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Baseline study and performance indicators for the Pacific Islands Oceanic Fisheries Management Project (PIOFMP II)

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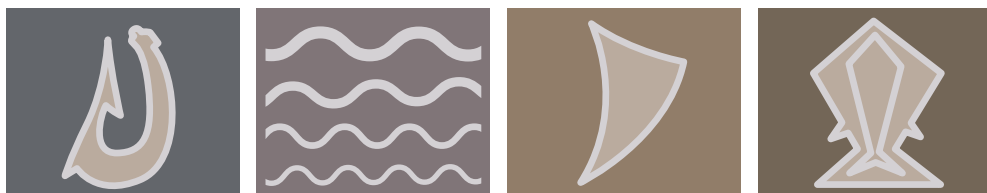
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Baseline study and performance indicators for the Pacific Islands Oceanic Fisheries Management Project (PIOFMP II)

A Report prepared for the Pacific Islands Forum Fisheries Agency (FFA)

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PACIFIC ISLANDS



OCEANIC FISHERIES MANAGEMENT

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Table of Contents

Introduction	vi
Purpose of the Report	vi
The Report	vii
Outcomes and benefits	viii
Part 1: A Baseline Study of the Oceanic Fisheries of WCPO	1
1. Introduction	2
1.2 The Baseline Study	2
1.3 Transboundary Diagnostic Analysis (TDA) and Strategic Action Plan (SAP)	3
2. Biology and status of key tuna stocks	4
2.1 General biology	4
2.2 Status of key stocks and impacts of fishing	5
2.2.1 Skipjack.....	5
2.2.2 Yellowfin	6
2.2.3 Bigeye tuna	8
2.2.4 South Pacific Albacore	9
3 Ecosystem considerations	13
3.1 Impacts of fishing	13
3.1.1 Target species	13
3.1.2 Bycatch and by-product species	13
3.2 Ecosystem issues associated with the WCPO	20
3.2.1 Physical environment	20
3.2.2 Ecosystem dynamics	20
4. Climate change	21
4.1 Predicted changes to key oceanic fisheries	21
4.2 Impact on marine jurisdictions	21
5. WCPO Tuna Fisheries	23
5.1 Purse seine	24
5.2 Longline	26
5.3 Pole and Line	27
6.0 Management Issues	28
6.1 WCPF Convention and Commission	28
6.1.1 Data on PacSIDS participation in Commission and associated meetings	29



6.1.2 Harvest strategy development	30
6.2 Illegal, unreported and unregulated (IUU) fishing.....	30
6.3 Subregional bodies.....	31
6.3.1 Parties to the Nauru Agreement (PNA)	31
6.3.2 Tokelau Arrangement (TKA).....	32
6.3.3 Te Vaka Moana.....	33
6.3.4 Melanesian Spearhead Group (MSG).....	33
6.4 Other key PIOFMP2 organisations	34
6.4.1 PITIA	34
6.4.2 WWF.....	35
6.5 National Agencies	35
6.6 Global instruments	36
7. Delivery of scientific assessment and monitoring services.....	38
7.1 Fisheries monitoring	39
7.2 Stock assessment and population modelling	41
7.3 Ecosystem monitoring and analysis	44
7.4 Data Management	45
8. Delivery of fisheries management services	48
8.1 Fisheries management	49
8.1.1 Regional assistance.....	50
8.1.2 Sub-regional assistance	50
8.1.3 National assistance.....	50
8.2 Fisheries Legislation	53
8.3 Fisheries operations	56
8.4 Training.....	58
9. Services provided by sub-regional entities	59
9.1 PNAO Office	59
9.1.1 Purse seine vessel day scheme (VDS).....	59
9.1.2 Longline VDS.....	60
9.2 TVM.....	63
9.3 Other Regional entities	64
10. Stakeholder participation and knowledge management.....	65
10.1 Information dissemination and awareness raising	65
10.2 Stakeholder engagement.....	65



10.3 Knowledge management (KM) and information systems 65

10.4 Project workshops and meetings..... 67

10.5 Project implementation 68

10.6 Gender issues..... 68

Part 2: A review of the GEF IW indicators framework and other PIOFMP-2 indicators 69

1. Introduction 70

2. GEF International Waters Operational Strategy and indicators 71

 2.1 GEF ProDoc indicators 72

 2.2 GEF IW Tracking Tool Indicators and baselines..... 72

Project Results Framework: Commentary 99

Abbreviations 119





The UNDP/GEF-supported International Waters Project (IW-Project) for the Pacific Small Island Developing States (PacSIDS) has had a significant input into oceanic fisheries management outcomes and research in the Pacific Islands region for close to 20 years. This input commenced with a Pacific SAP (Strategic Action Programme) Project (RAS/98/G32), implemented between 1999 and 2004. This project had two components: i) oceanic fisheries management and ii) integrated coastal and watershed management. The three-year oceanic fisheries management component was considered a pilot, and underpinned the successful conclusion and entry into force of the Western and Central Pacific Fisheries (WCPF) Convention.

In 2004 the GEF PDF-B fund supported the design of a second SAP project, the Pacific Islands Oceanic Fisheries Management Project (PIOFMP-I), which commenced in mid-2005 and was completed in 2010. This project assisted Pacific island countries as they moved to reform, realign and restructure their national fisheries laws, policies, institutions and programmes to take up the new opportunities, which the WCPF Convention created, and discharge the responsibilities which the Convention requires.

The PIOFMP-I project saw the coming into force of the WCPFC Convention, with the associated ratifications for PacSIDS. Under the project there was support for focused ecosystem-related science and capacity building. PacSIDS' national laws were reformed to provide for the obligations associated with being Members of the Commission, and national legal, policy, control and monitoring programs were restructured and strengthened.

New GEF assistance is now in place through FAO and UNDP for the new Pacific Islands Offshore Fisheries Management Project (PIOFMP-II) Project: Implementation of Global and Regional Oceanic Fisheries Conventions and Related Instruments in the Pacific Small Island Developing States (PacSIDS). This project provides support to PacSIDS as they move on from the foundational, institutional capacity-building activities of the PIOFMP-I project into an implementation phase to achieve systematic, sustained changes in fishing patterns and on-the-water behaviour.

The project objective is:

*To support PacSIDS in meeting their obligations to **implement and effectively enforce** global, regional and sub-regional arrangements for the conservation and management of transboundary oceanic fisheries, thereby increasing sustainable benefits derived from these fisheries; with an emphasis on implementation.*

Purpose of the Report

The purpose of this report is to describe the baseline situation in the context of the Project Document in relation to:

- the status of the fisheries, the target stocks and the ecosystem, including trophic status and status of key non-target species; and
- measures in place at national, sub-regional and a regional level for the conservation and management of the oceanic fish stocks of the Western & Central Pacific Ocean (WCPO) and the protection of the Western Tropical Pacific (WTP) large marine ecosystem (LME) from fisheries impacts.

The study provides initial measures of the indicators outlined in the project document: Projects Results Framework.

Specifically, this study:

- a) reviews the indicators described in the Project Results Framework for the four Project components, with suggestions for revisions;
- b) summarises the applicable GEF international Waters Operational Strategy and describes the GEF International Waters process, stress-reduction and environmental status indicators framework at a



- project level;
- c) provides a baseline to assess progress using the indicators during, and at the conclusion of the Project; and
- d) assesses and briefly describes the status of each of the indicators, where appropriate, as at May 1 2015.

The TORs for the project are provided as Attachment 1.

Study approach

The work was undertaken largely as a desktop study using information available from the Pacific Islands Forum Fisheries Agency (FFA), the Secretariat of the Pacific Community Pacific Oceanic Fisheries Programme (SPC/OFP) and other various sources, including the websites of the GEF and UNDP.

To promote continuity, the Study draws from and builds on:

- the Terminal Evaluation for the OFM component of the SAP Programme for International Waters; and
- the PIOFMPII project document and the resulting country reports and analysis, noting that the latter is now somewhat dated.

Visits were made to the two implementing regional organisations:

- SPC/OFP on 4 -8 April 2016; and
- FFA on 11-18 April 2016.

The consultant attempted to contact the PacSIDs to update country information, but had limited success with these endeavours during the time period of the study.

The Report

The report is provided in two parts:

- Part One: A Baseline Study of the Oceanic Fisheries of the western and central Pacific Ocean (WCPO).
- Part Two: A review of the UNDP and IW GEF-5 monitoring and evaluation indicators and their application to the OFMP.

The draft report was provided to the FFA Secretariat and SPC/OFP for comment. Their comments and suggestions have been incorporated into the final report.

Outcomes and benefits

The anticipated outcomes and benefits of this study are:

- identification of a set of indicators for the PIOFMP-II incorporating the GEF-IW approach to indicators; and
- a baseline study, including assessment of project indicators providing a basis for assessing progress by the PIOFMP-II against a set of indicators.

The background of the entire page is a complex, abstract pattern of overlapping, irregular shapes in various shades of red and white. The shapes resemble stylized, overlapping leaves or petals, creating a dense, textured effect. The colors range from a deep, dark red to a bright, clean white.

Part 1

A Baseline Study of the Oceanic Fisheries of WCPO



1. Introduction

This Project follows on from the first phase of the Pacific Islands Oceanic Fisheries Management Project (PIOFMP-I). The PIOFMP-I was designed to support foundational institutional and capacity building at the regional and national levels necessary to address the concerns, threats and root causes identified in the SAP¹.

The Terminal Evaluation found that at the outcomes level, the PIOFMP-I “...proved successful and effective, with outcomes likely to result in durable impacts in line with the environmental and development objectives that guided the project’s design”, noting in particular the contribution of the PIOFMP-I to establishing the WCPFC and enhancing SIDS’ capacities to participate in the WCPFC.

The PIOFMP-II is built substantially on the successful approach of PIOFMP-I, following advice from the PIOFMP-I Terminal Evaluation on lessons learned, supporting Pacific SIDS as they move from foundational capacity-building to implementation of measures at regional, sub-regional and national levels. These measures aim to achieve practical on-the-water changes in behaviour to promote sustainable fisheries in the oceanic fisheries of the WTP LME.

The Project has four technical components, which are specifically designed to implement actions to in support of effective ecosystem-based management (EBM).

- Component 1 supports PacSIDS as the major bloc at the WCPFC to adopt regional conservation and management measures.
- Component 2 supports the innovative approaches being developed by PacSIDS at a sub-regional level as they collaborate in common fisheries.
- Component 3 assists PacSIDS to apply measures nationally in their own waters and to their fleets, which is the major component of the Project.
- Component 4 aims to enhance stakeholder participation, including industry participation in oceanic fisheries management processes, and improve understanding and awareness more generally of the challenges and opportunities facing PacSIDS in oceanic fisheries management.

The project is funded by a GEF grant of \$10 million and is being implemented by two agencies, FAO and UNDP through two executing agencies, FFA and SPC/OFP. Some of the project activities will be delivered by regional entities, the most significant being the Office of the Parties to the Nauru Agreement (PNA), as well as the World Wildlife Fund (WWF), the Te Vaka Moana Group (TVM) and the Melanesian Spearhead Group (MSG). There is also scope for other regional entities to be identified and engaged in project activities.

1.2 The Baseline Study

This study was commissioned by FFA. The Study reviews the situation of the oceanic fisheries resources and associated fisheries as of mid-2015 and the status of:

- measures in place at a national, sub-regional and regional level for the conservation and management of the oceanic fish stocks of the Western & Central Pacific Ocean (WCPO) and the protection of the western tropical Pacific (WTP) large marine ecosystem (LME) from fisheries impacts; and
- the status of the WCPO fisheries, the target stocks and the ecosystem, including trophic status and status of key non-target species.

¹ Strategic Action Programme for International Waters of Pacific Islands



Specifically, the baseline study:

1. summarises the applicable GEF international Waters Operational Strategy and describes the GEF International Waters process, stress-reduction and environmental status indicators framework at a project level;
2. reviews the indicators described in the Project Results Framework for the four Project components and suggest appropriate revisions;
3. assesses and briefly describes the status of each of the indicators, where appropriate as of early 2016 (using, for example the information reported to the 2015 WCPFC meeting in Bali); and
4. provides a baseline to assess progress in the indicators during, and at the conclusion of, the Project.

In addition to the references provided, much of the information for the study was gathered directly from discussions and contributions from the staff of the FFA Secretariat and the OFP.²

1.3 Transboundary Diagnostic Analysis (TDA) and Strategic Action Plan (SAP)

It was agreed between the parties at the onset of the project that a modified TDA focused on Oceanic fisheries only will be undertaken for the OFMP 2.

While no TDA was undertaken for the PIOFMP-1, a comprehensive SAP was completed following extensive consultation with PacSIDs administrations, FFA, SPC and other stakeholders. Following completion of the SAP, a five-year implementation project, including an offshore fisheries management component, was funded by the GEF.

The current SAP, which was completed almost 20 years ago (1997) is now substantially out of date, with the major management deficiency identified in the SAP having been addressed with the WCPFC instituted. The extent and influence of sub-regional management arrangements, and most significantly those of PNA (Parties to the Nauru Agreement), are another major development not adequately covered by the SAP.

FFA will undertake the preparation of an updated oceanic fisheries management SAP with the assistance of regional specialists. Concerns arising from the impacts of climate change and associated variability, the effects of greatly increased fishing pressure on target stock status and non-target species, and other institutional changes including the emergence of the sub-regional organisations and arrangements will also need to be incorporated into the revised SAP.

Key future activities planned and directly funded under PIOFMP-2

1.2.3.3 Review oceanic fisheries management aspects of the Pacific Islands IW SAP

- A review of the oceanic fisheries management components of the Pacific Islands IW SAP undertaken by a consultant and planned for completion by the middle of the project year 4.

1.2.3.4 Submit updated oceanic fisheries management aspects of the Pacific Islands IW SAP for endorsement by PacSIDS

- Upon completion, an updated Pacific Islands IW SAP will be provided to the Forum Fisheries Committee (FFC) for review and endorsement.

² Note: The study includes narrative around the indicators, and in particular around more specific activities planned to achieve end-of-project targets. It is hoped this will assist with project mid-term and termination reviews (MTR and TR). These planned activities are arranged according to the activities outlined in the PIOFMP Project Document (ProDoc) and are boxed with a bold outline for ease of reading.



2. Biology and status of key tuna stocks

This section considers the general biology and the current status of tuna species targeted by the industrial fishery.

2.1 General biology

The tuna fisheries of the WCPO are based on four key species— skipjack, yellowfin, bigeye and albacore tuna. The most productive area in the WCPO for tuna lies in the equatorial zone (10°N-10°S) where around 80% of all tuna landed in 2014 from the WCPO (Figure 1) were caught (SPC data).

Skipjack and juvenile yellowfin and bigeye tuna school (frequently together) on the ocean surface and are commonly found in the tropical and subtropical waters of the WCPO. Schooling behaviour makes these fish vulnerable to surface fishing methods, the most significant being purse seine³ and to a much lesser extent, pole and line. Larger adult yellowfin and bigeye are generally found in deeper water, where they are more widespread and are caught using longlines⁴. Some larger yellowfin (two-three years of age) are also caught in free-swimming⁵ schools.

In contrast to skipjack and yellowfin tuna, albacore concentrate in temperate areas where food is abundant. Juvenile albacore are particularly common at the ocean surface where different water masses converge and are caught in relatively small numbers by trolling. Larger albacore are found in deeper waters (around the thermocline) and are caught on longlines.

Yellowfin and skipjack tuna spawn year round within 10 degrees of the equator and in the waters of higher latitudes when warm enough (>23-24°C). Bigeye tuna spawn at slightly higher latitudes but the duration of the spawning season is not known.

Tropical tunas are very productive and are generally much faster growing than their temperate counterparts (including albacore and southern bluefin tuna). A two-year old skipjack is around 5-6 kg in weight and 65cm in length, while a two-year old yellowfin can weigh close to 30 kg, with a length of 115-120 cm. Skipjack can be sexually mature at one-year old or less, while yellowfin achieve maturity in usually less than two years.

Bigeye is the longest lived, slowest maturing (about three years) and largest of the tropical tunas, reaching a maximum length of over 200 cm. It is therefore less resilient to fishing than skipjack or yellowfin tuna. Albacore, as may be expected in colder water habitats, are slower growing and longer lived, taking around 10 years to reach 20 kg in weight.

The biology (especially feeding habits, behaviour and mobility) of the key tuna species has an overriding influence on the distribution and type of fishing effort in WCPO oceanic fishery. The climatic and oceanographic effects associated with the El Niño/La Niña (or ENSO⁶) effects are known to have a particularly profound effect on the fishery. In this sense, an increased understanding of the biology and dynamics of the WCPO tunas within the context of the warm pool large marine ecosystem (LME) of the WCPO, is essential to achieving long term sustainability and optimal economic yields from the fishery (Lehody, 2008).

- 3 Purse seines consist of a wall of net that is used to surround schooling tuna and is then closed off by a wire to form a purse, holding up to more than 100t in a single set of the gear. Pole and line vessels catch surface fish from schools one by one, using a pole, fixed line and lure.
- 4 An extensive method of fishing using a mainline, frequently over 100kms in length, from which baited hooks are suspended on 'branch' lines at regular intervals. The line and hooks are suspended from the surface by floats, which are also attached to the mainline.
- 5 Purse seines are usually set around the following: i) natural floating objects (logs and floating debris), ii) specifically deployed objects called fish aggregating devices or FADs, which can be anchored or free floating, or iii) free-swimming fish in schools that are not associated with an object. i) and ii) are sometimes known as associated sets. For reasons that are not well understood, tuna tend to aggregate around floating objects and fishing on these tends to increase the effectiveness of purse seines as well as catches of juvenile bigeye and other bycatch.
- 6 El Niño / Southern Oscillation.

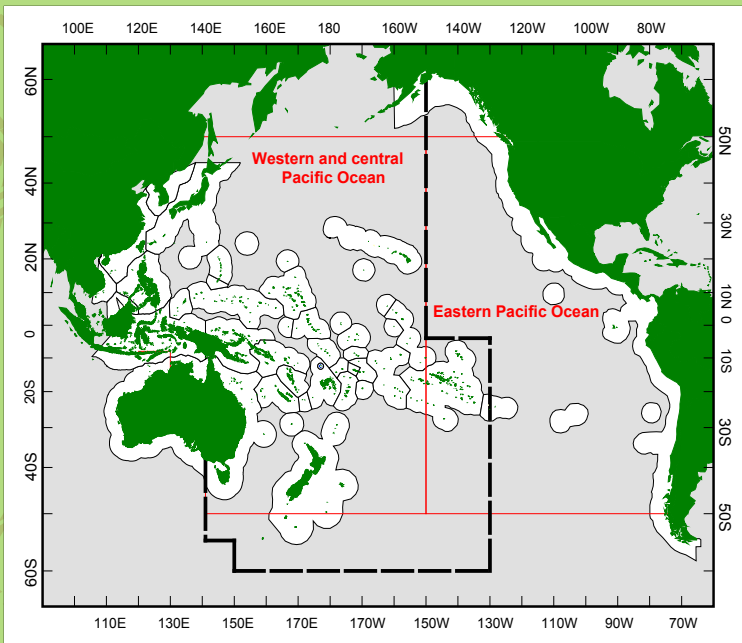


Figure 1. The western and central Pacific Ocean (WCPO), the eastern Pacific Ocean (EPO) and the WCPFC Convention Area (WCP-CA in dashed lines).

Sections 2.2.1 to 2.2.4 below provide an overview of the stock status of the four key tuna species in the WCPO.

2.2 Status of key stocks and impacts of fishing

2.2.1 Skipjack

Skipjack tuna⁷ is the dominant species in the WCPO tuna catch, accounting for around two-thirds of all landings over the last decade. Skipjack tuna catches in the WCPO more than doubled in the 1980s and have

⁷ Status commentary for skipjack based on Rice et al., 2014a.

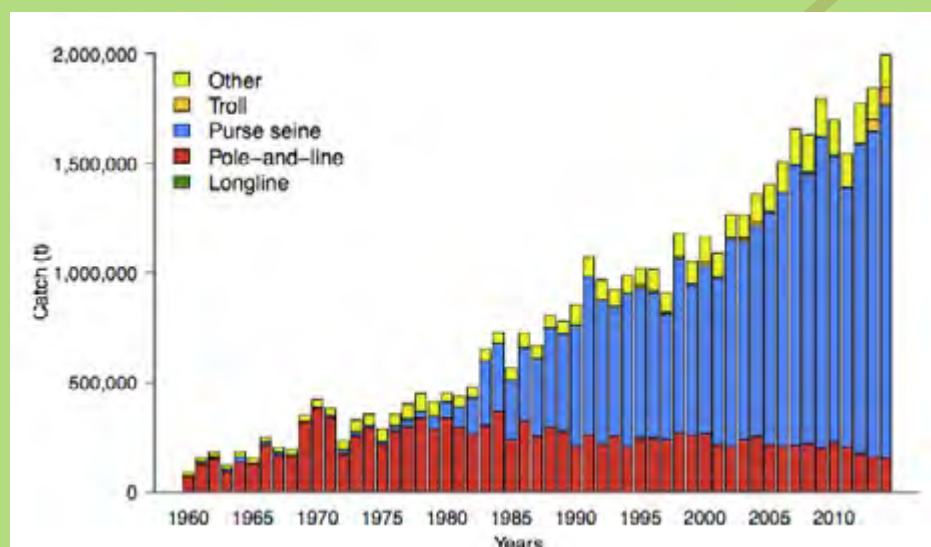


Figure 2. Catches of skipjack tuna in the WCPO, by gear type (SPC Data)

continued to increase in the ensuing years. The WCPO catch in 2014 was the highest on record at 1,982,578 metric tonnes (mt) and is above the estimated maximum sustainable yield (MSY⁸) of 1,532,000mt (Figure 2).

Catches of skipjack tuna (and associated juvenile bigeye and yellowfin tuna) show considerable inter-annual variation and are strongly influenced by El Niño/La Niña climatic effects, which also affect catch rates and stock size.

An integrated, length-based age and spatially structured model known as MULTIFAN-CL is now routinely applied to the tuna stock assessment in the WCPO. A number of alternative model options, considering various assumptions, including estimates of catchability and the spawning stock/recruitment relations are conducted on a regular basis.

Interpretations of the stock assessment indicate that there is little biological concern for skipjack. Estimated recruitment shows an upward trend over time, but estimated biomass (stock size) is declining over time, to about 52% of the level predicted in the absence of fishing. However, recent spawning biomass levels are estimated to be above the spawning biomass associated with the maximum sustainable yield (MSY) for skipjack, and well above the limit reference point of 20% of the level predicted in the absence of fishing⁹.

In 2014, the WCPFC Scientific Committee made the following observations on the status of the WCPO skipjack stock, based on the most recent stock assessment:

- The stock is currently only moderately exploited and current fishing mortality levels are sustainable.
- There is a continuing increase in fishing mortality and decline in stock size, which is having a significant impact on stock size, especially in the western equatorial region.
- There is concern that these high catches in the equatorial region could result in a range contraction of the stock, thus reducing skipjack availability to high latitude fisheries.
- Additional purse-seine effort will yield only modest gains in long-term skipjack catch and may result in a corresponding increase in fishing mortality for bigeye and yellowfin tuna. The management of total effort in the WCPO should recognise this.
- The spawning stock biomass (SB) is now around the mid-point of the range of candidate TRPs (target reference points) of 40%, 50%, and 60% of the unfished SB.

Baseline status of skipjack tuna: Skipjack is not overfished and overfishing is not occurring. The stock is within fishing mortality and biomass (MSY) reference points and above the LRP. However, the current levels of fishing are resulting in a decline in stock size, with implications for future catch rates and stock distribution. Scientific advice suggests action is necessary to avoid further increases in fishing mortality and keep the skipjack stock around the current levels, with tighter purse-seine control rules.

2.2.2 Yellowfin

Unlike skipjack tuna, yellowfin tuna¹⁰ are targeted by both surface fishing methods, principally purse seines, as well as deeper-set longlines. As with skipjack tuna, the WCPO yellowfin tuna stock is considered to be distinct from that of the EPO, with catches strongly influenced by El Niño/La Niña conditions. Between 1994 and 2014, the yellowfin tuna catch in the WCPO varied between 414,000 and 612,000mt.

Current fishing mortality rates for yellowfin tuna are estimated to be about 0.72 times the level of fishing mortality associated with maximum sustainable yield (F_{MSY}), which indicates that overfishing is not occurring. However, the 2014 catch exceeded, the MSY by around 13%.

⁸ MSY is the highest long-term average catch or yield that can be taken from a stock without its productivity being adversely impacted under prevailing ecological and environmental conditions.

⁹ WCPFC12 in December 2015 adopted an interim target reference point for the WCPO skipjack tuna stock of 50 percent of the estimated average spawning biomass in the absence of recent fishing (last 10 years).

¹⁰ Status commentary for yellowfin based on Davies et al., 2014.

Both biomass and recruitment have gradually declined over the duration of the fishery, with current spawning biomass estimated to be about 38% of the level predicted in the absence of fishing. Nevertheless, recent spawning biomass levels are estimated to be well above the SBMSY level, indicating that the stock is not overfished, and above the recently adopted limit reference point of 20% of the level predicted in the absence of fishing.

It is highly likely that the stock is not experiencing overfishing and is not in an overfished state, with the latest catch marginally above MSY (586,400mt).

The purse-seine catch of yellowfin tuna is typically around four times the size of the longline catch, with the majority of catch being taken in equatorial areas by large purse-seine vessels. Longline catches between 1994-2014 varied between 71,000 and 104,000mt, with the remainder being taken by pole-and-line and troll fishing methods, primarily in the domestic fisheries of Indonesia, Vietnam and the Philippines.

The domestic surface fisheries of the Philippines and Indonesia take large numbers of juvenile yellowfin and in the purse-seine fishery, greater numbers of juvenile yellowfin are caught in log and fish aggregating device (FAD) sets than in unassociated sets (Figure 3). A major proportion (by weight) of the purse-seine catch is adult (> 100 cm) yellowfin tuna. Yellowfin tuna are most heavily impacted by purse seine fishing and the fishing that occurs in the Philippines and Indonesia.

In 2014, the WCPFC Scientific Committee made the following observations on the status of the WCPO yellowfin stock based on the most recent stock assessment:

1. The WCPO yellowfin spawning biomass is above the biomass-based LRP and overall fishing mortality appears to be below that required to achieve MSY.
2. Levels of fishing mortality and depletion differ between regions with fishery impact highest in the tropical region.
3. WCPFC could consider a spatial management approach in reducing fishing mortality for yellowfin, particularly in those fisheries landing juveniles, to address fishing pressure in the tropical region and maximise yields.

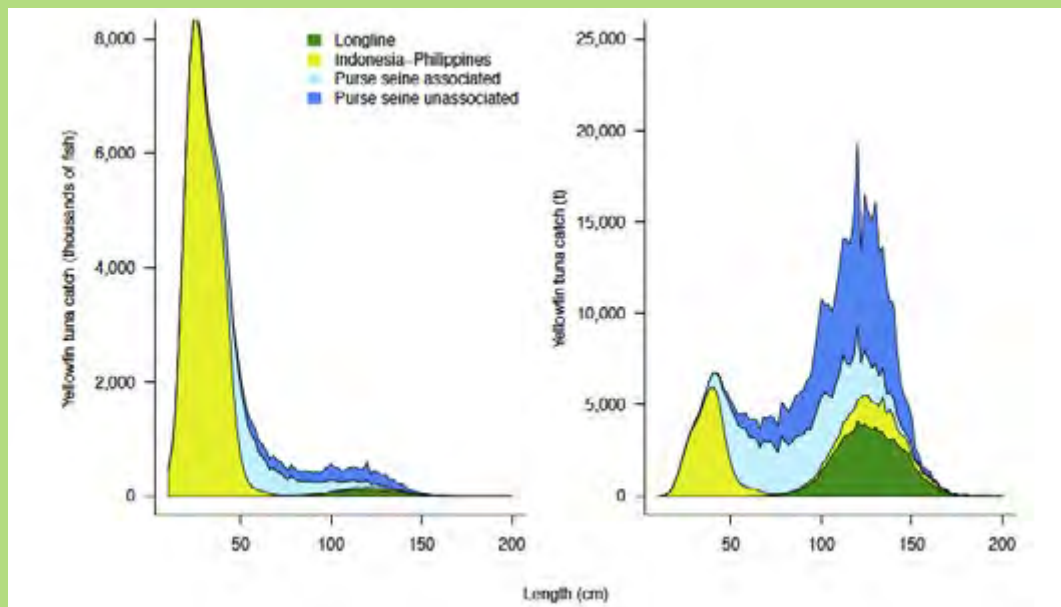


Figure 3: Time series of size composition (average for last five years, bottom) of yellowfin tuna catch (t) by gear in the WCPO

4. That the catch of yellowfin should not be increased from 2012 levels, which exceeded MSY and measures should be implemented to maintain current spawning biomass levels until the Commission can agree on an appropriate target reference point (TRP).

Baseline status of yellowfin tuna: Yellowfin tuna are not overfished and overfishing is not occurring. Until additional measures are implemented to reduce the fishing mortality on juveniles, catch should not be increased above 2012 levels and current biomass levels maintained, pending agreement of an appropriate TRP.

2.2.3 Bigeye tuna

The 2014 bigeye tuna¹¹ catch was 160,755mt, which was less than the highest historical catch of 190,145 tonnes, recorded in 2004. A 5,282mt decrease in purse seine catch was partially offset by a 8,894 mt increase in longline catch.

The majority of the WCPO catch is taken in equatorial areas, by both purse-seine and longline. In the equatorial areas much of the longline catch is taken in the central Pacific, adjacent to the important traditional bigeye longline area in the eastern Pacific.

As with skipjack and yellowfin tuna, the domestic surface fisheries of the Philippines and Indonesia take large numbers of juvenile bigeye in the range 20-50 cm. Most of the purse seine catch of bigeye (42%) consists of juvenile tuna, taken in association with FADs.

The longline fishery accounts for 46% of the catch of large bigeye, which are predominantly adult fish. This contrasts with large yellowfin tuna, which are also taken in significant amounts from unassociated schools in the purse-seine fishery and in the Philippines handline fishery.

Fishing mortality is estimated to have increased over time, particularly in recent years, and current levels are 1.57 times the level expected to produce MSY, therefore, overfishing is occurring. The spawning stock biomass is estimated to have declined over the duration of the fishery, with current spawning stock biomass estimated to be about 16% of the level predicted in the absence of fishing, which is below both the SB_{MSY} level and the recently adopted limit reference point of 20% of the level predicted in the absence of fishing (Figure 4). The stock is therefore considered to be overfished.

In 2014, the WCPFC Scientific Committee made the following additional observations on the status of the WCPO bigeye stock based on the most recent stock assessment:

- To rebuild the spawning biomass to above the biomass LRP will require a 33% reduction in fishing mortality from the 2004 level of fishing mortality, or a minimum 26% reduction from the average 2001-2004 level of fishing mortality.
- A minimum 36% reduction in fishing mortality from the average levels for 2008-2011 would be expected to return the fishing mortality rate to a level expected to produce MSY.
- Overfishing and the increase in juvenile bigeye catch has resulted in a considerable reduction in the potential yield of the WCPO bigeye stock and MSY levels would increase if the mortality of juvenile bigeye was reduced.
- Fishing mortality varies spatially within the Convention Area with high mortality in the tropical Pacific Ocean; as with yellowfin the WCPFC could consider a spatial management approach in reducing fishing mortality for bigeye tuna.

Baseline status of bigeye tuna: Bigeye tuna are overfished and overfishing is occurring. SC recommends substantial reductions to fishing mortality to achieve MSY and rebuild the spawning biomass above the limit reference point.

¹¹ Status commentary for bigeye based on Harley, 2014.

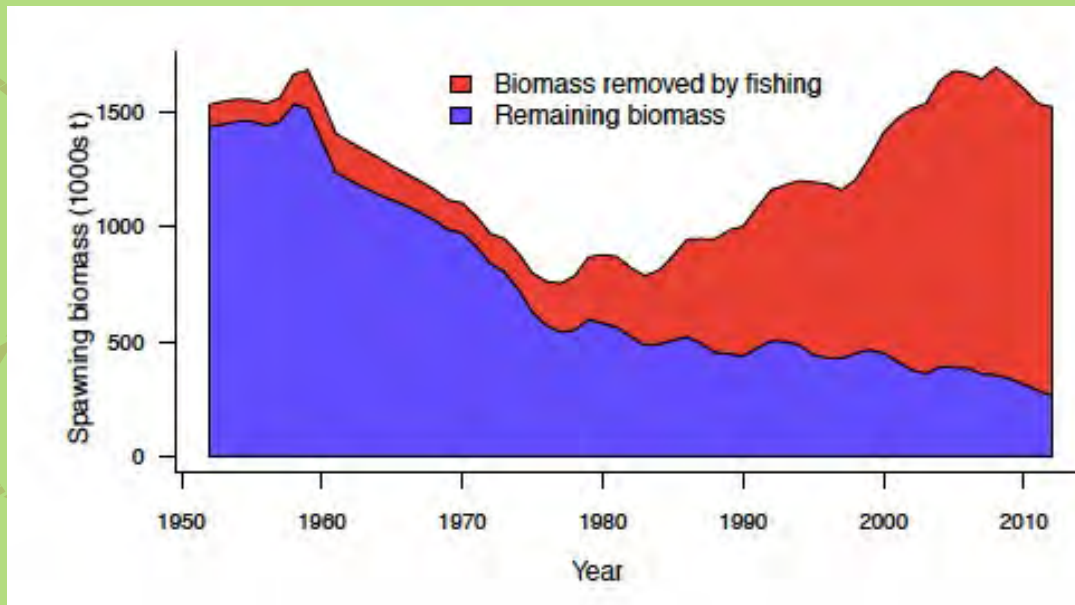


Figure 4: Estimated spawning biomass with [blue] and without [red] fishing (bottom left) from the 2014 bigeye tuna stock assessment

2.2.4 South Pacific Albacore

The most significant fishing method for albacore tuna¹² is longline, with a minor seasonal troll (surface) fishery. Prior to 2000, albacore catches in the WCPO were between 25-40,000mt per annum. Since 2000, there has been a considerable expansion in Pacific Island-based fishing effort on albacore, with historically high catches being taken between 2010 and 2012 (87,000mt).

The assessment indicates that fishing mortality has generally been increasing over time. Current fishing mortality is estimated to be 0.39 times the fishing mortality that will support the MSY, indicating that overfishing is not occurring, but fishing mortality on adults is approaching the assumed level of natural mortality. Spawning stock biomass levels are around 1.6 times the level required for MSY and at twice the level required to remain above the limit reference point. Thus the stock is not overfished. The healthy condition of albacore is due primarily to the selectivity of the fisheries relative to the size at which the species reaches maturity.

An index of economic conditions in the South Pacific albacore fishery presented to SC11 in 2015 (Reid et al, 2015) which integrated fish prices, catch rates and fishing prices, estimated a strong declining trend in economic conditions, reaching a historical low in 2013. While there was a slight recovery in 2014, conditions were still well below the average, primarily due to higher than average fishing costs and continued low catch rates. Domestic vessels from some longline fleets have reduced their fishing effort (i.e., tied up for periods of time) in response to these conditions. It should be noted that the South Pacific albacore fishery is, in most instances, not a stand-alone fishery, but part of a broader southern longline fishery that includes both yellowfin and bigeye tuna.

In 2015, the WCPFC Scientific Committee made the following additional observations on the status of the WCPO south Pacific albacore stock based on the most recent stock assessment.

¹² Status commentary for south Pacific albacore based on Harley et al., 2015.

- While overfishing is not occurring, further increases in effort will yield little or no increase in long-term catch and will result in further reduced catch rates.
- Decline in abundance of albacore is a key driver of the diminished economic conditions experienced by many Pacific Island Countries and Territories (PICT) domestic longline fleets. Further, reductions in prices are also impacting some distant water fleets.
- For several years, SC has noted that any increases in catch or effort in sub-tropical longline fisheries are likely to lead to declines in catch rates in some regions (10°S-30°S), especially for longline catch of adult albacore, with associated impacts on vessel profitability.
- SC11 recommended that longline fishing mortality and catch be reduced to avoid further declines in the vulnerable biomass so that economically viable catch rates can be maintained.

Baseline status of south Pacific albacore tuna: Albacore tuna are not overfished and overfishing is not occurring. The stock is in a relatively healthy condition biologically, but increasing effort and declines in catch rates have reduced economic returns substantially.

Figure 5 below shows the status of the four key target stocks on the so-called Majuro plot and Table 1 provides a narrative summary of stock status, reference points/projections and critical issues/data requirements.

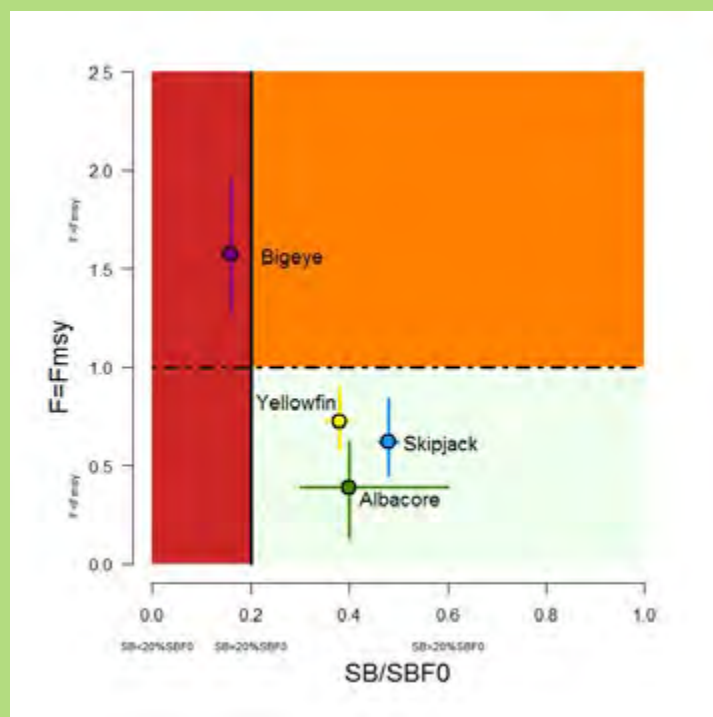


Figure 5: Status of albacore, bigeye, skipjack and yellowfin tuna stocks as at 1 May 2015

Table 1. Baseline stock status of key tuna species and associated issues

Species	Stock status as at mid 2015	Reference Points/Projections	Critical issues/ data and research requirements
Skipjack	Stock healthy, with moderate exploitation, but increasing relative to the stock's biological potential.	Estimated $F_{CURRENT}/F_{MSY} = 0.62$ and therefore overfishing is not occurring. Spawning biomass is well above SB_{MSY} (and agreed limit reference point) therefore the stock is not in an overfished state.	<ul style="list-style-type: none"> ■ Improve estimates of growth ■ Continue tagging across the range of the stock to support future assessments ■ Continue analyses of critical pole and line catch rate indices, noting that their level of fishing is reducing ■ Examine alternative indices based upon more plentiful purse seine data, noting uncertainties in the relationship between skipjack stock size and those indices
Yellowfin	Stock at or close to full exploitation. Latest catches marginally exceed MSY , with the fishing pressure highest in the equatorial area.	Estimated $F_{CURRENT}/F_{MSY} = 0.72$ and therefore overfishing is not occurring. As with skipjack spawning biomass is well above SB_{MSY} (and the agreed limit reference point) therefore the stock is not in an overfished state.	<ul style="list-style-type: none"> ■ Improve longline CPUE models ■ Continue tagging programmes, and data analysis for biological and movement parameters ■ Examine regional differences in growth and model the consequences ■ Refine species composition and total catches from domestic SE Asia fisheries

Species	Stock status as at mid 2015	Reference Points/Projections	Critical issues/ data and research requirements
Bigeye	The stock is depleted and management action is occurring.	Fishing mortality has increased in recent years, Estimated $F_{CURRENT}/F_{MSY} = 1.57$ and therefore overfishing is occurring. The spawning biomass is below SB_{MSY} and the agreed limit reference point of $20\%SB_{F=0}$ has been breached. The stock is in an overfished state, with $SB_{CURRENT}$ at around 16% of the level predicted without fishing.	<ul style="list-style-type: none"> ■ Conduct direct ageing of bigeye otoliths ■ Continue tagging activities over the spatial stock range to inform future analyses ■ Continue analyses of longline CPUE using operational data and of size data
Albacore	The stock is in a relatively healthy condition biologically, but increasing effort and declines in catch rates have reduced economic returns substantially.	Estimated $F_{CURRENT}/F_{MSY} = 0.39$ and therefore overfishing is not occurring. The spawning biomass is well above SB_{MSY} (and the agreed limit reference point) and therefore the stock is not in an overfished state.	<ul style="list-style-type: none"> ■ Re-evaluate otoliths from smaller fish to better model growth ■ Work with other tuna RFMOs to improve estimates of natural mortality ■ Collect hard parts from larger (longline-caught) fish to track trends in fishing mortality ■ Consider biological markers to improve east-west movement estimates ■ Continue analyses of longline CPUE using operational data ■ Refine modelling approaches for maturity and examine using a sex-structured model



3. Ecosystem considerations

In keeping with international developments in ecosystem based fisheries management (EBFM), the WCPF Convention has identified ecosystem issues as a significant component of the management of tuna fisheries in the WCPO. Clear responsibilities are laid out in the Convention, which include the need to take into account the impacts of fishing on target stocks, non-target species, species belonging to the same ecosystem, or dependent on, or associated with target stocks. There is also a requirement to protect biodiversity in the marine environment.

These responsibilities for WCPFC and other RFMOs have expanded over the last decade, with monitoring and reporting upon the ecosystem impacts of fishing now an important aspect of evaluating the sustainability of fisheries, and in particular for eco-label assessments. A critical step to developing appropriate monitoring and reporting protocols is an understanding of the processes by which marine ecosystems are structured.

Fishing is not the only anthropogenic factor that may have negative impacts on marine ecosystems and decoupling fishing from these other impacts (e.g. climate change) will aid in the identification of appropriate ecosystem indicators of fishing impacts and appropriate reference points for the implementation of management actions. In this way there will be a need to incorporate climate change information (and its impact on ecosystems, including target species) into management strategy evaluation (MSE) processes, the result of which may change how fishing occurs.

3.1 Impacts of fishing

3.1.1 Target species

The status of key target stocks (skipjack, yellowfin, bigeye and albacore tuna) has already been dealt with in section 2.2. above.

3.1.2 Bycatch and by-product¹³ species

Although albacore, bigeye, skipjack and yellowfin tunas have dominated annual catches from the WCPO, the fisheries also interact with and capture a large range of other species. Some non-tuna species, such as billfishes and sharks, are important components of the retained catches of industrialised fisheries in the region, especially in the longline fisheries (Molony 2005, OFP 2010). The fisheries also interact with a range of other species with no commercial value or species with non-commercial values (e.g. turtles, and to a limited extent, seabirds).

Analyses have been undertaken to identify which species or species groups are most vulnerable to fishing using an Ecological Risk Assessment¹⁴. Those species that have higher rates of interaction and low rates of population increase (long-lived, low fecundity and natural mortality) are in general most vulnerable. Sharks, turtles, marine mammals and seabirds typically fall into this category.

Levels of species bycatch vary with fishing method. Due to the low level of bycatch reported in longline fisheries and high degree of catch variability, it is difficult to obtain sufficient data to provide accurate total bycatch estimates, or detect the impact of tuna fishing on these species. This is in contrast to the purse seine fishery, which now has 100% observer coverage and, subject to the accuracy of species identification, the level of bycatch reported should improve rapidly. The biology and population dynamics of nearly all fish bycatch species are generally poorly known. The most significant issue for seabirds, turtles and sharks is that the total removals from the population is uncertain, whereas much of their biology and distribution is quite well known (due to them spending time at breeding colonies where they can be studied or are amenable to tag recovery for instance). For sharks, some species have been well studied in terms of biological parameters (e.g. mako sharks), whereas the biology and life history characteristics of others remain largely unknown.

¹³ Bycatch species are considered to have no commercial value or are prohibited from landing and are discarded, while by-product species have some commercial value and are retained. The term 'edible bycatch' is increasingly used to describe by-product, generally in the context of food security.

¹⁴ See D. Kirby Scientific Committee papers from 2005-2009



In the **purse seine fishery** the level of bycatch is between 1-2% (by weight) of the total catch. Bycatch from free-swimming sets are much lower on average (1.0%) than those from associated sets (2.0%). Following the lead taken by the PNA and the introduction of a Conservation and Management Measures (CMM) 2009-02¹⁵ discarding of target species, which was of up to 5.7% of the catch for associated sets, has now been virtually eliminated. Dolphins are not regularly taken by purse seines in the WCPO, since unlike the EPO, sets are not made on dolphin schools. The most significant bycatch species are the shark species, including silky and oceanic whitetip sharks and rainbow runners. Other species include mackerels, ocean triggerfish, mahi mahi and marlin (blue and black). (SC6 EB-IP-8)

Rates of bycatch in the **longline fishery** are considerably higher, at around 30% of the total catch. However, much of this is retained bycatch (by-product), which has some commercial value. There is considerable variation in the proportion of bycatch among deep sets in the western tropical Pacific (WTP) (26%), compared to shallow sets in the WTP (37%) and in the western south Pacific (WSP) albacore fishery (34%).

Figure 6 below provides the catch composition of the various categories of longline fisheries operating in the WCPO (Harley et al. 2015)

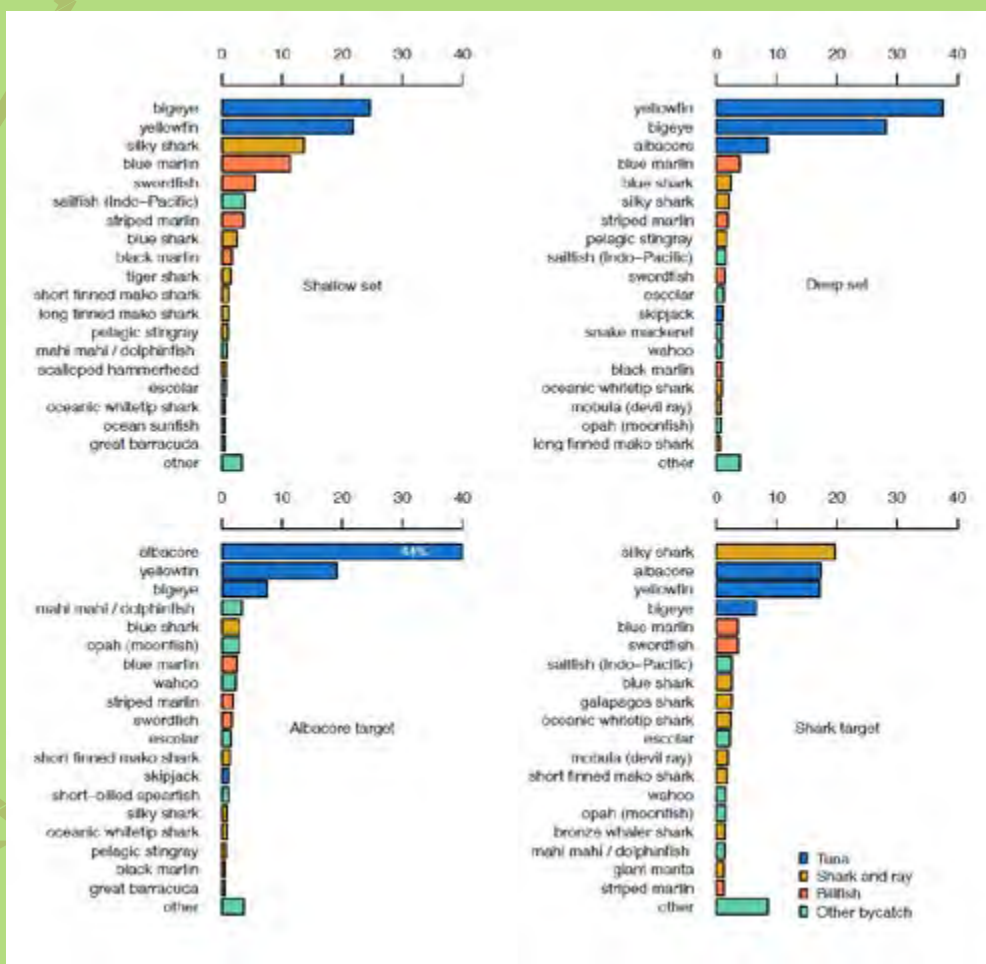


Figure 6 Catch composition of the various categories of longline fisheries operating in the WCPO based on observer data from the last decade.

15 CMM 2009-02 - Application of High Seas FAD Closures and Catch Retention



WCPO-reported catches of all species of sharks have exceeded 8 million individuals since 2012, up from 2-6 million per year in the previous decade¹⁶. The degree to which this is a result of improved data, rather than a 'real' increase is uncertain. Recent increases in reported catches are driven by Vietnam and Indonesia, both of which are engaged in ongoing data improvement projects. Shark finning still occurs in the WCPO and evidence of the effectiveness of the WCPFC shark finning ban is currently very limited¹⁷.

The majority of shark catch is in the longline fishery, with the purse seine fishery estimated to catch only 2-3% of the total (Lawson 2013). Despite recent requirements to report sharks to a species level, most catches are reported on logsheets as unidentified sharks. Of those sharks identified to species (on logsheets or by observers), blue sharks dominate the longline fishery, whereas silky sharks dominate the purse seine fishery¹⁸. Most of the WCPFC's designated key shark species are now listed by multi-lateral environmental agreements (MEAs) (e.g. CITES, CMS) requiring conservation, including shortfin mako, silky, oceanic whitetip, thresher, porbeagle, hammerhead and whale sharks. Implementation of national actions required under these MEAs have begun to generate often unmet demand for information about stock status and catch/trade levels.

As of May 2015, three shark stocks have been assessed in the WCPO: both oceanic whitetip (Rice and Harley (2012) and silky sharks (Rice and Harley 2013), were found to be overfished, with overfishing occurring, while the North Pacific blue shark (Rice et al 2014b) was considered likely to not be overfished or have overfishing occurring. No-retention measures have been adopted for oceanic whitetip, whale and silky sharks and a further shark mitigation measure was adopted in 2014 (see Table 2). This measure requires each national fleet to either ban wire leaders or shark lines and for all fleets targeting sharks to develop and submit shark management plans. As these measures have only been recently adopted, their effectiveness is yet to be evaluated.

The ongoing ABNJ (Common Oceans) Tuna Project has a significant component on sharks, which is centred in the Pacific and led by the WCPFC Secretariat. The project provides for four new, Pacific-wide shark stock status assessments as well as data improvement initiatives and post-release mortality studies. The project runs through to January 2019.

16 SPC logsheet data compiled in December 2015.

17 SC11 Summary Report

18 Ibid.



Billfish continue to form a significant proportion of the non-target catch, although in most WCPO fisheries of interest, these species are considered by-product and are retained due to their commercial value. Catches of billfishes by longline are dominated by blue marlin and swordfish, with lesser amounts of striped marlin. Recently, fisheries specifically targeting swordfish and striped marlin have developed in several countries within the WCPFC area. Sport fisheries also rely heavily on most billfish species.

Details of biology and ecology of all six species of billfish, while limited, are better known than a number of other bycatch species. Key issues include historic catches, current catches in longline fisheries and early life histories. Stock assessments of billfishes from the WCPFO relevant to PICs were completed in 2013 (for blue marlin and SW Pacific swordfish and in 2012 (for SW Pacific striped marlin).

Seabird mortality due to longlines is almost non-existent in the tropical WCPO compared with higher latitudes, where problems have been experienced with albatrosses and petrels. However, the low level of sub-tropical South Pacific observer coverage on many longline fleets means that the extent of interactions in this area is largely unknown.

The OFP has expended considerable effort on ecosystem based modelling and research. This modelling includes a number of important species of bycatch within the context of the overall tuna fishery and the WTP Warm Pool LME, including shark and billfish as top predators. Stomach contents of bycatch have been examined over many years, as have those of bycatch predators.

A major WCPFC initiative, the Bycatch Mitigation Information System (BMIS) provides a central repository of information on the mitigation and management of bycatch in WCPO. BMIS is a resource for fisheries managers, scientists, fishers and the general public that will enable Commission Members, Cooperating Non-Members and Participating Territories (CCMs) and other stakeholders to access and freely exchange information. Included in the BMIS data holdings are journal papers and technical documents on bycatch mitigation methods, WCPFC decisions and those of other organisations that refer to requirements to use mitigation methods to reduce catches of seabirds, sea turtles and sharks, collecting data on catches and species identification guides.





Table 2: Baseline conditions of bycatch (and by-product) species, and associated critical issues/requirements

Species	Overall status	Critical issues/requirements
All	Data on overall bycatch species limited; 100% observer coverage on purse seiners is generating considerable information relative to longline. However, for longliners, where coverage is minimal (<5%), more significant by-catch issues exist.	Increased observer coverage in the longline fleet, and better spatial and temporal distribution of observer coverage. Need for additional review of data currently held, including observer data and provision for updated estimates of bycatch levels, using observer reports. There is currently no publicly available compilation or evaluation of the interaction or mortality rates of the WCPFC members' fisheries on bycatch species.
Billfish	The SW Pacific swordfish stock is considered to be in danger of becoming overfished, with the possibility that overfishing is occurring. Blue Marlin is currently overfished but is not experiencing overfishing. The stock is nearly fully exploited. The southwest Pacific striped marlin assessment results indicate that the stock is fully exploited, is not experiencing overfishing, but may be overfished.	Research/data collection needs include: Improved understanding of the current harvest as a continuous incidental catch by the large, widely distributed longline fleet; role of billfish in the pelagic ecosystem; interaction with sport fisheries; and assessment of other species of billfish. For swordfish, the development of improved growth / maturity / mortality schedules at age to reduce uncertainty in the assessment; requiring collection of additional specimens from observers at sea; data analysis be conducted to identify areas of high catch concentration that could be subject to targeted management.
Sharks	WCPO-reported catches of all species of sharks have exceeded 8 million since 2012. Oceanic whitetip and silky sharks are overfished with overfishing occurring, while the North Pacific blue shark is considered not to be overfished, with overfishing not occurring. The majority of shark catch is by the longline fishery, with the purse seine fishery estimated to catch only 2-3% of the total. Most of the WCPFC's designated key shark species are now listed by multi-lateral environmental agreements (e.g. CITES, CMS) requiring conservation, including shortfin mako, silky, oceanic whitetip, thresher, porbeagle, hammerhead and whale sharks.	CCMs require sufficient data on which to base management actions arising from agreed CMMS and NPOAs. Currently there is insufficient data, as recognised by the shark component of ABNJ (Common Oceans) Tuna Project. Recent contraction in the shark fin market and concomitant growth in demand for shark meat emphasizes the need to think beyond finning regulations to comprehensively manage the level of shark fishing mortality. Identification of shark species in logbooks and by observers requires improved training, with most reported as 'unidentified sharks'. While some countries have declared 'shark sanctuaries', post-release mortality of sharks is not well understood. There is a need for additional shark assessments, including for porbeagle and bigeye thresher.



Species	Overall status	Critical issues/requirements
Turtles	<p>Five of the six sea turtles that are currently listed in threatened categories by the IUCN Red List, are found in the Pacific. The exception, Hawksbill sea turtles, though found in the Pacific, generally have a coastal distribution that minimizes their interaction with tuna longline fisheries. All sea turtles have been listed by the Convention on International Trade in Endangered Species (CITES) in Appendix I (i.e. a trade ban) for several decades. The South Pacific population of loggerheads is of greatest concern. The highest estimated total catches are taken in the tropical shallow (<100m) longline fishery, with the highest mortality rates occurring for deeper set logline gear, probably due to drowning. In contrast, mortality rates in purse seine gear is low, with more than 70% from associated sets. Most of those caught, however are released alive.</p>	<p>Current data on turtle interactions and mortalities are sparse due to poor longline observer coverage and are inadequate for robust risk assessment or to assess the impact of fishing.</p> <p>There is a need to continue to extend mitigation strategies to the commercial fleet and raise awareness of release techniques to decrease post-capture mortality.</p> <p>Research/data collection needs include: more detailed analyses of turtle-fishery interactions; dividing the longline and purse-seine fisheries within the tropical regions of the WCPFC into fisheries east and west of 170°E, in order to better estimate turtle-fishery interactions; and increased species identification rates by observers in all fisheries to permit a better assessment of the impacts of fishing on turtle populations.</p>
Seabirds	<p>Catches of seabirds on longlines in the tropical waters of the Pacific islands region are very rare in comparison with temperate waters and the risk of industrialised fishing to the sustainability of seabird populations in the WCPFC is considered low. The data on interactions between the industrialised fleets and seabirds between 15°N and 31°S is too limited to generate reliable estimates of catches and mortalities.</p>	<p>Many resident and transient seabirds in the tropical Pacific are listed as threatened by the IUCN and reducing seabird-fishery interactions in the region may improve the status of these seabird populations.</p> <p>Research and data needs include: increased observer coverage of longline fleets fishing between 20-30°S, improved identification of seabirds by observers, and improved reporting of condition and fate to increase the understanding of the interactions between seabirds and industrialised fisheries in the region.</p>
Mammals	<p>There are very few mammal interactions reported by observers within the longline fisheries of the WCPO and the overall impact of longline fisheries with marine mammals appears very low. There are some interactions with whales in the western tropical Pacific as a result of purse seine sets being made on tuna schools associated with whales and interactions during FAD purse seine sets. Depredation of longline catches by toothed whales is of increasing concern to operators in the WCPO tuna fishery. The direct loss to the Fijian economy from whale strikes is estimated by to be approximately FJD \$20,000,000 annually.¹</p>	<p>Future detailed analyses of mammal-fishery interactions may focus on this region and may consider dividing the purse-seine fishery of the WCPO into at least two separate fisheries, with division between the two fisheries set at 180°E.</p> <p>Better species identification of the few recorded interactions would permit a more thorough understanding of the impacts of fishing on mammal populations of the WCPO.</p>



Species	Overall status	Critical issues/requirements
Other species	Over 50 fish species are taken by longlines and purse seines, some of which are of commercial value, or of interest to the artisanal or recreational sectors.	No known significant sustainability issues, however little information exists on which to base such assumptions for most species. A better understanding of species composition through observer data collection is required and will be an ongoing task. An understanding of the basic productivity parameters for many of these species is a key gap to address in assessing whether sustainability issues exist.

The region has committed to deal effectively with bycatch as required under the relevant WCPFC CMMs listed below in Table 3.

Table 3: By-catch related CMMs in place as at May 1 2016

CMM	Description
2006-04	Limit on the number of fishing vessels fishing for southwest striped marlin south of 15°S and an obligation to report annually on bycatch levels, including the number and catch levels of vessels fishing for striped marlin in the Convention Area south of 15°S.
2008-03	Implementation of the FAO guidelines to reduce sea turtle mortality and interactions and to ensure safe handling.
2009-03	Limit on the number of vessels fishing for swordfish south of 20°S and the amount of swordfish caught in any one year; CMMs to not shift their fishing effort for swordfish to the area north of 20°S.
2010-01	Reduction in the total catch of north Pacific striped marlin via a phased reduction such that by 1 January 2013 the catch is [80%] of the levels caught between 2000 to 2003.
2010-07	Implementation of the FAO International Plan of Action for the Conservation and Management of Sharks (IPOA Sharks); reporting obligations on implementation of the IPOA and need for/status of NPOAs; full utilisation (no finning and discard of carcass); max 5% of weight of sharks on board as fins; prohibition on the movement of fins on fishing vessels in contravention of the CMM.
2011-04	Prohibition on the capture, storage, transshipment or landing of oceanic whitetip sharks; data collection requirements, including status upon release (dead or alive).
2012-07	Implementation by CCMs of the International Plan of Action for Reducing Incidental Catches of Seabirds in Longline Fisheries (IPOA-Seabirds); requirement to use at least two specified mitigation measures south of 30° South and north of 23° North; implementation of at least one measure in remaining waters encouraged; and associated reporting obligations.
2013-08	Prohibition on the capture, storage, transshipment or landing of silky sharks; data collection requirements, including status upon release (dead or alive).
2014-05	Ban on using wire traces as branch lines or leaders on tuna and billfish longlines to reduce shark mortality; requirement to develop management plans for targeted shark fisheries, to be submitted to SC.

While not strictly bycatch, cetaceans and whale sharks are afforded some level of protection from purse seine operations under CMM 2011-03 and CMM 2012-04, which banned the setting of purse seines on cetaceans and whale sharks respectively

PICTs have committed to various FAO International Plans of Action (IPOAs), including those for sharks, and other international agreements as required above. The degree to which these CMMS and other agreements are reducing bycatch mortality to acceptable levels (noting that there are no current measureable targets or strategies for managing bycatch) is highly uncertain.

3.2 Ecosystem issues associated with the WCPO

3.2.1 Physical environment

The Western Tropical Pacific (WTP) Warm Pool Large Marine Ecosystem (LME) is considered part of the larger Pacific-wide tropical oceanic environment known as the cold tongue-warm pool system. This system consists of a cold tongue of nutrient rich water generated by equatorial upwelling, and extends from the eastern to central equatorial Pacific. The cold tongue eventually encounters a large pool of very warm water in the west (the WTP Warm Pool LME). Productivity in the WCPO is largely influenced by the upwelling intensity and zonal extension that fluctuates in relation to the inter-annual variability linked to the El Niño Southern Oscillation (ENSO), and the more recently identified Pacific Decadal Oscillation (PDO). A correlation between ENSO and PDO signals is evident for the last 50 years, although whether ENSO fluctuations are influenced by, or are the cause of the PDO is still unclear.

3.2.2 Ecosystem dynamics

There is an increasing trend in fisheries management to develop ecological approaches that take into account species interactions and underlying ecosystem dynamics. To assess the impact of fisheries and environmental effects on the ecosystem requires a good understanding of the underlying marine ecosystem.

At a physical level, ENSO events have a direct effect on the productivity of the ocean and tuna fishing operations and there is an increased understanding of these effects. For example, during El Niño events, when trade winds decline and the cold tongue retreats eastwards and warmer (less productive) waters extend to the central Pacific, higher purse seine catches of skipjack are found in the eastern part of the WCPO. El Niño conditions also result in a vertical change in the thermal structure of the ocean resulting in the rising and vertical extension of yellowfin and bigeye temperature habitats, which in turn increases purse seine catch rates of yellowfin and longline catch rates of bigeye.

Predation induces an important mortality in the ecosystem that is often higher than fishery mortality, at least in the juvenile stages, and determining trophic interactions between species is a major step towards a better understanding of ecosystem dynamics.

4. Climate change

4.1 Predicted changes to key oceanic fisheries

Physical and biogeochemical changes in the ocean environment arising from climate change will influence tuna population dynamics through shifts in spawning conditions, habitat suitability and the distribution of food resources. These will have concurrent impacts on fish movement, behaviour, reproduction and mortality. Using SEAPODYM modelling, some overall long term predictions¹⁹ have been made for key target species of tuna in the WCPO:

The **skipjack** catch and biomass is predicted to slightly increase in the WCPO until 2050 at which point the biomass will then stabilise before starting to decrease after 2060, while the catch reaches a plateau. Both feeding and spawning habitat will become progressively more favourable in the eastern Pacific Ocean and also extend to higher latitudes, while the western equatorial warm pool is predicted to become less favourable for skipjack spawning.

Albacore stocks that were at 1.8 mt (67% of the biomass prior to industrial fishing) are predicted to decline to just under 0.8 mt (55% of the biomass prior to industrial fishing) by 2080, with current fishing effort held constant (Lehodey et al 2015). This has implications for the economics (i.e. profitability) of this fishery, which are already under pressure.

For **bigeye** tuna there is an improvement in spawning and adult feeding habitats both at subtropical latitudes and the ETP, while in the WCP the temperature becomes too warm for bigeye tuna spawning. The decrease in spawning is compensated by an increase of larvae biomass in subtropical regions. However, natural mortality of older stages will increase due to habitat changes arising from temperature and oxygen level changes. This increased mortality and the displacement of surviving fish to the eastern region will lead to a stable then declining adult biomass by the end of the century (Lehodey et al, 2010).

One overall effect of these changes is a shift in the concentrations of key tuna stocks to the east of the Pacific ocean, with potential impacts on both SIDS economies and the management of those stocks on the high seas.

4.2 Impact on marine jurisdictions

For most of the PacSIDS, the continuing validity of their maritime jurisdictions is necessary to sustain various social and economic activities and access to fisheries and other natural resources that provide food security, revenue and livelihoods. In particular, securing their maritime jurisdictions/boundaries is vital for the PacSIDS' development of an ocean-based economy, given the extent of their EEZs and the value of tuna resources that exist in those waters.

In addition, the 2014 Palau Declaration "*The Ocean: Life & Future*" called for 'strengthened regional efforts to fix baselines and maritime boundaries to ensure that the impact of climate change and sea level rise does not result in reduced jurisdiction'. The fulfilment of these objectives will safeguard the sovereignty and sovereign rights of PacSIDS from the adverse consequences of sea level rise caused by climate change

FAO has provided technical assistance to enable PacSIDS members of FFA to develop a collective response to changes in sea level due to climate change on maritime jurisdictional claims. This assistance provided for a consultative process involving two workshops held in July 2014 and May 2015 and the consideration of a draft report: *A preliminary assessment of jurisdictional baseline feature vulnerability to climate change, in the Tropical Pacific Island Region* by Dr Arthur Webb. From the workshops PacSIDS developed a range of national, regional and global actions to address this issue under the umbrella of a regional strategy: *Securing the Maritime Jurisdictions of Pacific SIDS against Climate Change*. This strategy was subsequently endorsed by FFC officials at FFC 94 in July 2015 in Funafuti, Tuvalu and subsequently by the FFC Ministers, meeting.

¹⁹ The predictions shown here are illustrative; the SEAPODYM modeling process is complex and has multiple inputs, including from climate models, which are all undergoing a process of continuous refinement, and assumptions about future fishing mortality.



Key future activities planned and directly funded under PIOFMP-2

Following consultation with FAO and FFA, it is understood that the process outlined above has fulfilled the requirements for activities under Output 1.2.2, i.e.

- 1.2.2.1 National consultation with Pacific SIDS and assessment and reporting of legal and socio-economic implications of sea-level rise on maritime jurisdictional claims of Pacific SIDS;
- 1.2.2.2 Selected national policy/legal personnel from 14 Pacific SIDS trained on sea-level rise impacts of climate change on Pacific SIDS jurisdictional claims in order to facilitate their effective input to regional strategy and responses;
- 1.2.2.3 Best policy and legal responses/options for recognition and preservation of jurisdictional claims of Pacific SIDS;
- 1.2.2.4 Regional strategy for Pacific SIDS response to legal and socio-economic impacts of sea level rise/climate change drafted and reviewed; and
- 1.2.2.5 Implementation of draft regional strategy launched.



5. WCP O Tuna Fisheries

This Section will deal with tuna fisheries in the WCPF Commission Area (WCP-CA) (Figure 1)²⁰. As Figure 7 below shows, the WCP O tuna fishery, both in terms of catch and value is dominated by skipjack tuna, which is primarily taken by purse seining.

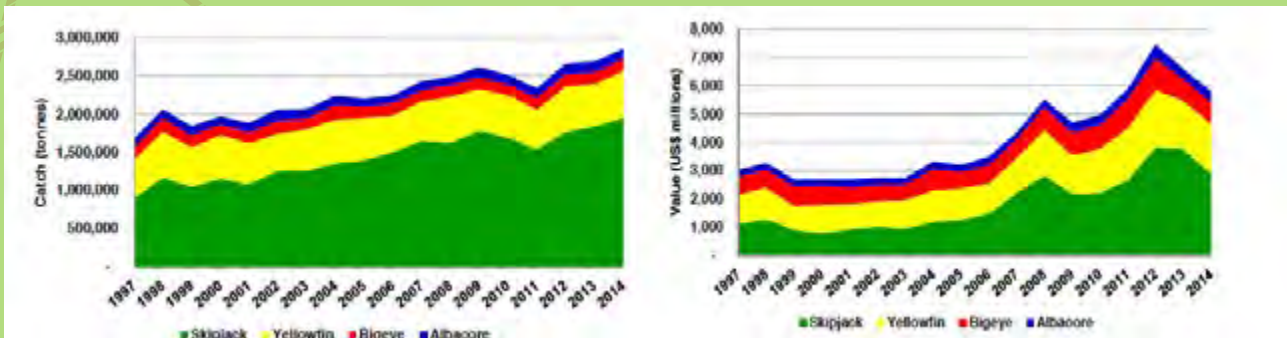


Figure 7. Catches and value of skipjack tuna, 1997-2014

Annual total catches of the four main tuna species (skipjack, yellowfin, bigeye and albacore) in the WCP-CA increased steadily during the 1980s as the purse seine fleet expanded, in the 1990s it then remained relatively stable until 1998 when it sharply increased and has remained at this elevated level since (Figure 16 and Figure 17). The provisional total WCP-CA catch of tunas in 2014 was estimated at 2,860,648 mt, the highest annual catch recorded (the previous record was in 2013 – 2,690,881 mt). During 2014, the purse seine fishery accounted for a record catch of 2,020,627 mt (71% of the total catch), with pole-and-line taking an estimated 203,736 mt (7%), the longline fishery an estimated 268,795 mt (9%), and the remainder (13%) taken by trolling gear and a variety of artisanal gears, mostly in eastern Indonesia and the Philippines (Figure 8). The WCP-CA tuna catch (2,860,548 mt) for 2014 represented 83% of the total Pacific Ocean catch of 3,486,124 mt, and 60% of the global tuna catch (the provisional estimate for 2014 is 4,783,629 mt, and when finalised is expected to be the highest on record, mainly due to increased WCP-CA catches).

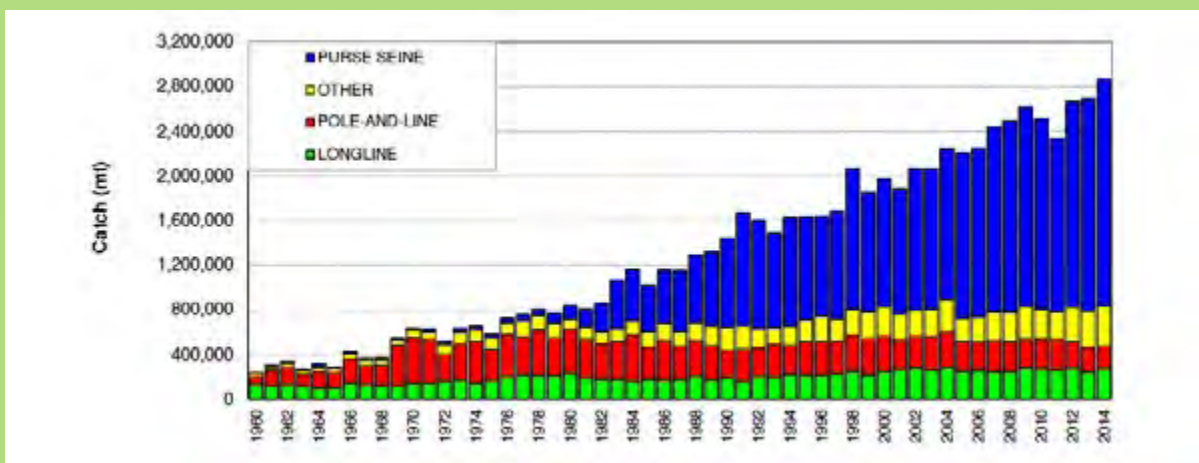


Figure 8. Annual total catch of skipjack, yellowfin, bigeye and albacore tuna, by fishing method, in the WCP-CA.

²⁰ This section draws heavily from Williams and Reid (2014).



5.1 Purse seine

The purse seine fishery is technology intensive and uses large highly mechanised and expensive vessels to catch surface swimming, schooling tunas (skipjack and small yellowfin and bigeye tuna) using surrounding nets.

Since the early 1990s the purse seine fishery has accounted for around 55–60% of the WCP–CA (Western and central Pacific Commission Area) total catch by volume, with annual catches in the range of 790,000–1,260,000 mt. In recent years however, the purse seine catch has increased to represent over 70% of the total tuna catch.

The majority of the WCP–CA purse seine catch is taken by the four main distant water fishing nations (DWFNs) fleets – Japan, Korea, Chinese-Taipei and USA, which currently number around 163 vessels. There has been an increasing contribution however, from a growing number of Pacific Islands fleets (95 vessels in 2014), with the balance from the Philippines and a variety of other fleets, including several new distant-water entrants into the tropical fishery (e.g. China, Ecuador, El Salvador, Spain and New Zealand).

The WCP–CA purse-seine fishery is essentially a skipjack fishery, unlike those of other ocean areas. Skipjack regularly account for 65–77% of the purse seine catch with the remainder made up of yellowfin 20–30%, with bigeye accounting for only a small proportion. Yellowfin catches tend to be generally higher during El Niño years and lower during La Niña years. Catches of juvenile bigeye by purse seine have been an ongoing issue given the status of the bigeye resource, with a strong correlation between higher catches and the proportion of FAD-associated sets and/or strong bigeye recruitment.

The provisional 2014 purse-seine catch of 2,020,627 mt was the highest catch on record and more than 120,000mt higher than the previous record in 2013 (1,899,627 mt).

The total number of Pacific-island domestic purse seine vessels has gradually increased to reach its highest level in 2014 (95 vessels), catching 520,000mt in 2014. The combined Pacific-islands purse seine fleet includes vessels fishing under the FSM Arrangement, bilateral agreements and domestically-based vessels and comprises vessels from FSM, Kiribati, Marshall Islands, PNG Solomon Islands and Tuvalu and Vanuatu.

The major non-Pacific Island purse seine fleets in 2014 were the US (40 vessels taking 298,000 tonnes), Korea (28 vessels taking 270,000 tonnes) Taiwan (34 vessels taking 237,000 tonnes) and Japan (73 vessels taking 210,000 tonnes).





Other major fleets include:

- the domestic Philippine purse-seine and ring-net fleets that operate in Philippine and northern Indonesian waters, and under the exemptions 2012-01 and 2014-01 in the high seas pocket north of PNG; and
- the domestic Indonesian purse seine fleet.

Figure 9 provides trends in annual catch and effort for the top five purse seine fleets operating in the tropical WCP-CA between 1996–2014.

Purse seine set types (either **associated** with drifting logs or fish aggregating devices (FADs) or **unassociated** (free schools) vary with oceanographic (ENSO) changes. Catch composition, including bycatch, varies between set types and the high levels of bigeye taken using FAD sets has led to the FAD closures now in place.

Potential increases in the productivity of purse seine vessels over time due to improved technical developments (e.g. faster vessels, new net technology, smart FADs, etc.) and resulting increases in total effective effort, implies that notable reductions in the number of vessel days over time may be needed to control overall fishing mortality. There is a need to understand the driving factors behind increases in fleet efficiency in order to understand how productivity may change in the future, and hence allow the development of plans to adjust fishing capacity over time to maintain stocks around TRPs, for example. In this sense, alternative metrics for fishing effort other than a fishing day may become more appropriate to effectively capture those changes driving improved fleet productivity.

The estimated delivered value of the entire purse seine tuna catch in the WCP-CA area for 2014 is \$3,171 million compared with \$4,038 million in 2013. This represents a decrease of \$867 million (21%) from 2013, despite the record catch. This decrease resulted from the \$711 million (23%) decrease in the delivered value of the skipjack catch (worth \$2,359 million in 2014) resulting from the decline in the skipjack composite price, (-29%), that more than offset the 7% increase in catch, as well as the decline of \$101 million (12%) in the value of the yellowfin catch caused by the 18% drop in the yellowfin composite price that more than offset the 6% increase in yellowfin catch.

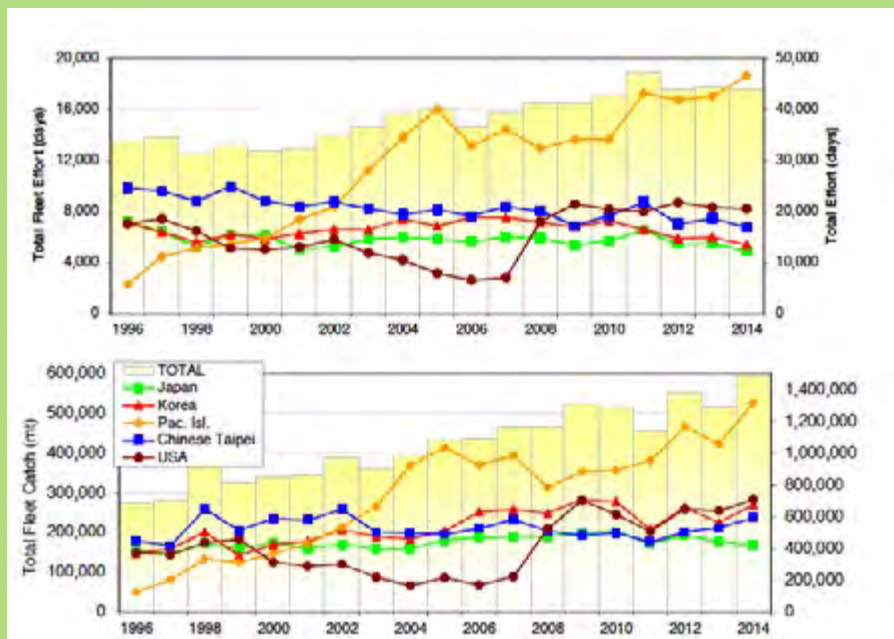


Figure 9. Trends in annual effort (top) and catch (bottom) estimates for the top five purse seine fleets operating in the tropical WCP-CA, 1996–2014. the WCP-CA.

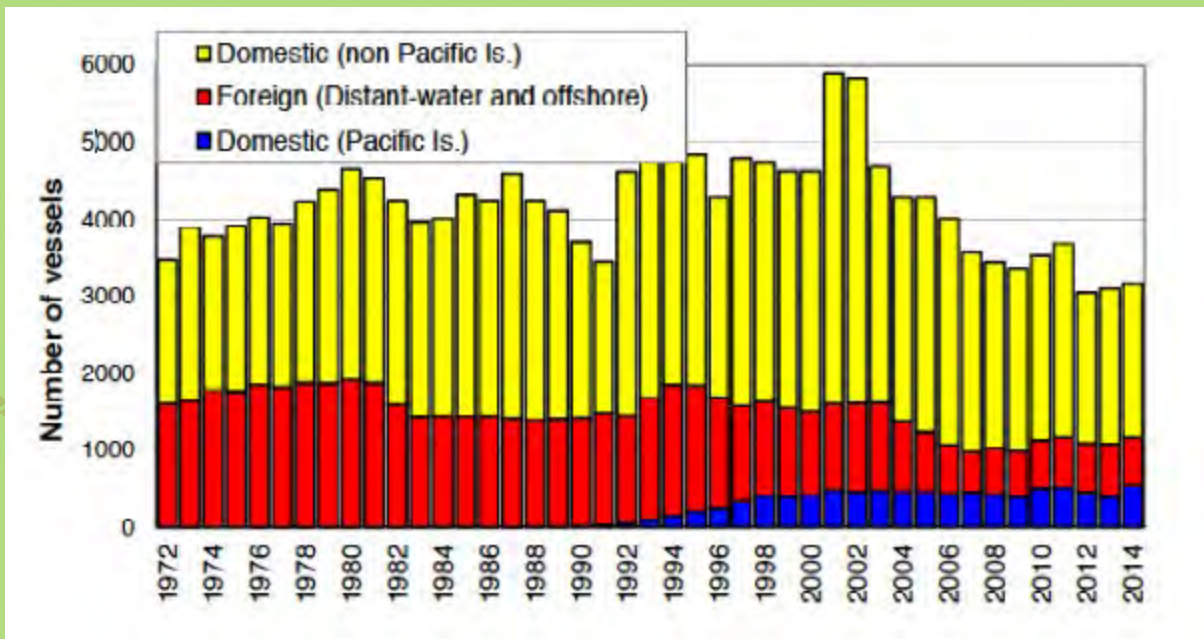


Figure 10. Longline vessels operating in the WCP-CA
 (Note: Available data does not make the distinction between foreign “distant-water” and “offshore”)

5.2 Longline

Longline fishing for tuna is less technically demanding and requires less capital than purse seining. Accordingly, it is of significant importance to domestic fleets in some Pacific island nations and territories. There are considerably fewer barriers to entry to this fishery, with the major constraints being the costs of fishing, catch rates and the availability of air transport for the shipment of highly valuable fresh sashimi-grade tuna.

The longline **fishery** continues to account for around 10–13% of the total WCP-CA catch but rivals the much larger purse seine catch in landed value. It provides the longest time series of catch estimates for the WCP-CA, with estimates available since the early 1950s. The total number of vessels involved in the fishery has fluctuated between 3,000 and 6,000 for the last 30 years (Figure 10).

The fishery involves two main types of operation:

- large (typically >250 GRT) distant-water freezer vessels, which undertake long voyages (months) and operate over large areas of the region. These vessels may target either tropical (yellowfin, bigeye tuna) or subtropical (albacore tuna) species.
- smaller (typically <100 GRT) offshore vessels, which are usually domestically-based, with ice or chilling capacity, and serving fresh or air-freight sashimi markets. These vessels operate mostly in tropical areas, although there are also domestic fisheries in the sub-tropical and temperate WCP-CA, including the fisheries of Australia, Japan, New Zealand and Hawaii;

There is also the relatively new south Pacific distant-water swordfish fishery (Spain) and a large fleet of small vessels in Indonesia and Philippines, which target yellowfin and bigeye by hand lining and small vertical longlines, usually around the numerous arrays of anchored FADs in these waters.

There have been significant changes in fleet operations during the past two decades, including:

- a gradual increase in the number of Pacific-Islands domestic vessels during the 1990s, especially in Polynesian nations, which has been maintained;
- growth of the Pacific Islands domestic albacore fishery, which has risen from taking 33% of the total south Pacific albacore longline catch in 1998 to accounting for around 50-60% of the catch in recent years;
- a trend towards targeting diversification in some fleets, notably those with ultra-low temperature freezing capacity, creating an ability to move between albacore, bigeye and yellowfin; and
- substantial declines in the number of foreign fleets (and catches) from Japan, Taiwan, and Korea.

The provisional WCP-CA longline catch (268,795 mt) for 2014 was slightly above the average for the past five years. The WCP-CA albacore longline catch (91,414 mt – 34%) for 2014 was the lowest for three years, 12,000 mt, lower than the record of 103,466 mt attained in 2010. The provisional bigeye catch (73,898 mt – 27%) for 2014 was higher than in 2013 but still amongst the lowest catches since 1996. In contrast, the yellowfin catch for 2014 (101,552 mt – 38%) was the highest for more than ten years, with increased catches by a number of fleets.

5.3 Pole and Line

The pole and line fishery is of decreasing significance to the Pacific islands due to economic factors and technological advances in the purse seine fishery. These advances have drastically reduced the costs of production of the purse seine sector, which targets the same species (skipjack tuna).

There remains a low level of distant-water pole and line activity by Japanese vessels in the Pacific islands region, with the bulk of the catch being taken by Japanese and Indonesian coastal fleets.





6. Management Issues

6.1 WCPF Convention and Commission

The Western and Central Pacific Fisheries Commission (WCPFC) was established by the Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPF Convention), which entered into force on 19 June 2004.

The WCPF Convention draws on many of the provisions of the UN Fish Stocks Agreement [UNFSA] while, at the same time, reflecting the special political, socio-economic, geographical and environmental characteristics of the WCPO region. The WCPF Convention seeks to address problems in the management of high seas fisheries resulting from unregulated fishing, over-capitalization, excessive fleet capacity, vessel re-flagging to escape controls, insufficiently selective gear, unreliable databases and insufficient multilateral cooperation in respect to conservation and management of highly migratory fish stocks.

The Convention also provides a framework for the participation of fishing entities in the Commission, which legally binds fishing entities to the provisions of the Convention, recognises the special requirements of developing States, and acknowledges the need for cooperation with other Regional Fisheries Management Organizations (RFMOs) whose respective areas of competence overlap with the WCPFC.

The Commission supports three subsidiary bodies; the Scientific Committee, the Technical and Compliance Committee and the Northern Committee, that each meet once annually. The meetings of the subsidiary bodies are followed by a full annual session of the Commission, usually held each December. The work of the Commission is assisted by a Finance and Administration Committee. PacSIDs have been heavily represented at these meetings.

- Current members of the Commission are: Australia, China, Canada, Cook Islands, European Union, Federated States of Micronesia, Fiji, France, Indonesia, Japan, Kiribati, Republic of Korea, Republic of Marshall Islands, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Philippines, Samoa, Solomon Islands, Chinese Taipei, Tonga, Tuvalu, United States of America, Vanuatu.
- Cooperating Non-member(s) of the Commission are: Ecuador, El Salvador, Mexico, Panama, Liberia, Thailand, Vietnam.
- Participating Territories at the Commission are: American Samoa, Commonwealth of the Northern Mariana Islands, French Polynesia, Guam, New Caledonia, Tokelau, Wallis and Futuna.

Collectively these three groups are known as CCMs (Commission Members, Cooperating Non-Members and Participating Territories).

Since its establishment, the Commission has agreed to a number of binding conservation and management measures (CMMs) as well as non-binding resolutions, the latter on non-target species, SIDSs' aspirations and the use of the best available science. CMMs in force can be found at <https://www.wcpfc.int/conservation-and-management-measures>.

It is necessary for members of the Commission to review their legislation to align their laws with the Convention and the decisions of the Commission, including CMMs. This requirement places a significant burden on SIDS and support from PIOFMP-2 will assist at a sub-regional and national level with meeting these obligations.

Considerable frustration has been expressed by SIDS at the time taken to agree to and implement effective CMMs, and in particular those to deal with bigeye overfishing and the southern albacore element of the southern longline fishery. Incremental progress seems to be slowing as WCPFC ends its first decade and enters a more consolidative stage, with CCMs struggling to assimilate and implement all its requirements. There are a number of high seas fisheries not yet under effective control (FFA 2015a).

Within the WCPFC, FFA assists and facilitates members' discussion to put forward CMMs, resolutions and other initiatives to the Commission, many of which are based on the Niue Treaty on Cooperation in



Fisheries Surveillance and Law Enforcement and the MTCs that have largely set the standard for many of the WCPFC requirements. The FFA hosts the WCPFC vessel monitoring system (VMS), and (with SPC) the WCPFC Regional Observer Programme (ROP), which is largely comprised of the national programmes of FFA Pacific Island Countries.

6.1.1 Data on PacSIDS participation in Commission and associated meetings

Through funding assistance from PEOFMP-1 and other sources, PacSIDS have been very well represented at Commission and associated meetings. Table 4 below provides PacSIDS engagement data for the last five years (SC 7-11, TCC 7-11 and WCPFC8-WCPFC12).

Table 4. Attendance at WCPFC meetings

Country/Interest group	Scientific Committee		Technical and Compliance Committee		Commission	
	Male	Female	Male	Female	Male	Female
Cook Islands	1	4	7	0	18	5
FSM	15	0	57	3	17	6
Fiji	15	1	14	0	22	0
Kiribati	7	1	2	6	11	11
Marshall Islands	15	7	22	2	28	0
Nauru	10	0	14	0	27	1
Niue	0	0	3	0	6	2
Palau	0	5	0	4	12	7
PNG	14	0	33	4	72	12
Samoa	5	4	8	4	13	9
Solomon Islands	8	2	12	4	13	2
Tonga	9	0	7	3	11	6
Tuvalu	9	1	11	1	19	1
Vanuatu	4	1	12	0	12	2
PacSIDS Domestic industry ²	2	1	66	10	37	5
Totals	114	27	268	41	318	69
ENGO delegates	34		31		58	



It is worthy of note that PacSIDs have held lead positions at both SC and TCC, providing Chairs for these meetings in recent years (SC 2012-201, TCC 2012-2013).

6.1.2 Harvest strategy development

Since 2012, the Commission has been working on the development of management objectives and harvest strategies, including target and limit reference points and decision (harvest control) rules. A series of three Management Options Workshops (MOWs) had been held as of mid-2015, which generated general support for the development of a harvest strategy-based management framework as outlined in the CMM proposed by FFA, which was subsequently agreed to by WCPFC as CMM2014-06²¹. Advice was also provided on a preliminary proposal for a TRP for skipjack tuna and the need to implement an effective management framework/ harvest strategy for the south pacific albacore fishery that meets management objectives.

6.2 Illegal, unreported and unregulated (IUU) fishing

Considerable efforts have been taken at the national, sub-regional (FFA/SPC/PNA) and regional levels (WCPFC) to mitigate IUU fishing in Pacific tuna fisheries. Many of these are likely to have been highly effective at achieving their intended purpose (e.g. the FFA and WCPFC VMS, the FFA Regional Register, the FFA Harmonised Minimum Terms and Conditions for Foreign Fishing Access, the Pacific Patrol Boat Program, Niue Treaty, 100% observer coverage on the PS fleet) and will have contributed to the relatively low estimates of IUU fishing across a number of sector/categories. Nevertheless, the results of a recent MRAG study²² indicate that substantial uncertainty still exists in relation to IUU activity across a range of key risks, and additional measures are required to strengthen incentives for voluntary compliance, reinforce deterrents to non-compliance and improve monitoring throughout the supply chain. Interestingly, estimates of IUU are dominated by the licensed fleet (95%), which has implications for MCS planning and investment. These implications include the need for stronger catch monitoring arrangements in the longline sector, better estimation of IUU through stronger monitoring and coordination of relevant statistics and stronger high seas MCS, based on in-zone initiatives. The latter will require action through the development and implementation of MCS measures/CMMs via the WCPFC.

21 Conservation and Management Measure to develop and implement a harvest strategy approach for key fisheries and stocks in the WCPO.

22 MRAG Asia Pacific (2016). Towards the Quantification of Illegal, Unreported and Unregulated (IUU) Fishing in the Pacific Islands Region. 101pp.





FFA members, through the MCS Working Group (MCSWG) under the guidance of the FFA Fisheries Operations Division (FOD) are now considering the key issues arising from the MRAG study.

The European Union (EU) in enforcing its regulations through the European Commission (EC) requires that only those products that have been certified as having been legally caught by the flag state concerned are allowed access to the EU market. Where the EC feels the country is not living up to its obligations under its regulations, it starts a dialogue process with that country. If, following the dialogue process the EC is not convinced that the country is doing what it should to address IUU fishing, the EC issues of warning, aka a 'yellow card', insisting that the country improve its legal and management frameworks with regard to IUU fishing. Fiji, Vanuatu, Papua New Guinea, Solomon Islands, and Tuvalu have all been issued with EC 'yellow cards'. In order to access the EU market, PacSIDS are working to address MCS gaps and achieve an EC 'green card', indicating that compliance and management issues have been resolved.

6.3 Sub-regional bodies

6.3.1 Parties to the Nauru Agreement (PNA)

The Nauru Agreement Concerning Cooperation in the Management of Fisheries of Common Interest (The Nauru Agreement) entered into force in 1982. It is an Oceania sub-regional agreement between the Federated States of Micronesia, Kiribati, the Marshall Islands, Nauru, Palau, Papua New Guinea, Solomon Islands and Tuvalu. The eight signatories, known as the PNA, collectively account for around 80% of the WCPO purse seine catch from their waters (2010-2014)²³, the balance being taken in the waters of other Commission Members, especially Indonesia and the Philippines as well as the high seas. These data underscore the scale of influence of the signatories to the PNA

The full range of PNA fishery management instruments implemented by the Parties to the Nauru Agreement includes:

- The Federated States of Micronesia Arrangement: which defines a multilateral licensing arrangement providing annual access to all PNA EEZs by purse-seine vessels, which contribute significantly to the enhancement of a PNA country's (the Home Party) economic involvement in the fishery;
- The Palau Arrangement, through the Purse-seine Vessel Day Management Scheme, now effectively

23 WCPFC12-2015-DP22



limits the amount of effort (in terms of number of fishing days) that can be exercised by purse-seine vessels in PNA waters during any one calendar year. A Longline Vessel Day Management Scheme is currently being implemented; and

- The Implementing Arrangements of the Nauru Agreement: There have been three of these, defining the measures that have been agreed by all Parties that will be implemented in the management of the activities of purse-seine vessels in their own EEZs, either through regulations or licensing conditions. These include the measures highlighted below, such as the requirement not to license any purse-seine vessel that also fishes in certain defined High Seas areas.

The PNA, through collective action and leverage based on the high proportion of the WCPF purse seine fishery being within their EEZs, has progressively taken control over the management of that fishery, including through the closure of high seas areas from 10 degrees north to 20 degrees south. This control has been achieved at national (through licencing conditions and regulation), sub-regional (though collective action as the PNA) and at the WCPFC (through the introduction, with the support of other FFA members, of a range of CMMs).

In 2010 the PNA established an office (PNAO) in Majuro, Marshall Islands, initially to improve efficiency of national observer programmes in maintaining 100% independent observer coverage aboard purse-seine fishing vessels in PNA waters. The work and staff of the PNAO has expanded considerably, and the office now has six full-time staff, with five based on Majuro. The aim of the PNAO is to build capacity within the Parties to enable effective implementation of the next phase of the VDS and other fisheries initiatives, ensuring that Parties' personnel are fully engaged in, and have ownership of the administration of PNA initiatives.

6.3.2 Tokelau Arrangement (TKA)

The Tokelau Arrangement for the Management of the South Pacific Albacore Fishery provides a framework for the development of cooperative zone-based management of South Pacific albacore tuna fisheries, including potentially wider implementation of the Harvest Strategy for the South Pacific Albacore Fishery than what was agreed between members of the FFC Sub Committee on South Pacific Tuna and Billfish Fisheries in 2013. While not having the leverage of the southern longline fishery that the PNA have over the purse seine fishery, the TKA group which comprised Australia, Cook Islands, Niue, New Zealand, Samoa, Tokelau, Tonga, Tuvalu and Vanuatu as at May 1 2015, is emerging as significant sub regional grouping.

While a collaborative South Pacific Albacore Catch Management Scheme has yet to be elaborated, the first and most essential component is in place – agreement by the Participants to limit the south Pacific albacore catch within their zones. These limits have been used, so far without success, to get agreement at WCPFC on a proposed WCPFC CMM to replace CMM 2010-05. Once developed, the TKA framework will be able to address issues that will allow Participants to secure the best available benefits from the fishery, including through avenues such as trading and cooperative licensing.

It is proposed that the Tokelau Arrangement South Pacific Albacore Catch Management Scheme develops in harmony with the Commission measure. The Commission measure establishes the overall limit for the stock in the Convention Area and governs fishing on the high seas, while the Tokelau Arrangement assists Participants and Associates to more effectively manage fishing within their zones. The Arrangement also provides for collaboration and agreement on the distribution of fishing between zones, which is important given the contribution of the high seas catch to the overall fishing mortality on southern albacore.

The Tokelau Arrangement also provides for “Associate Participation” by non-FFA members – particularly, South Pacific Territories – whose waters host fisheries for south Pacific albacore tuna, and who declare zone limits on the catch of albacore in ways that are compatible with the limits adopted by Participants to the Arrangement



6.3.3 Te Vaka Moana

The Te Vaka Moana Arrangement (TVM) is an agreement to cooperate in shared fisheries interests between five Polynesian PacSIDS (Cook Islands, Niue, Samoa, Tokelau and Tonga) and New Zealand. TVM's work centres on the management and development of shared fisheries resources, to ensure their sustainability, to leverage greater economic benefits, and to protect the important role that fisheries play as a source of food for TVM communities. TVM's overarching goal is 'to secure, protect and enhance associated long-term economic benefits able to be derived from fisheries and protect the important contribution fisheries make to the food security of the communities'. TVM programs to date have focused on improving MCS outcomes for its members, although attempts are currently being made to expand activities into areas of fisheries management and in particular, to secure stronger access to the south Pacific albacore fishery.

To some extent, the efforts of TVM members to strengthen their harvest rights to albacore have been overtaken by the Tokelau Arrangement²⁴ that came into effect on the 14th December 2014. This Arrangement potentially (subject to signature of the Agreement) includes all members of the TVM plus Australia, Fiji, Solomon Islands, Tuvalu, Vanuatu, New Caledonia, French Polynesia, American Samoa and Wallis and Futuna. As at May 1 2015, parties to the TKA were Australia, Cook Islands, Fiji, New Zealand, Niue, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu and Vanuatu.

6.3.4 Melanesian Spearhead Group (MSG)

The **Melanesian Spearhead Group (MSG)** is an intergovernmental organisation founded in 2007. Membership is composed of the four Melanesian states of Fiji, Papua New Guinea, Solomon Islands and Vanuatu, and the Kanak and Socialist National Liberation Front of New Caledonia. In June 2015, Indonesia was recognized as an associate member. Objectives of the MSG include: the promotion and strengthening of trade, economic and technical cooperation as well as the alignment of policies and shared goals of economic growth, sustainable development, good governance and security.

A MSG Fisheries Technical Advisory Committee was established in 2008. With the first meeting of the Committee being convened on 29-30 April, 2010 and attended by MSG senior fisheries officials, including regional organizations such as FFA, SPC, WWF South Pacific and Greenpeace. The Committee seeks to play a role in promoting MSG cooperation on sea surveillance; strengthening observer programmes between MSG members; enhancing conservation and management of tuna stocks within the boundaries of the MSG members; cooperating to carry out on-shore processing development of tuna within MSG member

²⁴ Tokelau Arrangement for the Management of the South Pacific Albacore Fishery





countries; strengthening trade of fish products such as canned, chilled and frozen amongst MSG members; enabling cooperation on allocation of fishing days under the Vessel day scheme (VDS) to fishing vessels flagged to MSG members; enhancing MSG solidarity on conservation issues pertinent to MSG members within the WCPFC Meetings; ensuring cooperation and consultations on issues relating to the delineation of maritime boundaries between MSG members; and strengthening MSG cooperation on in-shore resource and aquaculture development.

Since the 2010 meeting, the Fisheries Technical Advisory Committee (FTAC) of the MSG has been largely inactive. A FFA study was undertaken to examine longline fishery development options in 2011, which had implications for FTAC. At the 2015 Project Steering Committee (PSC) meeting it was agreed that a final approach should be made to MSG/FTAC to see if any interest remained in fisheries activities relevant to the Project, with the alternative being to allocate resources to the future development of the TKA. **Given the status of FTAC, it appears likely that funding to assist the successful implementation of the TKA, via support of members, may yield better outcomes.**

6.4 Other key PIOFMP2 organisations

6.4.1 PITIA

The Pacific Islands Tuna Industry Association (PITIA) was constitutionally founded in 2005 to provide a united voice for the domestic tuna industries, promote sustainable use of resources by domestic tuna industries and liaise with other relevant bodies on behalf of its members. A key function is to keep the smaller Industry associations fully informed on WCPFC developments and proposals and activities at FFA and SPC of concern to them. PITIA, as an “industrial” NGO, has no national borders and can robustly present the alternatives. For example, PITIA is able to provide frank and fearless advice to government(s) on issues such as comparing the benefits of deriving income from tendering vessel days under the VDS to facilitating domestic catching/ processing activities.

The PITIA membership includes 14 Pacific Island countries and several national industry associations. PITIA is essentially a voluntary organization, based in Honiara, Solomon Islands, with only the Executive Secretary as a paid employee.

When formed in 2005 it was seen as an “association of associations” and technically operates under this format today. The “associations” being the trade associations that were meant to have formed and



been active within the PIC's. DevFish²⁵ funds were made available at the time and trade associations do exist and are active in the larger fishing PIC's. In the smaller PIC's, where there is little offshore domestic development and fishing is mainly artisanal, they have fallen by the wayside.

At the PITIA AGM held in Brisbane in 2014 it was agreed to consider an alternative format whereby sector interests were represented rather than National Associations and the interim executive, who cover a broad range of interests from processing, purse seine and longline fishing, is working towards this goal.

The target focus of PITIA's work consists of three different aspects:

- Representation of Commercial interests to policy-making forums e.g. shark conservation and the impact of lack of South Pacific albacore management on domestic industries.
- Information dissemination and profile building, including on obligations arising from policy making forums to inform business planning, between PITIA members and with national fisheries administrations
- Promotion of sustainable fishing behaviour, which adds value to the industry

6.4.2 WWF

The World Wide Fund for Nature (WWF) is a global conservation organization. The WWF Pacific Programme Office (PPO) has been operating in the South Pacific since 1995 with offices in Fiji, Papua New Guinea and the Solomon Islands. WWF-PPO is largely focused on conservation and natural resource management of the marine environment. The Sustainable Fisheries and Seafood programme at the WWF PPO is an advocacy, awareness, research and policy input and project implementation initiative that has been working with the network of WWF offices globally and with partners to improve the health and management of tuna (offshore) and small scale (inshore) fisheries in the Pacific Islands region. Due to the highly migratory nature of tuna in the Pacific, to effectively safeguard their populations from overfishing across their extensive range, a highly collaborative approach between Pacific nations, territories and DWFNs is essential. As such, the programme focuses on lobbying, advocacy and partnership with national, regional and international organisations to promote responsible tuna fishing practices across large swathes of the Pacific. The WWF PPO focuses on three main activities:

Policy advocacy and awareness raising: through advocating changes to national, regional and international legislation to effectively change the way the fishing industry operates, and creating awareness among:

- i) governments and industry of the growing demand in Europe and North America for fish that have been certified as sustainably caught; and
- ii) Pacific Islanders of the challenges associated with offshore fisheries and the environmental, cultural, political and economic implications of their management.

Fisheries certification: using market based measures, to actively promote sustainable tuna fisheries management to protect Pacific stocks from the same fate as Atlantic and Mediterranean tuna populations.

Tuna Bycatch: driving the reduction of bycatch by changing fishing practices through education and training on bycatch avoidance and mitigation techniques.

6.5 National Agencies

It has been long recognised that most PacSIDS fisheries administrations require institutional strengthening if they are going to fully realise the promise and deal with the challenges offered by the sustainable development of oceanic fisheries resources. A number of fisheries administrations operate in silo-like conditions, with ineffective communication and input from other government agencies and non-governmental players, including environmental NGOs and industry. Some fisheries administrations have moved to various improved governance models that allow for more transparent, adaptive and responsible approaches, particularly in relation to private sector development. Cost recovery and adequate resourcing

²⁵ Development of Sustainable Tuna Fisheries in Pacific ACP Countries



of fisheries management agencies will also be of growing significance as the requirements to report and demonstrate implementation of the CMMs increase. Some useful examples of arms-length (from Government) authority models exist in the region (e.g. the National Fisheries Authority in Papua New Guinea) and more are likely to be developed in the future.

National capacity is severely overstretched in many PacSIDS fisheries administrations with inadequate resourcing for the management of the offshore fisheries sector, resulting in staff numbers as low as two in some countries. This is despite the often high pressure from within their own nations and governments for good management outcomes, given the significant contribution of tuna to government revenue and peoples’ livelihoods. Furthermore, their regional and international fisheries obligations are much the same as large developed countries, which is particularly challenging given that many international instruments do not take a realistic account of the special requirements of developing States, including PacSIDS.

Despite this, the only WCPFC members to emerge from the Commission’s 2014 compliance monitoring process as “compliant” were four FFA members and Canada.

6.6 Global instruments

This study focuses on the issues associated with:

- measures in place at national, sub-regional and regional level for the conservation and management of the oceanic fish stocks of the WCPO and the protection of the WTP LME from fisheries impacts; and
- the status of the fisheries, the target stocks and the ecosystem including trophic status and status of key non-target species.

There are a number of key global instruments relevant to fisheries in the WCPO and, where appropriate reference is made to these in the study. The WCPF Convention also makes extensive reference to, and is based on, the UN Fish Stock Agreement (UNSFSA). The WCPF Convention reflects the special political, socio-economic, geographical and environmental characteristics of the WCPO region and seeks to address a number of challenges to the management of tuna fisheries in that area. The key global instruments (in addition to UNSFA) relevant to tuna fisheries in the WCPO are listed below:

Table 5: Key global fisheries instruments

Agreement	Description
FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (Compliance Agreement)	Based on the need for effective action, consistent with international law, to deter reflagging of fishing vessels as a means of avoiding compliance with applicable CMMs on the high seas. Implemented by states through measures that including data collection, licensing and submission (to FAO) of a list of vessels fishing on the high seas
UN Convention on Biological Diversity (CBD)	Provides general guidance on best practices, but does not currently include any sanctions for countries that do not adhere to these practices. Parties are explicitly required to implement the CBD consistent with the rights and obligations of States under the United Nations Convention on the Law of the Sea.



Agreement	Description
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	This is self-explanatory. Includes sharks and turtles, both of which are by-catch in WCPFO fisheries and for which CMMs have been developed.
FAO International plans of action (IPOAs)	<p>(IPOAs) are voluntary instruments elaborated within the framework of the Code of Conduct for Responsible Fisheries. They apply to all States and entities and to all fishers. Four IPOAs have been developed to date.</p> <ul style="list-style-type: none"> ■ International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries (IPOA-Seabirds) ■ International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks) ■ International Plan of Action to Prevent, Deter, and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU) ■ International Plan of Action for the Management of Fishing Capacity (IPOA-Capacity) <p>IPOAs for Sharks and IUU are discussed in this study.</p>
The FAO Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (PSM Agreement)	The PSM Agreement envisages that parties, in their capacities as port States, will apply the Agreement in an effective manner to foreign vessels when seeking entry to ports or while they are in port. The application of the measures set out in the Agreement will, inter alia, contribute to harmonized port State measures, enhanced regional and international cooperation and block the flow of IUU-caught fish into national and international markets. The PSMA was not in force at the reference date for the baseline study.
FAO International Guidelines on Bycatch Management and Reduction of Discards.	A voluntary instrument to assist States and regional fisheries management organizations and arrangements (RFMO/As) in implementing the ecosystem approach to fisheries and United Nations General Assembly (UNGA) Resolution A/RES/64/7.

It should be noted that implementation of most of these agreements relies principally on action by parties at the national level, via the implementation of WCPF Commission CMMs and other regulations given effect through national legislation (fisheries management acts, regulations, statutory management plans etc). Detailed analysis of the degree to which SIDS are complying with or implementing the provisions of these instruments lies outside the TORs for the Baseline study.



7. Delivery of scientific assessment and monitoring services

The Oceanic Fisheries Programme (OFP) at SPC is the Pacific region's centre for tuna fisheries science and information, providing scientific advice to support the sustainable management of oceanic fisheries for economic growth and environmental conservation. In contributing to the regional management of tuna fisheries, SPC:

- Manages the region's data holdings for tuna fisheries in the WCPO;
- Supports PICTs and regional agencies to monitor the fisheries and use the data collected;
- Conducts targeted research on the ecosystems, biology and population dynamics of key pelagic resources; and
- Conducts stock assessments and evaluations of fisheries management strategies.

The SPC/OFP has a dual role as a provider of data and scientific services to the WCPFC as well as providing data and scientific services to PICTs, both nationally and sub-regionally. Service provision to both the FFA and WCPFC is governed by an inter-organisational memorandum of understanding. The most important programme outputs are information (e.g., reports on the status of fisheries, stocks and ecosystems), infrastructure (e.g., databases, monitoring programmes) and advice (e.g., regarding appropriate levels of fishing).

There is an emphasis on integrated systems between FFA/SPC and within SPC, mainstreaming the use of ecosystem models to inform stock assessments and management action.

SPC provides scientific support services to PICTs at three levels:

- At the national level, to national fisheries administrations in PICTs, primarily through support of information (including the status of fisheries, stocks and ecosystems) national fishery monitoring and database systems, provision of advice on appropriate levels of catch or effort, and associated national capacity building;
- At the sub-regional level, principally to the PNAO and also to TVM; and





- At the regional level, to FFA (data summaries and analyses, stock assessments and management advice) for its various tuna fisheries management initiatives. Including the TKA.

For PEOFMP-2, the OFP will be responsible for delivery of the following outputs:

- Output 1.2.1 Climate change forecasts and vulnerability assessments;
- Output 3.2.1 Effective national fisheries monitoring programmes and data and information management systems; and
- Output 3.2.1 National scientific analysis and support for ecosystem-based management of oceanic fisheries.

SPC is structured into four key areas: (i) fisheries monitoring, (ii) stock assessment and population modelling, (iii) ecosystem monitoring and analysis and, (iv) data management. At the end of each section below, key activities for the next four years relevant to the PEOFMP2 are identified. Activities under each input are described and boxed in bold to assist with MTR and TR evaluation.

7.1 Fisheries monitoring

Problems have been experienced with gathering data on the substantial catches taken in the WCPO by non FFA States outside this area, particularly from Indonesia, Philippines and Vietnam. Other tuna fisheries data includes annual catch estimates, unloading data, port sampling data and observer data. Annual catch estimates by fleet, catch and effort data grouped by time-area from DWFNs and other statistical information are provided on a regular basis via OFP publications and on-line, including the Regional Tuna Bulletin and the Tuna Fishery Yearbook.

Observers

National observer programmes and the Regional Observer Programme (ROP) provide a wide range of monitoring data for research and compliance purposes from the industrial tuna fishery of the WCPO region. This includes data for primary target species, non-target species (including bycatch) and length data. Observer coverage for purse seiners has increased dramatically since the previous PEOFMP project, initiated with the PNA Third Implementing Agreement (3IA) requirement of 100% observer coverage for the purse seine fleet from 2010 and subsequently broadened through the WCPFC CMM2008-01 to include a 5% observer coverage of longliners and for some components (purse seine FAD closure and longline coverage) to begin in 2009. This decision placed a considerable training and logistic burden on national and sub-regional observer programmes and hampered efforts to increase the already marginal coverage of longline vessels (less than 2% regionally, but $\geq 5\%$ for PacSIDS domestic fisheries within EEZs).

The ROP was established in February 2008 through CMM 2007-01, utilising existing sub-regional and national observer programmes. The definition of an ROP trip and the requirement by CCMs to provide ROP data to the WCPFC Secretariat have been clearly stated in the Convention and in CMM 2007-01.

The SPC/OFP has been processing observer data on behalf of its member countries for more than 20 years, with an increasing desire for members to enter their own data. Currently (mid 2015), 19 staff are employed in Noumea (13), Fiji (2) and at FFA in Solomon Islands (4) to enter and manage observer data.

Since the conclusion of PEOFMP-1, the emphasis of the ROP has been to shift away from regionally delivered services and expanding numbers of observers towards building standards, capacities within countries and quality assurance via an audit process. This has been achieved through three major strategies:

- Establishment, review and regular updates of the Pacific Islands Regional Fisheries Observer (PIRFO) standards. While SPC is still directly involved in this process, a PIRFO Certification Management Committee (CMC) has been established as an oversight body; the CMC is comprised of representatives from SPC and FFA, national observer coordinators (one each from PNA and non-PNA countries) and the WCPFC Secretariat (as an observer);



- Delivery of observer training via a collaboration of SPC and qualified national PIRFO trainers usually hosted through national maritime vocational training institutions, based on PIRFO standards, to achieve accepted and credible qualifications; and
- Establishing professionalism among observers with a clear career path based on PIRFO training stream, going from observer to de-briefer, trainer, assessor and finally, frontline manager qualifications.

In the next five years priority areas for the ROP are:

- A shift in focus of national observer programme capacity development from quantity to quality of data collected;
- Broad adoption of e-reporting by observers;
- Formal academic recognition of PIRFO standards; and
- Improved national cost recovery mechanisms and improvements in national financial systems to ensure sustainable funding for the ROP and national observer programmes.

Attachment 2 provides an indication of the status of observer programmes, in country capacity, and numbers of trained observers.

Unloadings and port sampling

Unloadings and port sampling data are an important element in Fisheries Information Management system (FIMS), especially given the transnational nature of WCPO tuna fisheries and the lack of port/transshipment facilities in many countries.

Port sampling is conducted to collect data on the species composition and the length-frequency of the landed catch. OFP continue to support the collection of biological data and/or the collection of landings data from around 18 ports in the Pacific Islands area of the WCP-CA, including ports in 8 FFA member countries. Support for this work includes port sampler training, technical and financial assistance, data processing, provision of forms and sampling equipment such as calipers.

- Port sampling data of purse seine unloadings has been discontinued, owing to the fact that port sampling data can be unreliable as it is affected by: set weight bias, grab sample bias and bias related to well mixing (but apparently not by size), and therefore the information is better collected through the ROP. Following 3IA catch retention rules, purse seine caught fish unsuitable for sale to usual markets is retained on-board, with an uncertain final destination. It is believed some of this catch is sold in PacSIDS, to the detriment of local fishers.

As at mid-2015, the collection and analysis of unloadings data required integration with the evolving development of catch documentation schemes (CDS), TUFMAN2, and the PIRFO. Data standards to deal with changing fishing regulations and practices are also required.

Attachment 2 provides an indication of the status of unloading data collection in PacSIDS.

Key future activities planned and directly funded under PIOFMP-2

3.2.1.2 Development of a comprehensive unloading data collection.

The following activities are planned across all fisheries:

- Integration of unloadings data with, or replacement by, emerging CDS schemes, including the PNG CDS and planned Commission CDS;
- Cross referencing unloadings data with TUFMAN2, as planned for VMS;

- Updating, where appropriate, the unloading and port sampling data standards as developed through the SPC/FFA Data Collection Committee (DCC) process;
- Development of unloading data collection and improvement plans; and
- PIRFO aligned certification of monitoring staff.

For purse seine fisheries:

- Total catch verification and knowledge of fate of unloadings.

For longline fisheries:

- An extension to the current longline catch sampling protocol to identify and record deeply frozen and highly dressed tuna and tuna-like species. The rise in frozen (part processed; e.g. head off, tail fin removed) landings.

7.2 Stock assessment and population modelling

Stock assessment of the major targeted tuna species and population modelling continue to be major components of the OFP's work, in support of scientific advice on the status of the stocks that is provided regularly.

MULTIFAN-CL, a length-based, spatially-explicit, age-structured model, has been under continuous development and improvement at SPC since 1991 and was first used for albacore in the early 1990s. This major step forward resulted in a modelling tool capable of providing a systematic stream of estimations of the major parameters that are needed for modern fisheries management. These include: fishing mortality, relative and absolute (with less precision) stock size, size structure, effort trends, recruitment, impact of fishing and catchability. Importantly, these estimates are provided within a spatial structure and with measures of uncertainty for each parameter. The data files used in the MULTIFAN-CL model are made available for independent review or analysis by interested scientists.

Tuna movement is recognised as playing a major role in its population dynamics and in determining the extent of actual and potential interaction between fisheries. SPC runs the Pacific Tuna Tagging Programme (PTTP), tagging skipjack, yellowfin and bigeye tuna throughout the equatorial WCPO (10°N–10°S; 120°E–130°). PTTP data on movement and behaviour contributes to, and reduces uncertainty in, WCPO tuna stock assessments. Specifically, tagging provides information on movement and mixing of tuna within the WCPO and with adjacent regions, the impact of fish aggregating devices (FADs) and species-specific vertical habitat utilisation. The PTTP, after relying solely on donor funding since 2006 now has funding through the Commission, with additional contributions from other donors including NZ, Korea and the EU. Almost 400,000 tunas have been tagged since 2006, with over 70,000 fish recaptured. This programme will be important in better understanding the rate of fishing and the connectivity of tuna across the WCPO.

By using tagging data and information from the ecological models discussed above, the simulation of skipjack populations and catch under different climatological (average) conditions has been achieved. Furthermore, the results of the comparison of the simulated CPUE from the models with observed average CPUEs has been very promising.

A major role of the OFP is communicating the results of assessments and ad-hoc reports requiring scientific advice.

- Data and research/stock assessment reports to the Commission are promulgated through a range of publications including SC reports and the Regional Tuna Bulletin and Tuna Fishery Yearbook.
- At the regional level SPC also works with the FFA to provide analytical support for Regional fisheries management initiatives. This includes support of sub-regional bodies, such as the Office of the Parties to the Nauru Agreement (PNAO) and Te Vaka Moana. These two bodies are implementing agencies for the POFMP-2.



- At the national level, SPC works closely with national fisheries counterparts to provide scientific advice. Two key elements of that advice is assistance with the development of Tuna management and development plans (with FFA) and completion of National Tuna Fisheries Status Reports (NTFSRs). The NTSFRs have been phased out due to the introduction of country web pages and Issue Specific National Reports (ISNRs – see below), which were initiated in 2013 and are confidential to SPC member countries (including PacSIDS). These web pages enable PacSIDS to easily access a wide range of data and analysis relating to their offshore fisheries. See Attachment 3 for a full list of information available to PacSIDS via their secure website country pages. Figure 10 below provide an example of the sorts of graphics available to SPC members on these website pages.

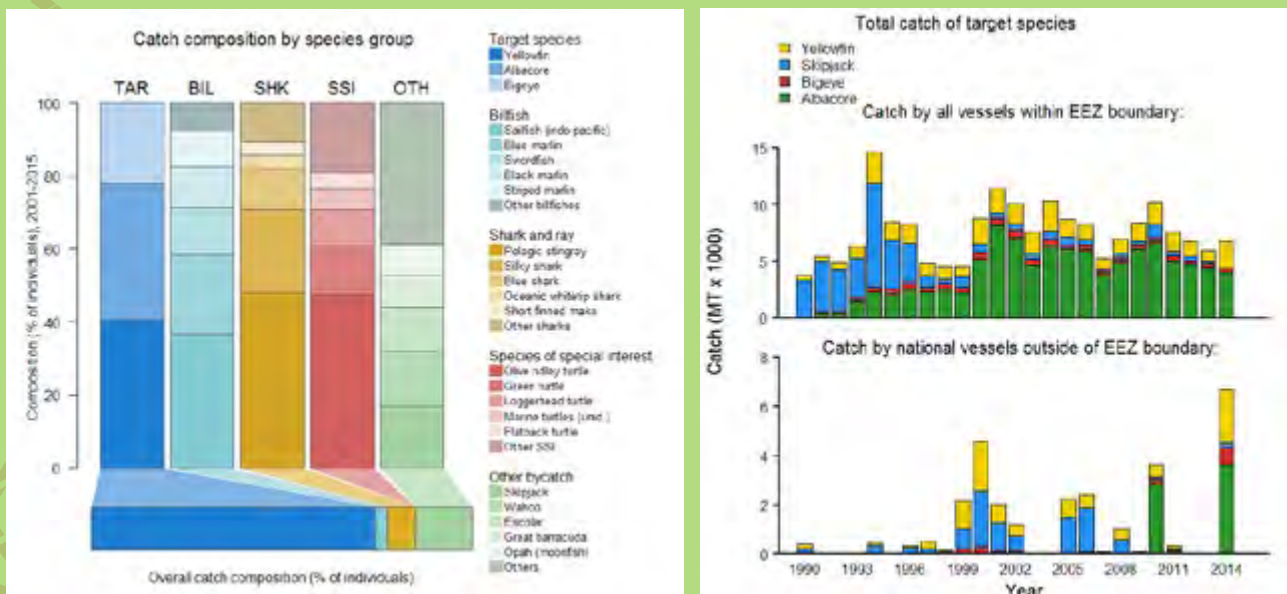


Figure 10: Sample graphics from SPC member country website pages (Longline)

In addition to advice related to the status of target species and the ‘standard’ fisheries data contained both in stock assessments and analysis on country web pages, the OFP provides SPC member countries with assistance in the form of country specific reports (CSRs) and ISNRs. The ISNRs commenced around 2011 but were not fully operational till 2013. The reports include:

- By-catch reports on the quantity, seasonality and potential value of non-target tuna species in longline fisheries;
- Bio-economic analyses, including on levels of fishing effort to achieve economic objectives;
- Factors influencing tuna longline CPUE;
- Interactions between artisanal and industrial fisheries;
- Impacts of FAD closure periods on catch and income from purse seine fisheries;
- Oceanographic and climatic influences on primary production and fish habitat; and
- Scientific analyses in support of the development of a VDS for the longline fisheries.



Attachment 4 provides an indication the status of these reports as at mid-2015.

Most fisheries administrations, (and fisheries researchers where applicable), in PacSIDs have little in-depth knowledge of stock assessment models, indicators and reference points. While it is unrealistic to plan or support in-country tuna stock assessments, it is increasingly important that island nationals engaged in managing fisheries have a sound understanding of, and an ability to interpret and question, the results of stock assessments.

OFP’s National Scientists conduct Stock Assessment Workshops (SAW), which seek to provide PICT fisheries staff with the skills to interpret, critique, use, and communicate the results of the regional tuna stock assessments conducted by SPC. In the last five years the OFP has conducted four national stock assessment workshops with 79 attendees as shown in Table 6 below

Table 6: Stock assessment workshops 2011-2015

Year	Males	Females	Total
2011 – Intro	11	4	15
2011 – Advanced	9	9	18
2013	14	8	22
2015	13	11	24
Total	47	32	79

Key outcomes of the SAW workshops include an increased capacity among participants to contribute to regional discussions, along with more authoritative reporting of key results and implications to managers to improve decision making at national levels. For the first time in 2015, SPC, with FFA assistance, used a survey to measure outcomes from the SAW and participation at SC 11. The results indicated that 89% of the 18 FFA members who attended the SAW felt more prepared to participate at SC11 and 88% gained an increased understanding of SC material.

OFP also provides opportunities for PacSIDS nationals to obtain training and experience in the activities of OFP through attachments to the various sections.

Key future activities planned and directly funded under PIOFMP-2

3.2.2.1 National assessments of regional and sub-regional management issues, and country-specific assessments

- Development of relevant ‘Issue Specific National Reports’ on scientific analyses to inform PICTs on issues of national relevance;
- Bioeconomic analyses of longline fleet activity;
- Development of tuna and shark management plans;
- Assistance with development of Vessel Day Schemes; and
- Further analyses of commercial/artisanal interactions.

3.2.2.2 Provision of scientific advice on WCPFC issues

The following activities are anticipated, and will be influenced by emerging issues at WCPFC:



- Scientific support for national officials attending WCPFC meetings;
- Scientific analyses and advice provided on implementation of regional Conservation and Management Measures for tuna and key non-target species within national management plans;
- Updates to national country web pages to ensure they reflect the latest information, and provide information to fulfil key CMM obligations.

3.2.2.3 Training, especially in stock assessment and ecosystem analysis

- Annual scheduling of up to two Stock Assessment Workshops at SPC headquarters; and
- PacSID scientist attachments to SPC to work on matters of special concern, with work coordinated by SPC National Scientists.

7.3 Ecosystem monitoring and analysis

To understand the effect of environmental conditions (such as El Niño), climate change and the impact of fisheries on the different components of the ecosystem, it is necessary to acquire a better understanding of the functioning of the ecosystem. Knowledge of the trophic structure, interaction between trophic levels and feedbacks of the pelagic ecosystem (i.e. who is eating who in the food web and how influential is the biomass of a species or trophic group upon others in the web) provides the information necessary to comprehend ecosystem functioning.

A large sampling programme has been in place in the WCPO since 2001 to collect stomach and tissue samples of pelagic predators to determine the trophic structure of the ecosystem through analyses of their diets. The tuna tissue bank held at SPC contains 13448 fish stomachs for diet analysis. Diet information of the main predators has been compiled into a diet matrix describing the prey-predator interactions. This information is being used in an ecosystem model of the western and central Pacific using the Ecopath with Ecosim software²⁶ (see below). This allows the testing of different scenarios of environmental forcing (e.g. ENSO effects) and impacts of fishing on the food web.

A food web study of the WCPO tuna ecosystem was completed by the first GEF project and provides an initial characterization of the Western Pacific Warm Pool Large Marine Ecosystem. In particular, trophic relationships among major components have been determined by conducting biological sampling, and databases to support detailed ecosystem modelling. Two forms of ecosystem modelling have been developed by the OFP. They provide the capacity to test different fishing policies and environmental (climate) change scenarios to assist managers with identifying plausible management options that will achieve their objectives.

- 1) **A spatial ecosystem and population dynamics model (SEAPODYM)**, which was initially developed for investigating physical-biological interactions between tuna populations and the pelagic ecosystem of the Pacific Ocean. It can be used to explore the underlying mechanisms by which climate and environmental variability affect the pelagic ecosystem and tuna populations. The model also includes a description of multiple fisheries and then predicts spatial-temporal distribution of catch, catch rates, and length-frequencies of catch based either on observed or simulated fishing effort. SEAPODYM has now been applied to all four key tuna species, and captures important changes in their population dynamics (including recruitment), which explains much of the time/space variability in catch and CPUE. The ability to include multi-species interactions is considered an important enhancement to the current single species stock assessments using MULTIFAN-CL. This capability allows fisheries managers to test management options e.g., changing levels and concentrations of fishing effort or implementing seasonal or full closures.
- 2) **Ecopath with Ecosim**, which is a complementary, biodynamic trophic modelling approach, based on the requirement that the biomass of the ecosystem is balanced and consequently the effects of altered biomass production or harvest on the entire ecosystem assemblage can be explored.

Ecopath provides a framework for the construction of mass-balance models of ecosystems, estimates of how abundant the resources are (i.e. biomasses), the productivity or mortality rates of the resources,

²⁶ <http://www.ecopath.org/>.



how they interact (diet compositions and food consumption rates), and how efficiently the resources are utilized in the ecosystem.

Data on the different components of the ecosystem is required and information central to the process of balancing the model is the diet matrix, which informs the links between the species. The Ecopath model includes 44 functional groups up the food chain, including, detritus, plankton, cephalopods, pelagic fish, small top predators and adult top predators. Ecopath also allows visualizing the ecosystem and it is a very useful learning tool to better apprehend the ecosystem and its functioning.

Given the description of the ecosystem in Ecopath, Ecosim provides a tool with the capacity of testing different fishing policies and environmental change scenarios. By means of dynamic simulations it will assist managers with identifying plausible management options that will achieve their objectives.

Key future activities directly funded under PEOFMP-2

The following activities are planned:

1.2.1.1 Use of SEAPODYM-CC forecast models to examine sub-regional to national impacts for target species

- Update biochemical and biological input data for IPCC climate models and climate scenarios;
- Forecasts to be started at the regional level, which will lead to analyses at the sub-regional level in out years of the project;
- Integrating climate change into day-to-day fisheries advice; and
- Development of climate change related ecosystem indicators, which are designed to be considered concurrently with stock status advice.

1.1.2.2 Begin assessment of CC impacts on key bycatch species for food security

- Bycatch monitoring and analysis and related capacity building;
- Putting bycatch issues into a climate change context; and
- Input into national bycatch assessments with regional summaries.

1.2.1.3 Work on tuna-diet to monitor CC effects on mid-trophic levels

- Continuation of the programme of analysis of samples of stomach contents collected by onboard observers to provide a long-term time series of data on proportions and distribution of small fish and squid.

1.1.1.4 Analytical report on CC impacts on oceanic fisheries with recommendations

- Ocean acidification vulnerability assessment; and
- Development of ecosystem indicators.

7.4 Data Management

The National Tuna Fisheries Database Management System (TUFMAN) is a database tool in use in mid-2015 which was developed for PacSIDS to manage their tuna fishery data and provides for data entry, data management, data quality control, administration, and reporting. A copy of TUFMAN is installed in each PacSID and operated on a one-on-one basis i.e. enabling countries to interact with TUFMAN directly, with data including those from logsheets, unloadings and observer reports. These are entered either by each country or SPC and retained on their national server, with the database backed-up and sent to SPC on a regular basis. While providing PacSIDS with the independence of managing their data, the philosophy of TUFMAN creates a number of issues. For instance, logsheets submitted by a vessel covering trips in multiple EEZs may be submitted in more than one country, creating duplication, requiring correction by SPC and resulting in costs and inefficiencies.

TUFMAN-2, which has been progressively introduced, commencing in the second half of 2015, is a cloud/

web-based system where fisheries data can be entered and analysed directly from any location, subject to secure login requirements data rules agreed between countries and regional agencies. The TUFMAN-2 concept means that data (once entered) are available in near real time anywhere in the world by authorised users with a secure login. This facility is of great value to PICs, e.g. to inform positions at regional/ Commission meetings and during access negotiations. With data sharing agreements mostly formalised, duplication of data in databases will all but be eliminated. Data quality control and coverage will also improve as TUFMAN2 is fully implemented.

TUFMAN-2 will enable sharing of information/integration with FFA's Regional information Management System (RIMFS) and the PNA FIMS system. SPC access to authorised 'packets' of VMS data in near-real time through a web service developed by FFA has meant that positional data reported and recorded from logsheets can easily be verified at the time of entry.

Entry of observer reports and the timely availability of observer data remains a significant challenge. There is a desire by PacSIDS to enter their own data (rather than SPC), however the resources to do so at a national level are in most cases, not readily available.

E-reporting (ER) and e-monitoring (EM) are being developed in many fisheries globally to improve data quality and flow. WCPFC10 considered a commissioned report that looked at the potential ER and EM in the Western and Central Pacific fisheries (Dunn & Knuckey, 2013) and established a working group to progress the issue at the Commission level. The PNA is well advanced with the establishment of their own systems (FIMS and iFIMS). SPC (with FFA) continue to support national information management systems (IMS), which include TUFMAN-2 data, observer programme management and data (via TUBs), transshipment, compliance data, VDS and VMS. The PNA and FFA/SPC IMS systems, though independent, are planned to have mechanisms for data flow between each system, which will be of benefit to the PICs using these systems.

Data standards and data collection are going through a period of major change with the advent of electronic collection through e-reporting (manual input of alpha and numeric characters) and e-monitoring (closed system collecting multiple images). The Tuna Fishery Data Collection Committee comprising membership from SPC / FFA Members, the secretariats of WCPFC and SPREP, the TVM Coordinator, and the PNA Office, will play a major role in both by:

- maintaining the existing paper-based framework for data collection; and
- developing the data collection framework for emerging technologies, particularly electronic monitoring and electronic reporting.²⁷

Capacity building in the area of monitoring programmes and data and information requirements is on ongoing activity of OFP. Over the last five years, this has included:

- Eight national tuna data workshops with 42 attendees²⁸.
- Five regional tuna data workshops (132 participants: 57% female, 43% male).
- 21 attachments of national staff.
- Printed and video training resource materials
- Thirty-six in-country visits by SPC Tuna Fisheries Data Management staff

Implementing monitoring and data and information systems, including TUFMAN2 will require additional training in the areas of the new comprehensive data quality control system within TUFMAN-2, how to use the comprehensive web-reporting tools and the new E-Reporting systems.

²⁷ The first Strategy Meeting of the Tuna Fisheries Data Collection Committee (DCC) was held at SPC in April 2016.

²⁸ These numbers include formal workshops and informal training but directed specifically to the national staff. In more recent years, OFP tends to use the Regional tuna data workshops to introduce new tools and then use in-country visits to conduct training, which takes the form of a one-day set of presentations, followed by staff using the tools with a one-on-one assistance/ additional training as required.



Attachment 2 provides information on the status of data and information systems in PacSIDS.

Key future activities planned and directly funded under PIOFMP-2

3.2.1.1 Further development of TUFMAN (as TUFMAN-2) including enhanced use of VMS data for catch and effort estimation

- enhanced use of VMS data for catch and effort estimation;
- integration of data sources at regional and national levels;
- enhanced data quality control through cross-referencing a range of other types of data, including data from other systems;
- extension of TUFMAN-2 to E-Reporting systems;
- comprehensive web-reporting system producing summaries tables, graphs and maps from integrated data in national data warehouses for national and regional reporting requirements; and
- closer alignment and integration to proposed CMS/CDS systems planned for the future.

3.2.1.3 Support for national FIMS, including the integration of data used for science, monitoring and management, to develop/support national data warehouses

- continuation and enhancement of the current capacity building, especially future activities directly funded under PIOFMP-2;
- capacity building around how to resolve complex issues identified in the data by the TUFMAN-2 data quality control system; and
- capacity building in managing the latest integrated structure in the data using new tools, which will be relevant to the proposed CMS/CDS systems, for example.



8. Delivery of fisheries management services

The Forum Fisheries Agency (FFA) provides a range of offshore fisheries management and development services to its 17 member countries. The FFA consists of: i) the Forum Fisheries Committee (FFC) as the governing body, comprising a representative from each member Country and Territory and; ii) the FFA Secretariat based in Honiara, Solomon Islands.

Each sovereign FFA member is responsible for its own fisheries policies, laws and regulations as they relate to the sustainable management of oceanic fisheries. The capacity of FFA members in the development of fisheries management arrangements varies greatly and all rely, to a greater or lesser extent, on services provided by the FFA.

The key roles of the Agency include:

- Building capacity at the national and regional level to manage and develop fisheries;
- Developing harmonised minimum terms and conditions for access, licensing and fisheries management;
- Administering the US Treaty and other regional arrangements;
- Implementing a range of MCS tools including the regional vessel register, VMS and associated electronic surveillance tools;
- Ongoing sharing of data and information throughout the region to inform fisheries management and facilitate cooperative surveillance and enforcement;
- Achieving substantial increases in the benefits accrued from fisheries resources as measured by a range of economic indicators; and
- Leading the development and operation of the WCPFC.

FFA will be responsible for delivering the following outputs under PIOFMP-2:

Output 1.1.1 Proposals for ecosystem-based WCPFC CMMs to control fishing mortality for target stocks and to mitigate impacts on non-target species.

Output 1.1.2: Proposals for WCPFC and other regional legal arrangements and compliance mechanisms to implement CMMs effectively and deter IUU fishing, prepared and supported by PacSIDS.

Output 1.2.3 Updated TDA for oceanic fisheries and updated oceanic fisheries management aspects of the Pacific Islands IW SAP.

Output 2.1.1: Enhanced sub-regional arrangements in the equatorial tuna fisheries, especially rights-based cap and trade catch or vessel-day schemes (VDS) for purse seine and longline fisheries, and fishery certifications.

Output 2.1.2: Enhanced sub-regional arrangements in the Te Vaka Moana (TVM) tuna fisheries, especially harvest rights and related management arrangements.

Output 2.1.3: Enhancements to other sub-regional management arrangements.

Output 3.1.1: New or revised national management plans and policies in support of ecosystem-based management.

Output 3.1.2: Revised national laws, regulations, license conditions and strengthened MCS programmes to operationalise WCPFC CMMs, sub-regional cap and trade schemes and other relevant conservation and management instruments.

Output 3.1.3: Priority bycatch species integrated into management planning processes at the national level and aligned with relevant sub-regional or regional measures or global instruments.

Output 4.1.1 Broader stakeholder (PacSIDS, regional institutions, fishing industry and business sector,



environmental NGOs, local NGOs, civil society, among others) awareness and involvement:

Output 4.1.2: Increased awareness and coordination through project workshops and meetings contributing to wider support for national, sub-regional and regional project activities with increased participation by women.

Output 4.1.3 Effective project implementation through monitoring and evaluation with feedback mechanisms utilizing the regional and sub-regional arrangements and existing national mechanisms.

Output 4.2.1 Knowledge management and information systems that support communications and advocacy efforts by PacSIDS for the best management of their oceanic fisheries resources.

FFA technical services relevant to OFMP are delivered in three key areas: fisheries management, fisheries legislation and fisheries operations. FFA also operates a Development Division which is not discussed herein. At the end of each section below, key activities for the next four years relevant to PIOFMP-II are identified. Activities under each input are described and boxed in bold to assist with MTR and TR evaluation.

8.1 Fisheries management

The Fisheries Management Division of FFA develops policy and management models, assists members to develop and implement national arrangements and supports members to build national capacity and regional solidarity for the sustainable management of tuna in the Pacific. This includes technical and policy expertise and support to members to participate in fisheries management decision-making bodies, most notably the WCPFC, FFC, PNA and their associated advisory bodies. The Division also provides US Tuna Treaty and Tokelau Arrangement administrative services.

The Division also provides advice to PacSIDS:

- by participating, where appropriate, in broader international processes including the processes of the UN, FAO, CITES and other RFMOs, including the Inter American Tropical Tuna Commission (IATTC) and the South Pacific Regional Fisheries Management Organisation (SPRFMO) - the role in the latter relates to keeping a watching brief in cases where SPRFMO high seas decisions interact with PacSIDS EEZ fisheries management;
- through consolidated CROP briefings on ocean issues, where the Division normally provides the FFA Chair for the CROP Marine Sector Working Group, alternating annually with SPC; and
- on fisheries matters on request to UN missions and members' representatives participating in those processes, both in written briefings and in-person support where appropriate.

Key future activities planned and directly funded under PIOFMP-2

1.1.1.1 Prepare briefs on conservation and management of target stocks and non-target species for Pacific SIDS for WCPFC Scientific Committee, TCC and Commission sessions.

- Prepare briefs, coordinate agreed talking points and provide intra-meeting advice as key issues arise for TCC, SC and Commission meetings
- Provide briefs to FFA members attending WCPFC Northern Committee meetings

1.1.1.2 Hold annual Management Options Consultations and ad hoc workshops and consultations as required at which PacSIDS formulate proposals for WCPFC CMMs on conservation and management of target stocks and non-target species for WCPFC CMMs and consider the proposals of other Members

- Annual MOC meetings will be convened at FFA in Honiara at least 5 weeks preceding the annual WCPFC meeting.
- Papers, including draft proposals for new/revised CMMs will be prepared.



1.1.1.3 Support PacSIDS in preparatory working group sessions before meetings of the WCPFC and the Scientific Committee

- Formal (FFC) and ad-hoc working groups and meetings of FFC members will be convened before and during WCPFC sessions to ensure adequate preparation and the provision of real-time advice to members.
- Convene the FFA science working group.

1.1.1.4 Hold Train-Sea-Coast course

- The current generic Train-Sea-Coast course will be customised/updated to suit WCPO circumstances to ensure a targeted course focuses on WCPFC issues.

8.1.1 Regional assistance

FFA provides a wide range of advisory services in support of members' efforts to engage in WCPFC processes, including to propose and have agreed at WCPFC CMMs that complement national management regimes and 'close the gaps' existing in ABNJ and non-PacSIDS EEZs. These services include:

- Preparation of briefs for SC, TCC and WCPFC meetings, including talking points on priority issues for FFA members;
- Analyses, advice and policy papers on priority fisheries management issues at the regional level; and
- Development of options for CMMs to address both target and by-catch species management, data collection and quality, and other MCS issues, as discussed at TCC, SC and the WCPFC. A Management Options Consultation (MOC) (see above) is held annually prior to each WCPFC meeting to develop and agree on FFA member positions on key management issues and CMMs to be put forward at the Commission.

8.1.2 Sub-regional assistance

Support is provided to the PNA although this has been reduced as the PNA has become more self-sufficient in zone-based management of purse-seine fisheries within PNA EEZs under the VDS. Support will be more focused on assisting Parties in the national implementation of the PNA longline VDS, and managing any interactions with the Tokelau Arrangement Catch Management Scheme in countries that are Party to both the VDS and CMS.

For the southern states, support is provided to members of the Te Vaka Moana (TVM) and Tokelau Arrangement (TKA). The latter of which mostly concerns the establishment and implementation of a zone-based catch management scheme (CMS) for the south Pacific albacore tuna longline fishery. Support and advice is also provided to the MSG FTAC.

8.1.3 National assistance

FFA will continue to assist member countries to design and implement national tuna fisheries management plans (TMPs) and operational procedures to achieve their own tuna fishery management goals. Only PNG and Cook Islands have a statutory (regulatory) management plan; others are somewhat variable in nature, and contain elements of science, MCS policy, regulation (e.g. license requirements, TACs and allocation between fleets). One clear consequence of the rapidly evolving regional tuna management context is that TMPs, which typically have a three-five year lifespan are becoming rapidly outdated or inconsistent with national obligations by the time they are finalised.

An internal (incomplete) report on FMPs observed that:

*It should be noted that tuna management (and development) plans are no longer considered appropriate for all countries and FFA is moving towards consideration of the broader **management framework**, which will not usually be implemented through a formal unitary plan, but the whole set of*

policies, rules and regulations through which tuna fisheries are managed, including harvest strategies, national licencing policies, access agreements etc.

Owing to the nature of the tuna resource and the need for cross-jurisdictional management, there is a demand for services to assist members to adapt their national frameworks to a rapidly evolving and ever-expanding set of regional and international obligations, agreements and 'voluntary' instruments.

Given the different priorities among FFA members regarding purse seine, tropical longline and sub-tropical longline fisheries, there is an increasing role for sub-regional arrangements, reflecting the significance of the different species and fisheries to their economies (see 6.3.1-6.3.3 above). FFA is also supporting some members to move toward effort and catch quota based systems, and the regulatory frameworks and systems needed to support them.

Attachment 5 shows the status of PacSIDS with respect to fisheries management plans and policies.

Key future activities planned and directly funded under PIOFMP-2

The following activities are planned:

3.1.1.1 Establish and update country-driven, prioritised programmes of work at a national level to strengthen national institutions, plans, policies, programmes & projects.

- Update and monitor Country Service Level Agreements (CSLAs); and
- Delivery of FFC- approved work plans, reporting against key result areas and outputs.

3.1.1.2 Support in-country activities to strengthen national fisheries management institutions, plans, policies, programmes and projects through technical advice and national workshops and consultations.

- Hold an average of three national WCPFC obligations workshops per year; and
- Review an average of three national fisheries management frameworks per year, ensuring compatibility and compliance with WCPFC, PNA, TKA and other obligations.

3.1.1.3 Organise attachments and study visits of national management planning and policy personnel to FFA and other SIDS.

- 10 attachments/study visits during the life of the project.

Given the increasing role of sub-regional arrangements and the different priorities among FFA members regarding purse seine, tropical longline and sub-tropical longline fisheries, the FFA Secretariat provides an increasing level of support to sub-regional groupings as there is a shift toward effort and catch quota based systems, and the accompanying regulatory frameworks and systems needed to support them.

A subset of management services provided by FFA covers assistance to members with the implementation of arrangements to manage bycatch, including through the use of national plans of action (NPOAs) for sharks and guidelines for the handling of sea turtles.

Sharks

There is no obligations for PacSIDS to establish shark NPOAs although it is recommended under the International Plan of Action for sharks (IPOA) and WCPFC CMM 2010-07. FFA has tried to revise CMM 2010-07 relating to sharks every year since it was introduced to make it more effective but has had limited success.

Attachment 6 shows the status of PacSIDS with respect to Shark NPOAs. Currently, four PacSIDS have NPOAs in place, all of which have been developed in accordance with the guidelines under the IPOA – Sharks. In many cases a stock assessment report (SAR) was not undertaken first, to inform the NPOA.



Generally this is because there is either a lack of data to inform the SAR or some urgency to implement an NPOA in the face of political/NGO pressure to implement a shark sanctuary.

The shark CMMS (see Table 3) are considered to not be particularly effective, since non-retention does not offer any form of protection, CMM 2010-07 has a number of loopholes including the ability to land fins as a % of carcass weight which is considered unenforceable. CMM 2014-05 bans wire or shark lines but not both, so a fisher wanting to catch sharks will just use one or the other, so no real protection is provided (Pers comm, I. Freeman, September 2016).

Several members have declared their EEZs shark sanctuaries although how these are enforced remains unclear. Normally the application of the sanctuary does not extend to archipelagic or territorial waters so inshore shark fisheries and artisanal fishing can still exist.

Seabirds and sea turtles

There is little in the way of specific NPOAs in the region for seabirds or sea turtles other than those implemented by NZ and Australia. Most countries make mention of the need to reduce interactions with sea birds and sea turtles in the Tuna Management Plans and several note that NPOA's will be developed if interaction rates with these species increase. Most members promote the use of safe handling techniques for sea turtles by referencing the guide developed under WCPFC auspices. De-hookers and line cutters were made available to most fleets in 2009 - 10 following the introduction of CMM 2008-03 on Sea Turtles and the use of these is promoted. Whether these tools still remain on vessels today is debatable.

There is less emphasis on sea birds in the tropical WCPO as there appears to be less interactions in tropical waters and consequently the current CMM only applies to vessels fishing south of latitude 30°S. Again most Tuna Management Plans highlight the requirement that CMM 2012-07, referring to seabirds, should be implemented when vessels are fishing in waters south of latitude 30°S or when seabird interactions increase significantly to a point where they become an issue.

All tuna plans make reference to the use of ecosystem based management principles, including the need to consider bycatch species interactions when developing management arrangements for tuna species. All recently developed tuna plans or ones that have been recently reviewed, now include a clause that states where bycatch or by-product species become target species, they will be included in the management arrangements in an annex to the tuna plan.

Key future activities planned and directly funded under PIOFMP-2

3.1.3.1 Undertake a review of the implementation by PacSIDS of sub-regional & regional bycatch measures and global bycatch instruments.

- Do a desk top study of all the TMPs and NPOAs, summarise measures in place that address by-catch issues and identify gaps; and
- Provide support to address gaps, including through TMPs or by-catch actions plans where appropriate resources exist to implement them.

3.1.3.2 Provide advice and assistance to PacSIDS to prepare National Plans of Action and National Management Plans for bycatch, and revise laws, regulations and licence conditions related to by-catch.

- Ensure bycatch management issues are considered and interaction reduction measures included when developing or revising tuna management and development plans;
- Assist with the WCPFC Bycatch Working Group and specifically the design of safe release guidelines for whale sharks and cetaceans;
- Generally promote responsible consideration of bycatch as best management practice whenever the opportunity arises at national/regional and international meetings; and
- Liaise with legal services to ensure regulations and licence conditions remain updated.



8.2 Fisheries Legislation

At the national level, the pace of change of international law relating to oceanic fisheries has imposed a large workload on Pacific SIDS for the establishment and revision of national laws. FFA assistance to members has moved on from initial work covering legislation associated with fisheries management within extended jurisdictions (EEZs) arising from UNCLOS. All Pacific SIDS national laws have been revised, with substantial support from the preceding PIOFM, to apply the WCPFC Convention, particularly the principles in the Convention and establishment of powers to control flagged vessels outside national waters.

FFA members are now focused on giving effect to various regional Treaties and Agreements, including those based on MTCs and the Niue Treaty and its subsidiary agreement, as well as WCPFC obligations, and in particular CMMs.

FFA provided advice to members on the insertion of a general provision into an Act to allow an authority (such as the Minister) to incorporate CMMs more easily into the domestic legal framework e.g. gazettal or Notice in Gazette or through Regulations. This is supplemented by the provision a table which sets out the obligations from the Convention and each CMM, against which suggested legislative text to capture those obligations is provided to members so that they can use or tailor as they wish, incorporating specific CMM obligations either as a regulation or license condition.

FFA Legal Services also provides high level and technical legal advice on members' legislative reviews, maritime boundaries, and the implementation of the Niue Treaty Subsidiary Agreement and associated Annexes.

Workshops and legal training in range of activities aimed ensuring legal frameworks are in place to support effective fisheries management over the last five years to mid-2015 the training services shown in Table 7 were delivered by Legal Services:

Table 7. Training provided by FFA Legal Services

From	To	Training	Male	Female	Total
24/09/2001	5/10/2001	Legal Fellowship Attachment	1	0	1
8/02/2002	19/02/2002	Legal Fellowship Attachment	0	1	1
13/10/2003	17/10/2003	Legal Fellowship Attachment	0	0	1
14/11/2004	19/11/2004	Legal Fellowship Attachment	1	0	1
7/02/2005	21/02/2005	Legal Fellowship Attachment	1	0	1
1/03/2005	8/03/2005	Legal Fellowship Attachment	0	1	1
1/02/2007	19/02/2007	Legal Fellowship Attachment	1	0	1
30/04/2014	23/05/2014	Legal Fellowship Attachment	1	1	2
28/04/2015	22/05/2015	Legal Fellowship Attachment	1	2	3
30/09/2015	14/10/2015	Legal Fellowship Attachment	1	0	1
19/10/2015	30/10/2015	Legal Fellowship Attachment	1	2	3
23/11/2015	27/11/2015	Legal Fellowship Attachment	1	0	1
7/03/2016	18/03/2016	Legal Fellowship Attachment	1	1	2
25/04/2016	20/05/2016	PDLP Legal Attachment	2	3	5



From	To	Training	Male	Female	Total
29/06/2009	10/07/2009	Fellowship Attachment reviewing Tonga 2001 TMDP	1	0	1
16/11/2015	19/11/2015	Prosecutors and MCS Officer Training	16	5	21
2/06/2005	1/07/2005	Dockside Boarding and Prosecutions	19	1	20
2/08/2005	15/08/2005	Dockside Boarding and Prosecutions	24	3	27
12/10/2005	26/10/2005	Dockside Boarding and Prosecutions	16	0	16
12/11/2005	26/11/2005	Dockside Boarding and Prosecutions	17	2	19
3/04/2006	7/04/2006	Dockside Boarding and Prosecutions	49	0	49
3/07/2006	14/07/2006	Dockside Boarding and Prosecutions	46	5	51
4/12/2006	15/12/2006	Dockside Boarding and Prosecutions	23	2	25
7/05/2007	16/05/2007	Dockside Boarding and Prosecutions	34	1	35
22/10/2007	31/10/2007	Dockside Boarding and Prosecutions	22	3	26
6/12/2007	12/12/2007	Dockside Boarding and Prosecutions	15	5	20
25/04/2008	2/05/2008	Dockside Boarding and Prosecutions	25	0	25
14/07/2008	22/07/2008	Dockside Boarding and Prosecutions	20	5	25
3/11/2008	11/11/2008	Dockside Boarding and Prosecutions	25	3	28
20/07/2009	24/07/2009	Dockside Boarding and Prosecutions	10	5	15
21/10/2009	27/10/2009	Dockside Boarding and Prosecutions	20	4	24
17/05/2010	21/05/2010	Dockside Boarding and Prosecutions	22	1	23
21/09/2010	24/09/2010	Dockside Boarding and Prosecutions	17	1	18
25/10/2010	29/10/2010	Dockside Boarding and Prosecutions	30	4	34
23/05/2011	27/05/2011	Dockside Boarding and Prosecutions	24	1	25
13/07/2011	19/07/2011	Dockside Boarding and Prosecutions	25	0	25
24/02/2012	29/02/2012	Dockside Boarding and Prosecutions	32	0	32
18/06/2012	22/06/2012	Dockside Boarding and Prosecutions	19	4	23
13/08/2012	17/08/2012	Dockside Boarding and Prosecutions	12	2	14
5/07/2013	15/07/2013	Dockside Boarding and Prosecutions	13	2	15
22/04/2014	28/04/2014	Dockside Boarding and Prosecutions	16	11	27
15/09/2014	19/09/2014	Dockside Boarding and Prosecutions	7	5	12



From	To	Training	Male	Female	Total
6/08/2007	24/08/2007	Fisheries Evidence Training and Investigation Course	15	1	16
11/08/2008	29/08/2008	Fisheries Evidence Training and Investigation Course	14	1	15
4/02/2013	24/02/2013	Fisheries Evidence Training and Investigation Course	14	3	17
3/02/2014	21/02/2014	Fisheries Evidence Training and Investigation Course	20	2	22
13/02/2012	17/02/2012	International Fisheries Negotiations Course	22	8	30
14/01/2014	15/01/2014	Fisheries Act and Regulations Training	20	5	25
16/01/2014	20/01/2014	Offshore Fisheries Management Decree Training	14	12	26

Other work by the Legal Services Division relevant to the PIOFMP project includes:

- Review and implementation of the Regional Minimum Terms and Conditions for Fishing Access (MTCs).
- Drafting texts to support WCPFC and other negotiations, including the US Treaty. Renegotiation Sessions.
- Drafting text to support the application of Electronic reporting and monitoring into legal frameworks

Attachment 7 provides the baseline status of legislative arrangements in PacSIDs.

Key future activities planned and directly funded under PIOFMP-2

3.1.2.1 Establish and update a programme of national legal work

- FFA legal team annual work program developed and approved by FFC including a capacity to respond on an as requested basis.
- At least five national consultations take place annually

3.1.2.2 Support national legal reviews, consultations and workshops

- Legal reviews and workshops and legislative updating included in national consultations

3.1.2.3 Organise attachments and study visits of national legal personnel to FFA and other organisations, including WCPFC

- At least three study visits to FFA by national staff undertaken annually

3.1.2.4 Provide templates for implementation in national laws, regulations and licensing arrangements of WCPFC CMMs, and other regional and sub-regional arrangements.

- Templates developed and available for national application as required



8.3 Fisheries operations

Fisheries compliance, encompassing monitoring, control and surveillance, remains a critical issue for PacSIDS. Through FFA and PNA initiatives, including those supported by the previous PEOFMP, considerable progress has been made in developing national compliance programmes, particularly through the use of VMS, a regional register of fishing vessels, the regional observer programme (ROP) and coordinated compliance operations between FFA members, using combined assets and third party (e.g. Australian and New Zealand Royal Air Force Surveillance) assistance.

While these initiatives are acknowledged, most PacSIDS will require strengthened in-zone compliance capacity to adequately apply the more rigorous CMMs that have arisen from the Commission and to ensure that their own EEZs have sufficient safeguards against IUU fishing. As regulations on the high seas and in neighbouring EEZs are increasingly applied effectively, the pressure on individual states' EEZ compliance arrangements will increase.

In efforts to reduce IUU, the significance of port state control and effective dockside boarding and prosecution has been acknowledged.

To deal with this increasing load on national administrations, FFA provides a range of capacity building activities including:

- A regional MCS Foundation course;
- In-country targeted Dockside Boarding and Inspection course;
- Attachments of nationals, both during regional combined surveillance operations and to the Division to gain broad experience of MCS from a regional perspective; and
- Provision of, and updates to, observer training to accreditation standards.

In addition to human resource requirements, PacSIDS are also facing rising costs of management and, over time, the likelihood that donors will not continue to fund routine core fisheries management activities. To address this, a cost recovery mechanism for the regional observer programme has been developed (and adopted in December 2015). Papua New Guinea has adopted and fully implemented a national cost recovery programme for their observer programme. Five other countries are incorporating various forms of cost recovery into their national finance systems prior to implementation.

MCS plans are in various stages of development with the assistance of the Secretariat. As Members assess themselves against each of the performance indicators and MCS components on the Regional Information Management Facility (RIMF) - this forms their countries' national assessment. Through this process Members seek to make improvements to their national FFA MCS Compliance Matrix and meet Commission requirements. The original FFA MCS regional Matrix (**Attachment 8**) and the accompanying national matrices were one of the main tools used by FFA to establish the Regional MCS Strategy (RMCSS). Following endorsement of the RMCSS, members were required to update the Matrix online on an annual basis and for these updates to be verified by FFA. Nine of the 14 PacSIDS provided updates, three of which were incomplete; the status of the Matrix, as at May 2015 is shown in Attachment 9. All nine that did the assessment online completed it around March 2014. Since then, only FSM and Tonga have updated their matrix. It is understood that only the Cook Islands self-assessment has been verified. Review of the RMCSS and use of RIMFS to update information in the national and regional MCS matrices is a priority activity planned for 2016/17.

A review of the MCS Matrix was proposed at MCSWG18 in 2015. Members agreed that the review of the MCS Matrix would be included in the review of the regional MCS strategy. Following MCSWG19 in 2015, those reviews were delayed until after the regional MCS review (and subsequent briefings to Ministers) was complete. This was undertaken in the course of 2016.

The WCPFC has in place a Compliance Monitoring Scheme (CMS) under CMM 2014-07, which monitors progress with the implementation of all current CMMs, including those relating to MCS. The scheme

is based on an extensive spreadsheet (5,000 rows) against which individual CMMs report progress in an annual report. This is a significant burden on PacSIDs, which is recognized by a facility in the CMS to signal the need for assistance with implementation and reporting on some CMMs. This spreadsheet is confidential.

Niue Treaty

The Niue Treaty on Cooperation in Fisheries Surveillance and Law Enforcement in the South Pacific Region or Niue Treaty is a multilateral treaty of members of the Pacific Islands Forum Fisheries Agency to *enhance their ability to enforce effectively their fisheries laws, and deter breaches*. A number of bilateral agreements have been made to give effect to the Niue Treaty, but in 2012 a comprehensive Multilateral Subsidiary Agreement (NTSA) for strengthening implementation of the Niue Treaty was agreed and finalised for signature. The NTSA entered into force in October 2015. FFA has been instrumental in assisting parties towards implementation of the NTSA, which, when operational will make use of a comprehensive information system (the Niue Treaty Information System – NTIS), with access through secure national IMS portals. Assistance will include: i) ensuring that Parties' laws are consistent with key NTSA agreements, such that there is a strong legal base to support the NTSA and; ii) develop overarching Regional Standards and Operating Procedures (SOPS) and national SOPS. This work has been crucial to ensuring national officers have clear steps/procedures to follow in planning or conducting cooperative activities

CDS

Traceability requirements, through various forms of catch documentation schemes (CDS) are expanding globally, regionally and nationally, both to combat IUU and fulfil various certification and other related schemes, such as the Marine Stewardship Council (MSC). The key to the development of an effective CDS will be the creation of policy and technical interoperability and cooperation to ensure that only legitimate WCPO product enters the commodity chain. FFA members are well placed given the existing high degree of cooperation between them, strengthened and widened by the NTSA, which has detailed and broad information sharing provisions for validation and certification of catch.

WCPFC will be used as a forum to develop indicators to identify those parts of the commodity chain where vulnerabilities exist for the entry of IUU product. Attention will be placed on monitoring the distribution and imports of WCPFC catch and associated trade volumes.

Mass Balance Reconciliation (MBR) is a concept based on the WCPFC mechanism for CCMs to declare catch, which is then compared to (reconciled with) the amount of CCMs' product landed, entering the domestic market or exported and imported. While CCMs have an expectation to report the destination of their catch, there is however, no requirement for processing States to report input and output, or market States to report total amount of WCPFC product imported. Addressing this short fall would assist WCPFC to understand the scale and nature of the commodity chain, act as an indicator of CCMs' existing trade reporting requirements, and gauge WCPFCs' CDS implementation.

There will be a need to develop CDS Standards from an RFMO perspective. These standards can be broadly grouped into three categories:

- Traceability - Tracking of products through the supply chain, which ensures that seafood products have met the standards that they lay claim to;
- Accreditation - Recognition by an impartial authority, such as the WCPFC, that certain bodies are qualified to carry out the task of certification; and
- Certification - process of verifying that products, processes and services meet certain standards.

The FFA Secretariat has been tasked with working on regional WCPFC CDS standards based on the concept of MBR and tailored to PacSIDs' requirements. This is because there is some concern that FAO's development of CDS guidelines, based on a highly technical specification, may be used by some market states to impose an inappropriate burden on PacSIDs.



Attachment 10 provides an indication of the status of national MCS arrangements.

Key future activities planned and directly funded under PIOFMP-2

3.1.2.5 Hold annual FFA MCS Working Group meetings and ad hoc workshops and consultations on regional legal arrangements and compliance mechanisms

- The annual FFA MCSWG will be held at FFA Headquarters in Honiara each year and;
- Other planned regional meetings/workshops include the Fisheries Licensing Officers' Workshop (FLOW).

3.1.2.6 Support national workshops on dockside boarding and inspection, prosecutions and other legal, MCS and enforcement aspects

- Three dockside boarding and inspection workshop planned per annum; and
- One Fisheries Evidence Training and Investigation course (FETIC) planned per annum.

3.1.2.7 Organise attachments and study visits of national legal, MCS and enforcement personnel to FFA and other PacSIDS

- General MCS Attachments: Four general MCS attachments per annum, covering the different aspects of MCS operations and tools available at the regional level;
- VMS Attachments; Four attachments per annum to build specific VMS capacities at the National level; and
- Regional Fisheries Surveillance Centre (RFSC): Four training attachments per annum targeting the four major surveillance operations conducted on an annual basis.

8.4 Training

FFA has a long history of training in fisheries management (see Table 8 below), across five major areas: MCS/VMS, Legal, Data, Observers and WCPFC obligation training. These training courses have been user-driven, in response to CSLA priorities and member country requests.

Table 8: Numbers of individuals in FFA countries receiving FFA-initiated fisheries management training, by gender.

Course	M	F	Total
MCS/VMS	995	158	1155
Legal	176	59	236
Data	40	20	60
Observer	140	11	151
WPFC/Obligations	47	19	66
Totals	1398	267	1668

Using these figures as a baseline, and as guided by the Regional Fisheries Training Framework²⁹ (FFA 2014)

²⁹ This framework was developed based on specific requests from donors in order to structure capacity building for the region



9. Services provided by sub-regional entities

FFA will endeavour in the next five years to train at least 2,500 Pacific Islanders from member countries in fisheries management across the areas named above. An increase in female participation from 16% (baseline) to 30% is planned. Given the demographic of the personnel employed in the fishing industry, and in particular observers, it would be unrealistic to aim higher than 30%.

Of note is the fact that FFA intends to consolidate the various training courses it offers into programs of study that are accredited as a TAFE (or university) qualification or part thereof. The first programme to reach accreditation in this way is the MCS training course, which will now be offered through the University of the South Pacific (USP) as a Certificate IV in Fisheries Enforcement and Compliance. Similar accreditation is planned for other courses including dockside boarding and inspection, evidence collection and investigation, fisheries data analysis and fisheries management plan development. In addition, it may be possible to convert attachments at FFA into credits if they have more structure and competency assessments.

To expand capacity building capability, FFA is using appropriately skilled staff as trainers and assessors with 19 FFA staff qualified to date. Subject to funding, over the next five years it is planned to use consultants to:

- development competency standards in areas where training has traditionally been done but only in an ad hoc manner; and
- train 20 more FFA staff as trainers and assessors.

These accredited qualifications will create career pathways for fisheries personnel in member States. There is also the need to provide fisheries personnel (mid and senior level managers in particular) with leadership and management as well as mentoring skills so that managers can actively contribute to the professional development of their staff, instead of always relying on regional organisations, such as FFA.

Enabling FFA members to identify training needs from their own assessments and then to apply for various well established and accredited courses will lead to improved planning and more long-term stable funding. FFA believes that this has been the missing link in fisheries management training i.e. having an accredited qualification in an area of need rather than, for instance, an attendance certificate, raises the value, consistency and quality of training. Such an approach also increases the momentum for targeted capacity building and actually drives the quest for achieving the end goal – competent national fisheries agencies delivering sustainable fisheries management.

9.1 PNAO Office

9.1.1 Purse seine vessel day scheme (VDS)

The PNAO provides administrative services for the purse seine VDS. The VDS is a scheme of tradable fishing effort (days) allocated to the eight Parties, with a hard limit on number of fishing days (~45,000 days) that can be fished. Using a process of collaboration between parties, the PNAO administers the VDS, under an objective of maximising net economic returns to parties from a sustainable purse seine fishery. The aim of a hard limit is to control output, increase VDS prices through creation of scarcity and improve the viability of PNA industries. Under the VDS the burden of excess fishing capacity is transferred to fishing fleets, who compete amongst themselves for access to PNA waters through the purchase of VDS fishing days. The VDS applies to PS vessels (~280) in EEZs, not the archipelagic waters of PNA members (Papua New Guinea, Solomon Islands). The total allowable effort (TAE) is allocated among members as PAEs (Party Allowable Effort). The success of the scheme is illustrated by the following:

- In 2010 when PNAO started, the value of a fishing day was US\$1,100 and the office had a full time technical staff of 3 realising a value of around \$60 million for US\$1,100.
- In 2012 the value of a fishing day had increased to US\$5,000 (minimum benchmark), realising around US\$230 million in value.

and to guide expenditure on such activities with some success metrics.



- In 2014 the value of a fishing day was set at US\$6,000 (minimum benchmark) with some days sold at ≥US\$7,000, realising around US\$274 million in value.
- By mid-2015 the value of a fishing day was set at US\$8,000 (minimum benchmark), with some traded days being sold in excess of US\$10,000 a day and realising US\$365 million in value. Some days are now being tendered³⁰.

Additional purse seine measures include the regulation of FAD fishing through a system of temporal bans during the 3rd quarter, a requirement for 100% observer coverage aboard purse-seiners, a minimum mesh-size, and a requirement for retention of all catch of tuna on board (no discards).

Since the establishment of the VDS:

- the revenue from tuna fisheries for its eight member nations has more than quadrupled in the period 2010-2014³¹;
- purse seine effort in logsheet days has been largely constant (49,600-55,997 days) with the 2014 effort of 49,704 days on a par with that in 2010 (49,808);
- purse seine catch increased from 1.22 mt in 2010 to 1.61 mt in 2014; and
- purse seine vessel numbers operating in PNA waters have been largely constant, ranging from 266-285.

The VDS was reviewed in March 2015³² and found to be ‘highly successful’ with few problems identified. A number of recommendations concerning areas where the VDS could be improved and strengthened were made, which the PNA are now considering carefully. The bulk of these recommendations aim at medium term, rather than immediate action and will require substantial preparation.

9.1.2 Longline VDS

The PNAO also provides administrative services for the tuna longline VDS, which has been trialled since 2009 and given effect by a management scheme, which entered into force in 5 December 2014³³. The longline VDS is analogous with the purse seine VDS in that its key objectives are to enhance the management of the longline fishery to optimise utilisation and management, maximise returns, support domestic industry development and increase control of the fishery. This is to be achieved by limiting longline effort (and hence catch) in the waters of PNA parties under a management scheme involving TAEs and PAEs, as with the purse seine VDS. Transfer of effort (days) between parties is allowed for under the scheme.

The longline VDS scheme is being introduced in an evolutionary manner. As at May 1 2015 there were five PNA members who had signed the agreement and obligated to bring their longline fishery within the limits of their PAEs, and also to ensure that the vessels they licenced complied with the requirements of the Longline VDS, in addition to any conditions which they also attached to those vessels. These parties (and others who subsequently sign the Agreement) that have vessels fishing under the longline VDS will have to make preparations prior to implementation. These preparations include: incorporating license information into the VDS register and PNA FIMS, development of national policies, regulations and license conditions and, though economic studies, arrive at appropriate benchmarks for fees.

30 Jack-Jossien, P. Presentation on the PNA Vessel Day Scheme to the Tenure and Fishing Rights Conference 2015 Siem Reap, Cambodia 23-27 March 2015.

31 PNAO 2015. Purse seine fishing activity in PNA waters. WCPFC2-2015 DP22

32 Hagrannoknir sf Review of the Purse Seine Vessel Day Scheme. PNAO, 157pp.

33 The Palau Arrangement for the Management of the Western Pacific Tuna Fishery – Management Scheme (Longline Vessel Day Scheme)



Key future activities planned and directly funded under PIOFMP-2

1.1.1.1 Prepare workplan in response to purse seine VDS External Review

- Work plan prepared and adopted by PNA members
- Provide support /consultancies in support of work plan implementation

2.1.1.2 Prepare and implement proposals to strengthen purse seine VDS, implement target reference points and harvest control rules for skipjack and other policy studies

- PNA adoption of Target Reference Point agreed and proposed to WCPFC
- Harvest Control Rule drafted and proposed to WCPFC

2.1.1.3 Finalise arrangements for implementation of longline VDS

- Visits to PNA countries and training of VDS officers, or bringing them all to the PNA Office in Majuro or another venue and running a course for all officers
- MOUs on catch documentation to ensure catch data is made available to Flag States
- (to meet EU requirements)

2.1.1.4 Provide advice on implementation of longline VDS

- Development of high level implementing arrangements will need to be developed for the longline VDS;
- Assistance with the development of national policies aligning the longline fishery to the longline VDS; and
- Economic studies, including the operational costings of the longline fishery and possible benchmarks for fees.

2.1.1.5 Hold technical and scientific meetings and workshops to build PNA PacSIDS capacities related to VDS implementation and strengthening

- Enhance awareness about the longline VDS through workshops, meetings and seminars internally with Licensing Officers, VDS Officers and other Fisheries Officers and externally with vessel operators.

2.1.1.6 Organise attachments and study visits of national personnel involved with VDS to FFA, PNAO and other VDS participant countries

- Study visits organised in response to demand

FAD tracking

Satellite buoy technology, including FADs, is developing rapidly, with options to assess biomass, species and fish sizes under each FAD, in addition to tracking to reduce search time. After several years' development, PNA has introduced mandatory FAD tracking in PNA waters. Coupled with e-reporting now in place, the PNA will have the ability to monitor FADs, associated catches and other interactions on or near real time. In addition to being used by fisheries managers and scientists to inform improved fisheries management, this data will be used by oceanographers and others to provide additional insight into the impacts of climate change on sea surface temperature and fish stocks.



Fisheries Information Management system (FIMS)

PNG/NFA and the PNA Office have used the services of a third party service provider (QAC) to develop comprehensive IMS systems called iFIMS/FIMS systems, which are purpose built to cover the wide ranging requirements to manage purse seine tuna fisheries at both the national and sub-regional level.

At this stage, these systems have primarily focused on a comprehensive catch documentation system (eCDS) and fisheries management (e.g. supporting the VDS). PNA member countries have access and regularly use the PNA FIMS, mainly related to the VDS component. As at mid-2015, PNG/NFA have fully implemented to the iFIMS system at the national level and the Solomon Islands have committed to this system in 2015, with several other PNA member countries expressing interest in adopting this system. The most recent development with the iFIMS system is the release of the observer tablet component of the iFIMS eCDS, which enables observer data (related to CDS) to be collected using tablets on board purse seine vessels, which are then transmitted to the iFIMS as one key source to verify catch information as a part of the eCDS (Williams, 2015).

PNA Pacific and MSC Accreditation

PNA's Pacific tuna label in conjunction with the Marine Stewardship Council certification of free school caught skipjack is driving the expansion and further development of European and other markets for certified product. The Pacific vertically integrated model is based on the capture of 'retail' rent at the consumer end, which aims to provide opportunities for establishing the PNA in the global market and providing impetus for PNA participation and economic development. In this way, the PNA seek to gain further benefits from tuna over and above selling access in the form of licenses via the VDS. Pacific CV is a 50/50 joint venture between PNA and Sustainable BV, a leading Dutch sustainable tuna trading company.

As at mid-2015, sales of MSC branded Pacific tuna were relatively slow, but with a number of large labels signalling an intention to join the scheme, sales are expected to climb. For example, John West Australia joined the scheme in December 2014.

In 2014, 86 fully MSC certified purse seine trips were completed and in 2015 it is anticipated that as many as 300 trips will be completed. Vessels from all significant fishing nations, other than Japan and all but one PNA processor are participating in the scheme.



Key future activities directly funded und PIOFMP-2

2.1.1.7 Undertake reviews to support Marine Stewardship Council certification, including auditing of the certification

- Reviews and audits undertaken in accordance with MSC standards
- MSC certification sustained on an annual basis

2.1.1.8 Provide training on MCS certification chain of custody requirements

- Training undertaken to meet MSC CoC needs
- MSC CoC training incorporated into PIRFO standard training

9.2 TVM

The TVM Strategic Plan 2013-2018 lists five key activities, driven through the activities of the TVM office (comprising one coordinator position, with FFA handling finances), under funding from New Zealand and assistance from FFA, SPC and external donors, including GEF. The activities are:

- Provision of high-quality regionally integrated advice provided to national governments on opportunities for leveraging increased sustainable economic returns. Proposed actions include: information sharing and exchange, development and agreement of rights-based management measures and ways to increase benefits such as cooperative licensing, trading rights and marketing;
- Developing cost-effective fishery services, enhanced through cooperation. Proposed actions include the creation of common systems processes and management arrangements and undertaking cost benefit and other analysis to assess the efficiency of alternative management systems;
- Strengthening national institutions with reduced reliance on external advice through increased capacity and capability and the use of all available resources. Actions include identifying and implementing opportunities for placements, internships and monitoring as well as targeted participation in specific training courses and scholarships;
- Strengthening fisheries rights through strong MCS arrangements; and
- Contributing to regional processes including FFA, SPC, and WCPFC with participants being better able to identify and convey national priorities.

The TVM group has struggled with differing priorities and interests between members, the resignation of the Manager and Coordinator and the appointment of a replacement Coordinator with reduced funding. These events have somewhat curtailed TVM activities. In 2014, MFAT funding for the TVM Development Program (TVMDP) was transferred to FFA as part of a new governance arrangement for TVM. Activities commencing in 2014 included: the recruitment of a dedicated TVM IMS analyst based at FFA to progress the establishment of a national level IMS, the completion of a MCS Strategy for Samoa with technical assistance supported by the TVMDP and the support to the Cook Islands Fisheries Field Office in Pago, including the funding support and recruitment of an observer de-briefer, both of which have the potential to be beneficial to all TVM participants in terms of services by the CIFFO and training for observers; institutional strengthening reviews, and IMS and MCS support.

A review of priorities and planning documents has been planned to clarify:

- i) how TVM participants want to cooperate and share resources and information to achieve individual national objectives; media training; and**
- ii) if they wish to proactively influence wider fisheries processes through discussing and reaching**



positions through coordinated regional engagement.

Key future activities planned and directly funded under PIOFMP-2

2.1.2.1 Establish TVM national harvest rights for albacore

- Conduct a workshop to raise awareness of, and exchange information on harvest rights systems in New Zealand, Australia and regionally.

2.1.2.2 Establish TVM national harvest rights for the purse seine fishery

- No planned activities at May 1 2015.

2.1.2.3 Establish other TVM national harvest rights

- Development of a QMS/alternative management scheme in a TVM participant country.

2.1.2.4 Establish systems, processes and operational activities to support TVM rights based management

- Development of a trial CDS system in a TVM country with fish exports.

9.3 Other Regional entities

In the OFMP II ProDoc, under 'enhancements to other sub regional management arrangements, specific mention is made of the MSG. The FTAC of the MSG has been largely inactive and there is a great deal of uncertainty concerning the role that the MSG will take in supporting tuna fisheries management.

With the signing of the Tokelau Agreement there is increased interest in the work of the TKA group and the implementation of effective management arrangements for southern albacore. It appears likely that support to this group will be key area of activity for PIOFMP-2.

Key future activities planned and directly funded und PIOFMP-2

2.1.3.1 Support for additional emerging sub-regional management arrangements

- Review funding for MSG and TVM and determine if funds are likely to be more effective if applied to assist the TKA in developing the sub-regional longline arrangement.



10. Stakeholder participation and knowledge management

10.1 Information dissemination and awareness raising

The value, extent and level of complexity of oceanic fisheries management, including stock status, ecosystem, economic and legal and compliance considerations, has resulted in many thousands of pages of technical papers, many of which are unintelligible to civil society, the fishing industry and the boarder community. While the WCPF Commission has a comprehensive website, the publications listed are highly technical and are written for an informed audience of fisheries specialists.

Domestic fishing industries within PacSIDS are not usually well briefed concerning progress with conservation and management issues at WCPFC, regional and sub-regional levels, and have limited engagement at FFA, WCPFC and other regional fisheries meetings. PITIA has played a major role in this regard, but with limited resources and support. National development agencies, including chambers of commerce, are frequently unaware of some of the issues facing domestic fishing industries. One of these issues is and understanding of the trade-offs between providing the incentives to encourage the expansion of domestic fishing ventures and increasing the revenue from the licensing of foreign vessels.

10.2 Stakeholder engagement

Effectively disseminating information on oceanic fisheries to the lay community and gaining effective stakeholder engagement is frequently not a priority for Pacific SIDS's governments or fisheries departments. In contrast, most DWFNs have significant industry input and attendance at RFMO meetings, and in many cases they drive government policy and negotiating stances. This situation is changing, with some Pacific Island delegations to the WCPFC, TCC and SC meetings including industry representatives. Given the stated development objectives of the region with respect to domestic industry development, it is considered essential that industry is party and has input into the management measures that will, in many cases, have a significant bearing on operations and profitability.

Some counties have industry associations for local based fleets, but most are not well resourced and meet only sporadically. PITIA, as the first regional industry NGO (INGO) offers an opportunity for engagement at a regional level.

Large, global reach environmental NGOs (ENGOS) such as WWF and Greenpeace have extensive and active fisheries programmes, but are largely unconnected with the formal fisheries management process, both at national and regional/Commission levels. These ENGOS, other NGOs and CSOs often have valuable in-country programmes which offer a ready conduit for information dissemination and engagement by civil society.

10.3 Knowledge management (KM) and information systems

Component four of the Project addresses Stakeholder Participation and Knowledge Management. It builds on the KM component of the previous OFMP project. Component four addresses the following key outcomes and outputs:

Expected Outcome 4.1 is: Greater multi-stakeholder participation in the work of the national and regional institutions with respect to oceanic fisheries management, including greater fisheries industry engagement and participation in Project, FFA, WCPFC and sub-regional activities.

Output 4.1.1

Broader stakeholder (Pacific SIDS, regional institutions, fishing industry and business sector, environmental NGOs, local NGOs, civil society, among others) awareness and involvement
Broader stakeholder (Pacific SIDS, regional institutions, fishing industry and business sector, environmental NGOs, local NGOs, civil society, among others) awareness and involvement

Output 4.1.2: Increased awareness and coordination through project workshops and meetings



contributing to wider support for national, sub-regional and regional project activities with increased participation by women

Output 4.1.3 Effective project implementation through monitoring and evaluation with feedback mechanisms utilizing the regional and sub-regional arrangements and existing national mechanisms:

Expected Outcome 4.2 is: Increased awareness of oceanic fisheries resource and ecosystems management and impacts of climate change

Output 4.2.1 Knowledge management and information systems that support communications and advocacy efforts by Pacific SIDS for the best management of their oceanic fisheries resources, including creation of a project website, publications, participation in relevant UNDP, FAO and GEF events and information exchanges particularly in IW:LEARN.

This section of the report addresses expected outcome 4.2

This work is guided principally by the development and early adoption of a Project Knowledge Management and Information System Strategy, based on the Strategy adopted for PIOFMP-I. The Strategy is principally targeted at addressing the lack of understanding by Pacific Islanders about their own oceanic fisheries resources and their importance to international waters management and global biodiversity, while also improving awareness and understanding of the Project and sharing Project outcomes globally. The dissemination of information and best practices will occur through activities that include design and preparation and use of logos and other Project identifiers, Project Website, Project Document Cataloguing System, webpage operations, links with IWLearn, Project information materials, including CDs, papers, videos, pamphlets, newsletters, interviews, press releases, and Project and SIDS representation at biennial IW conferences and the communication of best practices and experience notes at IW Learn events and other regional and international meetings on oceans.

The CTA presented a paper on the OFMP and the Pacific Tropical Warm Pool LME at the 2015 LME meeting at UNESCO in Paris and a further paper on OFMP integration was presented at the 2016 IW Learn Conference in Colombo, Sri Lanka in May 2016.

A contract was signed in October 2016 with an external provider to manage the update and operation of the OFMP II website and the integration of the wider OFMP KM strategy into key activity areas.



Key future activities planned and directly funded under PIOFMP-2

4.2.1.1 Develop a knowledge management and information system strategy

- A draft knowledge management strategy was developed as a part of OFMP 1 but it was not formally adopted. The project will revise and update the earlier KM strategy and propose it to the PSC for adoption.

4.2.1.2 Design logos and other Project identifiers, Project Webpage, Project Document Cataloguing System and progress reports

- The project has adopted the project logo from the previous project in order to ensure that the project is more readily identified by stakeholders. A contract has been proposed for website updating and management which was adopted in October, 2016.

4.2.1.3 Webpage Operations & links with IW Learn

- The updating of the project website is included in a consultancy contract and the scope of this contract includes supporting the link to IW learn

4.2.1.4 Project information materials, including CDs, papers, videos, pamphlets, newsletters, interviews, press releases

- Project promotional materials under development. Project supported activities reported in a range of media releases.

4.2.1.5 Project and Country representation at biennial IW conferences or IW Learn event

- Project CTA has attended and presented papers at LME 17 in Paris in 2015 and IW 8 in Sri Lanka in May 2016. OFMP 2 will ensure appropriate representation at all future meetings.

10.4 Project workshops and meetings

The key meetings supported by the project are the annual MCS working Group held each March (funded under the OFMP UNDP component) and the Management Options Committee (MOC) held each October (and funded under the OFMP FAO component).

Both these meetings are key to FFA and WCPFC processes with the MCSWG feeding in to FFC and TCC and the MOC combining members perspectives from SC and TCC in to position statements and proposals for the annual WCPFC meeting.

There is also provision within the project framework to support additional meetings which may include Licensing Officers, NTSA or TKA meetings. Under component 2 the project will support PNOA VDS implementation workshops.



Key future activities planned and directly funded under PIOFMP-2

4.1.2.1 Hold Inception Workshop

- The project inception workshop was held and reported in Nadi, Fiji in May 2015.

4.1.2.2 Hold RSC Meetings

- RSC meetings to be held annually. The first meeting was taken as the inception workshop and the second meeting was held in Vila, Vanuatu in May 2016. PSC meetings will be scheduled prior to the May FFC meeting for the duration of the project.

4.1.2.3 Secure National Focal Point nominations

- The project national focal points are agreed as the Heads of Fisheries for each Member or their nominees.

4.1.2.4 Support National Consultative Committee meetings

- Members are already constrained by a heavy meeting schedule. OFMP 2 business is preferably discussed on an informal basis

10.5 Project implementation

Key future activities planned and directly funded under PIOFMP-2

4.1.3.1 Baseline Study

- Baseline study prepared in 2016

4.1.3.2 Mid Term Evaluation

- Mid term evaluation scheduled for 2017

4.1.3.3 Terminal Evaluation

- To be completed at the end of the project.

4.1.3.4 Annual Reviews

- Annual reviews yet to be scheduled

10.6 Gender issues

Gender equity is a common mainstream theme across global and regional organisations. FFA and SPC have a committed gender policies. Under OFMP, there is no specific gender activity. However, the project has supported a publication which features women of influence in fisheries management.

FFA has been trying for some time to get specific gender employment data from members but has yet to access useful comprehensive information. So, there is a wider FFA target to produce more detailed gender related employment data but this is not specific to OFMP. Accordingly no data exists to develop meaningful and comprehensive gender baselines or targets. However, throughout the baseline study wherever gender data or targets were available (e.g. for training programmes) reference is made to these.

The background of the entire page is a complex, abstract pattern of overlapping geometric shapes in various shades of red and white. The shapes are irregular and organic, creating a textured, almost crystalline appearance. The pattern is consistent across the top and bottom sections of the page, with a white horizontal band in the middle where the text is located.

Part 2

A review of the GEF IW indicators framework
and other PIOFMP-2 indicators



1. Introduction

Effective monitoring and evaluation (ME) is an essential part of project management and is a requirement of most, if not all agencies that implement development projects in the Pacific. While at one level ME is conceptually simple, the range of approaches adopted across different agencies, and within agencies for differing project categories, is wide-ranging and complex.

The terminal review of the previous GEF project noted that:

‘The complexity of the project, and of UNDP and GEF reporting ‘...led to confusion, to the point where it has been easy to lose sight of the logic and coherence of the links between project activities and project development and environmental objectives. This has acted as a distinct disincentive to early examination of the practicality of the M&E system, with the result that the M&E system has been only partially utilised.’

Again there appears to be a dual system of reporting for PIOFMP-2:

- i) to GEF using the GEF International Waters Tracking Tool (IWTT) ; and
- ii) to UNDP and FAO using the GEF indicators, and the more standard logframe, both of which are contained in the PIOFMP-2 Project Document (ProDoc).

Since reporting for the OFMP deals for the most part with both UNDP/GEF requirements, the work undertaken by the consultant, by agreement, focused on the indicators contained in the log frame in the PIOFMP-2 Project Document (ProDoc) i.e. ii) above.

The aim of this section of the report is to:

- Briefly summarise the applicable GEF international Waters Operational Strategy and describe the GEF International Waters process, stress-reduction and environmental status indicators framework at a project level;
- Review the indicators described in the Project Results Framework for the four Project components, and suggest any appropriate revisions; and
- Within the limits of the information available, assess and briefly describe the status of each of the indicators, where appropriate, as at mid-2015.





2. GEF International Waters Operational Strategy and indicators

The GEF International Waters Strategy is partially based on the fact that the most significant water sources which produce food for global trade and domestic use and nourish the ecosystems that support life are transboundary in nature. A number of challenges persist across the oceans, with a substantial proportion of fish stocks being overfished, fished at their maximum, or in a depleted state³⁴. The GEF supports projects in helping countries work together to overcome these challenges in large water systems, including initiatives to collectively manage transboundary coastal and marine systems. These projects seek to enable countries to secure the future health of the ecosystems and the resources they support, in order to share the sustainable benefits arising from them. The GEF programme has supported a number of global marine fisheries projects under the IW strategy, including PIOFMP2.

The GEF5 strategy for IW builds on previous IW strategies and proposes to scale-up national and local action. The Strategy aims to help catalyze the implementation of multi-State agreed Strategic Action Programmes with, in the case of the OIFMP-2 project, a shared vision for the WCPO transboundary Large Marine Ecosystem (LME). GEF 5 projects will incorporate capacity building and knowledge generation to address climatic variability and change. Concerns related to climatic variability, sea-ocean warming, and ecosystem resilience are to be addressed through governance reforms at the LME level and through integrated management at local levels.

The goal of the international waters focal area in GEF-IW5³⁵ is:

The promotion of collective management for transboundary water systems and subsequent implementation of the full range of policy, legal, and institutional reforms and investments contributing to sustainable use and maintenance of ecosystem services.

The proposed GEF 5 IW objectives in relation to the PIOFMP-2 are:

- 1. Catalyse multi-state cooperation to balance conflicting water uses in transboundary surface and groundwater basins, while considering climatic variability and change.** GEF assistance will include support for the development and enforcement of national policy, legislative and institutional reforms, as well as demonstrating innovative measures/ approaches to fisheries management. This assistance will enable States to negotiate arrangements for the support of fisheries for protein in the face of multiple stresses, including climatic variability and change.
- 2. Catalyze multi-state cooperation to rebuild marine fisheries and reduce pollution of coasts and Large Marine Ecosystems while considering climatic variability and change.** This objective will be supported through policy, legal, institutional reforms and a multi-agency strategic partnerships that will contribute to the World Summit for Sustainable Development (WSSD) targets for recovering and sustaining fish stocks, including regional and national reforms in legal frameworks and governance, access rights, and enforcement in LMEs.
- 3. Support foundational capacity building, portfolio learning, and targeted research needs for ecosystem-based, joint management of transboundary water systems.** National inter-ministry committees will contribute to development of Strategic Action Programmes, which would include commitments to establish or strengthen institutions for multi-state, collective management and subsequent action. For marine ecosystems, GEF will utilize similar foundational capacity building as States adopt ecosystem-based approaches at the LME scale.
- 4. Promote effective management of Marine Areas Beyond National Jurisdiction (ABNJ).** Projects that develop and test technology and management arrangements for pelagic environments or help reduce by-catch including seabirds, marine mammals and sea turtles would be supported. GEF will work with NGOs and other stakeholders with capacity to contribute to the testing of measures and management options.

34 FAO (2014) The State of World Fisheries and Aquaculture 2014. Rome.223pp

35 GEF (2011). GEF 5 Focal Area Strategies. Washington. 110pp.



2.1 GEF ProDoc indicators

The PIOFMP-2 project has focused on Objective 2 above and the four GEF outcomes below, taken from the GEF Focal Area Strategies project:

Outcome 2.1: Implementation of agreed Strategic Action Programmes (SAPs) incorporates ecosystem-based approaches to management of LMEs, ICM principles, and policy/legal/ institutional reforms into national/local plans;

Outcome 2.2: Institutions for joint ecosystem-based and adaptive management for LMEs and local ICM frameworks demonstrate sustainability;

Outcome 2.3: Innovative solutions implemented for reduced pollution, rebuilding or protecting fish stocks with rights-based management, ICM, habitat (blue forest) restoration/conservation, and port management and produce measureable results; and

Outcome 2.4: Climatic variability and changes along coastlines and in LMEs incorporated into an updated SAP to reflect adaptive management and ICM principles

Baselines and comments on the GEF indicators in the ProDoc are provided at **Attachment 11**

2.2 GEF IW Tracking Tool Indicators and baselines

The GEF Tracking Tool uses four types of indicators. These are:

Process indicators, which are related to the establishment of regional or national frameworks/conditions for improving transboundary environmental/water resources quality.

Stress Reduction indicators, which infer a level of reduction, (e.g. less fishing effort to halt overfishing and reduce stocks).

Water, Environmental and Socioeconomic Status indicators, where indicators tend to be of the annual 'snapshot' type (e.g. stock assessments/status of stocks, level of bycatch, fishing mortality, fees for access, quantity of MSC certified product).

These three forms of indicators were developed by GEF in response to the requirement for an ME framework that acknowledges step-by-step progress towards the adoption of joint management regimes, country based reforms and priority investments that are necessary to support, in the OFMP case, the conservation and management of marine resources in the WCPO. A forth set of indicators relate to IW: LEARN Indicators and participation on IW events and the status of the OIFMP-2 website

As discussed above, the baseline study will not be addressing the full suite of indicators that will be used during the mid-term review (MTR) and terminal evaluation (TE) processes. These appear to be provided in the GEF IWTT and are far less complex than those developed for (and largely not used) PIOFMP-1. While the logframe indicators and baselines from the ProDOC can be used to populate the GEF IWTT, there is a stated need to establish baselines for others. Table 9 below makes specific reference to these baselines.

As with the previous project, the specified GEF indicators appear to be more like outcomes (FAD closure in place, no discards, purse seine efforts in place). A number of the indicators can be covered off using the existing UNDP indicators, as stated in the GEF IWTT.



Table 9: GEW IWTT indicators from PIOFMP Prodoc

Stress Reduction Indicator	Baseline status/comments
<p>Percentage of vessels applying seasonal FAD closure</p>	<p>The current Stress Reduction Measure specified in the GEF IWTT – No 7 Improved use of fish gear/technique is Improved use of fishing gear/techniques - % vessels applying improved gear techniques. A Commission report, prepared in conjunction with SPC, provides a report on the estimated FAD sets undertaken in the WCPFC-CA (20°N-20°S, by flag (WCPFC, 2015). Table 10 below provides a baseline for this indicator.</p> <p>Two additional stress reduction measures are suggested:</p> <ol style="list-style-type: none"> 1. An additional stress reduction indicator: Reduced fishing pressure (no.6 in the GEF-IW TT template) would be useful, expressed as a ton/year reduction in bigeye catch, which is the primary purpose of the seasonal FAD closures. As a baseline, the provisional 2014 WCP-CA bigeye catch was 73,898 mt for longline, and 67,367 mt for purse seine. This longline catch is among the lowest for 20 years, while the purse seine catch is amongst the highest for this fishery. 2. Measures of fishing mortality and level of spawning stock biomass for bigeye. The baselines for the status of bigeye fishing mortality and spawning biomass are provided at Section 2.2 of this study. It is suggested that 'Other' measurement category in the GEF-IW TT template be used to include this additional indicator
<p>Level of discards of tuna by purse seiners in PacSIDS' EEZs</p>	<p>Table 11 below provides historical and baseline data on the level of discards from purse seiners in the tropical waters of the WCPFC statistical area, excluding the domestic fisheries of Philippines and Indonesia. For 2014, (the most recent data available), baseline data are: skipjack 44,004 mt, Yellowfin 8,888 mt and bigeye 1,100 mt.³ Most, if not all observer data used for these estimates are from the EEZs of PacSIDS given the closure of the high seas pockets in recent years.</p> <p>Despite the ban on discards of target species of tuna other than in specific circumstances specified agreed under the 3IA in 2010. The level of discards appears to be rising, with around 20-25% of discarding reported as being due to fish size in three years 2012-2015. The other major source of discarding was recorded as gear damage (73-78% of discards). Gear damage, would include (maybe primarily) net damage where some fish might then escape, so some instances of no mortality. Observers are advised to record the catch volume in the pursed net, but if there is a rip then this would constitute gear damage. In any event, this indicator should be used with caution and/or further clarification sought from observer data.</p>
<p>Purse seine effort limits in Pac-SIDS' EEZs</p>	<p>The baseline requested in the GEF IWTT seems somewhat unrelated to the indicator (i.e. % of vessels in high seas complying with VMS requirements).</p> <p>It is suggested that useful indicators would be the overall level of fishing days under the purse seine VDS (i.e. the TAE or total allowable effort), given the stated objective of the PNA to create scarcity and value and manage towards a TRP of 50% of the spawning stock biomass</p> <p>Baseline data for the TAE for 2015 2015 was 45,610 days, of which 38,807 were used</p>



Table 10. Estimated FAD sets undertaken in the WCPFC-CA (20^{0N}-200S) (WCPFC, 2015)

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	CMM 2013-01 FAD Set limits
18,735	13,806	15,802	14,062	15,423	18,208	10,768	18,503	17,735	15,200	16,143	16,182

Table 11: Estimated discards (mt) by purse seiners in the tropical waters of the WCPFC Statistical Area, excluding the domestic fisheries of Indonesia and the Philippines (OFP 2015).

YEAR	SKIPJACK			YELLOWFIN			BIGEYE			TOTAL		
	Retained + Discarded	Discarded	%	Retained + Discarded	Discarded	%	Retained + Discarded	Discarded	%	Retained + Discarded	Discarded	%
1995	562,853	12,664	2.3%	180,110	1,063	0.6%	28,734	325	1.1%	771,697	14,052	1.8%
1996	546,868	17,937	3.3%	157,696	1,719	1.1%	38,773	876	2.3%	743,337	20,532	2.8%
1997	411,317	12,052	2.9%	271,396	1,873	0.7%	70,704	891	1.3%	753,417	14,815	2.0%
1998	580,194	17,232	3.0%	368,375	6,336	1.7%	64,472	774	1.2%	1,013,040	24,341	2.4%
1999	537,696	18,067	3.4%	287,221	5,744	2.0%	63,255	1,619	2.6%	888,172	25,430	2.9%
2000	623,130	29,973	4.8%	290,635	2,122	0.7%	39,511	1,193	3.0%	953,276	33,287	3.5%
2001	632,159	34,453	5.5%	272,634	2,099	0.8%	45,575	1,085	2.4%	950,368	37,637	4.0%
2002	815,022	40,914	5.0%	232,952	2,609	1.1%	55,137	717	1.3%	1,103,117	44,240	4.0%
2003	773,117	25,020	3.5%	274,034	4,905	1.8%	35,282	480	1.4%	1,032,433	30,405	2.9%
2004	782,143	34,336	4.4%	276,712	8,744	3.2%	63,843	1,954	3.1%	1,122,698	45,034	4.0%
2005	896,212	44,990	5.0%	314,662	7,111	2.3%	49,830	2,098	4.2%	1,260,704	54,199	4.3%
2006	972,415	22,366	2.3%	244,335	4,007	1.6%	48,829	669	1.4%	1,265,579	27,042	2.1%
2007	1,088,759	30,921	2.8%	277,040	3,158	1.1%	42,794	646	1.5%	1,408,593	34,725	2.5%
2008	1,018,143	20,363	2.0%	368,032	4,600	1.3%	49,998	1,270	2.5%	1,436,173	26,233	1.8%
2009	1,238,180	28,602	2.3%	279,173	4,160	1.5%	53,000	1,717	3.2%	1,570,354	34,479	2.2%
2010	1,142,816	15,199	1.3%	322,554	2,806	0.9%	51,032	745	1.5%	1,516,402	18,751	1.2%
2011	1,090,095	11,882	1.1%	284,456	2,219	0.8%	71,448	915	1.3%	1,445,999	15,015	1.0%
2012	1,300,952	19,644	1.5%	323,823	3,659	1.1%	61,537	591	1.0%	1,686,312	23,894	1.4%
2013	1,274,594	33,522	2.6%	299,004	4,306	1.4%	68,216	1,160	1.7%	1,641,814	38,987	2.4%
2014	1,401,401	44,004	3.1%	332,873	8,888	2.7%	63,226	1,100	1.7%	1,797,501	53,992	3.0%
Average	881,903	25,707	2.9%	282,886	4,106	1.5%	53,260	1,041	2.0%	1,218,049	30,855	2.5%



References

- Anon 1997.** Strategic Action Plan for International waters of Pacific Islands. South Pacific Regional Environment Programme. Apia, Samoa.87pp
- Davies, N, G. Pilling, S. Hoyleand J. Hampton. 2013.** Stock assessment of striped marlin (*Kajikia audax*) in the southwest Pacific Ocean. 8th Session of the Scientific Committee of the Western and Central Pacific Fisheries Commission. WCPFC-SC8-2012/SA-WP-05. Pohnpei, Federated States of Micronesia, 7-15 August 2012.
- Davies, N, G. Pilling, S. Harley and J. Hampton. 2013.** Stock assessment of swordfish (*Xiphias gladius*) in the southwest Pacific Ocean. 9th Meeting of the Scientific Committee of the Western and Central Pacific Fisheries Commission.WCPFC-SC9-2013/SA-WP-04.Pohnpei, Federated States of Micronesia, 6-14 August 2013.
- Davies, N, S, Harley, and J. Hampton. 2014.** Stock assessment of yellowfin tuna in the Western and Central Pacific Ocean. 10th session of the of the Scientific Committee of the Western and Central Pacific Fisheries Commission. WCPFC-SC10-2014/SA-WP-05. Majuro, Republic of the Marshall Islands 6-14 August 2014.
- Clarke, S. S Nicol and P. Williams.** Analysis of Sea turtle mitigation measure effectiveness in tuna longline fisheries. 11th Meeting of the Scientific Committee of the Western and Central Pacific Fisheries Commission.WCPFC-SC9-2013/EB-WP-06_Rev1..Pohnpei, Federated States of Micronesia, 5-13 August 2015.
- Dunn, S., & Knuckey, I. 2013.** Potential for E-Reporting and E-Monitoring in the Western and Central Pacific Tuna Fisheries. Report to the Western and Central Pacific Fisheries Commission, pp 128.
- FAO. (2014).** The State of World Fisheries and Aquaculture 2014. Rome.223pp
- FFA. 2014.** Regional Fisheries Training Framework, V1.1. FFA, Honiara, Solomon Islands. 60pp.
- FFA. 2015a.** FFA Annual Report for fiscal year 1 July 2014 -30 June 2015. FFA, Honiara, Solomon Islands. 60pp.
- FFA. 2015b.** 2015 Economic Indicators Report. FFA, Honiara. 28pp.
- Harley, S. et al. 2014.** Stock assessment of yellowfin tuna in the Western and Central Pacific Ocean. 10th session of the of the Scientific Committee of the Western and Central Pacific Fisheries Commission. WCPFC-SC10-2014/SA-WP-01. Majuro, Republic of the Marshall Islands 6-14 August 2014.
- Harley, S. et al. 2015.** Stock assessment of south Pacific albacore tuna. 11th Meeting of the Scientific Committee of the Western and Central Pacific Fisheries Commission.WCPFC-SC9-2013/SA-WP-04.Pohnpei, Federated States of Micronesia, 5-13 August 2015.
- Harley, S. P. Williams, S Nicol, J Hampton and S Brouwer 2015b** The Western and Central Pacific Tuna Fishery: 2014 Overview and Status of Stocks. SPC-OFP Tuna Fisheries Assessment Report No 15.
- ISC.** Stock assessment of blue marlin in the Pacific Ocean in 2013. Billfish working group. 9th Session of the Scientific Committee of the Western and Central Pacific Fisheries Commission.WCPFC-SC9-2013/ SA-WP-09. Pohnpei, Federated States of Micronesia, 6-14 August 2013.
- Lawson, T. 2011.** Estimation of Catch Rates and Catches of Key Shark Species in Tuna Fisheries of the Western and Central Pacific Ocean using Observer Data. WCPFC-SC7-2011/EB-IP-02.
- Lehodey, P.et al . 2010** Preliminary forecasts of Pacific bigeye tuna population trends under the A2 IPCC scenario. Prog. Oceanogr. 86,302-315
- Lehody, P.et al. 2013** Modelling the impact of climate change on Pacific Skipjack tuna population and fisheries. Climatic Change,Vol.119, Issues 1, pp 95-109.
- Lehodey et al. 2013** Modelling the impact of climate change on Pacific skipjack tuna population and fisheries. Climate Change Vol 119, Issue 1 pp 95-109
- Lehodey et al. 2015** Modelling the impact of climate change on South Pacific albacore tuna Deep Sea Research II, 113, pp 246-259.
- Lehody, P I Senina and R. Murtugudde. 2008** A spatial ecosystem and populations dynamics model



(SEAPODYM) – Modeling of tuna and tuna-like populations. *Progress in Oceanography* 78 (2008) 304–318.

OFP 2010. Non-target species interactions with the tuna fisheries of the western and central Pacific Ocean. 6th Session of the Scientific Committee of the Western and Central Pacific Fisheries Commission. WCPFC-SC6-2010/EB-IP-8. Nulualofa, Tonga 10-19 August 2010.

OFP. 2015. Estimates of annual catches in the WCPFC Statistical Area WCPFC-SC11-2015/ST IP-1

PNA Members and Tokelau. 2015 Purse seine activity in PNA waters. 2015. 12th Meeting of the Western and Central Pacific Fisheries Commission. WCPFC-SC11-2014/GN WP-1 Rev 1. Pohnpei, Federated States of Micronesia 3 - 8 December 2015.

Williams, P. 2015 National IMS and E-Reporting: Current status and future plans. WP7. 9th SPC Heads of Fisheries Meeting, 6-12 March 2015, Noumea, New Caledonia.

Reid, C and J. Raubani, 2015. Trends in economic conditions in the southern long line fishery. Scientific Committee of the Western and Central Pacific Fisheries Commission. WCPFC-SC9-2013.SA-WP-06. Pohnpei, Federated States of Micronesia, 6-14 August 2013.

Rice, J and S. Harley. 2013. Stock assessment of Silky Sharks in the WCPO. 9th Session of the Scientific Committee of the Western and Central Pacific Fisheries Commission. WCPFC-SC11-2013.MI-WP-03. Pohnpei, Federated States of Micronesia, 5-13 August 2015.

Rice, J and S. Harley. 2014. Stock assessment of Oceanic Whitetip Sharks in the WCPO. 8th Meeting of the Scientific Committee of the Western and Central Pacific Fisheries Commission. WCPFC-SC8-2012.SA-WP-03. Busan, Korea 7-15 August 2012.

Rice, J., S. Harley, N. Davies and J. Hampton. 2014 a. Stock assessment of skipjack tuna in the Western and Central Pacific Ocean. 10th session of the Scientific Committee of the Western and Central Pacific Fisheries Commission. WCPFC-SC10-2014/SA-WP-05. Majuro, Republic of the Marshall Islands 6-14 August 2014.

Rice, J., S Harley, and M Ka 2014b Stock assessment of blue shark in the Northern Pacific Ocean using stock synthesis. 10th session of the Scientific Committee of the Western and Central Pacific Fisheries Commission. WCPFC-SC10-2014/SA-WP-08a. Majuro, Republic of the Marshall Islands 6-14 August 2014.

Senina, I. SEAPODYM application for yellowfin tuna in the Pacific Ocean. 2015 11th Session of the Western and Central Pacific Fisheries Scientific Committee. WCPFC-SC11-2015/EB-IP-01. Pohnpei, Federated States of Micronesia, 5-13 August 2015.

WCPFC. 2015. Information paper: Data summaries in support of the discussion on the CMMs on tropical tunas (CMM2013-01 and CMM 2014-01). 12th Regular Session of the Western and Central Pacific Fisheries Commission. WCPFC12-2015-IP02_Rev.1 Kuta, Bali, 25 November 2015.

Williams, P. and T. Terawasi. 2015, Overview of tuna fisheries in the Western and Central Pacific Ocean including economic conditions – 2014. 11th Session of the Scientific Committee of the Western and Central Pacific Fisheries Commission. WCPFC-SC11-2014/GN WP-1 Rev 1. Pohnpei, Federated States of Micronesia, 5-13 August 2015



TERMS OF REFERENCE

Implementation of Global and Regional Oceanic Fisheries Conventions and Related Instruments in the Pacific Small Island Developing States (PIOFMP-II)

PROJECT BASELINE STUDY

1. Background

GEF has been supporting Pacific SIDS in their implementation of the IW Pacific Islands SAP, including:

a pilot phase of support, which underpinned successful efforts to conclude and bring into force the WCPF Convention, and

the PIOFMP-I, which focused on the early stages of establishment of the WCPFC and the reform, realignment, restructuring and strengthening of SIDS national fisheries laws, policies, institutions and programs to take up the new opportunities which the WCPF Convention created and discharge the new responsibilities which the Convention placed on Pacific SIDS.

The OFMP 1 project saw the coming into force of the WCPFC Convention and the associated ratification by Pacific SIDS. Under the project there was support for science was focused ecosystem-related science and capacity building. Pacific SIDS national laws were reformed to provide for the obligations associated with being Members of the Commission, and national legal, policy, control and monitoring programs were restructured and strengthened.

New GEF assistance is now in place through FAO and UNDP for the new Pacific Islands OFMP-II Project to support Pacific SIDS as they move on from the foundational, institutional capacity-building activities of the OFMP 1 project into an implementation phase to achieve systematic, sustained changes in fishing patterns and on-the-water behavior. This is the source of the title of this Project: Implementation of Global and Regional Oceanic Fisheries Conventions and Related Instruments in the Pacific Small Island Developing States (SIDS);

The project objective is to support Pacific SIDS in meeting their obligations to implement and effectively enforce global, regional and sub-regional arrangements for the conservation and management of transboundary oceanic fisheries thereby increasing sustainable benefits derived from these fisheries; with the emphasis on implementation.

The Project directly addresses the updated IW Goal for GEF-5 of: Promotion of collective management for transboundary water systems and subsequent implementation of the full range of policy, legal, and institutional reforms and investments contributing to sustainable use and maintenance of ecosystem services.

There are six major inter-related concerns about sustainability in these fisheries for transboundary oceanic fish stocks. They are:

- the impact on target transboundary oceanic fish stocks;
- the impact on other fish species, such as sharks and billfish;
- the impact on other species of interest (such as marine mammals, seabirds and turtles);
- the impact on foodwebs;
- other impacts on biodiversity; and
- the impact of climate change.



These issues are addressed in the OFMP 2 project through four project components. These are:

- Component 1: Regional Actions for Ecosystem-Based Management,
- Component 2: Sub-regional Actions for Ecosystem-Based Management,
- Component 3: National Actions for Ecosystem-Based Management,
- Component 4: Stakeholder Participation and Knowledge Management; and
- Component 5: Project Management.

Structured in this way, the Project:

- supports Pacific SIDS as the major bloc at the WCPFC to adopt regional conservation and management measures, through Component 1;
- supports the innovative approaches being developed by Pacific SIDS at sub-regional level as they collaborate in fisheries of common interest through Component 2: and
- assists SIDS to apply measures nationally in their own waters and to their fleets through Component 3, which is the major component of the Project.

The fourth technical component targets enhanced stakeholder participation, including industry participation in oceanic fisheries management processes, and improved understanding and awareness generally of the challenges and opportunities facing Pacific SIDS in oceanic fisheries management.

2. Baseline Study Purpose

The purpose of the baseline study is to describe the baseline situation in the context of Project Document in relation to:

- measures in place at national, sub-regional and regional level for the conservation and management of the oceanic fish stocks of the Western & Central Pacific Ocean (WCPO) and the protection of the WTP LME from fisheries impacts; and
- the status of the fisheries, the target stocks and the ecosystem including trophic status and status of key non-target species.

The Study will provide initial measures of the indicators outlined in the project document Projects Results Framework which is appended hereto. These indicators apply the structure of process, stress-reduction and environmental status indicators set down by the GEF International Waters Operational Strategy.

3. Baseline Study Scope of Work

The Consultant shall:

1. Briefly summarise the applicable GEF international Waters Operational Strategy and describe the GEF International Waters process, stress-reduction and environmental status indicators framework at a project level;
2. Review the indicators described in the Project Results Framework for the four Project components, and suggest any appropriate revisions;
3. Within the limits of the information available, assess and briefly describe the status of each of the indicators, where appropriate, at early 2016 (using for example the information reported to the 2015 WCPFC meeting in Bali); and
4. Prepare a report that can be used as a baseline to assess progress in the indicators during, and at the conclusion of, the Project.

The project document was prepared in 2009 – 2010 and, as such, the indicators and the Country status reports are now five years out of date and much has transpired in the regional, sub regional and national context since that time. The baseline study is expected to focus on the regional and sub regional developments since the time of the preparation of the project document. It is envisaged that the national status report will be updated during the course of 2016 through national level consultations and meetings.



4. Baseline Study Implementation

The Study will be undertaken largely as a desk study using information available from the Pacific Islands Forum Fisheries Agency (FFA) and the Secretariat of the Pacific Community Pacific Oceanic Fisheries Program (SPC/OFP). The Study will draw from and build on the Baseline and Progress Studies undertaken in the preparation of the Project Document.

The consultant shall:

- Visit Honiara and Noumea at a time agreed between the Parties for consultation with FFA and SPC/OFP;
- Review relevant available GEF IW and OFMP documents on indicators, and monitoring and evaluation more generally;
- Prepare a draft report; and
- Prepare a final study report taking into account comments on the draft by FFA and SPC/OFP.

5. Organisational and Institutional Arrangements

The Consultant will be accountable to the OFMP II Chief Technical Adviser and the FFA Director of Fisheries Management. FFA and SPC will cooperate fully with the Consultant in the provision of information required to carry out the study and will liaise directly with the Consultant as required to implement organisational arrangements.



Attachment 2:

Status of national observer programmes, unloading and port sampling and data and information management systems

Country	Observer programme as at mid 2015	Unloadings and port sampling	Data & information management systems
Cook Islands	7 (2014) national observers CIFFO established in Pago Pago to assist with vessel license inspections observer administration and collection of logsheets and HACCAP issues.	National Fleet unloadings coverage – high Foreign Fleet unloadings coverage – medium. Port sampling programme for Pago Pago office under resourced. Sampling of two domestic vessels in Rarotonga ongoing. Aim is to increase port sampling to 100% for catch-based quota system.	Very capable managers of their data with database tools. In the future, Installation/Training with TUFMAN-2 with expansion to E-Reporting envisaged in order to feed into their proposed national QMS system. More custom reports in the web reporting system expected.
Federated States of Micronesia	27 national observers, including 13 Marine Stewardship Council (MSC) certified observers. 4 certified debriefers including 1 trainer.	National fleet unloadings coverage – medium. Foreign fleet unloadings coverage – low. LL port sampling currently low due to highly dressed and deep frozen presentation of unloaded fish. Further advise requested from SPC.	Relatively large-scale user with respect to data collected and managed. Well-developed data collection and database system (TUFMAN); they will benefit when moving TUFMAN-2 system, but will need upskilling in how to use the comprehensive data quality control, for example.
Fiji	36 (2014) observers. Fiji has signed an MOU with Tuvalu to deploy observers on their vessels. FAO e-monitoring system (5 cameras per boat) on 5 licensed vessels and observers have the capacity to download the information and transfer the data to the database.	National fleet unloadings coverage – high Foreign fleet unloadings coverage – high. The LL port sampling target of 144 samples per year is fully achieved.	Largest manager of LONGLINE data with well-developed data collection and database system (TUFMAN); they will benefit if they can move to TUFMAN-2 system, but will need some upskilling in how to use the system. Data generated from E-Monitoring and E-Reporting into this system appears to be a future requirement.

Country	Observer programme as at mid 2015	Unloadings and port sampling	Data & information management systems
Kiribati	~200 national observers Number of debriefers~1 Trainers~1	National fleet unloadings coverage – medium. Foreign fleet unloadings coverage – medium. No LL port sampling.	Relatively large-scale user with respect to data collected and managed. Well-developed data collection and database system (TUFMAN); they would definitely benefit from moving TUFMAN-2 system, but will need upskilling. No requirements for E-Reporting expressed at this stage.
Marshall Islands	68 national observers. RMI implemented CDS transshipment monitoring with NFA assistance in training as RMI is trying to implement 100% coverage of all transshipments. iFIMS observer reporting planned	National fleet unloadings coverage – high Foreign fleet unloadings coverage – high. Database system for trapping P&L unloadings requested from SPC. LL port sampling @ 85-90%	Relatively large-scale user with respect to data collected and managed. Well-developed data collection and database system (TUFMAN); they will benefit when moving TUFMAN-2 system, but will need upskilling in how to use the comprehensive data quality control, for example.
Nauru	5 national observers. Programme under expansion.	No national fleet Foreign fleet unloadings coverage – medium. No local LL unloadings, thus no LL port sampling.	Tuna Fishery database (TUFMAN) but used sporadically due to continued issues with internal hardware. They would definitely benefit with a move TUFMAN-2 system.
Niue	No observer programme. No participation in observer training for some years.	No national fleet Foreign fleet unloadings coverage - medium to low. No local LL unloadings, thus no LL port sampling.	Small fishery and not database at this stage. They would definitely benefit with a move TUFMAN-2 system.
Palau	No active observer programme	No national fleet Foreign fleet unloadings coverage – high. LL port sampling @ 95%	Well-developed data collection and database system (TUFMAN); they will benefit when moving TUFMAN-2 system, but will need upskilling in how to use the comprehensive data quality control, for example.

Country	Observer programme as at mid 2015	Unloadings and port sampling	Data & information management systems
Papua New Guinea	275 national observers, 55 debriefers. Using iFIMS for observer e-reporting. Intention to start trialing video monitoring on PNG licensed long line and purse seine vessels	CDS in place LL Port Sampling is ongoing	PNG do not use TUFMAN but have the iFIMS/ FIMS system to manage their data. They could potentially use the TUFMAN2 system to at least have access to the comprehensive WCPFC Reporting module.
Samoa	3 national observers. 1 debriefer trainee. Programme under expansion with introduction of cost recovery process.	No National Fleet Foreign fleet unloadings coverage – medium to low. LL port sampling medium to high.	Have been using TUFMAN intermittently in the past and would benefit by using TUFMAN2 system.
Solomon Islands	101 national observers. 10 trainee debriefers. 2 Trainers and 1 assessor. 100% MSC observers on local NFD PS fleet	National fleet unloadings coverage -medium to low. 50% - 100% monitoring of unloading on 2 of the foreign locally-based long-line fishing companies (Soffish and Global) in Honiara. LL port sampling currently low.	Tuna Fishery database (TUFMAN) but used sporadically due to continued internal hardware/ internet issues and resources to process a large volume of data. They would definitely benefit with a move TUFMAN-2 system.
Tonga	20 national observers, 4 debriefers	National fleet unloadings coverage – high Foreign fleet unloadings coverage – high LL port sampling @100%.	Well-developed data collection and database system (TUFMAN) with very high coverage of data in their system; they will benefit when moving TUFMAN-2 system in allowing distributed data entry and enhanced reporting.
Tuvalu	46 national observers 1 certified debriefer and 5 trainee debriefers	National fleet unloadings coverage – medium to low (delayed). Foreign fleet unloadings coverage – medium to low. LL port transshipments in port is low to zero, no LL port sampling.	Tuna Fishery database (TUFMAN) used sporadically with better attention recently. They would benefit with a move TUFMAN-2 system.



Country	Observer programme as at mid 2015	Unloadings and port sampling	Data & information management systems
Vanuatu	34 national and observers. Availability of training an issue.	National fleet unloadings coverage – medium to low. Foreign fleet unloadings coverage – medium to low Most recently specific staff have been assigned to the follow up of unloading data, so immediate improvement expected. Currently no LL unloadings in port, thus no LL port sampling, unloading/ trans-shipments expected to recommence mid-2016.	Data collection and database system use (TUFMAN) still developing with some complexities in managing their data. They would benefit with the move to TUFMAN-2 system, mainly with respect to data sharing and reporting.



Attachment 3

List of current Issue-specific national reports (ISNRS)

Report	Purpose
LL Bioeconomics	Provide estimate of optimal fishing effort level to achieve one of two economic goals in the longline fishery: Maximum Economic Yield (MEY) or Breakeven (BE). MEY provides maximum economic profit while BE maximizes effort while allowing for minimal profit
LL CPUE	Using a series of fitted statistical models, quantify the contribution of various factors on tuna CPUE. Factors considered included time (year, month), space (latitude, longitude), vessel, regional biomass, oceanography (e.g., sea surface temperature (SST), mixed layer depth) and climate (e.g., Southern Oscillation Index (SOI)).
PNA LL VDS	Provision of scientific support to the continued development of the PNA longline Vessel Day Scheme by presenting data analyses to better understand the dependence of PNA longline fishing vessels on the International Waters area s within the tropical WPO.
ALB LL CPUE	Identify variables affecting albacore catch rates within EEZs and the specific influence of factors that can be controlled by fisheries managers, and variables that are outside their control but can be monitored; Examination of the potential implications for future albacore fishery CPUE levels.
FAD Closure	Provision of estimates of the potential impact on catches and income from implementing a FAD closure period.
Artisanal Interactions	To answer the following specific questions: 1. Is there an interaction? 2. What is the level and nature of the interaction (or impact by one sector on the other)? 3. What management options (if required) might reduce the likelihood of significant impacts on the artisanal fishery, while minimising impacts on the overall national interest? 4. Are improvements to data collection needed to make informed decisions on this issue?
Oceanographic report	Summary and description of key oceanographic and climate features affecting primary productivity and fish habitat.
LL Bycatch	Quantification of bycatch of non-tuna-target species using observer data, including a description of spatial and temporal catches and a complete list of all species encountered in observer data.
Coastal fishing activity	Identification and quantification of commercial fishing activity within 12 and 24 nautical mile territorial seas



Attachment 4

ISNRs delivered by SPC-OPF 2011 - mid 2015

	Bioeconomics	LL CPUE	PNA LL VDS	ALB LL CPUE	FAD Closure	Artisanal Interactions	Oceanographic report	LL Bycatch
Cook Islands	X	2015	X	2011	X	2015	2012	2014
Federated States of Micronesia	X	X	2012	X	2014	2014	2012	2014
Fiji	2012	2014	X	2011	X	X	2013	2014
Kiribati	X	X	2012	2011	2014	2013	2013	2014
Marshall Islands	X	X	2012	X	2014	2014	2013	2014
Nauru	X	X	2012	X	2014	2013	2013	X
Niue	X	2014	X	X	NA	2014	2013	X
Palau	X	X	2012	X	X	2014	2013	2014
Papua New Guinea	X	X	2012	X	2014	2014	2013	2014
Samoa	2013	2014	X	2011	X	2014	2013	X
Solomon Islands	2015	X	2012	X	2014	X	2013	2014
Tonga	2013	2014	X	X	NA	X	X	2014
Tuvalu	X	X	2012	X	2014	2012	X	X
Vanuatu	2013	2014	X	2011	NA	2013	2013	X

Attachment 5

National fisheries management plans/policies

Cook Islands	The current management plans and associated regulations for the longline fishery (2012) and purse seine fishery (2013) under the Marine Resources Act (2005) are now somewhat dated and are under review. Cook Islands is currently realigning its offshore fisheries management framework to be consistent with measures agreed at the WCPFC and recent regional developments (VDS, TKA etc). A draft Pelagic Longline Fishery Plan was developed and released for comment in November 2014, which when in force will replace the 2008 plan. The new Plan covers the implementation of a quota management system, which is scheduled for introduction via regulation in 2016.
Federated States of Micronesia	New FSM Tuna Management and Development Plan developed and adopted in 2015. The new Plan has a number updated sections, and most notably include reference to the VDS and other PNA initiatives.
Fiji	Current National Fisheries Policy outdated and MFJ have plans to develop and new, overarching policy in 2016 through a consultative process. New Fiji Tuna Management and Development Plan (2014-2018) in place, with detailed policies on offshore fisheries aimed at maintaining sustainability and supporting economic growth, employment, while promoting food security and rights-based, integrated fisheries management frameworks.
Kiribati	Kiribati has a comprehensive national fisheries policy (2013-2015) that has many elements of a management and development plan. The Policy has 35 Strategic Actions, including many relevant to the offshore sector with suggested donors, outcomes and impacts on the sector. A Draft Tuna Management Plan (2014) has yet to be approved by government.
Marshall Islands	The PNAO, through Poseidon has commissioned a Tuna Management and Development Plan, with clear goals and outcomes and defined actions for the three tuna fisheries; purse seine, pole-and-line and longline. This plan replaces the draft 2009-2011 plan
Nauru	The NFMRA National Sustainable Development Strategy for the Nauru Fisheries and Marine Resources Authority (NFMRA) 2009-2012 is now somewhat dated. The NFMRA Corporate Plan 2016-2021 is with Cabinet awaiting resolution. The Tuna Management Plan is 'pending with FFA for vetting' for more than 2 years now. In summary, there appears to be little in the way for formal offshore fisheries policy other than the legislation which is currently under review and the lapsed five year plan.
Niue	A Pelagic Management and Development plan came into force via Cabinet approval in 2012. The Plan is based on an Ecosystem based Approach to Fisheries Management (EAFM) and seeks to reconcile commercial fishing with subsistence and recreational fishing. Reference is made to both purse seine VDS and a catch based arrangement for longlining.
Palau	The major policy objectives of tuna management and development are set out in the National Tuna Fishery Management Plan (NTFMP), 2001 but it appears that the Plan has not been fully implemented.

Papua New Guinea	Well developed policy and management framework with clear policy towards domestic industry development as articulated in the National Tuna Fishery Management and Development Plan (2014). The plan is a statutory instrument
Samoa	The current management plans and associated regulations for the longline fishery (2012) and purse seine fishery (2013) under the Marine Resources Act (2005) are now somewhat dated and are under review. Cook Islands is currently realigning its offshore fisheries management framework to be consistent with measures agreed at the WCPFC and recent regional developments (VDS, TKA etc) . A draft Pelagic Longline Fishery Plan was developed and released for comment in November 2014, which when in force will replace the 2008 plan. The new Plan covers the implementation of a quota management system, which is scheduled for introduction via regulation in 2016.
Solomon Islands	The draft Solomon Islands Tuna Management and Development Plan (2015) provides a comprehensive policy and operational guidance for tuna fisheries, including full reference to the purse seine and longline VDS schemes.
Tonga	Tonga's National Tuna Fisheries Management and Development Plan (2015-2017), is a detailed policy document that provides guidance to the management and development of tuna fisheries as well as specific reference to CMMs and the albacore harvest strategy.
Tuvalu	Tuvalu's Tuna Management & Development Plan (2011-2015) articulates government policy, management and development strategies and an implementation plan. A new Tuna Management & Development Plan (2015-2019) is in preparation.
Vanuatu	The Revised Tuna Fishery Management Plan (2014) provides the overall policy framework, objectives, strategic actions and schedules for plan implementation.

Attachment 6

Status of NPOA sharks in PacSIDS

Country	Status of NPOA for sharks or shark management arrangements
Cook Islands	NPOA (2012) in place. Introduced shark regulations in 2012 that make it an offence for commercial fishers to have sharks or any shark parts on board a vessel in the EEZ. Regulation also deems any shark on board a vessel transiting the EEZ as being caught in the Cooks EEZ.
Fiji	Draft NPOA for sharks approved by Fisheries Department in 2014, awaiting endorsement by Cabinet. Offshore Management Plan bans the use of wire traces.
Federated States of Micronesia	No NPOA. Has recently declared their EEZ a shark sanctuary as part of the Micronesia Regional Shark Sanctuary. Recently changed legislation to include landing provisions for dead sharks (requirement to be forfeited and destroyed).
Kiribati	No NPOA. Currently drafting a Tuna Management Plan that has a section on sharks and recommends development of management arrangements or an NPOA. Most recently introduced a regulation (2015) that designates their EEZ and all Kiribati waters a shark sanctuary although the status of the legislation is unknown pending further advice
Nauru	No NPOA. Recent informal discussions with FFA on the need for an NPOA sharks and a tuna management plan – limited fishing in EEZ so NPOA may not be required.
Niue	No NPOA. Pelagic Management and Development Plan endorsed and contains provisions to develop an NPOA if required. Request with FFA to draft an NPOA this year as small numbers of sharks are landed by canoe fishers which is in contravention to their protected species status. No tuna fishing in EEZ at present although agreements for exploratory purse seine fishing have been signed.
Palau	No NPOA necessary since EEZ is declared a shark sanctuary to all forms of fishing – theoretically one is still required.
Papua New Guinea	No NPOA. Currently developing an NPOA for offshore and archipelagic waters with FFA assistance, first consultancy undertaken and a second planned for May 16. Had a targeted inshore shark fishery that was closed in 2014
Republic Marshall Islands	No NPOA necessary EEZ is declared a shark sanctuary to all forms of fishing so NPOA not implemented – theoretically one is still required.
Samoa	No NPOA. A SAR has just been completed and an NPOA for sharks is being drafted with assistance from WWF and FFA. Samoa has a Management Plan for sharks that is dated (2011).



Solomon Islands	NPOA in place (2014-16), Covers both inshore and offshore waters. The sale of fins is likely to be banned later this year under current discussions
Tonga	NPOA in place (2014). Recently approved by government and now operational.
Tuvalu	No NPOA. Revised TMDP has provisions for implementing elements of the shark CMMs but also seeking assistance from FFA to develop their NPOA or appropriate shark management measures.
Vanuatu	NPOA in place (2015-2018), endorsed by government

Notes:

1. All of the NPOA's have been developed in accordance with the guidelines under the IPOA – Sharks although in many cases an SAR was not undertaken first, to inform the NPOA. Generally this is because there is either a lack of data to inform the SAR or some urgency to implement an NPOA in the face of political/NGO pressure to implement a shark sanctuary.
2. Most, but not all NPOAs deal with offshore fisheries and inshore fisheries and catches by artisanal fishers are largely not considered. This is often due to the fact there is very limited data on inshore fishery interactions with sharks.
3. Several members have declared their EEZs shark sanctuaries although how these are enforced remains unclear. Normally the application of the sanctuary does not extend to archipelagic or territorial waters so inshore shark fisheries and artisanal fishing can still exist
4. There is no obligation to establish an NPOA although it is recommended under the International Plan of Action for sharks (IPOA) and the WCPFC CMM 2010-07



Attachment 7

National legislation relating to the WCPF Convention and Commission

Country	PIOFMP1	Legal update as at April 2016
Cook Islands	Marine Resources Act: updated (2005) with powers to implement the Core Conservation and Management Principles and Measures required under the Convention. International Legal Division in place, but inadequate capacity to support drafting of additional legislation to meet all Convention requirements and recently agreed (December 2004) Commission measures. Legislation requires updating.	Territorial Sea and EEZ (Amendment) Act 2011 – deals with material the Minister may publish and certify as evidence of the baseline. CMM requirements implemented through amending license conditions or through regulation. Territorial Sea and EEZ (Amendment) Act 2012 – establishes Contiguous zone. Marine Resources (shark Conservation) Regulations 2012 – total ban on shark fishing Marine Resources (Licensing) Regulations 2012 – includes flag states responsibilities. Marine Resources (Large Pelagic Longline fishery) Regulations 2012 Marine Resources (Purse Seine Fishery) Regulations 2013 Marine Resources Act is currently being updated and should be submitted for Parliamentary approval in November 2016.



Federated States of Micronesia

Chapter 24 of the Code of FSM Marine Resources Act requires updating⁴ to enable the implementation of some WCPFC measures to meet all Convention requirements and recently agreed (December 2004) Commission measures. Substantial legal capacity in its government legal offices (Attorney General), however need assistance for major technical initiatives in fisheries law.

PL 10-75 An Act amending t.24, s. 405(1997 -expand role of congress in approval process)

PL 11 -24 An Act amending t. 24, s.301 (1999 – establishment of the Micronesian Maritime Authority)

PL 11-57 An Act amending t. 24, s. 102 (2000)

PL 12-14 An Act amending t. 24 (2001)

PL 12-34 An Act repealing chapters 1 through 5, (2002)

PL No. 13-86 (2005) banning vessel until judgment is satisfied.

PL No. 14-47 amend s. 113 (2005)

PL 14 – 55 An Act to amend s. 405 (2006)

PL 18-108 An Act amending t. 24 s. chapter 1, 5, 9 (2014) – shark, landing of catch etc.

PL 18 -109 An Act to amend s. 603 clarify powers of authorized officers (2015)

PL 19 -21 (2015) shark prohibition

PL 19 -36 (2015) by-catch discard, shark



Fiji	<p>Fisheries Act 1942, last amended in 1992. Marine Species Act 1978. Requires new legislation. Need to improve flag state control, including the establishment of a process to authorise Fijian flagged vessels fishing on the high seas, and to better control Fiji flagged vessels fishing in the EEZs of other FFA states. No one legal specialist is assigned to Fisheries and assistance needed to Support Commission participation and Implement Commission decisions</p>	<p>Offshore Fisheries Management (amendment) Decree 2014, and Offshore Fisheries Management Decree 2012 – closed the caps as previously identified such as the Flag state control, and process to authorized Fijian Flagged vessel fishing on the HS and other EEZ (See part 5 of the decree)</p> <p>Fisheries (Protection of Turtles)(Amendment) Regulations 2010</p> <p>Marine Spaces (Foreign Fishing Vessels) (Amendment) Regulations 2009 - Licensing fees</p>
Kiribati	<p>The Kiribati Fisheries Ordinance makes provision for the promotion and regulation of fishing and fisheries industries in Kiribati, whilst the Marine Zones (Declaration) Act 1983 deals with internal waters, the archipelagic waters, the territorial sea and the EEZ of Kiribati. The Fisheries Ordinance is not consistent with the UN Fish Stocks Agreement and the WCPF Convention in many respects and new legislation is required. Legal support for Commission participation also needed</p>	<p>Kiribati Fisheries Act 2010 was amended by the Fisheries (Amendment) Act 2015</p> <p>Kiribati Marine Zones (Declaration) Act 1983 repealed by Marine zone declaration Act 2011</p>
Marshall Islands	<p>The Marine Resources Act 1997 has been recently been revised and the provisions of the Act are adequate to implement conservation and international obligations under UNIA and the Convention. Requires updating to cover some obligations, including flag state responsibility, inspecting state obligations and port state enforcement measures. Need to enhance prosecution capability and support legislation for recently agreed (December 2004) Commission measures.</p>	<p>Title 51 (Fisheries) Amendment Act, of 2011: vested power to the Authority to give effect to decision of RFMOs to which RMI is a member, through regulations or as condition to a permit or license.</p> <p>The Act covers flag state responsibilities, PSM etc.</p> <p>Fisheries License (third Implementation Arrangement) Regulations of 2009</p>



Nauru	<p>Fisheries Act 1997. Appears to be capable of meeting most general obligations of the Convention, but check of compatibility of Act and Regulations with Convention needed, and will require updating to enable the implementation of some WCPFC measures. Legal advice and training in selected areas, including in the area of regulations and licensing.</p>	<p>Fisheries (Amendment) Regulations 2010 Fisheries (PNA Third Implementing Arrangement) Regulations 2009 Fisheries (PNA Third Implementing Arrangement Amendment) Regulations 2010 Fisheries Licence (FADClosure) Regulations 2009</p> <p>Nauru now has the capacity to incorporate CMM requirements into legislation/regulation/license via a newly appointed Principle Legal Drafter with the Justice Department. Following a recent legislative review by FFA, the Justice Department Principle Legal Advisor and NFMRA, FFA is now developing a report on legal drafting instructions covering a range of legislative changes (due late 2016).</p>
Niue	<p>Territorial Sea and Exclusive Economic Zone Act 1997. Includes sufficient powers to make regulations to implement WCPF Commission decisions. However, Niue wishes to move away from access agreements towards more direct control of fishing vessels through regulations and licence conditions. Requires assistance with a review of existing/new legislation and drafting of regulations and licence conditions, and to support Commission engagement and support development of new measures in support of Commission decisions.</p>	
Palau	<p>Title 27, last amended in 2004. Unclear if existing legislation is compatible with UNFSA and the Convention. Requires new legislation. Legal support required for Commission participation and to Implement Commission decisions.</p>	

Papua New Guinea	<p>Fisheries Management Act 1998 general provisions believed compatible with the requirements of the Convention, but that assistance with updated legislation will be required in the medium term (2-3 years), Uniquely among FFA Island member states, PNG has a statutory management plan which, like the Act, may require support to assist with minor changes.</p>	<p>Fisheries Management (Amendment) Act 2015 Fisheries Management (amendment) Regulations 2015 – Port state measure etc.</p>
Samoa	<p>Fisheries Act 1988, last amended in 2002. There is a need to make sure that the legal provisions can be interpreted by stakeholders, which could be done through national workshops. Support required to for Commission participation and to Implement Commission decisions. Requires new legislation to ensure all the necessary provisions for implementation of the WCPF Convention, and support for drafting of additional legislation recently agreed (December 2004) Commission measures.</p>	<p>New legislation has now clauses to create Regulation to enable nationalising of required CMMs. Licensing conditions (Draft Fisheries Management Licensing Regulations 2016) and general management strategies procedures have been developed in line with these CMMs and under the Fisheries Management Act 2016</p>
Solomon Islands	<p>Fisheries Act 1998. The Fisheries Act 1998 has not been revised to reflect and implement the requirements of the WCPF Convention and assistance is need to update legislation to enable this, and the implementation of recently agreed (December 2004) Commission. Support also needed to get full benefits from Commission participation and to implement Commission decisions.</p>	<p>Fisheries Management Act 2015 Protected Areas Act 2010 Fisheries (PNA Third Implementation Arrangement) Regulations 2012 Fisheries (PNA Third Implementation Arrangement (Amendment) Regulations 2012</p>
Tokelau	<p>The Tokelau (Territorial Sea and EEZ) Act 1977 and Tokelau (EEZ) Fishing Regulations 1988. No specific provision in the Tokelau legislation to meet Convention and CMM requirements. Requires new legislation</p>	<p>Fisheries Management (Conservation Amendment) Regulations 2013 Fisheries Management (Conservation Amendment) Regulations 2014</p>



Tonga	<p>Fisheries Management Act 2002 includes the necessary powers for implementation of the UN Fish stocks Agreement and the WCPF Convention, and regulations are in the process of being promulgated. This will complete the immediate legal needs by Tonga. However, there will be a need to update the Act to enable implementation of recently agreed (December 2004) Commission measures. Support also needed to get full benefits from Commission participation and to implement Commission decisions.</p>	<p>Marine Resources (Amendment) Act 2012 Declaration of Archipelagic Baselines 2012 Declaration of Territorial Sea Baselines 2012 Fisheries Regulations Declaration of the Outer Limits of the Continental Shelf 2012 Declaration of the Outer Limits of the Exclusive Economic Zone 2012 Declaration of the Outer Limits of the Territorial Sea 2012</p>
Tuvalu	<p>New Marine Resources Act drafted and is ready to be enacted by Parliament. The Act is fully compatible with the requirements of WCPF Convention and is among the most up to date in the region. Likely to require updating to enable implementation of recently agreed (December 2004) Commission measures. Support also needed to get full benefits from Commission participation and to implement Commission decisions.</p>	
Vanuatu	<p>Fisheries Act 2005 provides a good framework for Vanuatu's participation in the WCPFC or other RFMOs to which Vanuatu has acceded. The new Act now covers Vanuatu's substantial flag state responsibilities. Regulations will require updating over time to enable the implementation of WCPFC measures</p>	<p>Vanuatu Fisheries Act No. 10 of 2014 Maritime Zones Act 2010 Vanuatu Qualifications Authority Act No. 1 of 2014 Foreign License Fees Order 2015 Draft Fisheries Regulations amendment 2016 – including charter arrangement etc.</p>

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



Attachment 9

MCS Compliance - National Assessment

MCS Component	Cook Is.	FSM	Fiji	Kiribati	Marshall Is.	Nauru	Niue	Palau	PNG	Samoa	Solomon Is.	Tokelau	Tonga	Tuvalu	Vanuatu	
1. Licensing (20)	Strong	Strong	Strong				Moderate/Strong			Strong	Moderate	Strong	Moderate/Strong			Strong
2. Vessel Monitoring System (23)	Strong	Strong	Strong				Moderate/Strong			Strong	Strong	Strong	Moderate/Strong			Strong
3. Observer Schemes (8)	Moderate/Strong	Moderate/Strong	Moderate/Strong								Strong	Moderate	Moderate/Strong			Moderate/Strong
4. Vessel Records and Authorisations to Fish (12)	Strong	Strong	Strong								Strong	Moderate	Moderate			
5. Port Controls and Monitoring (5)	Strong	Moderate/Strong	Moderate/Strong							Moderate/Strong	Strong	Weak	Moderate			Weak/Moderate
6. Prosecution (6)	Moderate/Strong	Strong	Moderate								Moderate	Moderate/Strong	Moderate/Strong			
7. Boarding and Inspection and At Sea Patrols (10)	Strong	Strong	Moderate/Strong							Strong	Moderate/Strong	Weak	Moderate/Strong			Moderate/Strong
8. Data Management and MCS Coordination (7)	Moderate/Strong	Strong	Moderate								Strong	Weak/Moderate	Moderate/Strong			Moderate
9. Aerial Surveillance (3)	Moderate/Strong	Moderate/Strong	Strong								Weak	Moderate	Moderate/Strong			
10. Legislation, Regulations and Management Plans (14)	Strong	Strong	Moderate/Strong							Moderate	Strong	Moderate/Strong	Moderate			Strong

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Attachment 10

Status of key MCS arrangements in PacSIDS as at mid 2015

Country	Status of NPOA-IUU	NTSA status of Agreement/ implementation
Cook Islands	Not yet revised	In force (from 30 July 2014)
Federated States of Micronesia	NPOA revised and adopted in 2014. Monitoring required	Signed 1/2/13
Fiji	NPOA revised and adopted in 2012 Monitoring visit in 2014	
Kiribati	NPOA revised in 2015 – unsure as to whether it is adopted	
Marshall Islands	NPOA revised and adopted in 2014. Monitoring required	Signed 27 September 2014
Nauru	NPOA revised in 2015 – unsure as to adoption status	In force (from 30 July 2014). NEMRA has a standing bilateral arrangement with FSM and RMI under the Niue Treaty and has exercised it once with FSM with poor results because of poor fuel quality out of Nauru.
Niue	Not yet revised	Signed July 2, 2014
Palau	Not yet revised	In force (from 30 July 2014)
Papua New Guinea	NPOA revised and adopted in 2014 – 15. Monitoring underway	Signed 6 February 2013
Samoa	Not yet revised	In force (from 30 July 2014)
Solomon Islands	NPOA revised and adopted in 2015. Monitoring underway	Signed July 2, 2014
Tonga	NPOA revised in 2016 but not yet adopted	
Tuvalu	NPOA revised in 2015 – adoption status uncertain	In force (from 3 October (2014)
Vanuatu	NPOA revised and adopted in 2012 Monitoring undertaken in 2014	In force (from 30 July 2014)



<p>Applicable GEF Strategic Objective and Program: IW GEF5 Objective 2: catalyze multi-state cooperation to rebuild marine fisheries and reduce pollution of coasts and Large Marine Ecosystems (LMEs) while considering climatic variability and change</p>			
<p>PIOFMP-II can be expected to provide one of the 5-6 examples of multi-state cooperation in an LME where 50% of the States adopt or implement national reforms and successfully demonstrate technologies and measures for sustainable fisheries that is the key target in the LME area for IW in GEF-5</p>			
Applicable GEF Expected Outcomes:	Applicable GEF Outcome Indicators:	Baseline	Contributions of Proposed Project
<p>Outcome 2.1: Implementation of agreed Strategic Action Programmes (SAPs) incorporates ecosystem-based approaches to management of LMEs, ICM principles, and policy/legal/institutional reforms into national/local plans</p>	<p>Indicator 2.1: Adoption or implementation of national/local reforms; functioning of national inter-ministry committees</p>	<p>See Outcome 4.1</p>	<p>National reforms and successful management measures will be delivered in all Pacific PacSIDS in the WTPWP LME to ensure sustainability of the oceanic fishery resources.</p>
<p>Outcome 2.2: Institutions for joint ecosystem-based and adaptive management for LMEs and local ICM frameworks demonstrate sustainability</p>	<p>Indicator 2.2: Cooperation frameworks agreed and include sustainable financing</p>	<p>See Outcomes 2.1 and 3.1</p>	<p>The WCPF Convention and the Commission were agreed and established with GEF support implemented by UNDP through FFA. The Commission is now financially self-sustaining; the proposed project will strengthen WCPFC further by supporting countries meet their obligations to the Convention to ensure long-term sustainability. In addition, the project will support the PNA who have the most productive tuna fishing grounds, to strengthen their subregional organization and management.</p>
<p>Outcome 2.3: Innovative solutions implemented for reduced pollution, rebuilding or protecting fish stocks with rights-based management, ICM, habitat (blue forest) restoration/conservation, and port management and produce measurable results</p>	<p>Indicator 2.3: Measurable results for reducing land-based pollution, habitat, and sustainable fisheries from local demonstrations, including community benefits (disaggregated by gender)</p>	<p>See Outcomes 2.1, 3.1 and 3.2</p>	<p>There will be measurable results from innovative management arrangements including rights-based cap and trade management systems, enhanced compliance and enforcement schemes including port state controls and catch tracking, and by-catch mitigation arrangements. These results will include increased benefits for Pacific PacSIDS.</p>
<p>Outcome 2.4: Climatic variability and change at coasts and in LMEs incorporated into updated SAP to reflect adaptive management and ICM principles</p>	<p>Indicator 2.4: Updated SAPs and capacity development surveys</p>	<p>See Outcome 1.2</p>	<p>OFM aspects of the Pacific Islands IW SAP will be updated based on a new diagnostic analysis taking into account climate change and achievements in strengthening regional and sub-regional management arrangements</p>



Project Objective	Indicators	Baseline	End of project target	Sources of verification	Assumptions
To support Pacific PACSIDS in meeting their obligations to implement & effectively enforce global, regional & sub-regional arrangements for the conservation & management of transboundary oceanic fisheries thereby increasing sustainable benefits derived from these fisheries	Status of key WCPO tuna stocks, using stock status indicators agreed by SC	3 of the 4 major tuna stocks not subject to overfishing, but fishing mortality is rising on these 3 tocks, measures are needed to maintain sustainability See Section 2.2 Status of Key stocks, and Table 1	Measures taken to maintain sustainability of all 4 major tuna stocks. Effectiveness of that actions will only be measurable beyond the life of the project (year 8). Disagree concerning comment on ability to measure effectiveness of actions during the life of the project. Rather than 'maintain sustainability' which is subjective, suggest better target would be no overfishing of major tuna stocks	Scientific Committee reports	WCPFC CMMs, PNA VDS & Implementing Arrangements & other regional & sub-regional arrangements are effectively complied with WCPFC can control fishing in the high seas Agreement on CMMs can be reached in the WCPFC with other Commission Members
	Status of key WCPO non-target species	6 preliminary measures in place for protection of cetaceans, whale sharks, seabirds & marine turtles, as well as controls on shark finning, & very recently adopted CMMs to protect some shark species but their effectiveness is not known. See Section 3.1.2 and Table 2, noting that during the life of the project some assessments of non-target species will occur, and reporting against by-catch CMMs will be provided to the Commission under the CMR.	Measures reflecting Scientific Committee advice & best practice among tuna RFMOs in place for major non-target species identified by the SC by end of year 2 as requiring protection. Effectiveness of that action will only be measurable beyond the life of the project (year 8)		

	Indicators	Baseline	End of project target	Sources of verification	Assumptions
	Number of Pacific PacSIDS meeting WCPFC obligations	Principal legislative & policy framework aligned with WCPFC obligations for most Pacific PacSIDS. But subsidiary legislation & policy instruments need updating. See Section 8.2 and Attachment 7	All participating PACIFIC PacSIDS' subsidiary legislation & policy instruments aligned with WCPFC requirements & systematic processes in place in all PACIFIC PacSIDS for adoption of new measures.	TCC Reports	
	Level of benefits to PacSIDS: a) access fee revenue & b) employment by gender	22,736 directly employed in fishing and processing (2014) Access fees estimated at \$380 (FFA, 2015) million (2014).	Employment in PacSIDS growing by up to 5% per year. with increasing proportion of women Access fees increasing by up to 10% per year	FFA Economic Indicators Report	

Component 1 Regional Actions for Ecosystem- Based Management

<p>Outcome 1.1: Comprehensive set of innovative on-the-water conservation & management measures (CMMs) adopted by the Western & Central Pacific Fisheries Commission (WCPFC) for stocks of the Western Tropical Pacific Warm Pool (WTPWP) LME, incorporating rights-based and ecosystem-based approaches in decision-making) & informed by sound scientific advice & information</p>	Extent of application of WCPFC CCMs to major target stocks	Two Interim CMMs in place focusing on bigeye and south Pacific albacore, and both have been identified as insufficient. No systematic measures for management of other major target stocks	Comprehensive & effective CMMs applied to all four major target stocks by 2017. Effectiveness of those CMMs will only be measurable beyond the life of the project (year 8)	WCPFC Reports, including reports of Commission sessions, the Scientific Committee (SC) & the Technical & Compliance Committee (TCC), CMR	<p>Differences between WCPFC Members do not result in gridlock in the Commission</p> <p>WCPFC is financially sustainable</p> <p>WCPFC SC & scientific work is adequately resourced & functions effectively</p>
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Indicators	Baseline	End of project target	Sources of verification	Assumptions
<p>Extent of application of WCPFC CMMS for major non-target species threatened by WCPFC tuna fisheries</p>	<p>Four preliminary CMMS in place for protection of cetaceans, whale sharks, seabirds & marine turtles. Four shark CMMS in place covering non-retention of some species, encouragement of live release, and bans on finning, wire traces and shark lines. The effectiveness of the measures is not known.</p>	<p>CMMS reflecting Scientific Committee advice & best practice among tuna RFMOs in place for protection of all major non-target species identified by the Scientific Committee by end year 2 as threatened by WCPFC tuna fisheries. Effectiveness of those CMMS will only be measurable beyond the life of the project (year 8)</p>	<p>WCPFC Reports, including reports of Commission sessions, the SC & TCC, & the Finance & Administration Committee</p>	<p>Limits of PacSIDS institutional & human resources capacities do not prevent them from participating effectively in the WCPFC</p>
<p>Output 1.1.1 Proposals for ecosystem-based WCPFC CMMS to control fishing mortality for target stocks & to mitigate impacts on non-target species prepared & supported by Pacific PacSIDS, including regulatory & market-oriented measures reflecting & contributing to global best practices & consistent with global, regional & subregional instruments & targets</p>	<p>Extent of submission of proposals for CMMS on target & non-target species by PacSIDS, & support for proposed CMMS on target & non-target species by PacSIDS</p>	<p>Partial & interim CMMS are in place on only two of the major target species (south pacific albacore & bigeye tuna), and both have been identified as insufficient. CMMS in place to reduce the impact of fishing on turtles, seabirds, whale sharks, oceanic whitetip sharks, & cetaceans</p>	<p>Proposals reflecting global best practices submitted to the Commission & supported by PacSIDS for conservation & management of bigeye, skipjack & yellowfin tuna, & protection of all non-target species identified by the SC by year 2 as requiring protection</p>	<p>Reports of WCPFC External Reviews FFA briefs for WCPFC meetings Reports of FFA Management Options Consultations & other relevant ad hoc consultation</p>

	Indicators	Baseline	End of project target	Sources of verification	Assumptions
	Percentage of PacSIDS participating in WCPFC sessions including proportion of representation & office holding, including those by gender in PacSIDS delegations	Baseline study will quantify the level of participation by PacSIDS at WCPFC sessions & PacSIDS personnel are beginning to become office holders. See Table 4 and accompanying text.	80% participation maintained by PacSIDS in all relevant WCPFC meetings, with PacSIDS personnel holding senior offices in the WCPFC & its subsidiary bodies. Gender target to be established by the baseline study		
	Number of briefs prepared & preparatory working groups facilitated to support PACSIDS for relevant WCPFC meetings	Processes developed in Phase I for preparation of Briefs & common PacSIDS positions Briefs prepared for all Commission and related meetings, as well as advice on other RFMOs	All request for briefing documents and preparatory working groups are completed and improved participation of PACIFIC PacSIDS		
Output 1.1.2 Proposals for WCPFC & other regional legal arrangements to complement CMMS effectively & deter IUU fishing prepared & supported by Pacific PacSIDS	Status of key WCPFC & other regional legal arrangements & compliance mechanisms operationalized.	WCPFC Vessel Monitoring System (VMS) & Regional Observer Programme (ROP) in early phase of partial implementation, Compliance Monitoring Scheme (CMS) under trial, no Port State Measure or Catch Tracking FFA MTCs out of date. Niue Treaty Implementing Arrangements developed but not in effect. WCPFC VMS and ROP now operational and CMS in place. Niue Treaty implementing agreement in place but in early states of implementation.	WCPFC VMS & ROP operational, CMS operational & Port State & Catch Tracking CMMS adopted. FFA MTCs updated Niue Treaty Implementing Arrangements in effect Reporting to WCPFC streamlined/automated Cooperative surveillance & enforcement enhanced under Niue Treaty	WCPFC Reports, including reports of Commission sessions & the Technical & Compliance Committee Reports of FFA Consultations on WCPFC & relevant FFC reports	Distant water fishing members of the WCPFC are not able to obstruct efforts to deter IUU fishing Additional & effective sources of assistance to PacSIDS in MCS capacity building are identified & taken up

Indicators	Baseline	End of project target	Sources of verification	Assumptions
Extent of submission of proposals for CMMs on WCPFC legal arrangements & compliance mechanisms by PacSIDS , & PacSIDS support for proposed related CMMs	Progress on CMS is constrained, & progress on Port state & Catch Documentation CMMs is severely constrained by considerations related to PacSIDS capacities. CMS now in place: comments regarding Port state control and catch documentation remain valid. See section 8.3 for a discussion of the baseline for CDSs	PacSIDS submit, or support proposals for CMS & relevant CMMs, including CMMs for Port State & Catch Tracking, & streamlined/automated procedures for reporting to the WCPFC		
Patterns of participation by PacSIDS in WCPFC & TCC sessions including extent of representation & office holding, including participation by gender in PacSIDS delegations	There is a high level of participation by PacSIDS at TCC sessions & PacSIDS personnel are beginning to become TCC office holders. See Table 4	At least 85% participation by PacSIDS in all TCC meetings, with PacSIDS personnel holding senior offices in the Commission & its subsidiary bodies		
Outcome 1.2: Adaptive management of oceanic fisheries in the Western Tropical Pacific Warm Pool (WTPWP) LME is put in place through better understanding of the impacts of climate change (CC)	Extent to which understanding of impacts of CC is reflected in management arrangements, including impacts on jurisdiction	There is a general understanding of the expected overall impacts but the information available has not been sufficiently specific to be reflected in management arrangements	Management arrangements including jurisdictional arrangements have been reviewed to take into account effects of CC	Project Reports FFA, PNA, TVM & WCPFC Records
				Analysis of impacts of CC demonstrates need for management to be adapted

	Indicators	Baseline	End of project target	Sources of verification	Assumptions
Output 1.2.1 CC forecasts & vulnerability of the Pacific PacSIDS region assessed & results & recommendations communicated to managers of potential impacts on oceanic fisheries	Forecasts of sub-regional CC impacts on major target species made available and accessible	WCPO-wide forecasts prepared for skipjack & bigeye tuna See Section 3.1.2 and Section 4. WCPO-wide forecast for albacore now prepared	Forecasts of sub-regional CC impacts on 4 major target species available by year 3	Project reports SPC scientific reports	Appropriate technical experts can be recruited Available data supports finer scale (sub-regional) forecasts & analysis)
	Number of assessments of CC impacts on key bycatch species	No information Longline bycatch reports completed for 9 PacPacSIDS under the ISNR programme (See Attachment 4)	Preliminary assessments of CC impacts for 6 key bycatch species by year 4		
Output 1.2.2 Assessment of sea level rise/climate change impacts on fisheries jurisdictions conducted in coordination with related initiatives & related training carried out for 14 Pacific PacSIDS	Scope & quality of technically sound information made available by the Project on the implications of sea level rise/CC on jurisdictional claims, including country-specific information	Some general legal and academic analyses undertaken, but no country-specific or PacSIDS region-specific work known. FAO-sponsored process produced a regional strategy to secure maritime jurisdictions of PacPACSIDS, which was subsequently endorsed by FFC. See Section 4.2	Analyses available of legal, political & economic implications of sea level rise/CC for the Pacific PacSIDS on their jurisdictional claims & sovereign rights with policy and strategy options, with priority to PACSIDS most vulnerable to inundation. At least 45 policy, legal and maritime boundaries personnel from FFA member countries trained in legal and socio-economic implications of climate change.	Project reports, including reports of national & regional consultations	PacSIDS attach priority to addressing the effect of sea level rise on fisheries jurisdiction PacSIDS can reach agreement on a regional approach

	Indicators	Baseline	End of project target	Sources of verification	Assumptions
Output 1.2.3 Updated TDA for oceanic fisheries & updated oceanic fisheries management aspects of the Pacific Islands IW SAP incorporating new information on WTPWPLME stock status, institutional & economic developments & climate variability & change	Increased awareness of jurisdictional implications of CC demonstrated	Broad concerns held but no real awareness of possible responses	Jurisdictional implications of CC addressed at appropriate regional & global fora	Reports of regional & global fora, including the Pacific Islands Forum, & media coverage	Relevant global fora attended by Pacific PacSIDS, high level government representatives
	Status of the revised TDA endorsement and implementation	Transboundary issues analyses undertaken in 1997. Research reveals aparial TDA has been completed for POIOFMP-2.	Revised TDA including climate variability and change adopted by the end of Year 2	Updated TDA finalized & endorsed by PacSIDS	Technical expertise can be sourced to update the technical elements of the TDA & SAP
	Status of the revised SAP endorsement and implementation	South Pacific SAP adopted in 1997 1997 SAP no longer valid; Commission established and operational for more than a decade, and sub-regional arrangements via PNA have changed WCPO tuna management substantially. These developments not reflected in the 1997 SAP.	Revised SAP incorporates new information on stock status, institutional & economic developments, & climate variability and change prepared by the end of Year 2	Ministerial level adoption of a declaration to update relevant sections of the SAP by year 3	PacSIDS have time in a crowded regional calendar to consider the updated TDA & SAP elements



Indicators	Baseline	End of project target	Sources of verification	Assumptions
Component 2 Sub-regional Actions for Ecosystem- Based Management				
Outcome 2.1 Sub-regional conservation & management arrangements are operationalized & enforced, including rights-based cap & trade arrangements for in-zone tuna fisheries, enhancing ecosystem sustainability & incentivized by sustainable fishery certifications	Status of Sub-regional conservation & management arrangements	<p>PNA purse seine VDS in early stages of implementation, other sub-regional arrangements broadly agreed or emerging but not yet implemented.</p> <p>PNA purse seine VDS now implemented and functioning effectively, as evidenced by review (see section 9.1).</p> <p>Harvest Strategy for the South Pacific Albacore Fishery that was agreed between members of the FFC Sub Committee on South Pacific Tuna and Billfish Fisheries in 2013. TKA framework being used to develop and implement a South Pacific Albacore Catch Management Scheme</p>	Project records Records of PNA, TVM & other sub-regional groupings	Sub-regional & arrangements strengthen, & do not undermine sustainable development of oceanic fisheries PacSIDS remain committed to sub-regional management arrangements

Indicators	Baseline	End of project target	Sources of verification	Assumptions
<p>Output 2.1.1 Enhanced sub-regional arrangements in the equatorial tuna fisheries, especially rights-based cap & trade catch or VDS for purse seine & longline fisheries, & fishery certifications</p>	<p>Status of rights-based cap & trade vessel-day schemes, & other PNA management arrangements</p> <p>PNA purse seine VDS beginning to operate with acknowledged weaknesses</p> <p>PNA longline VDS in trial phase</p> <p>See outcome 2.1 above</p>	<p>Weaknesses in the purse seine VDS addressed & longline VDS in operation. Other PNA management arrangements in operation</p>	<p>PNA Records</p> <p>MSC Audit reports</p>	<p>PNA Members maintain solidarity on key issues</p>
	<p>Volume of MSC-certified catch supplied to the market</p>	<p>PNA free school purse seine skipjack fishery certified but no catch marketed</p> <p>Marketing of MSC (Pacifica) tuna via joint venture arrangement with Dutch-based tuna marketing company well advanced.</p>	<p>20,000 tonnes of MSC-certified catch supplied to the market</p>	<p>Industry find it attractive to provide certified catch</p>
<p>Output 2.1.2 Enhanced sub-regional arrangements in the TVM tuna fisheries, especially harvest rights & related management arrangements</p>	<p>Status of harvest rights & related management regimes for TVM fisheries</p>	<p>No formal national harvest rights established for TVM tuna fisheries.</p> <p>QMS systems under development in Cook Islands and Samoa</p>	<p>National Harvest rights for TVM longline & purse seine fisheries agreed & beginning to be used</p>	<p>TVM, FFA & WCPFC (TCC & Commission meeting) records</p> <p>TVM & other PacSIDS able to agree on compatible in-zone management arrangements</p> <p>DWFNs prepared to cooperate in management of key stocks occurring in the high seas</p>

	Indicators	Baseline	End of project target	Sources of verification	Assumptions
Output 2.1.3 Enhancements to other sub-regional management arrangements	Status of monitoring arrangements & operational activities for TVM fisheries	Monitoring arrangements are operational at national level, but these need to be applied to monitoring harvest rights.	Monitoring of use of harvest rights for TVM tuna fisheries beginning to be implemented		
	Status of other sub-regional management arrangements	Additional sub-regional management arrangements are emerging. MSG FTAC operations initiated, but limited in impact to date MSG FTAC non-functional (see section 6.3.4). Emerging interest in supporting TKA members to develop arrangements for south Pacific albacore.	Technical capacity of FTAC strengthened, outcomes and outputs mainstreamed for implementation. Other sub-regional management arrangements contributing to sustainable development of oceanic fisheries where appropriate	Project Records Records of other sub-regional management arrangements	PacSIDS perceive other sub-regional arrangements as contributing to sustainable development of oceanic fisheries

Component 3. National Actions for Ecosystem-Based Management

Outcome 3.1 Innovative ecosystem-based on-the-water CMMs being effectively applied by Pacific PacSIDS in accordance with national plans & policies & with international, regional & sub-regional commitments & other relevant instruments	Number of Pacific PacSIDS applying ecosystem-based CMMs in accordance with new or revised management plans, fisheries policies, MCS plans & laws/regulations	Almost all Pacific PacSIDS have revised national laws to include obligations associated with the WCPFC Convention, but substantial lags exist in implementation of agreed arrangements through national plans, regulations and licence conditions, particularly for bycatch	At least 11 Pacific PacSIDS applying ecosystem-based CMMs in accordance with new or revised management plans, fisheries policies, MCS plans & laws/regulations	FFA Work Programme & Technical Reports WCPFC Reports	
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Indicators	Baseline	End of project target	Sources of verification	Assumptions
<p>Output 3.1.1 New or revised national management plans and policies in support of ecosystem-based management</p>	<p>Number of Pacific PacSIDS that have adopted new or revised oceanic fisheries management plans and/or policies</p>	<p>National management plans and/or policies adopted in at least 11 PacSIDS in support of ecosystem-based management</p>	<p>FFA Work Programme & Technical Reports</p>	<p>PacSIDS remain committed to regional & sub-regional management arrangements</p> <p>Countries willing to host & participate in workshops & make staff available for attachments.</p> <p>Appropriate national personnel able to participate</p> <p>National specialists available to take part</p>
	<p>Number of fisheries management institutional & human resources capacity building activities by PacSIDS</p>	<p>New skills needed as management arrangements become more comprehensive, sophisticated & complex</p>	<p>Project progress reports</p>	
	<p>Number of fisheries management planning & policy personnel trained by PacSIDS & gender</p>	<p>Large number of new management personnel appointed during Phase I requiring training</p>	<p>At least 60 management personnel in 14 PacSIDS trained in fisheries management, planning & policy</p>	<p>Training/ workshop/ attachment reports</p>

Indicators	Baseline	End of project target	Sources of verification	Assumptions
<p>Output 3.1.2 Revised national laws, regulations, license conditions & strengthened MCS programmes to operationalise WCPFC CMMs, sub-regional cap & trade schemes & other relevant conservation & management instruments</p>	<p>Number of Pacific PacSIDS that have adopted new or revised national laws, regulations, license condition & strengthened MCS programmes</p>	<p>Almost all national laws revised to include obligations associated with becoming Party to the WCPFC Convention, but shortfalls identified in the inclusion in national laws, regulations & license conditions of requirements arising from WCPFC CMMs & other sub-regional & regional instruments</p>	<p>Revised national laws, regulations & license conditions in at least 11 PacSIDS revised (to apply WCPFC CMMs, & regional & sub-regional arrangements including PNA implementing Arrangements, MTCs, & the Niue Treaty subsidiary arrangement) adopted.</p>	
	<p>Number of national legal & MCS reviews, consultations & workshops by PacSIDS</p>	<p>New skills needed as CMMs & MCS arrangements become more comprehensive, sophisticated & complex, & the threat of IUU fishing increases</p> <p>Large numbers of new legal & MCS personnel requiring training</p>	<p>Revised national laws, regulations, license conditions & strengthened MCS programmes in at least 11 PacSIDS adopted.</p>	
<p>Number of legal, MCS & enforcement training activities & personnel trained by PacSIDS & gender</p>		<p>At least 55 legal & 320 compliance officers trained to implement WCPFC CMMs, FFA MTCs & national laws</p>	<p>Training Reports</p>	

Indicators	Baseline	End of project target	Sources of verification	Assumptions	
<p>Output 3.1.3 Priority bycatch species integrated into management planning processes at the national level & aligned with relevant sub-regional or regional measures or global instruments</p>	<p>Number of National Plans of Action & National Management Plans for bycatch, & revisions to national laws, regulations & license conditions related to bycatch</p>	<p>Monitoring of bycatch occurring in most PacSIDS, but known shortfalls in implementation of monitoring of bycatch, especially key shark species, & bycatch mitigation measures. Weak regional standards for shark conservation</p>	<p>At least 11 PacSIDS have integrated bycatch mitigation into national management planning processes at the national level & aligned national requirements with relevant sub-regional or regional measures or global instruments. Better understanding of potential contribution of bycatch to food security</p>	<p>Project documentation WCPFC Compliance Monitoring reports</p>	<p>Sufficient priority attached to bycatch mitigation Improved information on bycatch rates & mortalities becomes available Resources available for bycatch mitigation monitoring & research</p>
<p>Outcome 3.2 Integrated data & information systems & scientific analysis being used nationally for reporting, policy-making, monitoring & compliance</p>	<p>Use of oceanic fisheries data and scientific analysis by Pacific PacSIDS.</p>	<p>Most PacSIDS have operational monitoring, licensing & MCS (VMS) data systems in place, but their use is limited gaps, weaknesses & lack of integration of data systems. Phase I outputs, including National Tuna Fisheries Status Reports, national scientific webpages & scientific inputs into ecosystem-based management plans provide a basis with enhanced skills for increased use of scientific advice in Phase II</p>	<p>Enhanced oceanic fisheries data and scientific analysis being used by all 14 Pacific PacSIDS, reflecting upgraded data & information systems in at least 10 Pacific PacSIDS, and newly integrated systems in at least 4 PacSIDS.</p>	<p>Project records FFA, SPC WCPFC Reports</p>	<p>PacSIDS capacity constraints do not unduly constrain their participation in data & scientific work</p>

Indicators	Baseline	End of project target	Sources of verification	Assumptions	
Output 3.2.1 Effective national fisheries monitoring programmes & data & information management systems developed	Level of development of PacSIDS national integrated data & information systems	Most PacSIDS have operational monitoring, licensing & MCS (VMS) data systems in place, but with some gaps & weaknesses. Work on integration has commenced	Upgraded data & information systems in operation in 10 PacSIDS .	Project reports	Countries can afford to release staff for training & attachments.
	Number of monitoring & data staff trained in each PacSIDS & gender balance in participation	Most monitoring & data personnel requiring have received training in regional data systems (TUFMAN); now require upskilling in TUFMAN-2 and data quality and control	Training provided to around 350 national monitoring & data personnel		
Output 3.2.2 National scientific analysis & support for ecosystem-based management of oceanic fisheries by Pacific PPacSIDS	Provision and use of ISNRs and web-page data	Commission-funded stock assessments by SPC/OFP Through the SC process. Increased focus on the provision of, and national capacity to use, ISNRs and data provided through national webpages.	Scientific advice & analysis on oceanic fisheries applied by all 14 PacSIDS	SPC Reports Project reports. Country web-page activity.	All PacSIDS seek national scientific advice.
	Level of participation by PacSIDS in SC sessions including extent of representation & office holding, including participation by gender in PacSIDS delegations	There is a high level of participation by PacSIDS at WCPFC & SC sessions & PacSIDS personnel are beginning to become office holders.	85% participation maintained by PacSIDS in SC meetings, with PacSIDS personnel holding senior offices in the SC	SC reports	Limits of PacSIDS technical & scientific capacities do not prevent them from participating effectively in the SC



Indicators	Baseline	End of project target	Sources of verification	Assumptions
Number of technical & scientific staff trained in each PACSIDS by gender	Regional workshops, attachments & in-country training in Phase I have established the foundation for scientific analyses. RTRF in place (2014) and beginning to be used to coordinate, consolidate and promote training.	Around 120 national technical & scientific personnel trained in stock assessment methods & interpretation & ecosystem assessment & monitoring	Project reports SPC presentations to PacSIDS for WCPFC & SC meetings, & relevant SPC & FFA meetings. Performance metrics in the RTFA.	Countries can afford to release staff for training & attachments.

Component 4. Stakeholder Participation & Knowledge Management

Outcome 4.1 Greater multi-stakeholder participation in the work of the national & regional institutions with respect to oceanic fisheries management, including greater fisheries industry engagement & participation in Project, FFA, WCPFC & sub-regional activities	Percentage of participation by industry & other civil society stakeholders in Project, FFA, WCPFC & sub-regional activities, including INGO & ENGO participation	PITIA & WWF participated in Phase I & both have recently strengthened their programmes in oceanic fisheries management Major progress under Phase I in external communications by the Project needs to be built on	Greater understanding of the need for management & the issues involved with proactive contributions from industry & other elements of civil society to the conservation effort	Project reports PITIA & WWF websites PITIA, WWF, FFA/FFC, SPC & WCPFC reports	High degree of political commitment to transparency & inclusivity Project activities & outcomes are effective in contributing to focusing increased attention on oceanic fisheries, especially management & conservation issues
	Number of national consultative or advisory processes/committees created or strengthened & operational	National consultative & advisory processes are variable & often weak if they exist at all. See Attachment	Formal advisory committees established & operational in at least 10 PacSIDS		

Indicators	Baseline	End of project target	Sources of verification	Assumptions
Output 4.1.1 Broader stakeholder (Pacific PacSIDS , regional institutions, fishing industry & business sector, environmental NGOs, local NGOs, civil society, among others) awareness & involvement	Pacific Island tuna industry contribution to oceanic fisheries management	'Association of Associations' approach has faltered. PITIA is considering an approach based on representing sector interests See 6.4.1 and 10.2.1	PITIA website Media statements made through agreed collective industry positions PITIA promotional material Reports of PITIA meetings	PITIA remains active & able to participate in Project activities PITIA able to use the knowledge & expertise of its Board & members to contribute to this process
Output 4.1.2 Increased awareness & coordination through project workshops & meetings contributing to wider support for national, sub-regional & regional project activities with increased participation by women	Extent of WWF & other ENGO engagement in oceanic fisheries management	WWF has recently strengthened its engagement in WCPO tuna fisheries Growing interest by ENGOs generally in WCPO tuna fisheries management	Websites of WWF & other ENGOs ENGO media statements & promotional material	WWF & other ENGOs able to maintain a focus on WCPO tuna fisheries
	No. of PacSIDS participating in Project Meetings	Level of participation in PIOFMP-I	Reports of Project activities and Meetings Project Gender Analysis	Senior PacSIDS personnel can find time to participate in the Inception Workshop & RSC meetings
	Percentage of participation of women in such events based on sex-disaggregated data	Level of participation in PIOFMP-I		

Indicators	Baseline	End of project target	Sources of verification	Assumptions	
Output 4.1.3 Effective project implementation through M&E with feedback mechanisms utilizing the regional & sub-regional arrangements & existing national mechanisms	Use of M&E Information	N/A	M&E information being used to ensure effectiveness of project activities & being fed into regional fisheries processes	RSC, FFC & SPC Heads of Fisheries Reports Mid-term and Final Evaluation Reports	PacSIDS participate effectively in M&E processes
Outcome 4.2 Increased awareness of oceanic fisheries resource & ecosystems management & impacts of climate change	Level of media coverage of relevant issues	Phase I & the early period of operation of the WCPFC has generated greatly increased interest, focused on iconic non-target species, especially sharks. Awareness of associated with target stocks is inadequate in relation to their regional & global importance	Widespread, well informed coverage in Pacific Islands media of issues associated with conservation management of target & non-target species, & CC impacts	Internet searches Project documentation Technical Reports & media coverage	Project activities & outcomes are effective in contributing to focusing increased attention on oceanic fisheries, especially management & conservation issues
	No. of communiques from relevant regional fora, including Pacific Island Leaders' meetings covering oceanic fisheries	General awareness of the expected impacts of CC on oceanic fish stocks & fisheries, but key institutional & legal aspects have not been raised.	Oceanic fisheries management regularly addressed in Leaders' communiques	Communiques from Pacific Leaders' meetings & other regional fora	

Indicators	Baseline	End of project target	Sources of verification	Assumptions
<p>Continuing donor interest in funding oceanic fisheries agencies & projects</p>	<p>Donors, including the ADB & World Bank shied away from fisheries as catches approached their limits because of perceived lack of potential development gains.</p>	<p>Success in this Project & related activities encourages increased donor interest in Pacific Islands oceanic fisheries, attracted by the scope for increasing value through better management;</p>	<p>Donor reports</p>	
<p>Output 4.2.1 Knowledge management (KM) & information systems (IS) that support communications and advocacy efforts by Pacific PACSIDS for the best management of their oceanic fisheries resources, including creation of a project website, publications, participation in relevant UNDP, FAO and GEF events and information exchanges particularly in IW:LEARN</p>	<p>Phase I strategy provides a basis but needs further development</p>	<p>Strategy developed in year 1 and implemented by Year 2</p>	<p>KM & IS strategy documentation</p>	<p>Skilled media expertise can be attracted to work with the Project</p> <p>Sufficient interest among stakeholders to make website effective means of communication & information dissemination</p>
<p>Project website established and launched in Year 1</p>	<p>Website from Phase I still in operation, but needs updating</p>	<p>Website is in operation by Year 2, and routinely updated, capturing results from Project activities, and providing links to key sources of information on regional oceanic fisheries</p>	<p>Measures of website use</p>	

Indicators	Baseline	End of project target	Sources of verification	Assumptions
Number of Pacific PacSIDS using quality promotional materials	Some experience in Phase I, with some successes, that can be built on, but this was an area identified as needing greater priority in PIOFMP-II	Project promotional materials being used by all 14 PacSIDS	Project CDs, pamphlets, videos, publications & giveaways	Counterparts available to participate in these events
Number of staff participation in relevant UNDP, FAO & GEF events (especially IW/LEARN)	Partnership developed with UNDP & GEF now needs to be complemented by association with FAO	Number of Project staff & counterparts participating in GEF, UNDP & FAO events especially biennial IW Conferences	Project Documents including travel reports	Counterparts available to participate in these events



Abbreviations

3IA	Third Implementing Arrangement of the Nauru Agreement
ABNJ	areas beyond national jurisdiction
B, B₀ B_{MSY}	biomass, biomass in the absence of fishing, biomass associated with achieving MSY
BMIS	Bycatch Mitigation Information System
CCMs	Commission Members, Cooperating Non-Members and Participating Territories
CMM	conservation and management measure (CMM)
CPUE	catch per unit of fishing effort
DWFN	distant water fishing nation
EBFM	ecosystem-based fisheries management
ECOPATH/ECOSIM	a software programme that allows for the modelling of entire ecosystems
EEZ	exclusive economic zone
ENSO	El Nino / Southern Oscillation
EPO	eastern Pacific Ocean
F, F₀ F_{MSY}	fishing mortality, fishing mortality in the absence of fishing, fishing mortality associated with achieving MSY
EU	European Union
FAD	fish aggregating device
FAO	Food and Agriculture Organisation of the United Nations
FFA	Forum Fisheries Agency
FFC	Forum Fisheries Committee
GEF	Global Environment Facility
IATTC	Inter-American Tropical Tuna Commission
IUU	illegal, unregulated and unreported (fishing)
IW	international waters
LME	large marine ecosystem
LOSC	UN Law of the Sea Convention, 1982
MCS	monitoring, control and surveillance
MEA	multilateral environmental agreement
MSY	maximum sustainable yield
mt	metric tonnes
MTCs	Minimum Terms and Conditions (of access)



MTR	mid-term review
MULTIFAN-CL	a length-based age-structured computer model used for fish stock assessment
NFA	National Fisheries Assessment
OFF	Oceanic Fisheries Programme of the Secretariat to the Pacific Community
PNA	Parties to the Nauru Agreement
PacSIDS	Pacific small island developing states
PDO	Pacific Decadal Oscillation
PICT	Pacific Island Countries and Territories
PIOFMP	Pacific Islands Oceanic Fisheries Management Project
PTTP	Pacific Tuna Tagging Programme
RFMO	regional fisheries management organisation
ROP	Regional Observer Programme
RTTP	Regional Tuna Tagging Programme
SAP	Strategic Action Plan
SCTB	Standing Committee on Tuna and Billfish
SEPODYM	spatial environmental population dynamic model
SB, SB₀	spawning stock biomass, spawning stock biomass in the absence of fishing
SPC	Secretariat to the Pacific Community
SC	Scientific Committee (of the WCPFC)
SSAP	Skipjack Survey and Assessment Programme
TFA	Tuna Fisheries Assessment
TKA	Tokelau Arrangement
TR	Terminal report
TRP	target reference point
UNDP	United Nations Development Programme
UNFSA	United Nations Implementing Agreement on Highly Migratory Fish Stocks and Straddling Fish Stocks 1995 (short title)
WTP	Western tropical Pacific
WCPFC	Western and Central Pacific Fisheries Commission
WCPO	western and central Pacific Ocean

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