research and data collection priorities - collection and validation of data from the fishery, monitoring and assessment of stocks, monitoring and assessment of the ecosystem, and evaluation of management options. The WCPFC Strategic Research Plan is supplemented by the SPC, FFA and national Strategic Plans to provide a comprehensive research plan for the fisheries under assessment across P1. P2 and P3. The WCPFC and SPC Plans and results are widely and publicly available, but the FFA and national research results are not all fully accessible. In line with the peer reviewer's comments we have downgraded the score to 90. A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2 (100) Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available (80)

15.4 Appendix C: Client Action Plan

FIJI TUNA BOAT OWNERS ASSOCIATION

MARINE STEWARDSHIP COUNCIL

CLIENT ACTION PLAN - January 2012

Condition 1: Reference Points, Management Outcomes: PI 1.1.2

Outcome	
PI	1.1.2
SG60	• Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.
SG80	 Reference points are appropriate for the stock and can be estimated. The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity. The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome. For low trophic level species, the target reference point takes into account the ecological role of the stock.
SG100	 Reference points are appropriate for the stock and can be estimated. The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of relevant precautionary issues The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
Scoring	Overall score: 75
Rationale	Target and limit reference points need to be formally agreed by management, consistent with the management objectives and scientific stock assessment Although management advice is given in relation to MSY-based reference points, there are no explicit limit or target points or regions defined. Explicit target and limit reference points (or regions) need to be defined meeting the MSC Principles and Criteria. In particular, a limit reference point is required which is set above the level at which there is an appreciable risk of impairing reproductive capacity.
Condition	 Condition 1: Target and limit reference points need to be formally agreed by management, consistent with the management objectives and scientific stock assessment. Timescale: Within four years of certification WCPFC must be in a position to demonstrate that the SG80 requirements have been met:
	Kerefence points are appropriate for the stock and can be estimated.

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	 The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity. The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome. For low trophic level species, the target reference point takes into account the ecological role of the stock. It is appropriate that stock-wide reference points be derived for albacore tuna through WCPFC processes. Some progress has been made though the WCPFC SC meetings with the presentation of working papers on potential reference points for the major tuna stocks. In particular, SC7 made specific recommendations to WCPFC in relation to the adoption of limit reference points and additional recommendations on future needs for the implementation of reference points more generally, and currently stock status is reported relative to MSY-based reference points. The client should encourage WCPFC, through the Fiji Fisheries delegation, to promote further work in the area to lead towards the development and adoption of reference points for the stock. Milestones in achieving this end require that the client provide evidence of : Year 1. Adoption of SC recommended limit reference points by WCPFC and development of appropriate target reference points. Year 2. Development of appropriate target reference points by SC to WCPFC. Year 3. Adoption of SC recommended target reference points by WCPFC.
Client action plan	 FTBOA note the urgency of implementing stock-specific reference points and associated harvest control rules given recent increases in overall regional albacore catch levels. To support the development of appropriate reference points for the South Pacific albacore stock, therefore, in the respective years the client will provide evidence of: YEAR 1 Engagement with the Fiji government to promote the completion and adoption of the Fiji Tuna Fishery Management Plan. Consultation with the Fiji Ministry of Fisheries and Forestry and where necessary FFA and FFA members through the Sub-Committee on South Pacific Tuna and Billfish Fisheries (SC-SPTBF) and Fiji delegates to WCPFC with the objective of establishing an agreed position on limit reference points for the stock that is consistent with the MSC SG 80 standards. The provision of any requested practical support for SPC, FFA and WCPFC analyses on limit and target reference points for albacore to support discussions at FFA SC-SPTBF meetings. Actions to raise awareness of the need for a WCPFC action on this issue, through the Pacific Island Tuna Industry Association (PITIA) YEAR 2 the provision of any requested support for SPC, FFA and WCPFC analyses on target reference points for albacore to support any further discussions at FFA SC-SPTBF

	the FFA SC-SPTBF meetings and the WCPFC Scientific Committee.
	2. Engagement with Fiji government officials, and where necessary FFA and
	its members, and WCPFC delegates from the other major countries fishing
	the stock in advance of the Commission meeting to seek their support for the adoption of appropriate target reference points by the WCPFC and appropriately drafted WCPFC Resolutions. 3 Collaboration with other industry sectors and NGOs in order to continue to
	raise awareness of the need for WCPFC to adopt appropriate reference points
	for the South Pacific albacore stock.
	4. Actions to raise awareness of the need for a WCPFC action on this issue,
	through the Pacific Island Tuna Industry Association (PITIA)
	YEAR 3
	1. Engagement with high-level Fiji government officials, and where
	necessary FFA and its members, and WCPFC delegates from the other major countries fishing the stock in advance of the Commission meeting to ensure appropriately drafted WCPFC Resolutions on the adoption of target reference points for the stock, for the WCPFC annual meeting, for consideration by the Commission.
Consultation on condition	The following organisations have committed to assist the fishery in undertaking the actions specified in the action plan: Fiji Ministry of Fisheries and Forestry, SPC, FFA

Condition 2: Harvest Control Rules and Tools, Harvest Strategy: PI 1.2.2

Outcome	
PI	1.2.2
SG60	 Generally understood harvest control rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached. There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.
SG80	 Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. The selection of the harvest control rules takes into account the main uncertainties. Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.
SG100	 Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. The design of the harvest control rules take into account a wide range of uncertainties. Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
Scoring	Overall score: 60
Rationale	Well-defined harvest control rules need to be proposed, tested and adopted. These

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	control rules need to be consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. Although this is implied within the harvest strategy, it is not clear how, in practice, the fishery will achieve the target point (or region) within which management wishes to maintain the stock or that rebuilding will be achieved if needed with the current tools.
Condition	Condition 2: Well-defined harvest control rules need to be proposed, tested and established through WCPFC working groups, committees and the Commission.
	 Timescale: Within four years of certification WCPFC must be in position to demonstrate that the SG80 requirements have been met: Well defined harvest control rules shall be in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. The selection of the harvest control rules shall take into account the main uncertainties. Evidence shall be available that indicates that tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.
	The harvest control rules need to be formulated in conjunction with the agreed reference points for the stock. The WCPFC has already adopted a measure to limit expansion of the fishery and maintain the stock above the B _{MSY} level, thereby, the default target biomass level. This measure satisfies some of the requirements of a harvest control rule as it reduces the risk of the stock declining below the target level and hence the lower limit reference point. However, there are no explicit management actions proposed (let alone adopted) for the fishery if the stock biomass limit reference point.
	Any harvest control rules would need to be applied to the entire stock and, therefore, need to be formulated by WCPFC. The client should encourage WCPFC, through the Fiji Fisheries delegation, to promote further work in formulating appropriate HCRs for the stock. Fiji Fisheries will need to appropriately implement adopted HCRs.
	Milestones in achieving this end require that the client provide evidence of:
	Year 1. Plans for the development and adoption of appropriate HCRs for albacore tuna should be in place by the first surveillance audit. Lobbying of WCPFC (if required) should also begin by the first surveillance audit.
	Year 2. Testing and demonstration of potential HCRs should be initiated by the second surveillance audit. This should be undertaken with consideration of any deliberations on appropriate reference points. It may require additional analyses this should be included within the work plan of the WCPFC.
	Year 3. HCRs should be in place by the third annual surveillance audit and an ongoing research plan is established to ensure the effectiveness of these HCRs.
Client action plan	FTBOA note the urgency of implementing stock-specific reference points and associated harvest control rules given recent increases in overall regional albacore catch levels. To support the development of appropriate

harvest control rules for the South Pacific albacore stock, therefore, in the respective years the client will provide evidence of:
YEAR 1
1. Engagement with the Fiji government to promote the completion and adoption of the Fiji Tuna Fishery Management Plan.
2. Consultation with the Fiji Ministry of Fisheries and Forestry, and where necessary FFA and FFA members through the Sub-Committee on South Pacific Tuna and Billfish Fisheries (SC-SPTBF) and Fiji delegates to
WCPFC with the objective of establishing an agreed position on harvest control rules for the stock that is consistent with the MSC SG 80 standards.
3. Support for and collaboration as requested on activities of the FFA SC-SPTBF in the analysis of harvest control rules consistent with candidate
reference points.
4. Engagement with Ministry of Fisheries and Forestry staff and Fiji delegates to WCPFC to:
a. promote the tabling of a statement to WCPFC at its Ninth Session (December 2012), urging other members to work diligently to adopt formal harvest control rules for all tuna stocks, as required by the WCPFC Convention.
b. engagement with high-level contacts between Fiji government officials, FFA and its members, and WCPFC delegates from the other major countries fishing the stock in advance of the Commission meeting to seek their support for the adoption of appropriate harvest control rules by the WCPFC.
c. ensure the work plan of the WCPFC Scientific Committee and FFA SC-SPTBF in 2013 will include analyses of candidate harvest control rules for albacore.
5. Actions to raise awareness of the need for a WCPFC action on this issue through the Pacific Island Tuna Industry Association (PITIA)
YEAR 2
1. Engagement with the Fiji Ministry to consolidate the Fiji position on harvest control rules for the South Pacific albacore stock at subsequent FFA and WCPFC meetings and workshops and encourage delegates from the other major countries fishing the stock to support the Fiji position. This shall be undertaken in conjunction with any deliberations on appropriate reference points.
2. Provision of any requested support for SPC, FFA and WCPFC analyses on HCRs for albacore to support any further discussions at the FFA SC- SPTBF meetings and the WCPFC Scientific Committee.
3. Collaboration with other industry sectors and NGOs in order to raise awareness of the need for WCPFC to adopt well-defined harvest control rules for the southern albacore stock
 4. Support as requested for the activities of the FFA SC-SPTBF in the analysis of harvest control rules consistent with candidate reference points. 5. Actions to raise awareness of the need for a WCPFC action on this issue through the Pacific Island Tune Industry Association (DITIA)
unough the Fachie Island Fulla muusu y Association (FITIA)

	YEAR 3 1. Practical support as requested to WCPFC meetings and workshops with the objective of achieving the adoption of harvest control rules for the South Pacific albacore stock by WCPFC. 2. Engagement with high-level Fiji government officials, and as required FFA and its members, and WCPFC delegates from the other major countries fishing the stock in advance of the Commission meeting to ensure appropriately drafted WCPFC Resolutions on well defined harvest control rules for the stock, to be tabled by Fiji and other countries fishing on the stock) at the 2014 (or 2015 if necessary) WCPFC annual meeting for consideration by the Commission. 3. Liaison with the Fiji Ministry of Fisheries and Forestry to ensure relevant supporting research is planned both within the FFA SC-SPTBF and the WCPFC Science Committee. 4. Actions to raise awareness of the need for a action on this issue through the Pacific Island Tuna Industry Association (PITIA)
Consultation on condition	The following organisations have committed to assist the fishery in undertaking the actions specified in the action plan: Fiji Ministry of Fisheries and Forestry, SPC, FFA.

Condition 3: Status retained non-target species. P 2.1.1

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Outcome	2.1.1
PI	Status : The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species.
SG60	 Main retained species are likely to be within biologically based limits or if outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species. If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or bindering recovery.
SG80	 Main retained species are highly likely to be within biologically based limits, or if outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.
SG100	 There is a high degree of certainty that retained species are within biologically based limits. Target reference points are defined and retained species are at or fluctuating around their target reference points.
Scoring	Overall score: 70
Rationale	This condition only affects those four shark species that are main (e.g. blue shark and short-finned mako) or minor retained bycatch (e.g. silky and oceanic white tip) species.
	Blue shark: Stock assessments to date, including those using Pacific data through

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	2002, have not indicated overfishing or an overfished state and as such the stock is likely to be within biologically based limits. Management measures taken by the fishery, such as the use of small circular hooks, deep sets, a prohibition on the use of wire traces and a requirement to release live sharks suggests that the fishery has a partial strategy of demonstrably effective management measures in place that the fishery does not cause the retained species to be outside biologically based limits (70).
	<u>Short-finned mako</u> : Recent abundance indices and median size analyses for shortfin mako in the WCPO have shown no clear trends; therefore there is no apparent evidence of the impact of fishing on this species in the WCPO and as such the stock is likely to be within biologically based limits. Management measures taken by the fishery, such as the use of small circular hooks, deep sets, a prohibition on the use of wire traces and a requirement to release live sharks suggests that the fishery has a partial strategy of demonstrably effective management measures in place that the fishery does not cause the retained species to be outside biologically based limits (70).
	<u>Silky shark</u> : It appears that, based upon length-frequency information that the majority of the population is relatively stable, although there may be areas of local depletion. As such it appears high likely that this species is within biologically-based limits. Management measures taken by the fishery, such as the use of small circular hooks, deep sets, a prohibition on the use of wire traces and a requirement to release live sharks suggests that the fishery has a partial strategy of demonstrably effective management measures in place that the fishery does not cause the retained species to be outside biologically based limits (70).
	<u>Oceanic white tip shark</u> : Although there has been no stock assessment conducted for this species to date, recent analysis of four different datasets for the WCPO show clear, steep and declining trends in abundance indices. Management measures taken by the fishery, such as the use of small circular hooks, deep sets, a prohibition on the use of wire traces and a requirement to release live sharks suggests that the fishery has a partial strategy of demonstrably effective management measures in place that the fishery does not hinder stock recovery and rebuilding (60).
	In summary, the first three of these shark species are likely to be within biological limits (the status of the oceanic white tip shark is less certain). For all shark species there are measures in place (e.g. ban on wire traces, the use of circular hooks and a CMM requiring the release of all live sharks), but at present these cannot be considered to be demonstrably effective.
Condition	Condition 3 : the Client should put in place a formal strategy and implementation arrangements that are designed to ensure that there are demonstrably effective management measures so that the fishery does not hinder recovery and rebuilding of vulnerable shark species.
	Milestones in achieving this end require that the client provide evidence of:
	Year 1. A formal strategy and implementation plan should be developed in readiness for the first annual surveillance.
	Year 2. Testing and demonstration of the formal strategy and implementation plan should be initiated by the second surveillance audit.
	Year 3. There should be verifiable information that these measures are demonstrably

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	effective by the third annual surveillance audit.
Client action	FTBOA note that stock assessments of shark are currently being performed by SPC
plan	on behalf of the WCPFC. These assessments focus initially on oceanic white tip and
	silky shark, with assessments of blue shark and mako to follow. These will give a
	clearer picture of the status of these species.
	It is noted that the long-lived, low fecundity life history of most shark species implies a considerable period of time may be required to quantitatively demonstrate positive impacts of mitigation measures on the wider stock status, and this time period may be beyond the period of certification for some species. Scientific advice will be sought when evaluating the direct effectiveness of FTBOA strategies to mitigate shark bycatch.
	In the meantime, in collaboration with the Fiji Ministry of Fisheries, the FTBOA have already initiated a shark-mitigation plan to reduce the bycatch of shark during fishing. In the respective years the client will demonstrate the following to the CAB:
	YEAR 1
	1. A formal strategy and implementation plan has already been developed in collaboration with the Fiji Ministry of Fisheries. The Fiji longline licence conditions for 2012 note: "No drop line and shark line is to be carried on board (section 1.3); all licensed vessels fishing in the archipelagic waters, the 12 miles territorial seas and the EEZ are to have on board fins that total no more than 5% of the weight of sharks on board" (section 1.4; consistent with WCPFC decisions).
	2. The FTBOA will adopt the use of the shark by species logbook prepared by SPC to provide more detailed and accurate record keep of retained shark by species. YEAR 2
	Testing the effectiveness of the implemented strategy will be with the support of Fiji Ministry of Fisheries and Forestry observer programme, which combined with the monitoring programme initiated to address Condition 5 will allow a preliminary examination of the catch rates of sharks of different species within the FTBOA fishery, and comparison with historical catch rate information.
	YEAR 3 FTBOA will provide any requested practical assistance for the analysis of observer data to assess the effectiveness of measures to provide verifiable information that measures are demonstrably effective such that the fishery does not hinder recovery and rebuilding.
	In years 2 or 3, where deemed scientifically necessary (see above), FTBOA will discuss the implementation of enhanced shark bycatch mitigation measures with the Ministry. These measures may include avoiding particular locations or periods where analyses show fishing leads to a particularly high shark bycatch rate.
Consultation	N/A
on condition	
	1

Condition 4: Management Strategy retained non-target species. P 2.1.2

Outcome	2.1.2
PI	Management strategy: There is a strategy in place for managing retained species that
	is designed to ensure the fishery does not pose a risk of serious or irreversible harm to
	retained species.
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SG60	 There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding. The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).
SG80	 There is a partial strategy in place, if necessary that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding. There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved. There is some evidence that the partial strategy is being implemented successfully.
SG100	 There is a strategy in place for managing retained species. The strategy is mainly based on information directly about the fishery and/or species involved, and testing supports high confidence that the strategy will work. There is clear evidence that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its overall objective.
Scoring	Overall score: 75
	This condition only affects those four shark species that are main (e.g. blue shark and short-finned mako) or minor retained bycatch (e.g silky and oceanic white tip) species. CMM-2006-05 (amended in 2008 (CMM-2008-06), 2009 (CMM-2009-04) and 2010 (CMM-2010-07)) is specific to shark bycatch management. It requires that CCMs take measures to (i) implement the FAO International Plan of Action for the Conservation and Management of Sharks (non-binding); (ii) define key shark species / shark catch & discard reporting requirements (non-binding); (iii) support research and development of strategies for the avoidance of unwanted shark captures (non-binding); (iv) fully utilize any retained catches of sharks (inc restrictions on finning (binding); (v) to prohibit their fishing vessels from retaining, trans-shipping, landing, or trading any fins (binding) and (vi) encourage the release of live sharks (binding). The Fiji Fisheries Department has communicated the requirements of these CMMs to the UoC and shark gear is banned on Fijian domestic vessels as a license condition.
	The FTBOA makes active efforts to reduce shark bycatch by utilizing monofilament traces (wire traces are banned) that results in most sharks biting through the line and escaping before being brought alongside the boat. In additional all the client fleet uses small (size 13 - 140 'D' shaped hooks that tend to have lower shark catch rates. As the fishery tends to operate at greater depths then at where most sharks are found, shark bycatch tends to occur only on the branch lines adjacent to the floats.
Rationale	There is a precautionary partial strategy in response to the potential vulnerability of shark species that is expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure the fishery does not hinder their recovery and rebuilding (80). There is an objective basis that this strategy (prohibition of wire traces, deep-set fishing and the use of small, circular hooks and the recommended release of live sharks) will work (80). However there is some evidence that this strategy is no always being adhered to (e.g. live sharks are not released and are retained) (60). Overall 70.
Condition	Condition 4: the Client should put in place a formal strategy and implementation

	arrangements that are designed to ensure that there are demonstrably effective management measures so that the fishery does not hinder recovery and rebuilding of vulnerable shark species.
	Milestones in achieving this end require that the client provide evidence of:
	Year 1. A formal strategy and implementation plan should be developed in readiness for the first annual surveillance.
	Year 2. Testing and demonstration of the formal strategy and implementation plan should be initiated by the second surveillance audit.
	Year 3. There should be verifiable information that these measures are demonstrably effective by the third annual surveillance audit
Client action plan	FTBOA note that stock assessments of shark are currently being performed by SPC on behalf of the WCPFC. These assessments focus initially on oceanic white tip and silky shark, with assessments of blue shark and mako to follow. These will give a clearer picture of the status of these species.
	It is noted that the long-lived, low fecundity life history of most shark species implies a considerable period of time may be required to quantitatively demonstrate positive impacts of mitigation measures on the wider stock status, and this time period may be beyond the period of certification for some species. Scientific advice will be sought when evaluating the direct effectiveness of FTBOA strategies to mitigate shark bycatch.
	In the meantime, in collaboration with the Fiji Ministry of Fisheries, the FTBOA have already initiated a shark-mitigation plan to reduce the bycatch of shark during fishing. In the respective years the client will demonstrate the following to the CAB:
	 YEAR 1 1. A formal strategy and implementation plan has already been developed in collaboration with the Fiji Ministry of Fisheries. The Fiji longline licence conditions for 2012 note: "No drop line and shark line is to be carried on board (section 1.3); all licenced vessels fishing in the archipelagic waters, the 12 miles territorial seas and the EEZ are to have on board fins that total no more than 5% of the weight of sharks on board" (section 1.4; consistent with WCPFC decisions). 2. The FTBOA will adopt the use of the shark by species logbook prepared by SPC to provide more detailed and accurate record keep of retained shark by species.
	YEAR 2 Testing the effectiveness of the implemented strategy will be with the support of Fiji Ministry of Fisheries and Forestry observer programme, which combined with the monitoring programme initiated to address Condition 5 will allow a preliminary examination of the catch rates of sharks of different species within the FTBOA fishery, and comparison with historical catch rate information.
	YEAR 3 FTBOA will provide any requested practical assistance for the analysis of observer data to assess the effectiveness of measures to provide verifiable information that measures are demonstrably effective such that the fishery does not hinder recovery and rebuilding.
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	In years 2 or 3, where deemed scientifically necessary (see above), FTBOA will
	discuss the implementation of enhanced shark bycatch mitigation measures with the
	Ministry. These measures may include avoiding particular locations or periods where
	analyses show fishing leads to a particularly high shark bycatch rate.
Consultation	The following organisations have committed to assist the fishery in undertaking the
on condition	actions specified in the action plan: Fiji Ministry of Fisheries and Forestry, SPC, FFA

Condition 5 :Information/monitoring retained non-target species P 2.1.3

Outcome	2.1.3
PI	Information / monitoring : Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species
SG60	 Qualitative information is available on the amount of main retained species taken by the fishery. Information is adequate to qualitatively assess outcome status with respect to biologically based limits. Information is adequate to support measures to manage main retained species.
SG80	 Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery. Information is sufficient to estimate outcome status with respect to biologically based limits. Information is adequate to support a partial strategy to manage main retained species. Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).
SG100	 Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations. Information is sufficient to quantitatively estimate outcome status with a high degree of certainty. Information is adequate to support a comprehensive strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective. Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
Scoring	Overall score: 75
	This condition only affects those four shark species that are main (e.g. blue shark and short-finned mako) or minor retained bycatch (e.g silky and oceanic white tip) species. Some steps have already been taken toward assessment of shark species through a multi-year project on ecological risk assessment conducted by SPC in collaboration with FFA, CCMs and NGOs, and presented to the SC at each of its meetings beginning in 2006 (Kirby & Molony, 2006). In 2010 the WCPFC SC agreed a research plan for the assessment of the status of these stocks (Clarke & Harley, 2010). To date this research due to be completed in mid-2013 has a (i) provided shark data to WCPFC for use in further assessments, (ii) created a shark tagging information system (STAGIS) and a meta-database of tagging studies; and (iii) prepared a proposed approach to the upcoming silky and oceanic whitetip shark assessments. In February 2011, the WCPFC rules for "Scientific Data to be Provided to the Commission" were revised to specify provision of annual catch

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	estimates and operational level catch and effort data from longline and troll (in number) fisheries for blue, silky, oceanic whitetip, mako, thresher, porbeagle, and hammerhead sharks (winghead, scalloped, great and smooth) sharks (WCPFC 2011). Size data are also required for those species for which stock assessments will be undertaken. CMM-2009-04 (and subsequently CMM-2010-07) also requires that each CCM include both catches and discards of silky shark and oceanic whitetip to species level in their annual reports (Shelley Clarke, pers. comm., 04 Aug. 2010).
Rationale	There is both qualitative and quantitative information on the amount of all the main shark bycatch species (e.g. blue shark and mako) and most of the minor shark bycatch (e.g. oceanic white tip and silky sharks) taken by this fishery (80).
	However this information is only adequate to qualitatively assess outcome status with respect to biologically based limits (60).
	This information is adequate to support a partial strategy to manage the main shark bycatch species, but not sufficient to evaluate with a high degree of certainty (i.e. recent observer information on shark finning levels) whether a strategy is achieving its objective (80).
	At present there is insufficient detail to assess ongoing mortalities to all bycatch species as observer information suggests that much of the shark catch is currently retained rather than released (60). Overall 75.
Condition	Condition 5 : the Client fleet, with the assistance of the Fisheries Department, should seek to improve the monitoring of both shark landings and bycatch (discards or live releases) to species level for the key shark species identified in CMM-2010-07 (blue shark, silky shark, oceanic whitetip shark, mako sharks, and thresher sharks, porbeagle shark and hammerhead sharks (winghead, scalloped, great, and smooth)).
	Milestones in achieving this end require that the client provide evidence of:
	Year 1. A formal monitoring plan should be developed in readiness for the first annual surveillance.
	Year 2. The formal monitoring plan should be finalised and initiated at least three months before the second surveillance audit, with initial outputs available to the surveillance team.
	Year 3. There should be verifiable information that these measures are demonstrably effective by the third annual surveillance audit
Client action plan	To address this condition the FTBOA will demonstrate the following to the CAB.
	YEAR 1 In discussion with the Fiji Ministry, FTBOA will implement a formal shark bycatch monitoring plan. This will support the planned expansion of the Fiji Ministry of Fisheries and Forestry observer programme, and ensure observers have access to FTBOA vessels. In liaison with the Fiji Ministry, FFA and SPC, FTBOA will help develop an on-board monitoring plan across all FTBOA vessels that is consistent with the quantitative data collection process of the Ministry observers. This will allow the number and fate of bycatch sharks to be assessed. This will be based on the adoption of a by species logbook to monitor shark landings.
	YEAR 2

	The monitoring will then be implemented across the FTBOA fleet where observers are not present. In liaison with the Fiji Ministry, FFA and SPC, the results of the monitoring will be collated for the second surveillance audit.
	YEAR 3 In the third year, the data collection programme will continue, with annual review of the results developed in collaboration with the Fiji Ministry.
	This data collection programme will be continued in subsequent years, as required.
Consultation on condition	The following organisations have committed to assist the fishery in undertaking the actions specified in the action plan: Fiji Ministry of Fisheries and Forestry, SPC, FFA

Condition 6: Information/monitoring ETP species P 2.3.3

Outcome	2.3.3
PI	Information / monitoring : Relevant information is collected to support the management of fishery impacts on ETP species, including (i) information for the development of the management strategy; (ii) information to assess the effectiveness of the management strategy; and (iii) information to determine the outcome status of ETP species.
SG60	 Information is adequate to broadly understand the impact of the fishery on ETP species. Information is adequate to support measures to manage the impacts on ETP species Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.
SG80	 Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a full strategy to manage impacts. Sufficient data are available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.
SG100	 Information is sufficient to quantitatively estimate outcome status with a high degree of certainty. Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives. Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species
Scoring	Overall score: 60
	The main ETP interactions of this fishery are with sea turtle and sea birds. However the level of interaction between the predominantly deep-setting longline fishery and these two species groups is considered very low. There is some information on the catch numbers, approximate volume, fate, and condition upon release etc through observer coverage (c. 7.6%). This is supported by robust debriefing and quality control processes that are considered adequate. Information is adequate to broadly understand the impact of the fishery on ETP species.

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	This information is adequate to support measures to manage the impacts on ETP species and to qualitatively estimate the fishery related mortality of ETP species.
	However, it is not adequate to quantitatively estimate outcome status with a high degree of certainty, nor support a full strategy to manage impacts, nor the consequences for the status of ETP species because it cannot support species-specific stock assessments.
Rationale	Information is adequate to broadly understand the impact of the fishery on ETP species. However it is not sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a full strategy to manage impacts (60).
	Information is adequate to support measures to manage the impacts on ETP species (60)
	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species. However it is insufficient to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.
Condition	Condition 6 : A reporting system to record the occurrence and outcome of all interactions with sea turtles and seabirds should be developed at fleet level. The robustness of this reporting system should be independently verifiable.
	Milestones in achieving this end require that the client provide evidence of:
	Year 1. A formal monitoring plan should be developed in readiness for the first annual surveillance.
	Year 2. The formal monitoring plan should be finalised and initiated at least three months before the second surveillance audit, with initial outputs available to the surveillance team.
	Year 3. There should be verifiable information that these measures are demonstrably effective by the third annual surveillance audit
Client action plan	YEAR 1 In discussion with the Fiji Ministry, FTBOA will implement a formal ETP bycatch monitoring plan, consistent with the shark bycatch monitoring plan developed to address Condition 5. This will support the planned expansion of the Fiji Ministry of Fisheries and Forestry observer programme, and ensure observers have access to FTBOA vessels. In liaison with the Fiji Ministry, FFA and SPC, FTBOA will help develop an on-board monitoring plan across all FTBOA vessels that is consistent with the quantitative data collection process of the Ministry observers. This will allow the number and fate of ETP species to be assessed.
	YEAR 2 FTBOA will trial the on-board monitoring approach on a sub-set of vessels, and adjust the programme as required based on practical feedback from the crew. The monitoring will then be implemented across the FTBOA fleet where observers are not present. In liaison with the Fiji Ministry, FFA and SPC, the results of the monitoring will be collated for the second surveillance audit.
	YEAR 3 In the third year, the data collection programme will continue, with annual review of

	the results developed in collaboration with the Fiji Ministry.	
	This data collection programme will be continued in subsequent years, as required.	
Consultation on condition	The following organisations have committed to assist the fishery in undertaking the actions specified in the action plan: Fiji Ministry of Fisheries and Forestry, SPC, FFA	

Condition 7: Compliance and Enforcement P 3.2.3

PI Comp ensure SG60 • M fi	bliance and enforcement: Monitoring, control and surveillance mechanisms e the fishery's management measures are enforced and complied with. Ionitoring, control and surveillance mechanisms exist, are implemented in the shery under assessment and there is a reasonable expectation that they are	
SG60 • M	Ionitoring, control and surveillance mechanisms exist, are implemented in the shery under assessment and there is a reasonable expectation that they are	
ef • Sa th • F fi ir	anctions to deal with non-compliance exist and there is some evidence that anctions to deal with non-compliance exist and there is some evidence that any are applied. Ishers are generally thought to comply with the management system for the shery under assessment, including, when required, providing information of apportance to the effective management of the fishery.	
SG80	 A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules. Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence. Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery. There is no evidence of systematic non-compliance. 	
SG100 • A im at • Sa da • T sy ef • T	comprehensive monitoring, control and surveillance system has been nplemented in the fishery under assessment and has demonstrated a consistent oility to enforce relevant management measures, strategies and/or rules. anctions to deal with non-compliance exist, are consistently applied and emonstrably provide effective deterrence. here is a high degree of confidence that fishers comply with the management ystem under assessment, including, providing information of importance to the effective management of the fishery. here is no evidence of systematic non-compliance.	
Scoring Over	Overall score: 70	
Rationale Monit WCP reason fisher comp Sanct	toring control and surveillance mechanisms exist in this fishery both at FC level and Fiji national. This includes VMS and logbooks. There is a nable expectation that they are effective, since similar systems in other ies have proved effective and been implemented in the region, enforced and lied with.	

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	deal with non-compliance are consistently applied.	
	Fishers are generally thought to comply with the management system for the client fishery however there is some evidence of some systematic non-compliance may exist (Ministry records).	
Condition	Condition 7: Sanctions that deal with noncompliance are consistently applied Milestones in achieving this require that the client provide evidence of.	
	Year 2. By the second surveillance audit the fishery must, demonstrate that sanctions are consistently applied and thought to provide effective deterrence.	
	Year 2. By the second surveillance audit, the fishery must provide evidence that the monitoring, control and surveillance mechanisms work together to form part of a system, and demonstrate an ability to enforce relevant management measures, strategies and/or rules.	
	Year 3. By the third surveillance audit the fishery must also demonstrate that there is no evidence of systematic non-compliance	
Client action plan	The FTBOA notes that this condition requires close liaison with the Fiji Ministry of Fisheries and Forest, and the FTBOA will continue to work closely with the relevant Fiji Ministries in this regard. Where necessary, requests will be made of the FFA and/or WCPFC via the Ministry for required information.	
	In the respective years the client will demonstrate the following to the CAB:	
	YEAR 2 At the second audit, using available information the client will provide an audit report summarising regulatory compliance within the FTBOA fishery. This will detail any incidences of non-compliance within the fishery under certification, how non-compliance was identified (based on data generated from the logbook, observer and inspection programmes in place), and the outcomes (including sanctions applied), in order to examine both consistency and the functionality of existing MCS programmes. This will be performed in collaboration with relevant Fiji Ministries.	
	The output will demonstrate whether the MCS system operating has demonstrable ability to enforce relevant management measures, strategies and/or rules, and that any sanctions applied have been consistent.	
	YEAR 3 At the third annual audit the client will provide a report examining the performance of any vessels within the unit of certification subsequent to the application of any sanctions, providing evidence that regulatory measures have reduced any systematic non-compliance within the fishery under certification. Again, this will be developed in collaboration with relevant Fiji Ministries.	
	If any areas of systematic non-compliance are identified, regulatory measures, based on recommendations from Managers, will be instituted in order to reduce the amount of non-compliance, and reports of performance presented at subsequent audits	
Consultation on condition	Ministry of Fisheries and Forest	

15.5 Appendix D: Stakeholder Comments

WWF Submission



for a living planet[®]

WWF Submission to Moody Marine Ltd MSC Certification of the Fiji Albacore (*Thunnus alalunga*) tuna long line fishery

October 2011

WWF South Pacific Programme Office and WWF Smart Fishing Global Initiative

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Introduction

WWF welcomes the decision by the Fiji Tuna Boat Owners Association's (FTBOA) to seek Marine Stewardship Council (MSC) certification of albacore tuna (*Thunnus alalunga*) taken by longline fishery operating across the waters of the Fijian EEZ.

As input to the MSC assessment process, WWF has conducted a preliminary assessment of the Albacore Tuna Longline Fishery against the Default Assessment Tree of the MSC Fisheries Assessment Methodology (FAM, v2.1, 1 May 2010) and supporting Policy Advisory and Technical Advisory amendments. While WWF has not attempted to score the Fishery against individual indicators our assessment suggests that the Fishery may score below the 80 Scoring Guidepost for some indicators and that, potentially, the fishery could fail to meet Scoring Guidepost 60 for some indicators (1.2.1 and 1.2.2, 2.1.1, 2.1.2, 2.2.1, 2.2.2, 3.2.1 and 3.2.3). It is our view, however, that some of our concerns may be addressed through the provision of more information and details, particularly in relation to the regional and domestic management programs.

RFMO management

Despite the fact that many international fisheries are now covered by some kind of management regime, it is clear that they are not working, as Hilborn *et al* (2007) express it: "The existing governance regimes for high seas fisheries have failed totally. Despite the existence of numerous regional management organizations (RMOs) as mandated by the UN fishing agreements, none of them regulates high seas fisheries to any effect".

Two of the key elements of the good fisheries management i) setting precautionary harvest control rules in line with scientific advice; and ii) the use of precautionary reference points is mostly lacking from tuna fisheries management.

Although it is reasonably clear that the Albacore stock is above biological based limits, the lack of concise management measures explicit for the Albacore fishery is a worrying state of affairs, albeit that it is noted. Whilst it appears it could be interpreted that there are implicit default limit or target reference points used in the assessments of Albacore, as with each tuna stock, it is a requirement of MSC process (Policy Advisory 12v2:2) that measures should be set and imbedded by management, in this case WCPFC, and implemented as part of the management plan. There must be both limit and target reference points as well. The WCPFC and the South Pacific countries have not as yet adopted precautionary conservation measures for this stock, most specifically North of 20°S. In addition there is a lack of comprehensive and consistent best practices to mitigate bycatch associated with tuna fishing (e. g. when adopted CMMs on sharks, Fiji has been slow to initiate any management action).

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WWF is concerned that the very limited evidence at present suggests a likely failure in the case of this MSC assessment. Critically, there is not a robust and precautionary harvest strategy in place for Albacore tuna in the South Pacific regional fishery, and that no fishery specific objectives have been set which link levels of exploitation to target and limit reference points, and without a harvest strategy in place, there is no evidence to suggest that a strategy is likely to work. It is also noted that apart from access restrictions applied South of 20°S, management rules and tools are only partially in place for some countries, accepting that CMM 2005-02 (replaced by 2010-05) allows for South Pacific states to pursue a responsible level of development of their fisheries for South Pacific albacore. The CMM's focus is more on preventing DWFN from operating South of 20°S, for fear that effort restrictions in other tuna related fisheries could result in a transfer of DWFN effort to Albacore. However, longline catch rates appear to be declining, but catches over the last 10 years have been at historically high levels. Nevertheless, the strategy could be risky with an increase in charter arrangements linked to the South Pacific states, in this case, Vanuatu and Fiji.

WWF is aware of an evaluation of a prospective zonal harvest strategy due for completion by FFA in December 2012. This may suggest that the assessment could be premature, and that it would be advisable to await the introduction of measures as advised by FFA.

Unit of Certification (UoC)

The MSC announcement for the assessment of the fishery indicates 3,000 to 4,000 tonnes caught annually. WWF assumes that these figures relate to catch taken inside the Fijian EEZ, as opposed to the High Seas or Archipelagic waters and that the UoC refers to the EEZ jurisdiction. It is critical that Moody Marine unambiguously defines the unit of certification for this fishery.

Retained species, bycatch, ETP and ecosystem related issues

WWF considers the relevant species to be assessed as retained species at least including bigeye tuna, yellowfin tuna, blue marlin, striped marlin, swordfish and other finfish species (opah, escolar, dolphin fish and wahoo) and all retained sharks. WWF also identifies the importance of some bycatch species such as pelagic stingray, lancet fish, pomfrets, sun fish and discarded shark species. Retained and bycatch species may also include other sharks that are not covered under CMM 2010-07. WWF considers that all sharks specified under CMM 2010-07 require special attention due to their vulnerability, and fall within the definition of main. This means that the retained and bycatch scoring should include the following species: blue shark, oceanic whitetip shark, hammerhead shark, silky shark, short fin and long fin mako sharks, and thresher sharks as well as pelagic stingrays.

Condition Setting

WWF notes that the most recent MSC Guidance on Setting Certification Conditions (MSC, 2010c) requires that, in when setting conditions, the certification body shall consult with: "all relevant entities...if those conditions are likely to require investment of time or money by those entities, or changes to management arrangements or regulations, or rearrangement of research priorities by these entities, in order to satisfy the certification body that the conditions are achievable by the certification client and realistic in the time frame specified".

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MSC defines 'relevant entities' as "all fisheries management or research agencies, authorities or regulating bodies that might have authority, power or control over management arrangements, research budgets and/or priorities".

WWF believes this raises a potential difficulty with respect to certification of a fishery that is subject to management by a regional fisheries management organization (RFMO). In the case of the Albacore Tuna Fishery, WWF considers that the WCPFC, including the SPC as the Commission's contracted scientific services provider is, a relevant management and research entity. Since the WCPFC, like other RFMOs, are governed by their membership, any such consultation would need to be with the members through a Commission meeting. Given the range of interests in the Commission, WWF believes that, depending on the nature of conditions sought to be imposed, that it may be very difficult to get a commitment to changes to management arrangements, regulation or research priorities in order to satisfy the MSC requirements of a particular component of the Commission's mandate.

Principle 1: Target Species

WWF notes the MSC has confirmed that Principle 1 applies to the whole of the fish stock exploited by the fishery:

"The Standards Council agreed that Principle 1 applies to the whole of the fish stock(s) exploited by the fishery seeking certification. So a fishery could only pass if the whole fish stock(s) meet this standard, and it would not pass if the standard was not met irrespective of who (e.g., the fishery seeking certification or other fisheries) was responsible for the stock not meeting the standard (MSC,2010a)".

SG60	SG80	SG100
It is <u>likely</u> that the stock is above the point where recruitment would be impaired.	It is <u>highly likely</u> that the stock is above the point where recruitment would be impaired.	There is a <u>high</u> <u>degree of certainty</u> that the stock is above the point where recruitment would be impaired.
	The stock is at or fluctuating around its target reference point.	There is a <u>high degree of certainty</u> that the stock has been fluctuating around its target reference point, or has been above its target reference point, <u>over</u> <u>recent years</u> .

Stock status: 1.1.1: The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing

Stock assessment

Current evidence¹² suggests that the stock is neither suffering overfishing nor is it overfished. There is no indication that current levels of catch are not sustainable with regard to recruitment overfishing. There is some concern historically high level catches in recent years could lead to a reduction in CPUE, given age specific mortality of the long line fleets, to low levels with only moderate increases in yields (CMM 2010-02). The 2011 albacore stock assessment conducted by the Secretariat of the Pacific Community (SPC) on behalf of the Western and Central Pacific Fisheries Commission (WCPFC) notes that the

¹² Hoyle, S. 2011, WCPFC-SC7-2011/SA-WP-06 Document: Peer Reviewer Template

recent high levels of catch across the whole South Pacific stock have continued and biomass estimates have continued to decline. Declines in overall biomass of the stock will influence abundance and catch rates and highest catches in recent years have been taken in Fiji, Vanuatu, American Samoa and French Polynesia. Catch rates of DWFN vessels have fallen across all four regions of the ALB assessment, but catch rates of foreign charter vessels operating in Vanuatu are increasing significantly.

There are two central reference points BMSY and FMSY which are estimated within the stock assessment. The assessment uses the dimension less Bcur/BMSY and Fcur/FMSY to determine status. Estimates of mean (2005-2007) SSB/SSBMSY (from 1.7 to 4.9) are quite variable between model configurations, but all indicate that the stock is well above the MSY reference point. The MSY levels, on which management reference points are implicitly defined, take account of the knowledge of the biology of the stock. Where uncertainty exists (such as with the stock recruitment relationship steepness), precautionary values have been used. The reference points are adequate for evaluating the stock status. The conclusions of the model appear relatively robust, at least within the statistical uncertainty of the current assessment¹³.

The regional stock assessment model for albacore uses standardised CPUE time series as abundance indices. There are no fishery-independent indices of abundance for the South Pacific stock. Returns from tagging programmes provide information on rates of fishing mortality, however, the return rates were very low and therefore lead to highly uncertain estimates of absolute abundance. There is a high degree of certainty that the stock is above the point where recruitment would be impaired.

In recent years (particularly in 2003), declines in CPUE were observed in some South Pacific states fisheries. Investigations have shown that these declines appear to be a consequence of changed oceanographic conditions, though high levels of localised effort may also be reducing CPUE in these fisheries. Biomass trends are driven largely by recruitment. Recruitment variability, influenced by environmental conditions, will continue to be the primary influence on stock size and fishery performance (Langley and Hampton, 2008). ALB show a natural seasonal movement pattern with fish moving southwards during the winter months to feed in the sub-tropical convergence zone (STCZ) at about 40⁰S. Catch rates tend to be highest in sub-tropical areas in December-January and May-July as fish migrate south during early summer and north during winter¹⁴. Migration tends to correspond with the movement of the 23-28⁰C isotherm.

WWF considers that the stock assessment provides a high level of confidence that the albacore tuna stock remains at a high level of productivity and has a low probability of recruitment overfishing.

Reference points

The WCPFC has not adopted formal reference points. However stock assessments conducted by SPC use B_{MSY} and F_{MSY} as limit reference points and provide advice to the

¹⁴ ibid, Hoyle & Davis, 2009Document: Peer Reviewer Template

¹³ Hoyle, S. *et.al.* 2008, WCPFC-SC4-2008/SA-WP-8; Hoyle, S. & Davies, N. 2009, WCPFC-SC5-2009/SA-WP-6

Commission in this context. While there is no target reference point in place for the WCPFC albacore tuna fishery, the FAM (paragraph 6.2.10) states that for well managed stocks that do not have target reference points the stock will still need to be assessed in terms of the overall outcome objectives: i.e. for SG80 the stock status is highly likely to be above the point at which there is an appreciable risk that recruitment is impaired, and will be at or around a level consistent with B_{MSY} . The stock assessment indicates that this is the case for the albacore stock. However, whilst there are default TRPs and LRPs applied, the actions do not follow specific requirements PA12v2:2 stating that measures should be set by management (which we take to be WCPFC), and implemented as part of the management plan. This suggests that this P1 is likely to score below 80, and is likely to be consistent with the conclusion from the Albacore assessment.

SG60	SG80	SG100
Generic limit and target reference points are based on justifiable and	Reference points are appropriate for the stock and can be estimated.	Reference points are appropriate for the stock and can be estimated.
reasonable practice appropriate for the species category.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of relevant precautionary
	The target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome.	issues. The target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or
	For low trophic level species, the target reference point takes into account the ecological role of the stock.	outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.

Reference points 1.1.2: Limit and target reference points are appropriate for the stock.

Reference points

WWF believes that the WCPFC must formally adopt target and limit reference points, for all stocks of tuna within its jurisdiction. Without such the fishery does not meet MSC standards. In 2009 a special workshop on reference points was held by the WCPFC Scientific Committee's Methods Specialist Working Group and this was also superseded by identification of candidate limit reference points for the key target species in the WCPFC (WCPFC SC7-2011/MI-WP-01). As a result of the recent Scientific Committee meeting 7 in 2011, the Scientific Committee made 11 recommendations to the WCPFC regarding the adoption and implementation of reference points for the WCPO key tuna fisheries, including albacore (Pages 84-85, SC seventh regular session adopted summary report). WWF notes, however, that reference points have been under consideration in the WCPFC since 2006 and, that while the Scientific Committee has made recommendations to the Commission in 2011 on appropriate reference points, there can be no certainty that the Commission will formally adopt them.

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Current management

The WCPFC's report to the second joint meeting of Tuna RFMOs in 2009 stated that "Management decisions to date have been based on maintaining stocks at or above MSYbased reference points". This is consistent with provisions of the WCPFC Convention, specifically Article 5(b) and Article 6.

Article 5(b) requires the Commission to:

" ensure that such measures are based on the best scientific evidence available and are designed to maintain or restore stocks at levels capable of producing maximum sustainable yield, as qualified by relevant environmental and economic factors, including the special requirements of developing States in the Convention Area, particularly small island developing States, and taking into account fishing patterns, the interdependence of stocks and any generally recommended international minimum standards, whether subregional, regional or global;"

Article 6 of the Convention requires that the Commission apply the guidelines of Annex II of the United Nations Fish Stocks Agreement (Guidelines for the Application of Precautionary Reference Points in Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks). Point 7 of Annex II reads as follows:

"The fishing mortality rate which generates maximum sustainable yield should be regarded as a minimum standard for limit reference points. For stocks which are not overfished, fishery management strategies shall ensure that fishing mortality does not exceed that which corresponds to maximum sustainable yield, and that the biomass does not fall below a predefined threshold. For overfished stocks, the biomass which would produce maximum sustainable yield can serve as a rebuilding target."

WWF believes that these provisions of the Convention may constitute implicit target or limit reference points that are, in the absence of explicitly determined stock reference points, the default generic indicators to be applied by the Commission.

Given that the MSC has confirmed that Principle 1 applies to the whole of the fish stock, and the low level of albacore caught specifically by the Fijian long line fishery (6%) exploited by the fishery (MSC 2010a), the onus for addressing Principle 1 indicators must fall, ultimately, on the WCPFC, which is responsible for management of the albacore tuna stock fished in the South Pacific Tuna Fishery.

WWF believes that the adoption of explicitly determined limit and target reference points for albacore tuna is a priority for the sustainable management of the Albacore stock, and that this is required for meeting successfully the MSC certification under the current MSC FAM standards. Therefore WWF believes that this fishery assessment fails to meet the SG 60 level.

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Harvest strategy 1.2.1: There is a robust and precautionary harvest strategy in place

SG60	SG80	SG100
The harvest strategy is <u>expected</u> to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy <u>work</u> <u>together</u> towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is <u>designed</u> to achieve stock management objectives reflected in the target and limit reference points.
The harvest strategy is <u>likely</u> to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but monitoring is in place and <u>evidence</u> exists that it is achieving its objectives.	The performance of the harvest strategy has been <u>fully evaluated</u> and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
Monitoring is in place that is expected to determine whether the harvest strategy is working.		The harvest strategy is <u>periodically</u> <u>reviewed and improved</u> as necessary.

The harvest strategy for albacore tuna includes monitoring, stock assessment and management action. <u>There are no explicit harvest control rules</u>. Monitoring of the stock is based on catch and effort data, length-frequency data and tagging data. The stock assessment has been discussed under 1.1.1. Moreover, were a strategy to exist, details would have to show the extent of their application within the Archipelagic waters of Fiji, Vanuatu, Solomon Is and Papua New Guinea; and the EEZs.

The WCPFC, while noting that current catch levels from the South Pacific albacore stock appear to be sustainable, has only applied a capacity limit for vessels operating South of 20°S, for fear that effort restrictions in other tuna related fisheries, could result in a transfer of DWFN effort to Albacore (Conservation and Management Measure-2005-02) adopted, in accordance with the Article 10 of the WCPFC Convention, that: "Commission Members, Cooperating Non-Members, and participating Territories (CCMs) shall not increase the number of their fishing vessels actively fishing for South Pacific albacore in the Convention Area south of 20°S above current (2005) levels or recent historical (2000-2004) levels." Overall catches in 2010 were above the 2001-2004, reversing the historic trend of catches falling below this level.

The CMM also protects the legitimate rights and obligations of South Pacific states who may wish to pursue a responsible level of development of their fisheries for South Pacific albacore. However, the CMM does not, nor actions taken by individual nations, reflect a concise strategy, and most critically, these are not linked to TRPs and LRPs. Some countries, not least New Zealand, Papua New Guinea, Solomon Islands, Kiribati, Vanuatu, Niue and Tokelau, have not set limits on their levels of exploitation, whilst others, Fiji, Cooks Is, Samoa, Tonga and French Polynesia have set a limited entry licensing scheme. Moreover, access to the High Seas remains largely unrestricted. WWF therefore believes that an increase in effort, were it to occur, may jeopardise, in part, the basis for the CMM and that some South Pacific states have aspirations to increase DWFN Bilateral access agreements without the appropriate riders on capacity limits set in their national legislation. There is a lack of credible evidence to demonstrate that the strategy is achieving its objectives and that the strategy is likely to work because LRPs and TRPs are not enshrined in management policy across the range of SIDS. WWF is also aware of a review of harvest strategies, rules

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and tools underway through support of FFA. WWF would therefore expect to see measures adopted before a successful certification can occur.

<u>SG60</u>	<u>SG80</u>	<u>SG100</u>
<u>Generally</u> understood harvest control rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit	<u>Well defined</u> harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	<u>Well defined</u> harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.
reference points are approached.	The <u>selection</u> of the harvest control rules takes into account the <u>main</u> uncertainties.	The <u>design</u> of the harvest control rules take into account a <u>wide</u> range of uncertainties.
There is <u>some evidence</u> that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	<u>Available evidence indicates</u> that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	<u>Evidence clearly shows</u> that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.

Harvest control rules and tools 1.2.2: There are well defined and effective harvest control rules in place

The MSC defines harvest controls rules as: a set of well-defined pre-agreed rules or actions used for determining a management action in response to changes in indicators of stock status with respect to reference points. The harvest strategy for the Albacore Tuna Fishery does not contain control rules.

It is also accepted that <u>some</u> countries have varying local fisheries management plans, with explicit limits on the number of vessels that may participate in the fishery.

However, an insufficient set of management mechanisms are in place to restrict exploitation rates further should the default limit reference point be approached and there are no signs that WCPFC is moving to develop harvest control rules for the stock. WCPFC has shown itself to be capable of implementing management in response to scientific advice on stock status, for example, of bigeye and yellowfin tuna and now skipjack tuna. However the effectiveness of this response, and specific exemptions for SIDS, is questionable and this underlines the importance of well-defined harvest control rules to ensure a timely and adequate response. WWF believes in order that this fishery passes that there must be generally understood harvest control rules in place, which would <u>reduce the levels of exploitation as the limit reference points are approached, and that there is evidence that the tools used to implement harvest control rules are effective in controlling exploitation and would expect a more extensive analysis to demonstrate the effectiveness of HC rules and tools.</u>

As noted in relation to Indicator 1.2.2, the lack of well-defined harvest control rules for the Albacore Fishery is a serious concern to WWF and should be a Condition.

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Information / monitoring 1.2.3: Relevant information is collected to support the harvest strategy

<u>SG60</u>	<u>SG80</u>	SG100
<u>Some</u> relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy. Stock abundance and fishery removals	A <u>comprehensive range</u> of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly relevant to the current harvest strategy,
Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	are <u>regularly monitored at a level of</u> <u>accuracy and coverage consistent with</u> <u>the harvest control rule</u> , and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule. There is good information on all other fishery removals from the stock.	is available. <u>All information</u> required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of the inherent <u>uncertainties</u> in the information [data] and the robustness of assessment and management to this uncertainty.

There is a comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information) available. The current stock assessments¹⁵ identified some uncertainties. However, there is generally good information on other fishery removals from the stock across the range of participants in the fishery.

Assessment of stock status 1.2.4: There is an adequate assessment of the stock status

SG60	SG80	SG100
The assessment estimates stock status relative to reference points. The assessment identifies major sources of uncertainty.	The assessment is appropriate for the stock and for the harvest control rule, and is evaluating stock status relative to reference points. The assessment takes uncertainty into account. The assessment of stock status is subject to peer review.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery. The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way. The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored. The assessment has been internally and externally peer reviewed.

The most recent South Pacific albacore stock assessments are fully described in Hoyle *et al.* (2008, 2010) and Hoyle and Davies (2009) and Hoyle (2011). The assessment uses the stock assessment model and computer software known as MULTIFAN-CL (or MFCL).

¹⁵ Hoyle, S., 2011, WCPFC-SC7-2011/SA-WP-06 Document: Peer Reviewer Template

The stock assessment takes uncertainty into account and evaluates stock status relevant to default reference points in a probabilistic way. WWF considers, that for the purposes of the stock assessment, it is adequate that stock assessment results are reported by the SPC against default reference points and that the WCPFC Scientific Committee provides management advice based on those reference points.

The assessment model's underlying structural assumptions are regularly reviewed, with a focus on providing reliable estimates of population dynamics. Improvements include a more precautionary stock-recruitment relationship adopted as the default and various changes to the catch and effort time series and their treatment in the model. This has led to a more realistic and credible model which fits the data better than previously. Various problems with bias in the CPUE series that result from switches in targeting identified in 2008 appear to have been largely resolved. The conflict between information in the CPUE and the longline length frequency data remains, but its effects have been reduced.

There is some conflict between the length frequency data and the other sources of information in the model, which may be biasing abundance estimates. Some CPUE and selectivity data need to be improved, particularly from the distant water fishing nations to allow better standardisation and stratification. Being a single sex, the model does not account directly for different sex ratios in the catches. Further research has also been suggested on various areas relevant to developing the model structure, including growth and movement information. Although there are problems with not all data being provided¹⁶, data were considered adequate for the assessment.

Currently the stock assessment conducted by SPC is subject to peer review by scientists from WCPFC member countries within the Scientific Committee framework. There is currently no established process for regular external peer review of the SPC stock assessments. A recent independent review of the WCPFC's transitional science structure and function has recommended that the Commission implement a periodic external peer review process on all contracted assessments of the Commission, including reciprocal review with other tuna RFMOs. This approach has been adopted by the WCPFC with the bigeye tuna stock assessment to be the first to be subject to external review.

WWF reiterates that there are no harvest control rules in the fishery against which to assess the effectiveness of the stock assessment. Further, there is a need to integrate robust tagging data into the stock assessment.

Principle 2: Ecosystem

WWF notes the MSC has confirmed that Principle 2 applies as follows:

"The Standards Council agreed that Principle 2 applies to the fishery (a combination of stock(s)/gear/practice) seeking certification, <u>so long as the fishery as a whole</u> is conducted in a way that does not substantially undermine the objectives of Principle 2 across the whole range of the fish stock(s). This was intended to allow Principle 2 to be applied across the full spatial range of the fish stock(s) involved, and the relevant ecological structure and

¹⁶ Jones& Shallard, (2009) WCPFC-SC5-2005/ST-WP-02 Document: Peer Reviewer Template

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processes, and not be limited to just the local effects of the fishery seeking certification (MSC, 2010a)".

It is therefore critical that albacore fishery as whole, not just the Fijian fleets; impact on ecosystem is assessed under Principle 2.

Fiji catches in 2009, other than Albacore tuna, include as a percentage of the total, yellowfin tuna (20%), bigeye tuna (5%), blue shark (5%), common dolphin fish (2%), opah (2%), escolar (1.8%), blue marlin (1.5%), wahoo (1.4%), swordfish (1.4%), mako sharks (1.2%), barracuda (0.5%), striped marlin (0.5%), oceanic whitetip shark (0.4%), silky shark (0.4%), black marlin $(0.05\%)^{17}$. WWF notes that the reported shark catch on longline logsheets for Fiji is much lower than the estimated catch from observers and trade reports, suggesting a serious underreporting¹⁸.

Fiji annual reports to WCFPC mention that unlike most distant-water longline fisheries, the Fiji domestic fishery lands and markets a number of non-tuna species, although shark trunks and other species that are not commercially viable (e.g. lancet fish) are typically discarded. It also specifies that discards, including shark trunks, where fins were historically retained, are not included in the total catch.

WWF notes the FAM 7.15 "Prior to scoring the fishery, certification bodies shall determine and document under which Component any Principle 2 species will be assessed. For example, when considering a seabird species taken as bycatch that is also listed as threatened under relevant national legislation, the certification body would recognise that the species is primarily managed as an Endangered, Threatened or Protected (ETP) species and therefore it will only be considered when scoring the ETP species' PIs, and not in the scoring of Bycatch species' PIs. In addition, the wider ecosystem impacts of, for instance, retained catch removals should also be considered under the Ecosystem Component." We therefore request a list of bycatch and discarded species which were not available to any RBF scoring.

In assessing the various species by category, WWF would expect to see clear distinctions between retained, bycatch and Endangered, Threatened and Protected species. These include blue shark, silky shark, oceanic whitetip shark, mako sharks, and thresher sharks, porbeagle shark (south of 20°S, until biological data shows this or another geographic limit to be appropriate) and hammerhead sharks (winghead, scalloped, great, and smooth).

WWF would specifically like to see that all species listed above, irrespective of whether interpreted as 'minor' are incorporated into the assessment. WWF perceives that some of these species are either of high value to the fisher (marlins and swordfish), or demonstrate particular vulnerability (FAM V.1, 7.2.2). More specifically, WWF believes that the MCS definition of 'main' is inadequate. WWF requires that, in order to score greater than SG80 and in accordance with FAM definitions, that all retained species should be assessed.

¹⁷ Amoe, J.,(2009). Fiji annual report. WCPFC-SC5-AR/CCM-07, table4

¹⁸Amoe, J.,(2009). Fiji annual report. WCPFC-SC5-AR/CCM-07 and Lack. & Meere, (2010) WCPFC-SC6-2010/EB-IP-03, tbA2.5, p74 and tbA2.13, p82

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Retained Species Status 2.1.1: The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species.

SG60	SG80	SG100
Main retained species are <u>likely</u> to be within biologically based limits or if outside the limits there are <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	Main retained species are <u>highly</u> <u>likely</u> to be within biologically based limits, or if outside the limits there is a <u>partial strategy</u> of <u>demonstrably</u> <u>effective</u> management measures in place such that the fishery does not hinder recovery and rebuilding.	There is a <u>high degree of certainty</u> that retained species are within biologically based limits. Target reference points are defined and retained species are at or fluctuating around their target reference points.
If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		

Retained Catch Profile in the Fiji Albacore Longline Fishery Yellowfin tuna

Yellowfin are taken by a variety of gears - purse seine (>50% of the WCPO catch by weight, with a wide size range of fish), longline (16%, mostly adults), pole-and-line (4%), plus a range of gears in the domestic fisheries in Indonesia and Philippines, taking mostly smaller fish (25-30%). The total WCPO yellowfin catch has been mostly between 270,000 and 440,000t since 2000, but reached a record 543,000t in 2008 before falling back to 350,000t in 2010. The SIDS fleet accounts for 3% of the total, with Fiji catching between 1000t to 2500t annually.

Yellowfin tuna stock assessments, using the MULTIFAN- CL assessment model and associated computer software, have been carried out by SPC since 1999, with the most recent assessments in 2007 (Langley *et al.*, 2007), 2009 (Langley *et al.*, 2009) and 2011 (Langley *et al.*, 2011).

Management advice is framed with respect to indicators of fishing mortality and biomass relative to MSY levels i.e. $F_{current} / F_{MSY}$, and $B_{current} / B_{MSY}$. These currently serve as proxy or default reference points for the WCPFC, which has yet to develop formal reference points for the management of stocks under its care.

The current (2011) yellowfin assessment concludes that, for the most plausible range of model versions used¹⁹, $F_{current} / F_{MSY}$ is estimated at 0.56 – 0.90, and both $B_{current} / B_{MSY}$ and $SB_{current} / SB_{MSY}$ are above 1.0 (1.25-1.60, and 1.34-1.83 respectively), indicating that the WCPO yellowfin stock is not in an overfished state. The ratios $Bt/Bt_{,F=0}$ provide a time-series index of population depletion by the fisheries. Depletion has increased steadily over time, reaching a level of about 50-55% of unexploited biomass (a fishery impact of 45-50%) in

¹⁹ Langley *et al.*, 2011, WCPFC-SC7-2011/SA- WP-03, p31 Document: Peer Reviewer Template

2006-2009. This represents a moderate level of stock-wide depletion although the stock remains considerably higher than the equivalent equilibrium based reference point (B_{MSY}/B_0 as 0.35-0.40). However, depletion is considerably higher in the equatorial region 3 where recent depletion levels are approximately 0.30 for total biomass (a 70% reduction from the unexploited level). Impacts are moderate in region 4 (37%), lower (about 15-25%) in regions 1, 5, and 6 and minimal (9%) in region 2. If stock-wide over-fishing criteria were applied at the level of our model regions, we would conclude that region 3 is fully exploited and the remaining regions are under-exploited. As Fiji pertains to region 6, Figures 1 and 2 show that the assessed fishery has a minimal overall impact on WCPO yellowfin tuna stocks which is consistent with the "marginal contribution" approach in para 7.1.14 of the FAM.



Figure 1. Distribution of cumulative WCPFC yellowfin tuna catch from 2000-2009 by 5 degree squares of latitude and longitude and fishing gear²⁰longline (blue), purse-seine (green), pole-and-line (grey) and other (dark orange)

²⁰ Langley *et al.*, 2011, WCPFC-SC7-2011/SA- WP-03 fig6, p57 Document: Peer Reviewer Template



Figure 2. Total annual catch (1000s mt) of yellowfin by fishing method and MFCL region from 1952 to 2010. Data from 2010 are incomplete²¹.

In conclusion, it is noted that biomass is <u>currently</u> above 0.2 B_0 as an indicator for the point at which the yellowfin tuna stock would be considered to be at risk of serious recruitment overfishing or of serious or irreversible harm. It is therefore concluded that there is high degree of certainty that yellowfin tuna stocks in the WCPO are <u>currently</u> within biologicallybased limits. Applying FAM 6.2.19, an LRP (B_{lim}) of 0.2 B_0 is appropriate, with current biomass levels well above this, obviating any risk of reproductive impairment.

Bigeye

Like yellowfin, bigeye are taken by a variety of surface gears as juveniles and by longline gear as adults. The total bigeye catch for the WCPO in 2010 was estimated at 94,700 t, the lowest ever recorded. The longline fishery typically accounts for around 60-70% of the catch, the purse seine fishery 20-25%, and pole-and-line and other fisheries the remainder.

The South Pacific fleets account for 6% of the total, with Fiji catching 650t to 750t.

Bigeye tuna stock assessments using MULTIFAN-CL have been conducted almost annually since 1999, with recent assessments in 2008(Langley *et al.*)²², 2009(Harley *et al.*)²³ and this year (Davies *et al.*)²⁴. The assessment covers 6 spatial regions in the WCPO, with data for the period 1952-2010 grouped by quarters, for 25 defined fisheries.

The new assessments, include improved estimates of bigeye catch and effort data, especially from Indonesia and the Philippines, revised spill sample estimate for purse seine

²¹ Langley et al., 2011, WCPFC-SC7-2011/SA- WP-03

²² Langley *et al.*, 2008, WCPFC-SC4-2008/SA-WP-1 Rev.1

²³ Harley et al., 2009, WCPFC-SC5-2009/SA-WP-4

²⁴Davies *et al.*, 2011,WCPFC-SC7-2011/SA- WP-02 Document: Peer Reviewer Template

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catch, new standardized CPUE time series for the longline fishery, and changes to some structural assumptions. The most recent assessment also included catch estimates for all fleets for the last year of the assessment, for the first time.

Fishing mortality for adult and juvenile bigeye tuna is estimated to have increased continuously since the beginning of industrial tuna fishing. For the base model, $F_{current} / F_{MSY}$ is considerably greater than 1 (1.58), indicating that overfishing is occurring, and that a 29% reduction in fishing mortality is required from the 2001-04 level to reduce fishing mortality to sustainable levels (consistent with the aim of CMM 2008-01).

Based on these results, the assessment concludes that overfishing is occurring on the bigeye tuna stock.

MSY has been reduced to less than half its levels prior to 1970 through increased harvest of juveniles. Because of that and overfishing, considerable potential yield from the bigeye tuna stock is being lost. Based on these results, the assessment concludes that MSY levels would rise if mortality of small fish were reduced which would allow greater overall yields to be sustainably obtained.

The 2011 assessments also provide estimates of the impact of fishing attributed to various fishery groups as shown below, which is consistent with the "marginal contribution" approach in para 7.1.14 of the FAM. From this analysis, the impact of longliners is estimated as reducing spawning potential by around 30%, which is significant. However, the non-distant water fleet accounts for 3% of the total, and Fiji, 0.3% (see Figures 3 and 4).



Figure3. Estimates of reduction in spawning potential due to fishing (fishery impact) by region and for the WCPO attributed to various fishery groups (base case model)²⁵. LL = all longline fisheries; PH/ID = Philippines and Indonesian domestic fisheries; PS assoc = purse seine log and FAD sets; PS unassoc = purse seine school sets; Other = pole and line fisheries and coastal Japan purse-seine

²⁵ Harley *et al.*, 2010, WCPFC-SC6-2010/SA-WP-04, fig40, p82 Document: Peer Reviewer Template



Figure 4. Total annual catch (1000s mt) of bigeye tuna by fishing method and MFCL region from 1952 to 2009²⁶ Note: Fiji fishing area is included in region 6.

As noted, the assessments are subject to quite rigorous internal review within the SC, but have not yet been subject to external review, even though the assessments are internationally regarded as being of high quality²⁷. There are plans for the first external review of an assessment in 2011, with bigeye scheduled as the first species assessment for review. Details of the review process have yet to be developed.

Sharks

WCPFC Key Shark Species Overview. The top ten most frequent shark species observed in Fiji longline catch are: blue shark, oceanic whitetip shark, silky shark, pelagic stingray, shortfin mako²⁸ shark, blacktip shark, bigeye thresher (recently listed by IOTC as a prohibited species), longfin mako shark, great hammerhead, scalloped hammerhead²⁹ however, only 4 species, oceanic whitetip, silky shark, blue shark and pelagic sting ray make up for nearly

²⁶ Harley et al., 2010, WCPFC-SC6-2010/SA-WP-04, fig5, p45

²⁷ Allen, 2010 (p.24)

²⁸ Listed as vulnerable under the World Conservation Union's IUCN-Redlist and in 2008 was listed under Appendix II of the Convention on Migratory Species CMS. The shortfin mako are fished throughout their range and have an inherent and proven high susceptibility to population decline caused by fishing pressure. Shortfin mako are likely to have several sub-populations, several of which are in decline. ²⁹ Lack. & Meere, (2010) WCPFC-SC6-2010/EB-IP-03, p86

90% of the number of sharks observed since 1994^{30} .

Blue shark (*Prionace glauca*), oceanic whitetip (*Carcharhinus longimanus*), shortfin and longfin mako (*Isurus spp.*), silky shark (*Carcharhinus falciformis*), common, pelagic and bigeye thresher sharks (*Alopias spp.*), great hammerhead (*Sphyrna mokarran*) and scalloped hammerhead (*Sphyrna lewini*), are among the key shark species identified by the Scientific Committee of WCPFC for the western and Central Pacific. Blue shark is the most common, but not the most vulnerable, of pelagic sharks. Recent ecological risk assessments for the Atlantic longline fisheries have ranked the shortfin mako, along with the silky shark, as among the most vulnerable pelagic sharks, and along with bigeye thresher the most vulnerable of the WCPFC key species (Cortés et al. 2010, Arrizabalaga et al. 2011) in Clark, 2011.³¹.

Stock assessments are available only for blue shark, and shortfin mako (ambiguity with the definition of stocks and sharing of stocks with the northern hemisphere, and taking a precautionary approach the southern populations of makos are in big trouble along with their northern family members, and some preliminary studies for silky shark. There are no formal stock assessments for oceanic whitetip, longfin mako, thresher sharks or hammerheads.

For blue shark and shortfin mako stock assessments to date have not indicated overfishing or an overfished state. However, in the recent WCPO analyses, substantial recent catch rate declines are found for blue shark and no clear trends for shortfin mako. Ongoing issues of concern for the WCPO are: 1) a previously published study suggesting shortfin mako stock reduction in the Northwest Pacific using virtual population analysis; 2) the high vulnerability of shortfin makos to longline fishing; and 3) the potential for collateral targeting in directed fishing for blue sharks in the North Pacific.³² The status of longfin mako stocks is unknown for the WCPO and worldwide.

Although there has been no stock assessment conducted to date for oceanic whitetip, recent analysis of four different datasets for the WCPO show clear, steep declining trends in abundance and sizes for this species. Given the strong existing evidence for the depleted state of the oceanic whitetip population in the WCPO, stock assessment studies may clarify but will not alter the case for further conservation and management action³³. This has been documented for the ETPO as well and IATTC adopted a conservation measure in 2011. Silky sharks have a restricted habitat range compared to the other WCPFC key species but within this range they dominate both longline and purse seine catches. Although silky sharks have been shown to have declining catch rate trends in past studies in the Pacific, no strong trends were found in recent (2011) WCPO analyses. Nevertheless, declining size trends in two datasets, declining catch rates in these two datasets for the most recent years of the time series, and increasing removals all indicate a need for close, ongoing monitoring of indicators. Further research may allow better definition of trends and a clearer depiction of stock status.

³⁰ Lack. & Meere, (2010) WCPFC-SC6-2010/EB-IP-03, p79

³¹ Clark 2011, WCPFC-SC7-2011/EB-WP-04, p4-5

³² Clark 2011, WCPFC-SC7-2011/EB-WP-04

³³ Clark 2011, WCPFC-SC7-2011/EB-WP-04, p7

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According to the Shark Research Plan³⁴ (SRP) developed by the Secretariat of the Pacific Community-Oceanic Fisheries Programme (SPC-OFP) the stock assessment for silky shark is scheduled for completion by the last quarter of 2011 and the stock assessment for oceanic whitetip shark by the middle of 2012. As the first opportunity for WCPFC review of these assessments will be SC8 in 2012, it is proposed that both assessments be undertaken in parallel, with preliminary results considered at the 2012 Pre-Assessment Workshop (PAW) and final results presented to SC8. The SRP identifies blue shark and mako sharks as the next priority for assessment with these results presented at SC9. At this time it is anticipated that blue and mako stock assessments will be undertaken in parallel, following the assessment methods used for silky and oceanic whitetip sharks.

Shark catches in Fiji albacore longline fishery

Historical data of shark catch estimates show a decrease of the percentage of sharks in total catch, from 10.8% in 2004 to 4.7% in 2007, with an increase to 6.9% in 2008³⁵. It is noteworthy that the reported shark catch on longline logsheets for Fiji is much lower than the estimated catch from observers and trade reports, suggesting serious underreporting³⁶.

Shark catches have been rarely recorded on a species basis in longline logsheets. According to available data³⁷, the **blue shark**, **mako sharks**, **oceanic whitetip** and **silky shark** account for over 90% of the Fiji shark catch. It should also be noted that the estimation of total catch does not take into account the discards at sea (shark trunks, other shark discards, dead or alive)³⁸.

Catch rates decreased in 2007compared to 2006, to less than a half for blue shark and less than a third for mako sharks, increasing again in 2008. On the other hand, catch rates for oceanic whitetip and silky shark showed steep declines over the same period. Annex 2 in Clark³⁹ shows a greater interaction with adult blue sharks than juveniles, while for silky shark, juveniles are more often recorded in Fiji area. It is important to note that for three shark species recorded in Fiji longline catch, blue shark, oceanic whitetip and silky shark, the interaction with females is higher than with males. For mako sharks, adult males and juvenile females are more often recorded than adult females and juvenile males.

Figure 5⁴⁰ shows historical data on fishing effort by flag (left) and shark catches by flag for six regions of the WCPFC Statistical Area.

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³⁴ Clark & Harley, 2010 in Clark et al., 2011, WCPFC-SC7-2011/EB-IP-01, p12

³⁵ Fiji Annual reports to WCPFC

³⁶ Fiji Annual reports to WCPFC and Lack. & Meere, (2010) WCPFC-SC6-2010/EB-IP-03, tbA2.5, p74 and tbA2.13, p82

³⁷ Amoe, J.,(2009). Fiji annual report. WCPFC-SC5-AR/CCM-07

³⁸ *ibid* 36

³⁹ Clarke, S., 2011, WCPFC-SC7-2011/EB-WP-04, p2

⁴⁰ Clarke et al. (2011). WCPFC-SC7-2011/EB-WP-01, Annex2



Figure 5. Comparison by region and flag of longline logsheet effort (left panel, in hundreds of hooks) and total sharks recorded on logsheets (right panel, in number of sharks), using aggregated (5x5 degree square) data, for six regions of the WCPFC Statistical Area. Data as of 13 July 2011.⁴¹

WWF considers that there is insufficient information to conclude that sharks are within biologically based limits. There are indications that blue shark might be overfished and that silky shark and oceanic whitetip stocks are declining. The status of longfin mako, bigeye thresher sharks and great and scalloped hammerhead sharks stock status are unknown. Based on this information, and the volume of sharks taken, WWF does not believe that there is sufficient information available to demonstrate that the 'known effects' are unlikely to create unacceptable impacts on these species. Fiji does not apply a non-retention policy as other major Pacific country fleets, French Polynesia and Samoa. <u>WWF would therefore question whether there is sufficient evidence to support a score of SG 60 for some of these species, and more specifically, does not believe that there are measures in place to ensure that the fishery does not hinder recovery. Moreover, details on the status of shark species are poorly known, and as such the assessors would have to demonstrate that there are measures in place that are expected to result in the fishery not causing the retained species to be outside biological limits, or hindering recovery.</u>

Billfish

All other retained species are defined within the MSC assessment methodology as 'minor' (Para 7.2.2, MSC FAM). Stock assessments are undertaken for **blue marlin** and **striped marlin**. These two stocks are considered of higher significance than black marlin, which is less frequently caught. **Blue marlin** is presently defined stable provided that current levels of effort do not increase (WCFPC SC 5, Scientific Committee report). Molony⁴² (2008)

⁴¹Clarke *et al.* (2011). WCPFC-SC7-2011/EB-WP-01, fig3, p6

⁴² Molony, 2008, WCPFC-SC4-2008/EB-IP-6 Document: Peer Reviewer Template

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reports that annual catches of blue marlin in the WCPO purse-seine fishery since 1990 have fluctuated between 200 t and 300 t per year with annual catches in the longline fleet exceeding 20,000 t since 2002. The most recent stock assessment for blue marlin were conducted in 2003⁴³, using MULTIFAN-CL, and concluded that the most pessimistic status of Pacific blue marlin is that the stock is close to being fully-exploited.

The stock assessment undertaken for **swordfish** in the South Western Pacific region indicated an increase in (south-west) stock abundance in recent years and the model projections predict further increase at current levels of fishing mortality. Plausible assessments indicate that overfishing is not occurring and the south western Pacific swordfish stock is not in an overfished state. A new assessment is expected for swordfish in 2011, which will be followed by a review of CMM 2009-03. There are concerns about data uncertainties and that the spatial scope of previous assessments does not include the South-Central Pacific⁴⁴.

Other retained finfish

Opah (Lampris guttatus), **escolar** (Lepidocybium flavobrunneum), **wahoo** (Acanthocybium solanderi) and **dolphinfish** (mahi-mahi) (Coryphena hippurus) account each for less than 5% of the catch.

Opah and escolar are species with low productivity (Fish Base⁴⁵) and given their vulnerability should not be considered minor. There is no information about the stock status of these species and the fishery impact is unknown and a precautionary approach is advisable.

Wahoo and dolphinfish have not been formally assessed. They are assumed to be stable, but no information is available as to whether overfishing is occurring or not. Wahoo and dolphinfish are prolific species and they are likely to handle relatively high levels of fishing pressure (fishwatch⁴⁶). However the lack of region-specific information suggests a precautionary approach to exploitation until more robust information becomes available.

On the basis of the information available to it, WWF does not believe it is possible to determine whether opah, escolar, common dolphinfish and mahi mahi are highly likely to be within biologically based limits. WWF recommends the use of the Risk Assessment methodology as a suitable assessment tool.

The table below summarises details of risk assessment undertaken to date, highlighting the vulnerability of species caught (Gillette M, 2011).

Stock Conditions and/or Ecological Kisk Assessments of Tuna Longine Bycatch							
Species	Stock Condition	Ecological Risk	Additional Information				
Blue Shark	Clarke (2010), "In the	Medium to Low	Kleiber (per. com. Oct.				

Stock Conditions and/or Ecological Ris	k Assessments of Tuna Longline Bycatch
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⁴³ Kleiber *et al.*, 2003

⁴⁴ Scientific Committee, fifth regular session, August 2009.

⁴⁵ www.fishbase.org

⁴⁶ www.nmfs.noaa.gov/fishwatch/

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Species	Stock Condition	Ecological Risk Assessment (ERA)	Additional Information
(Prionace glauca)	WCPO Kleiber et al. 2009 (North Pacific only): population appears close to biomass at MSY.	(Clarke 2010)	2010) states, "The main conclusion is that the population was hard hit in the 1980s by the high seas drift net fishery followed by good recovery in the 1990s .As far as sharks go, blue sharks appear to be pretty resilient. We sometimes call them the rabbits of the shark world in that they are reported to produce an average of 35 pups per litter".
Silky Shark (Carcharhinus falciformis)	Unknown	Medium (Clarke 2010)	The stock status of most pelagic shark species is not known (Chapmen 2001)
Oceanic Whitetip Shark (Carcharhinus longimanus)	Unknown	Medium (Clarke 2010)	The stock status of most pelagic shark species is not known (Chapmen 2001)
Shortfin Mako Shark (Isurus oxyrinchus)	Unknown	Medium (Clarke 2010)	Population status is unknown, but analyses suggest that Shortfin Mako Shark is not overfished in the Pacific (NOAA 2010).
Opah (Lampris guttatus)	There is no evidence that Opah populations are in decline, or that overfishing is occurring (NOAA 2010).	Medium (Clarke 2010)	Very little is known about Opah; history of biomass estimates for Opah is unknown (NOAA 2010).
Great Barracuda (Sphyraena barracuda)	Unknown	Medium (Kirby 2007)	
Sickle Pomfret (Taractichthys steindachneri)	Unknown	Medium (Kirby 2007)	
Wahoo (Acanthocybium solandri)	Pacific Wahoo population levels are estimated to be high, but no information is available as to whether overfishing is occurring or not (NOAA 2010).	Medium (Kirby 2007)	Wahoo is a fast growing species and can handling relatively high levels of fishing pressure (NOAA 2010).
Pelagic Stingray (Dasyatis violacea)	Unknown	Medium	
Omosudid (Omosudis lowii)	Unknown	Medium (Kirby 2007)	
Short-Billed Spearfish (Tetrapturus angustirostris)	Unknown	Medium (Kirby 2007)	There are presently no urgent concerns regarding the stock status of the billfish species in the WCPO (Chapmen 2001)
Escolar (Lepidocybium	Unknown	Medium (Kirby 2007)	

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Species	Stock Condition	Ecological Risk Assessment (ERA)	Additional Information
flavobrunneum)			
Oil fish	Unknown	Low (Kirby 2007)	
(Ruvettus pretiosus)			
Long-Nosed Lancet Fish (Alepisaurus ferox)	Unknown	Low (Kirby 2007)	
Swordfish (Xiphias gladius)	Populations of swordfish in the Pacific are very healthy. Pacific swordfish is not overfished and overfishing is not occurring (NOAA 2010).	Medium (Kirby 2007)	The biomass of North Pacific swordfish is 75% above the biomass needed to support maximum sustainable yield (NOAA 2010).
Blue Marlin (Makaira mazara)	No concern (Chapmen 2001)	Medium (Kirby 2007)	There are presently no urgent concerns regarding the stock status of the billfish species in the WCPO (Chapmen 2001).
MahiMahi/Dolphinfish (Coryphaena hippurus)	Population status is not formally assessed but is assumed to be stable. No overfishing appears to be occurring (NOAA 2010).	Medium (Kirby 2007)	D. Itano (2010), "Some evidence that dolphinfish abundance may be increasing as an ecological response to fishing down other pelagic top trophic level beasts".
Blackfin Barracuda (Sphyraena qenie)	Unknown	Medium (Kirby 2007)	
Indo-Pacific Sailfish (Istiophorus platypterus)	Unknown	Medium (Kirby 2007)	There are presently no urgent concerns regarding the stock status of the billfish species in the WCPO (Chapmen 2001).
Striped Marlin (Tetrapturus audax)	In: Langely et al. (2006): This assessment was considered to be preliminary as there was a great deal of uncertainty regarding key parameters in the assessment, particularly natural mortality and growth. It was uncertain whether overfishing was occurring or whether the stock was overfished. It was subsequently recommended that, as a precautionary measure, there be no increase in striped marlin fishing mortality in the south- western Pacific, particularly in the area encompassing the Coral and Tasman Seas as these fisheries account for the	Medium (Kirby 2007)	The fishery has supported catches at about the MSY level for the last 20 years (average annual catch 1984–2003 of 2,400 mt) at a relatively constant level of fishing effort. Consequently, there is no indication that current exploitation rates are having a deleterious impact on the productivity of the stock (Langley et al. 2006).

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Species	Stock Condition	Ecological Risk Assessment (ERA)	Additional Information
	majority of the striped marlin catch in this area.		

Source: Gillette M (2011)

Retained species management strategy 2.1.2: There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species.

SG60	SG80	SG100
There are measures in place, if necessary, that are expected to	<u>There is a partial strategy in</u> place, if necessary that is	There is a strategy in place for managing retained species.
species at levels which are highly likely to be within biologically based limits, or to ensure the	retained species at levels which are highly likely to be within biologically based limits, or to	The strategy is mainly based on information directly about the fishery and/or species involved, and testing
fishery does not hinder their recovery and rebuilding.	ensure the fishery does not hinder their recovery and rebuilding.	supports high confidence that the strategy will work.
The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	<u>There is some objective basis for</u> <u>confidence that the partial</u> <u>strategy will work, based on</u> some information directly about	There is clear evidence that the strategy is being implemented successfully, and intended changes are occurring.
	thefisheryand/orspeciesinvolved.There is some evidence that thepartialstrategyisbeing	<u>There is some evidence that the</u> <u>strategy is achieving its overall</u> <u>objective.</u>
	implemented successfully.	

The main management measure applying to yellowfin and bigeye is the Commission's Conservation and Management Measure (CMM) 2008-01, which was adopted in December 2008, and replaces earlier measures in 2005 and 2006. The CMM was developed to *"mitigate the overfishing of bigeye and yellowfin tuna and to limit the growth of fishing capacity in the WCPO"*, to *"ensure through compatible measures for the high seas and EEZs that bigeye and yellowfin stocks are maintained at levels capable of producing their MSY"*, in accordance with Article 5 of the Convention. However, CMM 2008-01 allows an *exemption for members and participating territories that caught less than 2,000 tonnes in 2004*.

A technical evaluation of the measure was undertaken to see if the objectives were being met during the first year of application of the measure⁴⁷, with subsequent analyses since that time⁴⁸. One of the significant conclusions from this was that *the reductions in longline catch do not result in the required reduction in fishing mortality on adult bigeye tuna*.

WWF is aware that the P2 scoring guideposts are assessed against the specific fishery, i.e. Fiji longline effort, but taken collectively with the other non DWFN catches, long line catches could conceivably have some impact on the stock of bigeye tuna. WWF notes the MSC has confirmed that Principle 2 applies as follows:

47 Hampton & Harley, 2009

⁴⁸ SPC, 2009; Hampton & Harley, 2010 Document: Peer Reviewer Template

"The Standards Council agreed that Principle 2 applies to the fishery (a combination of stock(s)/gear/practice) seeking certification, <u>so long as the fishery as a whole</u> is conducted in a way that does not substantially undermine the objectives of Principle 2 across the whole range of the fish stock(s). This was intended to allow Principle 2 to be applied across the full spatial range of the fish stock(s) involved, and the relevant ecological structure and processes, and not be limited to just the local effects of the fishery seeking certification (MSC, 2010a)".

It is therefore critical that albacore fishery as whole, not just the Fijian fleets; impact on retained species is assessed under Principle 2.

However, both Figure 2 and Figure 3 show interactions with yellowfin tuna and bigeye tuna by the South Pacific fleets are low and are not likely to hinder recovery. Nevertheless, WWF is concerned that the CMM exempts the domestic fleet from a management obligation. This is particularly worrying, were South Pacific fleets to perceive 2000t as a target, which if put into effect could elevate the significance of this group and required management action.

WCFPC Scientific Committee (CMM 2006-04) has recommended as a precautionary measure that there be no increases in fishing mortality on **striped marlin** until estimates of stock status are more certain, as increases in fishing mortality are likely to move the stock towards an overfished state.

WCPFC Scientific Committee (CMM 2009-03) has recommended the following precautionary measures for swordfish:

- Commission Members, Cooperating Non-Members and participating Territories (CCMs) shall exercise restraint through limiting the number of their fishing vessels for swordfish in the Convention Area south of 20°S, to the number in any one year between the period 2000- 2005 (listed in Annex 1).
- In addition to vessel limits established under paragraph 1, CCMs shall exercise restraint through limiting the amount of swordfish caught by fishing vessels flagged to them in the Convention Area south of 20°S to the amount caught in any one year during the period 2000 2006.
- CCMs shall not shift their fishing effort for swordfish to the area north of 20°S, as a result of this measure.
- No later than 30 April 2010 CCMs shall nominate the maximum total catch of swordfish that it shall continue to be permitted to fish in the area south of 20°S. This amount shall be no more than their maximum verified.

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WWF requires evidence that the above CMMs (2006-04 and 2009-03) are being implemented correctly by the Fiji Fisheries Department in order to show compliance with the scoring issue "<u>The measures are considered likely to work, based on plausible argument</u> (e.g., general experience, theory or comparison with similar fisheries/species). "

WWF is aware that an Environmental Risk Assessment has been undertaken for Fiji. WWF expects to see risk levels identified for opah, escolar, wahoo and dolphinfish (mahi-mahi) within the ERA, and for actions to have been formulated accordingly.

Sharks

CMM 2010-07 applies to sharks, and replaces earlier measures in CMM 2009-04. This measure takes account of *"the United Nations Food and Agriculture Organization (FAO) International Plan of Action for the Conservation and Management of Sharks calls on FAO members, within the framework of their respective competencies and consistent with international law, to cooperate through regional fisheries organizations with a view to ensuring the sustainability of shark stocks as well as to adopt National Plans of Action for the conservation and management of sharks".*

The WCPFC's management mandate relates to highly migratory fish species, including shark species, listed in Annex 1 of the United Nations Convention on the Law of the Sea of 10 December 1982 (UNCLOS) and extends to the management of non-target species taken in fisheries for target stocks.

CMM 2010-07 for sharks requires CCMs to encourage their fishers to return live sharks, that are not utilized, to the water and imposes a maximum fin:carcass ratio of 5% to all sharks retained.

Little information has been collected on catch, life status and the fate of shark species through observer programs. However, WWF notes that there is evidence that observerbased estimates of catch of sharks may substantially understate catch (Clarke, 2009). Further, there is very little logbook data for shark catch and submission of shark catch data was not mandatory under the previous CMMs.

CMM 2010-07 recognises the need to collect data on catch, effort, discards, and trade, as well as information on the biological parameters of many species, to enable effective shark conservation and management and requires that each CCM to include key shark species, as identified by the Scientific Committee, in their annual reporting to the Commission of annual catch and fishing effort statistics by gear type, including available historical data, in accordance with the WCPF Convention and agreed reporting procedures. CCMs are also required to report annual retained and discarded catches in Part 2 of their annual report and to support research and development of strategies for the avoidance of unwanted shark captures (e.g. chemical, magnetic and rare earth metal shark deterrents).

Fiji has not adopted a National Plan of Action for the conservation and management of sharks. Alternative local measures for shark avoidance or shark management are not reported. A ban on shark finning is currently being considered by the Fiji Department of Fisheries.

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There is no information available on how the CMMs for sharks were implemented in Fiji but Fiji has not reported to FAO shark fins exports since 2006. However, fresh and frozen shark exports increased from 11t in 2006 to 183t in 2007 and 128t 2008 (source Fishstat). This indicates that sharks are still targeted as a commercial species. It is noteworthy that some other South Pacific countries apply a non shark catch retention policy, and mortalities of sharks, when released alive, is generally low⁴⁹.

In addition, the WCPFC's non-binding resolution on Bycatch (2005-03) specifies that fishers shall:

- avoid to the extent practicable, the capture of all non-target fish species that are not to be retained; and
- promptly release to the water unharmed any non-target fish species that are not to be retained, to the extent practicable.

These measures, taken together with the low impact that the fishery has on ETP species, and the ongoing and increasing collection of observer data in the fishery is considered to constitute a strategy that includes measures to minimize mortality. However there is no evidence of the effectiveness of either CMM 2007-04, 2008-03 or 2010-07, as applied to the Fijian longline fishery. This would suggest, given the possible status of some shark species, that the fishery has no measures in place to minimise the mortality of ETP species, and to ensure that the fishery does not hinder recovery. Based on the information available to it, WWF believes that the lack of a management strategy will prevent the fishery from meeting a score of SG 60.

⁴⁹ Molony, B. (2005). WCPFC–SC1 EB WP–1 Document: Peer Reviewer Template

Retained species Information / monitoring 2.1.3: Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species.

<u>SG60</u>	<u>SG80</u>	SG100
Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
Information is <u>adequate</u> to <u>qualitatively</u> assess outcome status with respect to biologically based limits.	Information is <u>sufficient</u> to estimate outcome status with respect to biologically based	Information is <u>sufficient</u> to <u>quantitatively</u> estimate outcome status with a <u>high</u> <u>degree of certainty</u> .
Information is adequate to support <u>measures</u> to manage <u>main</u> retained species.	limits. Information is adequate to support a <u>partial strategy</u> to manage <u>main</u> retained species.	Information is adequate to support a <u>comprehensive strategy</u> to manage retained species, and evaluate with a <u>high</u> <u>degree of certainty</u> whether the strategy is achieving its objective.
	Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.

There is quantitative information available from logbooks and observer records and from specific research projects to estimate the amount of the main retained species (bigeye tuna, yellowfin tuna) taken by the fishery. There are stock assessments for bigeye and yellowfin tuna. There are management strategies in place for bigeye and yellowfin tuna. These strategies, which are aimed at reducing effort, should in theory also act as a partial management strategy for other retained species such as billfish.

WWF notes two particular areas of concern in respect to information. Whilst there is intent to extend the fishery observer programme to 20 %, the current observer coverage, is reported to be around 3%⁵⁰. WWF believes that this is extremely low, and questions whether there is sufficient data available from the Fijian fishery. WWF is also aware of the underestimate in the reporting of some retained and bycatch species from logbooks. These facts suggest that the scoring issue related to "Information is <u>adequate</u> to <u>qualitatively</u> assess outcome status with respect to biologically based limits" of the SG 60 cannot be easily met.

CMM 2010-07 recognizes the need to collect data on catch, effort, discards, and trade, as well as information on the biological parameters of many species, to enable effective shark conservation and management and requires that each CCM shall include key shark species, as identified by the Scientific Committee, in their annual reporting to the Commission of annual catch and fishing effort statistics by gear type, including available historical data, in accordance with the WCPF Convention and agreed reporting procedures. CCMs shall also report annual retained and discarded catches in Part 2 of their annual report. CCMs shall as

⁵⁰Amoe, J.,(2009). Fiji annual report. WCPFC-SC5-AR/CCM-07, table5 Document: Peer Reviewer Template

appropriate, support research and development of strategies for the avoidance of unwanted shark captures (e.g. chemical, magnetic and rare earth metal shark deterrents).

In collaboration with WWF South Pacific, the Fisheries Department is undertaking a project on the levels of by-catch of Species of Special Interest by longline vessels. The findings of the assessment will be used to determine relevant and cost effective mitigation actions that can be employed in order to minimize any negative impacts of longline fishing on these species of special interest.⁵¹

Reporting and information collecting is expected to be highly improved in the near future. However, until such time as the SPC completes that analysis, WWF believes that it is not possible to determine whether there is sufficient information to support a management strategy for sharks.

Bycatch species: Status 2.2.1: The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups.

<u>SG60</u>	<u>SG80</u>	SG100
Main bycatch species are likely to be within biologically based limits, or if outside such limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	Main bycatch species are highly likely to be within biologically based limits or if outside such limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	There is a high degree of certainty that bycatch species are within biologically based limits.
If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		

According to FAM para 7.3.1. bycatch species are species in the catch that are not retained and that are discarded, as well as those that die as a result of unobserved fishing mortality where those species have not already been assessed under Principle 1 or other components in Principle 2. As discussed under Indicator 2.1.1, Fiji longliners land and market most of the catch it therefore has a commercial value and should be assessed as a retained species.

WWF believes many species of bycatch should be considered "main" given their vulnerability. **Pelagic stingray** may be considered the most important bycatch species. Lack, in *Pacific Islands Regional Plan of Action for Sharks: Guidance for Pacific Island Countries and Territories on the Conservation and Management of Sharks* (2009)⁵² mentions that pelagic stingray comprises between 10% and 26% of observed longline shark catch in Fiji, New

⁵¹ Amoe, J.,(2010). Fiji annual report. WCPFC-SC6-AR/CCM-07

⁵² Lack, 2010, WCPFC-SC6-2010/EB-IP-03 p31

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Caledonia, Solomon Islands, FSM, French Polynesia, Samoa and Palau. Lack also reports that WSP albacore fisheries discard 98% of pelagic stingray with 3% mortality on capture. It is not clear whether pelagic stingrays suffer high levels of post capture mortality. Nevertheless, relatively low catch rates and stable median size may mean that catches are sustainable (Molony, 2008 in Lack, 2009)⁵³.

Other bycatch species may include lancetfish, barracuda, pomfrets, and ocean sunfish.

On the basis of the information available to it, WWF does not believe it is possible to determine whether pelagic stingray, lancet fish, barracuda, pomfrets and ocean sunfish are highly likely to be within biologically based limits. However, due to the low level of catch, it is unlikely that the fishery would cause these species to be outside biologically based limits or to hinder recovery. WWF recommends the application of the Risk Based Framework.

Bycatch may also include other species that are not considered under PI 2.1.1(retained) or PI 2.3.1 (ETP).

Bycatch	species	Management	strategy:	2.2.2:	There is	a strategy	/ in	place	for	managing	bycatch	that	is
designe	d to ensu	ire the fishery	does not p	oose a ri	isk of seri	ous or irre	vers	ible h	arm	to bycatch	populati	ons.	

SG60	SG80	SG100
There are <u>measures</u> in place, if necessary, which are expected to maintain main	There is a <u>partial strategy</u> in place, if necessary, for managing bycatch that is expected to	There is a <u>strategy</u> in place for managing and minimising bycatch.
bycatch species at levels	maintain main bycatch species at	The strategy is mainly based on information
which are highly likely to be within biologically based	levels which are highly likely to be within biologically based limits	directly about the fishery and/or species involved, and testing supports <u>high</u>
limits or to ensure that the	or to ensure that the fishery does	<u>confidence</u> that the strategy will work.
recovery.	not finder then recovery.	There is some <u>evidence</u> that the strategy is
	There is some objective basis for	achieving its objective.
The measures are considered	confidence that the partial	-
likely to work, based on plausible argument (e.g.	strategy Will Work, based on	Inere is <u>clear evidence</u> that the strategy is being implemented successfully and
general experience, theory or	the fishery and/or the species	intended changes are occurring.
comparison with similar	involved.	
fisheries/species).		
	There is some evidence that the	
	partial strategy is being implemented successfully.	

There is no information available on Fiji longliners discards and the bycatch species cannot be clearly identified. The 2009 (Fiji) Annual Report to WCPFC states that unlike most distant-water longline fisheries, the Fiji domestic fishery lands and markets a number of non-tuna species, although other species are not commercially viable (e.g. lancet fish) are typically discarded⁵⁴.

The fishery will be expected to show whether these species identified are outside biologically based limits. It is however likely that the bycatch species represents a very small

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⁵³Lack, 2010, WCPFC-SC6-2010/EB-IP-03 p63

⁵⁴ Amoe, J.,(2009). Fiji annual report. WCPFC-SC5-AR/CCM-07

proportion of the catch and this reflects the relatively selective nature of the longline fishing gear.

However, in the event that risks are identified, WWF would expect to see demonstration of a strategy. Examples might include use of wire tracers and other devices.

In is noteworthy that in 2005, the WCPFC adopted a Resolution on Non-target Species, which called on CCMs to encourage their vessels to avoid the capture of all non-target fish species that are not retained (i.e. to avoid capture of species which are discarded) and to release discards promptly to the water unharmed. Resolutions of the WCPFC are not binding on the parties. Apart from this Resolution there are no management measures in place to control the take of the bycatch species.

Fiji's tuna management plan 2006, mentions that the Science Committee of the WCPFC raised the issue of poor reporting of bycatch during fishing operations and specific efforts will be undertaken to improve the situation on bycatch reporting and increasing observer coverage of longline operations on Fiji based vessels.

Bycatch species Information / monitoring 2.2.3: Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.

<u>SG60</u>	<u>SG80</u>	<u>SG100</u>
Qualitative information is available on the amount of main bycatch species affected by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species affected by the fishery.	<u>Accurate and verifiable information</u> is available on the amount of all bycatch and the consequences for the status of affected populations.
Information is <u>adequate</u> to <u>broadly understand</u> outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is <u>sufficient</u> to quantitatively estimate outcome status with respect to biologically based limits with a <u>high degree</u> <u>of certainty</u> .
Information is adequate to support <u>measures</u> to manage bycatch.	Information is adequate to support a <u>partial strategy</u> to manage main bycatch species.	Information is adequate to support a <u>comprehensive strategy</u> to manage bycatch, and evaluate with a high degree of certainty whether a strategy is achieving its objective.
	Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.

Information on discards from the longline fleet may be collected by observers and in logbooks. However, WWF did not find available any bycatch information reported by the assessed fishery. WWF can only make assumptions on what the bycatch species might be. These assumptions are based on Mary Lack's report on sharks⁵⁵ and information on WSP

⁵⁵ Lack, 2010,WCPFC-SC6-2010/EB-IP-03 Document: Peer Reviewer Template

longline fishery discards in Oceanic Fisheries Programme report on Non-Target Species Interactions with the Tuna Fisheries of the Western and Central Pacific Ocean⁵⁶.

WWF is not aware of any <u>qualitative information</u> on the amount of main bycatch species affected by the fishery. It would therefore appear that information is **not** <u>adequate</u> to <u>broadly understand</u> outcome status with respect to biologically based limits and to support <u>measures</u> to manage bycatch⁵⁷.

A score of SG60 for the bycatch species outcome performance indicator may rely on whether the fishery can demonstrate measures and practices that make unlikely that this fishery could seriously deplete the population or hinder recovery (e.g. practices expected to result in very low fishing mortality) even the status of the species is very uncertain. WWF could not find information and evidence that such practices exist. In addition, WWF notes the MSC has confirmed that Principle 2 applies as follows:

"The Standards Council agreed that Principle 2 applies to the fishery (a combination of stock(s)/gear/practice) seeking certification, <u>so long as the fishery as a whole</u> is conducted in a way that does not substantially undermine the objectives of Principle 2 across the whole range of the fish stock(s). This was intended to allow Principle 2 to be applied across the full spatial range of the fish stock(s) involved, and the relevant ecological structure and processes, and not be limited to just the local effects of the fishery seeking certification (MSC, 2010a)".

It is therefore critical that albacore longline fishery as whole, not just the Fijian fleets; impact on retained species is assessed under Principle 2.

ETP species Status 2.3.1: The fishery meets national and international requirements for protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.

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⁵⁶ Oceanic Fisheries Programme, WCPFC-SC6-2010/EB-IP-8

⁵⁷ Note: Bob Gillett's son has undertaken a University Thesis on Fiji LL bycatch and might be able to provide information. Document: Peer Reviewer Template

Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species. Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental effects (direct and indirect) of the fishery on ETP species.

The longliners interact with ETP species listed on international conventions or variously protected under Fiji national legislation. As international binding agreements, CITES, CMS and CMM 2010-07 for sharks. Fiji has acceded to the Convention for International Trade in Endangered Species of Wild Fauna and Flora (CITES). Fiji is not party to the Convention for Migratory Species (CMS) but participates in the Convention's Agreements or MOUs. Species protected under these agreements include seabirds, marine turtles, whales, dolphins and sharks.

The 2009 and 2010 Fiji annual reports to WCPFC indicate that protected species of marine turtles, whales, dolphins and sharks have been recorded by observers as caught in the albacore tuna longline fishery. Fiji observers have not been able to identify sea birds so far and therefore interactions are unknown, however the SPC ERA suggests that the risk of interaction with sea birds in the area may be significant⁵⁸.

Turtles (CITES and CMS)

Olive ridley, leatherback, hawksbill, loggerhead, and unidentified turtle interactions have been recorded by observers in Fiji longline fishery. Of the various factors affecting marine turtle encounter rates in longline fisheries, the depth of set appears to be the most important⁵⁹

The Fiji national observer records⁶⁰ showed a higher level of interaction with turtles in 2009 (2 loggerhead sea turtles, 1 Hawksbill, 1 Leatherback, 2 Olive Ridley Turtles) compared to the previous years. This is attributed to the improved reporting by the national observer programme.

Whales and Dolphins (CITES and Memorandum of Understanding for the Conservation of Cetaceans and their Habitats in the Pacific Islands Region)

There are only a small number of encounters recorded with whales in the longline fishery: 2 toothed whales and 2 dolphins in 2009, which have been released alive. However, the low rate of recorded encounters might be due to the lack of reporting.

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⁵⁸ Filippi, D. et al. 2010, WCPFC-SC6-2010/EB- IP 01

⁵⁹ Kirby (2009), WCPFC-SC5-2009/EB-WP-05

⁶⁰Amoe, J.,(2009). Fiji annual report. WCPFC-SC5-AR/CCM-07

Fiji annual report to WCPFC in 2010 mentions that the national observer records for the interaction rates of Species of Special Interest showed a higher level of interaction in 2009 compared to the previous years. This is attributed to the improved reporting by the national observer programme⁶¹.

Sea birds

SPC ERA data suggest that longliners interaction with sea birds is low during spring and summer and increases to medium during autumn and winter⁶². However, the main conclusion of SPC ERA is that areas of high potential encounter rates are not necessarily the same as areas where fishing has greatest risk of population effects. There are some small, highly vulnerable populations in tropical waters (e.g. Fiji petrel – *Pseudobulweria macgillivrayi* –IUCN critically endangered, threatened with extinction⁶³), whose limited range includes some high fishing effort areas.

WWF believes that available **data is insufficient** to suggest whether there is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species

⁶¹ Amoe, J.,(2010). Fiji annual report. WCPFC-SC6-AR/CCM-07

⁶² Filippi, D. *et al.* 2010, WCPFC-SC6-2010/EB- IP 01

 ⁶³ IUCN Red List of Threatened Species (2010). Version 2011.1
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ETP species Management strategy 2.3.2: The fishery has in place precautionary management strategies designed to:

- meet national and international requirements;
- ensure the fishery does not pose a risk of serious or irreversible harm to ETP species;
- ensure the fishery does not hinder recovery of ETP species; and
- minimise mortality of ETP species.

SG60	SG80	SG100
There are measures in place that minimise mortality, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species The measures are considered likely to work, based on plausible argument (eg general experience, theory or comparison with similar	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, that is designed to be highly likely to achieve national and international requirements for the protection of ETP species. There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, that is designed to achieve above national and international requirements for the protection of ETP species. The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
fisheries/species).	the species involved. There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully, and intended changes are occurring. There is evidence that the strategy is achieving its objective.

The WCPFC has in place two CMMs that apply specifically or generically to protected species taken as bycatch. These are:

- CMM 2007-04 Conservation and Management Measure to Mitigate the Impact of Fishing for Highly Migratory Fish Stocks on Seabirds
- CMM 2008-03 Conservation and Management of Sea Turtles

Seabirds

CMM 2007-04 requires CCMs to implement the International Plan of Action for Reducing Incidental Catches of Seabirds in Longline Fisheries (IPOA-Seabirds) if they have not already done so and report to the Commission on their implementation of the IPOA-Seabirds, including, as appropriate, the status of their National Plans of Action for Reducing Incidental Catches of Seabirds in Longline Fisheries

CMM 2007-04 adopts that CCMs shall require their longline vessels to use at least two of the mitigation measures in Table 1, including at least one from Column A in areas south of 30 degrees South and north of 23 degrees North. In other areas, where necessary, CCMs are encouraged to employ one or more of the seabird mitigation measures listed in Table 1.

Table 1: Mitigation measures

Column A Side setting with a bird curtain and weighted branch lines Column B Tori line3

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Night setting with minimum deck lighting Tori line Weighted branch lines

Weighted branch lines Blue-dyed bait Deep setting line shooter Underwater setting chute Management of offal discharge

CCMs are encouraged to adopt measures aimed at ensuring that seabirds captured alive during longlining are released alive and in as good condition as possible and that wherever possible hooks are removed without jeopardizing the life of the seabird concerned. WWF is not aware of any NPOA adopted for the Fiji longline fleet, or if any national ERA has been undertaken to determine whether action is required.

Turtles

CMM 2008-03 requires that, commencing from 1 January 2010, CCMs with longline vessels that fish in a shallowset:

1. employ at least one of the following measures:

- Use only large circle hooks with an offset not exceeding 10 degrees.

- Use only whole finfish for bait.

- Use any other measure, mitigation plan or activity that has been reviewed by the Scientific Committee (SC) and the Technical and Compliance Committee (TCC) and approved by the Commission to be capable of reducing the interaction rate(observed numbers per hooks fished) of turtles in (swordfish) shallow-set longline fisheries.

2. record and report:

- measures applied and results

- all incidents involving sea turtles during fishing operations and report such incidents to the appropriate authorities of the CCM

3. provide results of the reporting to the Commission as part of the reporting requirements.

CCMs with longline fisheries other than shallow-set swordfish fisheries are urged to:

1. Undertake research trials of circle hooks and other mitigation methods in those longline fisheries.

2. Report the results of these trials to the SC and TCC, at least 60 days in advance of the annual meetings of these subsidiary bodies.

WWF is not aware of any NPOA adopted for the Fiji longline fleet, or if any national ERA has been undertaken to determine whether action is required.

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ETP Species Information / monitoring 2.3.3: Relevant information is collected to support the management of fishery impacts on ETP species, including:

- information for the development of the management strategy;

- information to assess the effectiveness of the management strategy; and

- information to determine the outcome status of ETP species.

SG60	SG80	SG100
Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species, and	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	if so, to measure trends and	Information is adequate to support a
Information is adequate to	support a full strategy to manage	comprehensive strategy to manage impacts,
support measures to manage	impacts.	minimize mortality and injury of ETP
the impacts on ETP species		species, and evaluate with a high degree of
	Sufficient data are available to	certainty whether a strategy is achieving its
Information is sufficient to	allow fishery related mortality	objectives.
qualitatively estimate the	and the impact of fishing to be	
fishery related mortality of	quantitatively estimated for ETP	Accurate and verifiable information is
ETP species.	species.	available on the magnitude of all impacts,
		mortalities and injuries and the
		consequences for the status of ETP species.

WWF believes that there is insufficient information to determine whether the fishery is a threat to the protection and recovery of ETP species and to measure trends in the impact of the fishery on these species and question whether the SG 60 can be met.

The Albacore Tuna Longline Fishery is now subject to an observer programme, but coverage is very low (around 3%). SPC-OFP has previously advised SC that observer coverage needs to be very high to estimate statistically rare events, i.e. seabird/turtle catches and mortalities, with confidence⁶⁴. There is not enough information to quantify the impact of the assessed fishery on marine turtle population.

Ecosystem	Status 2	.5.1: The	fishery	does	not	cause	serious	or	irreversible	harm	to t	the l	key	elements	of
ecosystem	structure	and func	tion.												

SG60	SG80	SG100
The fishery is <u>unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is <u>highly unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is <u>evidence</u> that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.

All target and retained tuna species, billfish species and sharks belong to the top predator component in the trophic structure of the pelagic ecosystem in Western and Central Pacific Ocean. The trophic impact of removing large quantities of tuna has not been confirmed. A number of studies are currently being conducted by SPC that will clarify the trophic relationships in the Western and Central Pacific.

⁶⁴ Kirby,(2008) WCPFC-SC4-2008/EBSWG-WP-1 Document: Peer Reviewer Template

Previous studies that have shown the influence of climate variability on tuna (e.g., Lehodey et al. 1997, Fournier et al., 1998; Lehodey et al 2003)⁶⁵ have been confirmed and point to a clear link between tuna recruitment and climatic fluctuations. It is possible that climatic fluctuations have a greater impact on tuna stocks variability than the fisheries.

The analysis of major top-order predator stocks in the Pacific Ocean (bigeye tuna, yellowfin tuna, large skipjack tuna, albacore tuna and blue shark) show that they prey heavily on skipjack. Removing these top level predators could significantly affect the abundance of skipjack (Sibert *et al.*, 2006). Allain (2010)⁶⁶ studied the trophic structure of 4 distinct regions of WCPO. However, in South Pacific Subtropical Gyre (SPSG) system, where Fiji belongs, epipelagic prey species are less important and the bathypelagic highly migrant preys are predominant. The vertical structure for SPSG is different compared to the other regions, having a very deep thermocline and a low thermal gradient. These conditions allow an easier access to the deep preys including the molluscs. The results of these studies may indicate a potentially more extensive rather than intensive impact when removing top predators from SPSG system, involving a higher diversity of prey species and deeper oceanic layers. In consequence, the fishery is less likely to create a trophic cascade as defined in FAM para 7.6.3 a), with significant increase in abundance of one or few species and decreased diversity.

SG60	SG80	SG100
There are <u>measures</u> in place, if necessary, that take into account potential impacts of the fishery on key elements of the ecosystem.	There is a <u>partial strategy</u> in place, if necessary, that takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the	There is a <u>strategy</u> that consists of a <u>plan</u> , containing measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional
The measures are considered likely to work, based on <u>plausible argument</u> (eg, general experience theory or	Ecosystem Outcome 80 level of performance.	relationships between the fishery and the Components and elements of the ecosystem.
comparison with similar fisheries/ ecosystems).	likely to work, based on <u>plausible</u> <u>argument</u> (eg, general experience, theory or comparison with similar fisheries/ ecosystems).	This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.
	There is <u>some evidence</u> that the measures comprising the partial strategy are being implemented successfully.	The measures are considered likely to work based on <u>prior experience</u> , plausible argument or <u>information</u> directly from the fishery/ecosystems involved.
		There is <u>evidence</u> that the measures are being implemented successfully.

Ecosystem Management strategy 2.5.2: There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function.

There is very limited evidence to suggest that there is a robust and precautionary harvest strategy in place for Albacore tuna in the South Pacific regional fishery, and that no fishery

⁶⁵ in Lehodey 2005, WCPFC–SC1 EB WP–8

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⁶⁶ Allain, 2010, WCPFC-SC6-2010/EB- IP-10, p3

specific objectives have been set which link levels of exploitation to target and limit reference points, and in these conditions the strategy may not be sufficient to maintain ecosystem structure and function.

Having clear strategies to manage target, retained and bycatch species might be enough to address the impacts on the ecosystem. However, WWF didn't find enough evidence that such measures exist and are effective, a key component of the SG60.

SG60	SG80	SG100
Information is adequate to <u>identify</u> the key elements of the ecosystem (e.g. trophic	Information is adequate to broadly understand the key elements of the ecosystem.	Information is adequate to <u>broadly</u> <u>understand the key elements</u> of the ecosystem.
community composition, productivity pattern and biodiversity).	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but <u>may not have</u> been investigated in detail	Main <u>interactions</u> between the fishery and these ecosystem elements can be inferred from existing information, and <u>have been</u> <u>investigated</u> .
on these key ecosystem elements can be inferred from existing information, but <u>have</u> <u>not been investigated in</u> <u>detail</u> .	The main functions of the Components (i.e. target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species and Habitats are identified and the main functions of these Components in the ecosystem are <u>understood</u> .
	Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components <u>and elements</u> to allow the main consequences for the ecosystem to be inferred.
	Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	development of strategies to manage ecosystem impacts.

Ecosystem Information / monitoring 2.5.3: There is adequate knowledge of the impacts of the fishery on the ecosystem. Information is adequate to identify the key elements of the ecosystem (e.g. trophic structure and function, community composition, productivity pattern and biodiversity).

Given that it is unlikely that the fishery will disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm, it is likely that the information is adequate to broadly understand the key elements of the ecosystem.

Principle 3: Governance and Policy

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WWF notes the MSC has confirmed that Principle 3 applies as follows:

"The Standards Council agreed that Principle 3 applies to the fishery (a combination of stock(s)/gear/practice) seeking certification, except where elements of Principle 3 are required to achieve Principles 1 and 2. This was intended to allow Principle 3 to be applied flexibly to achieve Principles 1 and 2 (MSC, 2010a)."

Introductory comments

The totality of the management system of the Fiji Albacore Tuna Fishery includes:

- The Western and Central Pacific Fisheries Commission (WCPFC), the tuna RFMO for the WCPO
- Regional organisations that provide management services to the WCPFC and the Fiji, including in particular the FFA and the SPC
- The national government of Fiji

Most, if not all, of the measures adopted by the FFA have now been translated into broader initiatives under the WCPFC. For example – vessel register, observers, VMS. For this reason, WWF considers that the FFA governance and policy does not need to be assessed separately under Principle 3.

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Legal/Customary Framework 3.1.1: The management system exists within an appropriate and effective legal and/or customary framework which ensures that it:

- Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2;

- Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and

- Incorporates an appropriate dispute resolution framework.

SG60	SG80	SG100
The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2.	The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2.	The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2.
The management system incorporates or is subject by law to a <u>mechanism</u> for the resolution of legal disputes arising within the system. Although the management authority or fishery may be	The management system incorporates or is subject by law to a <u>transparent mechanism</u> for the resolution of legal disputes which is <u>considered to be effective</u> in dealing with most issues and that is appropriate to the context of the fishery	or is subject by law to a <u>transparent</u> <u>mechanism</u> for the resolution of legal disputes that is appropriate to the context of the fishery and has been <u>tested and proven to be effective</u> . The management system or fishery acts proactively to avoid legal disputes or
subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating	The management system or fishery is attempting to comply in a timely fashion with binding judicial	rapidly implements binding judicial decisions arising from legal challenges. The management system has a
the same law or regulation necessary for the sustainability for the fishery.	decisions arising from any legal challenges. The management system has a	mechanism to <u>formally commit</u> to the legal rights created explicitly or established by custom on people dependent on fishing for food and
The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	mechanism to <u>observe</u> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.

Fiji has ratified or acceded to both the United Nations Convention on the Law of the Sea (UNCLOS) and the United Nations Fish Stock Agreement (UNFSA). Reference to applying the precautionary approach is contained within the 'Offshore Fisheries Management Decree', as are a series of other goals that *are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2*. The Decree also makes reference to taking into account the interests of artisanal, subsistence fishers and local communities.

The WCPFC

The Convention reflects current international laws and standards relevant to management of migratory species and the ecosystem, including specific reference to the precautionary approach. The Commission seeks input from recognized international law experts to ensure Document: Peer Reviewer Template

that its decision-making is informed in relation to compliance with international law and protocols. The Convention includes dispute resolution mechanisms based on those in Part VII of the UNFSA. The WCPFC has a consensus-based decision-making process, with provision for a two-chambered voting process requiring a 75% majority in both chambers if all efforts to reach a decision by consensus have been exhausted⁶⁷, (Rule 22). However, this has never been formerly tested. The Convention explicitly recognizes the rights of artisanal and subsistence fishers and the dependence of coastal States and States fishing on the high seas on the stocks concerned. The Convention identifies as a function of the WCPFC the development of criteria for the allocation of catch or effort. To date, the Commission has not allocated fishing rights but has sought and received external advice on allocation mechanisms and options.

From the information available, WWF is not able to form an informed view of the extent to which the application of Fiji's management system, in its totality, is consistent with international laws and standards so would expect Moody Marine to clearly demonstrate this. There is a concern as to whether the Ministry of Fisheries has the capacity to meet their obligations to the international instruments to which they are a party. Some core measures, explicitly defined as CMMs, e.g. a NPOA on sharks (CMM 2010-07), have not been introduced.

The assessors are also required to demonstrate that there is a process for dispute resolution and that there are binding national judicial decisions arising from any legal challenges.

SG60	SG80	SG100
Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood. The management system includes consultation processes that obtain relevant information from the main	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction. The management system includes consultation processes that regularly seek and accept relevant	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction. The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The
affected parties, including local knowledge, to inform the management system.	information, including local knowledge. The management system demonstrates consideration of the information obtained. The consultation process provides opportunity for all interested and affected parties to be involved.	management system demonstrates consideration of the information and explains how it is used or not used. The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.

Consultation, roles and responsibilities 3.1.2: The management system has effective consultation processes that are open to interested and affected parties.

The Fiji system

⁶⁷ WCPFC, 2004a Document: Peer Reviewer Template

The organizations and individuals involved in the management system are clearly identified. There is a Fisheries Advisory Council in place with appointees including non government organisations with an interest in fisheries. The Department actively seeks to encourage participation by sending out an advisory and an invitation to stakeholders to attend meetings such as the ones on the Offshore Fisheries Decree, and has with WWF, demonstrated an open agenda in terms of receiving position papers on various Directives and measures, including CMMs.

National roles and responsibilities are clearly defined within the 2010 Decree⁶⁸.

WCPFC System

The WCPFC has a comprehensive governance structure in which participation by Members and CNMs is encouraged. The mechanisms for participation include meetings of the Commission, Scientific Committee, Technical and Compliance Committee and Finance and Administration Committee. Each group has well defined terms of reference and the roles and responsibilities of members and non-members are well defined in the Convention, in the Rules of Procedure and in relevant CMMs. The views of Members and CNMs are considered in the adoption of operational procedures and CMMs. The WCPFC facilitates the participation of relevant non-members and encourages eventual membership.

Observer participation is encouraged and facilitated in line with the Rules of Procedure and observers are permitted to make oral submissions to the Commission and its subsidiary bodies. Written documents prepared by observers can also be tabled at meetings as information documents in line with the Rules of Procedure.

Long term objectives 3.1.3; The management policy has clear long-term objectives to guide decision-making
that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach.

SG60	SG80	SG100
Long-term objectives to guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are implicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy

The Fiji system

The Offshore Fisheries Management Decree, 2010 has a set of clearly defined Long Term objectives, which as referenced earlier, include adherence to the precautionary approach and *environmental factors on target stocks, non-target species, and species belonging to the same ecosystem.* It is noteworthy that this principle indicator is assessed outside the specific fishery under assessment. However, these objectives are not incorporated in the Tuna Fisheries Management Plan and evidence is needed to show that Long-term objectives to guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are implicit within management policy.

⁶⁸ Fiji Offshore Fisheries Management Decree Draft 02 – July 10Document: Peer Reviewer Template

WCPFC System

The WCPFC convention specifies its objective as:

"to ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stocks in the Western and Central Pacific Ocean in accordance with the 1982 Convention and Agreement [UNCLOS and UNFSA respectively]". This objective is elaborated upon in the Convention by the specification of principles and measures for conservation and management.

Article 5 of the Convention specifically requires that the WCPFC apply the precautionary approach and Article 6 elaborates upon how this shall be done.

Incentives for sustainable fishing 3.1.4: The management system provides economic and social incentives
for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing.

SG60	SG80	SG100
The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and explicitly considers incentives in a regular review of management policy or procedures to ensure that they do not contribute to unsustainable fishing practices.

The WCPFC Convention provides for the allocation of total allowable catch or effort although such allocations have not yet been made. Fiji's own management plan makes reference to a global TAC, but which is nowhere close to being fished.

The WCPFC provides subsidies to Pacific Island nations to facilitate their participation in Commission activities and their implementation of CMMs. However it might be argued that these subsidies are in fact consistent with the pursuit of sustainability.

A number of WCPFC CMMs exclude the Small Island Developing States (SIDS) from their provisions. While WWF appreciates the need for the SIDS to have equitable and fair opportunities to develop their fisheries for albacore, within the constraints of sustainability, WWF believes that excluding the fisheries of the SIDS, or portions of fisheries of these nations from some CMMs, effectively constitutes a perverse incentive.

WWF believes that there are some aspects of the management system that provide economic incentives to sustainable fishing. Fijian vessel owners reportedly have access to a series of input subsidies (fuel, bait and other inputs – boat and engine parts). The assessors will have to clearly show that providing input subsidies has not contributed to an increase in fishing effort, and is used to specifically address disparities that may exist as a result of Fiji's locational disadvantageous, or reflect a response to heavy national tax requirements.

Fishery Specific Objectives 3.2.1: The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.

	<u>SG60</u>	<u>SG80</u>	<u>SG100</u>
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Objectives, which are broadly	Short and long term objectives,	Well defined and measurable short
consistent with achieving the	which are consistent with achieving	and long term objectives, which are
outcomes expressed by MSC's	the outcomes expressed by MSC's	demonstrably consistent with
Principles 1 and 2, are implicit	Principles 1 and 2, are explicit within	achieving the outcomes expressed by
within the fishery's	the fishery's management system.	MSC's Principles 1 and 2, are explicit
management system.		within the fishery's management
		system.

The Fiji system

The Fiji Department had in place a designated fishery management plan (2006-2010). Explicit long term objectives are defined but no reference is made to the precautionary approach to fisheries management or the ecosystem approach to fisheries management. WWF is unaware of an update to this plan, but the plan as it is, in our view, is lacking in explicit references to outcomes which relate directly to MSC Principles 1 and 2. There is no reference to linking reference points to harvest strategies, the application of fishery specific tools, and ecosystem, bycatch and ETP management. In WWF's view, the document lack's substance, is out of date, and does not meet the SG 60 guidepost.

The WFPFC system

The long term objectives of WCPFC are clearly articulated as described above. Short-term objectives for specific stocks and ecosystem impacts are identified in relevant CMMs and through default reference points for target stocks. The fishery's objectives can be identified and are consistent with the MSC's Principles 1 and 2. However, many of the CMMs are not specified in terms of measurable targets or outcomes.

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Decision-making processes 3.2.2: The fishery-specific management system includes effective decisionmaking processes that result in measures and strategies to achieve the objectives.

SG60	SG80	SG100
There are <u>informal</u> decision- making processes that result in measures and strategies to achieve the fishery-specific objectives.	There are <u>established</u> decision- making processes that result in measures and strategies to achieve the fishery-specific objectives.	There are <u>established</u> decision-making processes that result in measures and strategies to achieve the fishery- specific objectives.
Decision-making processes respond to <u>serious issues</u> identified in relevant research, monitoring, evaluation and consultation,	Decision-making processes respond to <u>serious and other important issues</u> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions	Decision-making processes respond to <u>all issues</u> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
adaptive manner and take some account of the wider implications of decisions.	Decision-making processes use the precautionary approach and are based on best available information.	Decision-making processes use the precautionary approach and are based on best available information.
	<u>Explanations</u> are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	<u>Formal reporting</u> to all interested stakeholders describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.

Fiji system

The decision-making process for the Fiji Department of Fisheries is laid out in the Offshore Fisheries Management Decree. The assessors will be required to gauge from stakeholder consultations and published Ministerial orders, how the Department responds to *serious and other important issues identified in relevant research, monitoring, evaluation and consultation.* In particular, to CMMs and that *explanations are provided for any actions or lack of action associated with findings.*

WCPFC system

Consensus is the general rule for decision-making by Commission Members during their annual meetings. If consensus cannot be reached, voting, grounds for appealing decisions, conciliation and review are all part of the decision-making process, as described in Article 20 of the Convention.

The application of the precautionary approach and the use of the best available scientific advice is required by the WCPFC Convention. There is some evidence that the application of these requirements by the Commission has been tested through CMM 2005-02, but to date only applied South of 60°S.

There are well-established procedures for reporting of material considered by and outcomes of the Commission and its subsidiary working committees.

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Compliance and enforcement 3.2.3: Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with.

SG60	SG80	SG100
Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
Sanctions to deal with non-	Sanctions to deal with non-compliance	Sanctions to deal with non-
compliance exist and there is	exist, are consistently applied and	compliance exist, are consistently
some evidence that they are	thought to provide effective	applied and demonstrably provide
applied.	deterrence.	effective deterrence.
Fishers are generally thought	Some evidence exists to demonstrate	There is a high degree of confidence
to comply with the	fishers comply with the management	that fishers comply with the
management system for the	system under assessment, including,	management system under
fishery under assessment,	when required, providing information	assessment, including, providing
including, when required,	of importance to the effective	information of importance to the
providing information of	management of the fishery.	effective management of the fishery.
importance to the effective	There is no evidence of systematic	There is no evidence of systematic
management of the fishery.	non-compliance.	non-compliance.

Fiji system:

Duties, powers and sanctions are laid down in the Fisheries Decree, 2010. This also makes provision for the implementation of the Observer scheme, which places independent data collectors on board fishing vessels;

WWF is unclear of Fiji's specific response to the issue of illegal, unreported and unregulated (IUU) fishing in the domestic long line sector. The assessors will need to demonstrate

- The ability to enforce relevant management measures, strategies and/or rules by producing evidence of inspections, offences detected and actions taken;
- That fishers themselves comply, and when required, providing information of importance to the effective management of the fishery;
- There is no evidence of systematic non-compliance.

The FFA has developed a regional monitoring, control and surveillance strategy which includes regional cooperation to control fishing in the region. The strategy was endorsed by Forum Fisheries Committee Ministers in July 2010.

However, MRAG (2009) identifies some specific concerns that need to be addressed:

- That Fiji fisheries did not have processes to effectively undertake inspections consistent with WCPFC measures
- Lack of concerted effort from police & judiciary to prosecute as current state does not motivate detections/apprehensions.
- Only ~ 25% of detected violations investigated.

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- Observer coverage is 3% in 2009 (was 4.7% in 2008)
- Current financial penalties are inadequate and low by regional standards, although penalties do allow for forfeiture of vessels and catch.

WWF is aware of an ongoing FFA sponsored initiative to upgrade MCS capacity and implementation within the region. The assessors will clearly have to demonstrate how these weaknesses have been overcome to demonstrate compliance with the above SGs.

The WCPFC's Technical and Compliance Committee is also continuing consideration of port State measures, chartering arrangements, catch/statistical documentation, the control of nationals, and compliance monitoring and reporting.

The WCPFC relies largely on the IUU vessel listing process as an incentive for compliance. There are no other sanctions in place for non-compliance by members with CMMs. In 2009, the Commission agreed to terms of reference to establish a Compliance with Conservation and Management Measures Working Group.

Overall, WWF questions the ability of Fiji to ensure that the measures they adopt are monitored and enforced effectively.

<u>SG60</u>	SG80	SG100
Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely
Research results are available to interested parties.	MSC's Principles 1 and 2. Research results are disseminated to all interested parties in a timely	information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
	fashion.	Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.

Research plan 3.2.4: The fishery has a research plan that addresses the information needs of management.

The WCPFC has a Strategic Research Plan 2007-2011 in place which identifies four overall research and data collection priorities:

- collection and validation of data from the fishery
- monitoring and assessment of stocks
- monitoring and assessment of the ecosystem
- evaluation of management options.

The research plan relates largely to scientific and ecosystem research, i.e. to Principles 1 and 2. While governance issues are not addressed directly by the research plan, the WCPFC has commissioned a number of research projects that inform aspects of governance, for example the institutional arrangements for provision of scientific advice and options for

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allocation of participatory rights. Research reports are made available on the WCPFC's web site in a timely fashion.

In response to regional and global concerns about the status of shark populations, a Shark Research Plan (SRP)⁶⁹ was developed by the Secretariat of the Pacific Community-Oceanic Fisheries Programme (SCP-OFP) was approved by the Commission in December 2010 (WCPFC 2010). WWF believes that outputs from the research work will provide effective input in support of this assessment.

The Department of Fisheries, within its Decree also makes provision for Research Plans. It is however acknowledged that SPC forms the service provider for Fijian fisheries.

Monitoring and management performance evaluation 3.2.5: There is a system for monitoring and evaluating the performance of the fishery-specific management system against its objectives.

SG60	SG80	SG100
The fishery has in place	The fishery has in place mechanisms to	The fishery has in place mechanisms
mechanisms to evaluate some	evaluate key parts of the management	to evaluate all parts of the
parts of the management	system and is subject to regular	management system and is subject
system and is subject to	internal and occasional external	to regular internal and external
occasional internal review.	review.	review.

WWF is not aware of specific mechanisms for evaluating the performance of Fiji's Department of Fisheries. The inadequacy in the design of the Tuna Fisheries Management Plan raises questions as to whether management actions are explicit, and if so whether there is an internal and external performance review process in place. The Objectives, Strategies and commitments, provided in the Management Plan lack reference to any form of evaluation indicators.

The WCPFC has not yet undertaken a performance review but it is noted that one is about to be implemented⁷⁰.

Stock assessments conducted by the SPC are subject to internal peer review by other members of the Scientific Committee. A recent Independent *Review of the Commission's Transitional Science Structure and Functions* suggested periodic external review of the stock assessments. This has been adopted by the WCPFC, though WWF is unaware as to whether an external review has taken place on the Albacore stock assessment.

An annual report is provided to the Commission by the Secretariat on compliance of members with the reporting provisions of the Commission. Progress with implementation of CMMs is monitored through the reporting provisions within the CMMs themselves or the Annual Reports by members to the Commission.

 ⁶⁹ Clarke *et al.*, (2011b), WCPFC-SC7-2011/EB-IP-01
 ⁷⁰ WCPFC Circular: 2011/03

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Condition Setting

WWF notes that the most recent MSC Guidance on Setting Certification Conditions (MSC, 2010c) requires that, in setting conditions, the certification body shall consult with:

"all relevant entities...if those conditions are likely to require investment of time or money by those entities, or changes to management arrangements or regulations, or rearrangement of research priorities by these entities, in order to satisfy the certification body that the conditions are achievable by the certification client and realistic in the time frame specified".

MSC defines 'relevant entities' as "all fisheries management or research agencies, authorities or regulating bodies that might have authority, power or control over management arrangements, research budgets and/or priorities".

WWF believes this raises a potential difficulty with respect to certification of a fishery that is subject to management by a regional fisheries management organization (RFMO). In the case of the Albacore Tuna Fishery, WWF considers that the WCPFC, including the SPC as the Commission's contracted scientific services provider, is, a relevant management and research entity. Since the WCPFC, like other RFMOs, are governed by their membership, any such consultation would need to be with the members through a Commission meeting. Given the range of interests in the Commission, WWF believes that, depending on the nature of conditions sought to be imposed, that it may be very difficult to get a commitment to changes to management arrangements, regulation or research priorities in order to satisfy the MSC requirements of a particular component of the Commission's mandate.

Concluding Comments

WWF has identified a range of underlying issues concerning the potential certification of the Albacore tuna (*Thunnus alalunga*) fishery operating across the waters of the Fijian EEZ. In summary WWF is concerned that:

- The UoC is not clearly defined in respect of the longline fishery's geographical area, i.e. does it also include Archipelagic and Territorial Waters so as to include the entire stock?;
- Stock management is not based around any reference points
- A regional specific harvest strategy is not clearly defined; and that tools are not shown to have been implemented across the range of the fishery.
- The vulnerability status of some retained species, especially some shark species are poorly known, and that there are insufficient measures in place to ensure that these species are within biological limits.

WWF's analysis has also identified a number of issues which are of particular concern in the context of potential MSC certification of the Fijian Albacore Fishery. These issues relate to the following indicators:

Principle 1:

- Reference points 1.1.2: Limit and target reference points have not been adopted, and whilst there may be an implicit reference point, it has not been formally adopted nor applied in management. There also must be both target and limit reference points, not just one or the other.
- Harvest strategy 1.2.1: CMM 2005-2 and its replacement 2010-05 does not represent a robust and precautionary harvest strategy in place.
- Harvest control rules and tools 1.2.2: There are no defined and effective harvest control rules in place.
- Research 1.2.4: Research is of a high quality.

Principle 2:

- Retained Species Status 2.1.1: The fishery may pose a risk of serious or irreversible harm to some retained species and may hinder recovery of depleted retained species.
- Retained species management strategy 2.1.2: There are only partial strategies in place for managing some retained species, and risks to some species may not have been identified.
- Retained species Information / monitoring 2.1.3: Information on the nature and extent of retained species may be adequate to determine the risk posed by the fishery to some retained species, but it is unclear whether the observer scheme effectively identifies all retained species interactions.
- Bycatch species: Status 2.2.1: The fishery may pose a risk of serious or irreversible harm to some bycatch species or species groups and may hinder recovery of depleted bycatch species or species groups.
- Bycatch species Management strategy: 2.2.2: There are no partial strategies in place for managing bycatch species, and the risks may not have been appropriately identified.

- Bycatch information 2.2.3: Information on bycatch is inadequate, and evidently is not sufficient to detect any level of risk that may prevail.
- ETP species Status 2.3.1:
 - Concerns are raised as to the vulnerability of Fiji petrel and uncertainty of other species of interest (birds and mammals)
- ETP species Management strategy 2.3.2: The fishery does not appear to have applied effective precautionary management strategies designed to:
 - o meet national and international requirements;
 - ensure the fishery does not pose a risk of serious or irreversible harm to ETP species;
 - ensure the fishery does not hinder recovery of ETP species;
 - o minimise mortality of ETP species; and
 - o collect and record information on ETP encounters and their life status.

Principle 3:

- Legal/Customary Framework 3.1.1: The management system exists within an appropriate and effective legal and/or customary framework which ensures that it:
 - May be capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2;
 - Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and
 - It is not clear that the management system incorporates an appropriate dispute resolution framework.
- Consultation, roles and responsibilities 3.1.2: Roles and responsibilities as well as consultation processes appear to be in place at WCFPC and national level.
- Long term objectives 3.1.3: The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach.
- Incentives for sustainable fishing 3.1.4: Subsidies appear to be in place, but it is not clear whether these might promote unsustainable fishing.
- Fishery Specific objectives 3.2.1: The fisheries specific management plan is not demonstrably consistent with MSC principles 1 and 2.

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- Decision-making processes 3.2.2: The fishery-specific management system appears to include decision-making processes that result in measures and strategies to achieve the objectives. However, it is not clear whether decisions are implemented in a timely and adaptive manner.
- Compliance and enforcement 3.2.3: Monitoring, control and surveillance mechanisms appear to show weaknesses in terms of the consistent application of sanctions. Other issues relating to the effectiveness of the MCS regime may also be problematic.
- Research Plan 3.2.4: The SPC research plan is adequate.
- Monitoring and management evaluation 3.2.5: There do not appear to be systems in place to evaluate the effectiveness of the management system in Fiji. There is a proposed review of WCPFC.

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ACRONYMS	
CCMs	Members, cooperating non-members and participating territories (of the WCPFC)
CITES	Convention for International Trade in Endangered Species of Wild Fauna and Flora
CMM	Conservation and management measure (of the WCPFC)
CMS	Convention on Migratory Species
CNM	Cooperating Non Members
CPUE	Catch Per Unit Effort
DWFN	Distant Water Fishing Nations
EEZ	Exclusive Economic Zone
ERA	Ecological risk assessment
ETP	Endangered, Threatened and Protected
FTBOA	Fiji Tuna Boat Owners Association
FAM	Fisheries Assessment Methodology (MSC)
FAO	Food and Agriculture Organization of the United Nations
FFA	Forum Fisheries Agency
IPOA	International Plan of Action
IUCN	The World Conservation Union
IUU	Illegal, unreported and unregulated (fishing)
LRP	Limit Reference Points
MCS	Monitoring, control and surveillance
MOU	Memorandum of Understanding
MSC	Marine Stewardship Council
MSY	Maximum sustainable yield
NPOA	National Plan of Action
PSA	Productivity-susceptibility analysis
RBF	Risk Based Framework
RFMO	Regional fisheries management organization
SG	Scoring Guidepost
SIDS	Small Island Developing States
SPC	Secretariat of the Pacific Community
SRP	Shark Research Plan
STCZ	Sub-Tropical Convergence Zone
TRP	Target Reference Points
UNCLOS	United Nations Convention on the Law of the Sea of 10 December 1982
UNFSA	The Agreement for the Implementation of the of the Provision 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
UoC	Unit of Certification
VMS	Vessel monitoring system
WCPFC	Western and Central Pacific Fisheries Commission
WCPO	Western and Central Pacific Ocean
WWF	World Wide Fund for Nature

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International Seafood Sustainability Foundation



McLean, Virginia, 23 September, 2011

Dr. Jo Akroyd (j.akroyd@moodyint.com) Intertek Moody Marine Moody International Certification Merlin House, Stanier Way Wyvern Business Park Derby DE21 6BF UK

> Subject: Performance Indicators and Scoring Guideposts for Fiji Albacore Tuna Longline Fishery

Dear Dr. Akroyd:

I refer to my letter of August 1 requesting that the default FAM not be used in this assessment and your response by email on August 6 in reference to the treatment of target species under P1 or P2.

We insist that scoring a species that is actively targeted by a fishery under P2 instead of P1, simply because of how the Unit of Certification is defined, is wrong. Doing so will avoid the responsibility of adequately managing these target species that the fishery is taking because the P2 conservation standards for SG80 are much weaker than they are under P1.

Intertek Moody Marine is now intending to use the FAM V2 Risk Based Framework (RBF) for target species other than albacore when there is "insufficient information" to score them with the default guideposts.

ISSF is concerned that this will further weaken the conservation standards under which target species outside the Unit of Certification will be assessed. In particular, we note that part of the RBF scores are related to the degree of overlap between the distribution of the stock and the fisheries taking them. Under P1, these default scores relate to the overlap between the stock and <u>all fishing activity</u> affecting the stock. Under P2, the scores relate only to the overlap with the Unit of Certification activities. We can safely assume that the spatial distribution of the Fijian longline fishery is tiny compared to the distribution of Pacific albacore, such that the use of the default RBF for target species other than albacore will result in high scores.

In addition to the above consideration, we are concerned that deciding which target species have "insufficient information" can be rather subjective and have important ramifications for scoring.

ISSF insists that Intertek Moody Marine does not have to use the default FAM or the default RBF in the FAM simply because of the Client's definition of the Unit of Certification. We call upon you as the Certifying Body to responsibly evaluate target species in this fishery against P1 standards, considering all sources of fishing mortality upon the stocks, even if these species are not candidates to carry the MSC logo.

Yours sincerely,

International Seafood Sustainability Foundation P.O. Box 11110 McLean, VA 22102 P: 703-226-8101 F: 703-226-8100 SJackson@ISS-Foundation.org www.ISS-Foundation.org

Susan S. Jackson President Cc:

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R.Howes V.Restrepo W. Fox

MSC Interview Record WWF Meeting

IMM Attendees

Lead Auditor/Coordinator: Jo Akroyd Team Members: Tim Huntington Kevin McLoughlin

Stakeholders:

Affiliation WWF Fiji WWF Fiji WWF Australia Asian fisheries Society MSC FFA Observer

Location: Novotel

Date: 12 October 2011

1. Introduction. MML Lead Auditor to introduce MSC assessment to Stakeholders, including

- Fishery Unit of Certification only the Fiji EEZ NOT high seas.
- Assessment Team
- Intertek Moody Marine as independent CB accredited to carry out MSC assessments
- Purpose of meeting information collection and identification of issues relevant to fishery assessment
- MSC Principles & Criteria and Assessment Process being followed; FAM Assessment Tree
- RBF not to be used in this assessment
- That stakeholder comments may be non-attributable if required

2. Status

What is the nature of the organizations interest in the fishery (e.g. client / science / management / industry / eNGO etc)

e NGO - fully engaged in the assessment process

3. IMM Questions

Assessment team questions for stakeholder response

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Date of issue: 19 January, 2011 File: TAB_D_031_peer_reviewer_template_v1.doc

Representatives

Seremaia Tuqiri Jackie Thomas Peter Trott Patricia Kailola Bill Holden Hugh Walton Bob Gillett **IMM** thanked WWF for its very constructive submission and agreed to consider it carefully and incorporate relevant information into the assessment report.

4. Stakeholder Key Issues

WWF shares the aspirations of the Fijian tuna industry for a sustainable and profitable future. WWF provided a detailed written submission and gave an overview of the issues raised in this submission, Although WWF is actively engaged in the assessment and supportive of the client seeking certification it has some fundamental concerns. These are outlined in detail in their report which is attached It also considers that this assessment may be premature. In summary, concern was raised over:

Principle 1

- the lack of limit or target reference points.
- The lack of robustness in the harvest strategy
- The lack of harvest control rules.

Principle 2

- Concerned about vulnerability of certain species e.g. sharks and others.
- Information on bycatch is not adequate to determine the risk levels.
- In terms of managing bycatch species, there are no specific mitigation strategies.
- Concerns about seabirds, needs to be investigated.
- Uncertainty of other species, including mammals.
- No NPOA for sharks, but in process. Need to stress stakeholder process behind this.
- No precautionary management strategy for ETP species

Principle 3

- Do subsidies in place have an impact on sustainable fishing
- There are weaknesses in compliance and enforcement
- There do not appear to be systems in place to evaluate the effectiveness of the Fiji management system.
- Concern over the observer coverage and robustness.
- Insufficient notice to stakeholder of consultation meetings
- Draft legislation not yet finalised

5. Other issues

WWF Fiji is looking at use of circular hooks to reduce turtle bycatch. They will be working with the private sector (Solander) using observers to verify the use of de-hooking and other mitigation tools.

WWF also have a project with the PITIA on whale depredation. Initial trials were held initially in the Coral Sea and will come down to Fiji in November 2011.

WWF have developed a bycatch compendium. for all RFMOs. Also KOBE bycatch reports. WCPFC has been "glacial" in its response to this.

WWF suggested that IMM contact Birdlife International.

6. Closing

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IMM Lead Auditor: WWF were thanked for their engagement and very constructive and supportive submission. IMM agreed to take this submission an dconcerns raised seriously..

IMM Lead Auditor

Stakeholders By email

QM And.

J.M Akroyd

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MSC Interview Record 11th October 2011 Ministry of Fisheries and Forestry

IMM Attendees Lead Auditor/Coordinator: Jo Akroyd Team Members: Tim Huntington Kevin McLoughlin	
Stakeholders: Affiliation 1. Ministry of Fisheries and Forestry	Representatives Anare Raiwalui Mele Raicebe Netani Tavaga Aisake Batibasaga
Location: Fiji Fisheries Department	

1. Introduction. MML Lead Auditor to introduce MSC assessment to Stakeholders, including

- Fishery Unit of Certification (and client)
- Assessment Team

Date: 11 October 2011

- Intertek Moody Marine as independent CB accredited to carry out MSC assessments
- Purpose of meeting information collection and identification of issues relevant to fishery assessment
- MSC Principles & Criteria and Assessment Process being followed; FAM Assessment Tree
- RBF (if applicable)
- That stakeholder comments may be non-attributable if required

2. Status

What is the nature of the organizations interest in the fishery (e.g. client / science / management / industry / eNGO etc)

Fisheries management/compliance/enforcement/monitoring

3. IMM Questions

Assessment team questions for stakeholder response

1. Overview of P1 issues and sought information on how harvest control rules are implemented.

- 2. Overview P2 sharks and turtles. Ecosystem approach
- 3. Research
- 4. Consultation and relationship with the client group

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4. Stakeholder Key Issues

What, if any, specific substantive issues or concerns are identified regarding the fishery? (P1 -P2 - P3)

What information is available to allow us to determine the status of the fishery in relation to each issue?

P1 Stock assessment, reference points and harvest strategy. The WCPFC is the managing body for the whole of the WPO. Fiji input into these meetings is generally through FFA and SPC. All relevant information is fed back to Fiji Ministry of fisheries who follow up on necessary action.

P2 Sharks: Protection of sharks. Fiji is seeking a Decree on the prohibition of harvesting of sharks within the Fiji EEZ. It is planned for this to be submitted to cabinet in November. 95% certain shark decree will happen. This is likely to cause compliance problems, but these can be resolved. All companies have been notified that shark finning industry will face changes and advised to look for alternative income sources (most companies have looked at alternative e.g. bycatch). There have been consultations (since Jan 2009), inc industry, Solicitor General Office, Dept of Indigenous Affairs, Dept of Env', Native Lands and Fisheries Commission. Most companies have submitted shark landing data.

Currently conducting a value chain analysis and cost / benefit analyses to determine the ecological and financial cost / benefits of shark fishing. This will be used to support and justify a total ban on shark products. 80-90% of currently landings are blue shark, with most fish being finned even if alive when retrieved.

Log sheets are from SPC and these (and observer forms) are reviewed biannually to update them with new data collection requirements & CMMs. Log sheets only lists 'sharks''. However they are recorded to a species level in observers and companies landing data of fins.

Turtles protected by law, all sea mammals. Endangered & Protected Species Act (2002). NOAA turtle mitigation training in 2008 - for observers, Gov't & industries. This was reinforced in Sept 2011. There is an inventory of vessels and tools. A lot of awareness training and publication has taken place. Already an NPOA for sea turtles (will send a copy).

Opah. Not a concern at either national or regional level.

Ecosystem approach. New decrees have integrated EAF via FFA legal / technical assistance (HW). The Ministry confirmed that the EAF has been incorporated into the new fisheries decrees with SPC / FFA assistance.

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P3 Compliance with filling in of logbooks and unloading data sheets is generally good with FTBOA vessels and agreement between them is also good (there can be some overestimation on the logbooks compared with unloading).

Implementing control rules has been relatively straightforward as requirements from WCPFC CMMs are transferred directly to the licence conditions upon reissue of licences. Logsheets and observer forms are developed by SPC and are amended regularly to address changes in requirements. There is an annual data workshop with SPC. Boarding and unloading forms are used to monitor compliance with requirements.

CMM Compliance. Relevant parts are transferred to the Department and industry advised through meetings with the industry and written advice.

Licences are renewed each year by a committee involving all relevant Government departments. Minutes are recorded.

Currently vessels apply to offload catch. The Ministry checks every boat that comes in including logbook entries, shark catches and compliance with the licence conditions. Conditions include:

5% rule (fins / trunks) except fresh fish vessels as it of possible to bring in trunks. Wire traces are currently illegal (and this is reflected in licensing conditions).

Limit of 2,500 hooks / 2 weeks in archipelagic waters and territorial seas. Only for vessel <19 m, e.g. Fiji Fish fleet. Other vessels no hook limits.

The Ministry records shark fin purchases, mostly 'brown shark (OWT, hammerhead, tiger and black-tip), mako and blue shark..

Research

There is mostly inshore and coastal focus, with little research on pelagic fisheries Research is carried out by SPC and FFA.

The Ministry is preparing a new Fisheries Policy 2012 – 2014 including research priorities. This will include an NPOA for sharks.

There is research funding from both Government and private sectors. The latter tends to be NGOs, so it reflects their concerns e.g. turtles, sharks, whale predation upon LL catches.

5. Other issues

(e.g. any other stakeholders we should contact, any written submissions to follow?)

After current offshore, inshore and aquaculture decrees (all in final draft stage). Enacted by 2012.

6. Closing

IMM Lead Auditor:

- Summary of key points stakeholder to confirm in writing (sign if hard copy)
- Are comments to be attributed?
- Timescale for completion, including further opportunities for stakeholder input

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Confirmed by email

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IMM Lead Auditor JM Akroyd

Stakeholders

MSC Interview Record 11th October 2011 Ministry of Fisheries and Forestry

IMM Attendees Lead Auditor/Coordinator: Jo Akroyd Team Members: Kevin McLoughlin

Stakeholders: Affiliation

1. Ministry of Fisheries and Forestry

Representatives

Anare Raiwalui Mele Raicebe Netani Tavaga Jone Amoe

Location: Fiji Fisheries Department

Date: 14 October 2011

2. Status

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What is the nature of the organizations interest in the fishery (e.g. client / science / management / industry / eNGO etc)

Fisheries management/compliance/enforcement/monitoring

3. IMM Questions

Assessment team questions for stakeholder response

- **1. Resolution of disputes**
- 2. Consultation processes
- **3.** Ministry's responsibilities
- 4. Incentives for sustainable fishing
- 4. Sanctions for non compliance

Ministry of Fisheries of Forestry response

1. Resolution of disputes

Currently any disputes are resolved through the court system. In the draft offshore degree there is a process for dispute resolution clearly laid out

2. Consultation processes

The Ministry are proactive in consulting with industry and the NGOs. They hold regular meetings and send out information. Evidence was provided of letters send out regarding CMM requirements. Minutes of meeting are recorded.

3. Ministry's responsibilities. Organizations involved in management processes are clearly identified and individual within the organization have current job descriptions.

The annual business plan identifies the roles and responsibilities of the Ministry, outputs performance indicators, timelines and budget

4. Incentives for sustainable fishing. Size of vessels, TAC, restricted licence numbers, good behavior taken into account when renewing licences

4.Sanctions for non compliance. Examples provided when sanctions have been imposed eg loss of licnece, vessel which changed its name taken to courts, 13cases where vessel successfully prosecuted for infringements concerning misreporting in log books or fishing area

5. Other issues

(e.g. any other stakeholders we should contact, any written submissions to follow?)

6. Closing

IMM Lead Auditor:

- Summary of key points stakeholder to confirm in writing (sign if hard copy)
- Are comments to be attributed?

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• Timescale for completion, including further opportunities for stakeholder input

Confirmed by email

gn Azel.

IMM Lead Auditor JM Akroyd

Stakeholders

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IMM Attendees Lead Auditor/Coordinator: Team Members:

Stakeholders: Affiliation

1. Min. of Fisheries & Forestry (Observer Debriefer)

Not present Tim Huntington

Representatives Apenisa Sauturaga

Location: Min. of Fisheries & Forestry (Suva, Fiji)

Date: 13 October 2011

1. Introduction. MML Lead Auditor to introduce MSC assessment to Stakeholders, including

- Fishery Unit of Certification (and client)
- Assessment Team
- Intertek Moody Marine as independent CB accredited to carry out MSC assessments
- Purpose of meeting information collection and identification of issues relevant to fishery assessment
- MSC Principles & Criteria and Assessment Process being followed; FAM Assessment Tree
- RBF (if applicable)
- That stakeholder comments may be non-attributable if required

Comments: Brief introduction given.

2. Status

What is the nature of the organizations interest in the fishery (e.g. client / science / management / industry / eNGO etc)

Fisheries management and governance in Fijian waters

3. IMM Questions

Assessment team questions for stakeholder response

Observer debriefing process

4. Stakeholder Key Issues

What, if any, specific substantive issues or concerns are identified regarding the fishery? (P1 -P2-P3)

What information is available to allow us to determine the status of the fishery in relation to each issue?

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Showed Vessel Trip Compliance Form (GEN-3). Continuously updated (Dec 2007, Dec 2009 and now Dec 2011).

When observers return from trips, they meet the debriefer onboard for a (usually) 30 minute debriefing session. If there are any major problems, these are reported to MoFF management. Misreporting in log sheets is a regular occurrence, esp. on bycatch levels and fish for crew consumption. However Observer data is robust. At the end of the month observer data is sent to the Compliance Officer in Suva for cross-checking. All observer data is confidential as no one in the vessel is allowed to read the data and the observer main objective is to collect data and not to enforce law.

5. Other issues

(e.g. any other stakeholders we should contact, any written submissions to follow?)

6. Closing

IMM Lead Auditor:

- Summary of key points stakeholder to confirm in writing (sign if hard copy)
- Are comments to be attributed?
- Timescale for completion, including further opportunities for stakeholder input

Confirmed by Email

Confirmed by Email

Stakeholders

P2 CBA Assessor

Record meeting notes sent to AS on 13/10/11 and email confirming that this was an accurate record received 14/10/11.

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IMM Attendees Team Members: Tim Huntington (P2)

Stakeholders: Affiliation 1. SPC Monitoring Supervisor

Representatives Deirdre Brogan, Fisheries

Location: Ministry of Fisheries & Forestry, Suva

Date: 13th October 2011

1. Introduction. MML Lead Auditor to introduce MSC assessment to Stakeholders, including

- Fishery Unit of Certification (and client)
- Assessment Team
- Intertek Moody Marine as independent CB accredited to carry out MSC assessments
- Purpose of meeting information collection and identification of issues relevant to fishery assessment
- MSC Principles & Criteria and Assessment Process being followed; FAM Assessment Tree
- RBF (if applicable)
- That stakeholder comments may be non-attributable if required

Comments: Brief introduction given.

2. Status

What is the nature of the organizations interest in the fishery (e.g. client / science / management / industry / eNGO etc)

SPC provide scientific support to WCPFC members

3. IMM Questions

Assessment team questions for stakeholder response

Robustness of the Fiji observer system and data quality control

4. Stakeholder Key Issues

What, if any, specific substantive issues or concerns are identified regarding the fishery? (P1 -P2 - P3)

What information is available to allow us to determine the status of the fishery in relation to each issue?

DB is in Suva to conduct a tuna fishing data workshop. This will be based around tools and training provided previously at a regional level by SPC / FFA. DB stated that observers are trained in a rigorous manner via SPA / FFA, with the expectation that they will soon have

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their own in-country training team. The country has a good core of observers, so only need 2-3 new observers per year. Each received three weeks core training in observation techniques, plus extra training in subjects such as first aid, safety at sea and fire fighting. SPC/FFA have put in competency standards which have been formally used since 2010, although a similar un-recognised standard has been maintained before this date. The standards are available on SPC's website <u>http://www.spc.int/oceanfish/en/ofpsection/fisheries-monitoring/observers</u> Karl Staisch (WCPFC Regional Observer Programme Coordinator) recently inspected the Fiji observer programme (September 2011) and concluded "*The programme has carried out adequate measures to ensure that it is in compliance with the minimum standards of the Commission's Regional Observer Programme. The Programme has made undertakings as the programmed to develop; deficiencies as outlined in this report have been corrected*"¹.

There is one SPC / FFA trained and certified debriefer in Fiji (Apenisa Sauturaga – see separate interview). He has a set list of questions, goes through the data fields checking for incomplete, incorrect or erroneous data conducts a 'sanity' check. Apenisa has at least three years debriefing experience, including observer trips at sea.

Observer forms are scanned in Suva and sent to SPC electronically, where data entry is done. Data quality checks are then carried out in Noumea, both on data entry and then automatically though in-built database cross-checks. Catch reports, vessel tracks etc are printed off and manual cross-checks on the data reports are also conducted. There are informal cross-checks of observer data with other data collection e.g. log sheets to determine reporting levels.

DB was "quite happy" of the Fiji tuna data collection programme, and considered it to be "innovative" and "eager to improve areas of reporting and implementation of management measures". There is a need to do greater cross-checking of data sets e.g. observer records, log sheets and landing records.

5. Other issues

(e.g. any other stakeholders we should contact, any written submissions to follow?)

6. Closing

IMM Lead Auditor:

- Summary of key points stakeholder to confirm in writing (sign if hard copy)
- Are comments to be attributed?
- Timescale for completion, including further opportunities for stakeholder input

Confirmed by email

IMM Lead Auditor

Stakeholders

Record meeting notes sent to DB on 13/10/11 and amended notes received 14/10/11.

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15.6 Appendix E:

Registered companies / vessels within Unit of Certification: eligible to sell MSC certified product

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