

MACALISTER ELLIOTT AND PARTNERS LTD.

MSC Public Comment Draft Report

The SZLC, HNSFC & CFA Cook Islands EEZ south Pacific
albacore longline fishery

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Glossary

Term / acronym	Definition
B_0	equilibrium unexploited total biomass
$B_{F_{current}}$	equilibrium total biomass at $F_{current}$
B_{init}	Initial biomass at the start of the stock assessment model (for the albacore assessment, B_{1960})
B_{MSY}	equilibrium total biomass at MSY
CAB	Conformity Assessment Body
CCM	WCPFC Commission Members, Cooperating non-Members, and participating Territories
CFA	China Southern Fishery Shenzhen Co. Ltd
CI	Cook Islands
CIFA	Cook Islands Fishing Association
CIFFO	Cook Islands Fisheries Field Office
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMM	WCPFC Conservation and Management Measure
CNM	WCPFC cooperating non-member
CoC	Chain of Custody
CPUE	Catch per Unit Effort
CSFC	China Southern Fishery Shenzhen Co. Ltd
CTIA	Cook Islands Tuna industry Association
EEZ	Exclusive Economic Zone
eNGO	Environmental Non-Governmental Organisation
ERA	Ecological Risk Assessment
ERA	Endangered, threatened or protected species
FAME	SPC Division of Fisheries, Aquaculture and Marine Ecosystems
FAO	Food and Agricultural Organization
$F_{current}$	Average fishing mortality at age, July 2007 – June 2010
FFA	Pacific Islands Forum Fisheries Agency
FFC	Forum Fisheries Committee
FIP	Fishery Improvement Programme
F_{MSY}	Fishing mortality at age resulting in MSY
FTBOA	Fiji Tuna Boat Owners Association
HCR	Harvest Control Rule
IPOA	International Plan of Action
ISC	International Scientific Committee for Tuna and Tuna like Species in the N. Pacific Ocean
ISSF	International Seafood Sustainability Foundation
IUCN	International Union for the Conservation of Nature
LRP	Limit Reference Point
LTFV	Luen Thai Fishing Venture Ltd
MCS	Monitoring, Control and Surveillance
MEP	MacAlister Elliott and Partners Ltd.

MEY	Maximum Economic Yield
MFEM	Crown Law and Ministry of Finance and Economic Management
MMR	Ministry of Marine Resources of the Cook Islands
MOW	WCPFC Management Options Workshop
MRA 2005	Cook Islands Marine Resources Act 2005
MSC	Marine Stewardship Council
MSE	Management Strategy Evaluation
MSY	Maximum Sustainable Yield
MSY, Y_{FMSY}	equilibrium yield at F_{MSY}
NFMS	US National Marine Fisheries Service
Nm	Nautical mile
NOAA	US National Oceanic and Atmospheric Administration
NPOA	National Plan of Action
NTADS	Non-target and dependent species
OFF	Oceanic Fisheries Programme (OFF) within the SPC Division of Fisheries, Aquaculture and Marine Ecosystems
PCDR	Public Comment Draft Report
PICI	Pacific Islands Conservation Initiative
PICs	Pacific island countries
PITIA	Pacific Islands Tuna Industry Association
PNA	Parties to the Nauru Agreement
PRC	People's Republic of China
RFMO	Regional Fisheries Management Organization
SB_0	equilibrium unexploited spawning potential
$SB_{Fcurrent}$	average current spawning potential in the absence of fishing
SBinit	Initial spawning potential at the start of the stock assessment model (for the albacore assessment, SB_{1960})
<u>SC</u>	<u>Southern Committee OR Scientific Committee</u>
SC7	Scientific Committee 7 th Regular Session
SEAPODYM	Spatial Ecosystem and Population Dynamics Model
SIDS	Small Island Developing States
SP	spawning potential - equivalent measure to spawning stock biomass under the assumption that reproductive output is proportional to biomass over the size at maturity – but can take account of other patterns of reproductive output
SPC	Secretariat of the Pacific Community (formerly South Pacific Commission)
SPREP	Secretariat of the Pacific Regional Environment Programme
SRP	WCPFC Strategic Research Plan
SZLC	Liancheng Overseas Fishery (Shenzhen) Co. Ltd
TAC	Total Allowable Catch
TCC	Technical Compliance Committee of the WCPFC
TRP	Target Reference Point
TVM	Te Vaka Moana
UNCLOS	United Nations Convention on the Law of the Sea
UNFSA	United Nations Fish Stocks Agreement
UoC	Unit of Certification
VDS	Vessel Day Scheme

VMS	Vessel Monitoring System
WCPFC	Western and Central Pacific Fisheries Commission
WCPO	Western and Central Pacific Ocean
WWF	World Wildlife Fund
$Y_{F_{current}}$	Equilibrium yield at $F_{current}$

1. Executive Summary

This report is the Public Comment Draft Report for the SZLC, HNSFC & CFA Cook Islands EEZ south Pacific albacore longline fishery. The assessment team consisted of Dr. Jo Gascoigne (Team Leader, Principle 1), Dr Dale Kolody (Principle 1), Chrissie Sieben (Principle 2) and Ian Cartwright (Principle 3). Two site visits were held: December 2-5 2013 in Cairns, Australia (coincident with the 10th meeting of the West and Central Pacific Fisheries Commission) and February 3 - 4 2014 in Rarotonga, Cook Islands.

The fishery under assessment operates in the EEZ of the Cook Islands. A small proportion of trips may include sets made on the high seas, but these are not included in the Unit of Certification. The fishery lands the catch mainly to a cannery in Pago Pago, but with some landings in Rarotonga and Tahiti. The offshore longline fishery in the Cook Islands EEZ is limited by the Cook Islands Government (Ministry of Marine Resources) to a maximum of 50 licences, although in 2014 only 37 were issued. This fishery has 20 of those licences. The client fishing vessels are Chinese flagged except for one which is flagged in FSM. In 2013, the fishery landed ~2300 tonnes of albacore from the Cook Islands EEZ in total.

The fishery is managed at both the regional level (through the WCPFC, as well as other regional bodies such as FFA and SPC) and at national level (through the Cook Islands MMR). The WCPFC is responsible for management of tuna stocks in its area (as agreed by its member countries), while the Cook Islands may also take additional measures to manage fisheries in its EEZ. Stock assessments and other scientific analyses are conducted by SPC/OFP, while FFA deals with regional-level management issues and management cooperation for its members. Other regional organisations, such as TVM and PNA act as fora for regional cooperation and lobbying. The Cook Islands is a member of all these organisations except PNA. Key management measures in place for this stock are, at regional level, WCPFC CMM-2010-05, which aims to constrain effort on the South Pacific albacore stock south of 20°S, and at national level a ceiling on the number of licences for offshore longliners in the EEZ (50) and a threshold level for total albacore catch from the EEZ of 8,000 tonnes, which will trigger discussion on the need for further management. Neither of these were reached in 2013. In 2012, the 8000 tonne threshold was breached, and action was taken (cancellation of exploratory licences). In addition, the regional Tokelau Arrangement (an agreement of South Pacific coastal states, not yet in force) allows for the application of a 'TAC' on albacore applying to the parties' EEZs, with a division into transferrable national quotas. Regional measures are also in place for the management of bigeye and yellowfin tuna, sharks and sea turtles, and the Cook Islands EEZ has been declared as a shark sanctuary, with retention of sharks prohibited.

In terms of stock status, the most recent stock assessment concluded that stock is not overfished, and that there is a low risk that overfishing is occurring. Current catch levels may be around those equating to MSY, but confidence intervals on estimates of MSY are wide. MSY reference points are estimated in the stock assessment for the purpose of analysis, but are not used in management. A formal limit reference point has been agreed by WCPFC, but likewise is not incorporated into any management measures as yet. The harvest strategy up till now has been to try and control effort, via WCPFC CMM 2010-05 as well as in the Cook Islands EEZ, although the Tokelau Arrangement is a step forward towards control of catches directly.

Key data sources on interactions with other species are i) logbooks and ii) observer reports (the fishery has ~10% observer coverage). Main retained species in the fishery are bigeye, yellowfin and blue marlin. The bait used is Indian oil sardine from China and Oman. There were no main bycatch species. As noted above, since the Cook Islands EEZ is a shark sanctuary, sharks were considered under ETP species. Key ETP species of concern in the

area, and known to interact with longline fisheries, were sharks (blue, oceanic white-tip, mako and thresher) and turtles (loggerhead, hawksbill, leatherback, green and olive ridley). Impacts on seabirds and cetaceans were also considered but not thought to be significant. Key management measures in place for sharks include i) ban on wire traces and ii) a ban on retention of any part. For turtles, they include i) the use of circle hooks, ii) requirement to carry dehookers and iii) a requirement to discard using best practice.

In terms of scoring, the three Principles scored an average score of 80.6 (Principle 1), 83 (Principle 2) and 80.75 (Principle 3). No PI scored less than 60. The assessment team concluded provisionally that the fishery should be certified, subject to eight conditions, three on Principle 1, two on Principle 2 and three on Principle 3. These are summarised below.

One recommendation was also put forward by the team.

Conditions and recommendations:

Condition number	Condition	Performance Indicator
1	The management system should formally adopt a target reference point for the South Pacific albacore stock which is consistent with maintaining the stock at B_{MSY} or some other measure with similar intent or outcome. This target reference point should be used for management purposes.	1.1.2
2	The fishery should put in place a regional harvest strategy, incorporating limit and target reference points (management objectives), a harvest control rule and management actions, such that the strategy is responsive to the status of the stock and the elements of the strategy work together to maintain the stock at or around the target level. The key missing elements of the harvest strategy at present are 1. a target reference point formally adopted by the regional management system, and 2. a well-defined harvest control rule with associated management actions. These issues are also addressed specifically in conditions 1 and 3.	1.2.1
3	A well-defined regional-level harvest control rule should be put in place, with associated management actions (in the form of a CMM or another form as appropriate) which together act effectively to reduce exploitation rates as the limit reference point is approached. The selection of the harvest control rule should take into account the main uncertainties regarding the status of the stock or the impact of the fishery (or other uncertainties if considered important).	1.2.2
4	The occurrence and outcome of all catches of ETP species (sharks, sea turtles, seabirds and cetaceans) by LTFV vessels should be systematically and accurately reported on so that fishery-related mortality on ETP species can be quantitatively determined and the effectiveness of the management strategies can be determined. Where a need has been identified, the collected data should enable further development of management strategies to ensure that the fishery does not hinder recovery of ETP species.	2.3.1, 2.3.3
5	The client will provide evidence that all Cook Islands regulations on fishery interactions with sea turtles are consistently respected and adhered to by LTFV crew so that it can be demonstrated that the fishery does not pose a risk of serious harm to sea turtles, mortality of sea turtles is minimized and the fishery does not hinder recovery of vulnerable sea turtle populations.	2.3.2
6	The client must provide evidence that processes at national level are put in place to i) regularly engage with key stakeholders to seek and	3.1.2

Condition number	Condition	Performance Indicator
	accept relevant information, and ii) demonstrate that the information obtained from such engagement has been duly considered.	
7	<p>The client should demonstrate that the subsidies identified by FFA and acknowledged by the client do not lead to perverse incentives that are inconsistent with achieving the outcomes expressed by MSC principles 1 and 2;</p> <p>Or</p> <p>Implement a harvest strategy that includes strengthened harvest control rules that are more responsive to increasing effort in the albacore fishery, such that the impact of subsidies is restricted to lowering the operating costs of subsidized fleets, rather than acting as an incentive to increase effort.</p>	3.1.4
8	<p>By working with the relevant Cook Islands management agencies, the client should demonstrate i) that decision-making processes at national level respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions and ii) that information on fishery performance and management action at national level is available to stakeholders on request, and that explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.</p>	3.2.2
Recommendation	<p>Frequent infringements against Marpol regulations are noted in the observer reports due to the dumping at sea of plastics, metals, chemicals, and old fishing line. The exact frequency of these types of incidents is unknown and therefore the impact cannot be estimated. While there is no provision in the MSC standard to assess this type of activity against the scoring guideposts, any fishery proclaiming to provide the best environmental choice in seafood (through the MSC logo) should be discouraged from any form of dumping at sea. The team acknowledges that this is a widespread problem across global fisheries; however it is recommended that incidents of dumping at sea are demonstrably reduced.</p>	n/a

2. Authorship and Peer Reviewers

The authors of this report (MEP assessment team) are:

Dr Jo Gascoigne (Team Leader): Dr Gascoigne is a former research lecturer in marine biology at Bangor University, Wales. She is a fully qualified MSC Team Leader with particular expertise in the assessment of Principle 1 (target species stock status and management). She has been involved as expert and lead auditor in all of MEP's previous MSC assessments and numerous pre-assessments. For this assessment, Dr. Gascoigne was the team leader and responsible for Principle 1.

Dr Dale Kolody: Dale completed a Ph.D. in fisheries oceanography (UBC, Canada) and has spent the last 15 years researching pelagic fish and fishery dynamics at CSIRO (Australia), including recent secondments to the Secretariat of the Pacific Community - Oceanic Fisheries Programme (New Caledonia) and Indian Ocean Tuna Commission Secretariat (Seychelles). During this full assessment Dale shared responsibility with Jo Gascoigne for Principle 1.

Chrissie Sieben: Chrissie Sieben has a Master's Degree in Marine Environmental Protection which she obtained at the University of Wales, Bangor. She is MSC fisheries manager at MEP and specialises in marine and fisheries ecology, marine environmental impact assessment and sustainable fisheries. As a fully qualified MSC assessment team member she is involved in MSC pre and full assessments and fishery surveillance audits and participates regularly in MSC CAB training sessions and workshops. Chrissie was the lead author for the pre-assessment of this fishery. During this full assessment she was in charge of Principle 2.

Ian Cartwright: Ian Cartwright is a fisheries management expert with over 30 years' experience in the Pacific region and is based in Tasmania, Australia. From 1996 to 2000 he acted as the Deputy Executive Director of the Forum Fisheries Agency. He subsequently became Director of the consultancy Thalassa Consulting Pty Ltd, working on fisheries management and development in the region. Completed projects include the development of a publicity strategy on the mitigation of the impacts of pelagic longlining for the Secretariat of the Pacific Community (SPC); a baseline study of the western and central Pacific tuna fishery for the Forum Fisheries Agency/Pacific Community (SPC); review of a model fisheries access agreement between developing coastal States and distant water fishing nations for the WWF; and provision of consulting services in connection with the MSC certification of the Australian skipjack fishery. Mr. Cartwright is a fully qualified MSC assessment team member and was in charge of Principle 3.

The peer reviewers for this report are:

Robert Gillett: Mr Gillett has over 30 years fisheries/marine resource sector work with international organizations, development banks, national governments, and private companies in 41 countries. Based in Fiji, his work has concentrated on the fisheries of the Pacific Islands and in particular the tuna fisheries. He has spent three years working on a pole and line tuna vessels. Mr Gillett has completed a number of important reviews of the Pacific tuna industry including looking at bycatch and discard issues for the IOTC, the

provision of information on tuna in the Western Pacific Ocean, a review of the sustainable status of tuna fishing stocks in both the Pacific and Indian Ocean. Mr Gillett has also acted as MSC peer reviewer for both the pole and line Maldivian skipjack fishery and the North Pacific tuna pole and line and troll/jig albacore fishery. He is the co-author of over 300 publications on fisheries and marine resources many related specifically to Pacific based tuna issues.

Dr Max Stocker: Dr. Stocker is a scientist with over 30 years of extensive experience in fisheries science. He is currently proprietor of Stocker & Associates Consultants conducting Marine Stewardship Council certification projects. Dr. Stocker acted as marine fisheries consultant under contract with Fisheries and Oceans Canada (DFO) to provide scientific advice on highly migratory species in the Pacific Ocean. He was the lead Canadian scientist for highly migratory species for the Western and Central Pacific Fisheries Commission (WCPFC) and the Inter-American Tropical Tuna Commission (IATTC). From 1978-2006 Dr. Stocker held the position of research scientist with DFO at the Pacific biological Station conducting population dynamic studies, conducting peer reviewed stock assessments of many marine species, and communicating results to fisheries managers and stakeholders. He authored and co-authored over 90 scientific papers and reports, and made over 50 presentations in national and international scientific meetings. Dr. Stocker chaired the Pacific Scientific Advice Review Committee (PSARC) for many years and edited and published over 30 advisory documents on the stock status of marine species and the implications of harvest management on these stocks. Additionally, Dr. Stocker served as in-house stock assessment consultant to the New Zealand Fishing Industry Board in the early 1990s conducting peer reviewed stock assessments, participating in the peer review process, and advising the Board on inshore and deepwater fisheries.

3. Description of the Fishery

3.1 Unit(s) of Certification and scope of certification sought

MEP confirms that the fishery under assessment is in conformity with Principle 3, Criterion A1 and Principle 3, Criterion B14 of the MSC Certification Requirements v1.3:

- Criterion A1: A fishery shall not be conducted under a controversial unilateral exemption to an international agreement.
- Criterion B14: Fishing operations shall not use destructive fishing practices such as fishing with poisons or explosives.

Therefore, MEP concludes that the fishery is within the scope of the MSC certification process.

The 'unit of certification' (UoC) is the definition of the fishery under assessment (stock/fleet/gear type/management jurisdiction). The first act of the assessment was to define the UoC, as described in the following table:

Species	Albacore (<i>Thunnus alalunga</i>)
Geographical range	Cook Islands Exclusive Economic Zone (excluding the internal waters and territorial sea of the Cook Islands)
Method of capture	Longline
Stock	South Pacific albacore
Management System/s	At national level: Cook Islands Ministry of Marine Resources At regional level: Western Central Pacific Fisheries Commission (WCPFC)
Client group	Luen Thai Fishing Venture (LTFV), with Liancheng Overseas Fishery (Shenzhen) Co. Ltd (SZLC); China Southern Fishery Shenzhen Co. Ltd (CSFC); and China Fishing Agency Ltd. (CFA) conducting albacore longline fishing operations in the Cook Islands EEZ. Liancheng Overseas Fishery (Shenzhen) Co. Ltd (SZLC) is 100% subsidiary of Luen Thai Fishing Venture. SZLC owns 51% of the China Southern Fishery (Shenzhen) Co. Ltd (CSFC). Huanan Fishery (Cook Islands) Co. Ltd. China Fishing Agency Ltd. is 100% owned by LTFV.
Other eligible fishers	None

3.1.1 Scope of Assessment in Relation to Enhanced Fisheries

The MSC defines enhanced fisheries as: Any activity aimed at supplementing or sustaining the recruitment, or improving the survival and growth of one or more aquatic organisms, or at raising the total production or the production of selected elements of the fishery beyond a level that is sustainable by natural processes. It may involve stocking, habitat modification, elimination of unwanted species, fertilisation or combinations of any of these practices (MSC Certification Requirements v1.3).

The fishery under assessment is a wild capture fishery and does not meet the above definition. This fishery is therefore not considered enhanced.

3.1.2 Scope of Assessment in Relation to Introduced Species Based Fisheries (ISBF)

The MSC defines Introduced Species Based Fisheries (ISBF) as: Any fishery which prosecutes a target fin or shellfish species that was intentionally or accidentally transported and released by human activity into an aquatic environment beyond its natural distribution range. This does not include species that are “introduced” into a location due to an expansion in their natural geographic range (MSC Certification Requirements v1.3).

The fishery under assessment does not meet the above definition. This fishery is therefore not considered ISBF.

3.2 Overview of the fishery

3.2.1 Description of fishery

There are two distinct longline fisheries which take place in the Cook Islands EEZ, one based in Rarotonga targeting swordfish and tuna within about 60 nm from the island for primarily domestic consumption, and the other targeting offshore albacore in the northern portion of the Cook Islands EEZ. The fishery under assessment belongs to the second group, prosecuting an offshore longline fishery and landing mostly to a cannery in Pago Pago but also periodically in Rarotonga and Tahiti (with the objective of landing a higher proportion of the catch in these ports in the future).

Offshore fishing for tuna and associated species has been prevalent in waters surrounding the Cook Islands since the 1950s when Japanese longline vessels were active. These vessels began to be replaced in the 1970s by vessels from Taiwan and Korea. The Cook Islands declared their EEZ in 1977 and began licensing Korean and Taiwanese longliners in 1980 and 1981 respectively. These vessels were geared principally for the canned albacore market but also took catches of yellowfin and bigeye (MMR, 2006). Since 2002 a significant domestic-based fleet has become established, and an increasing number of domestic or domestically-based foreign vessel licenses were issued. Today, these licences are limited to a maximum of 50 for the offshore longline fishery, although only 37 were issued in 2014. The client for this assessment has 20 of those licences. In 2013, the Cook Islands issued exploratory licences for bigeye and swordfish longlining (13 bigeye and 4 swordfish). This experiment lasted only one year, because of concerns that some of the bigeye vessels were actually targeting other species, notably albacore. The client fleet was not involved in this fishery.

The client fishing vessels (see Table 1) are registered in China and are predominantly Chinese flagged; note that one vessel carries a Federated States of Micronesia (FSM) flag.

The vessels must comply with Chinese regulations (e.g. in relation to circle hooks, also completing Chinese logbooks) as well as Cook Islands regulations in the Cook Islands EEZ (e.g. completion of SPC logbook, compliance with Shark Sanctuary) (further details on regulations are given in Section 3.5). Depending on the productivity of the fishery within the Cook Islands EEZ, vessels within the UoC are likely to fish year-round. They also occasionally fish in high seas areas adjacent to the Cook Islands EEZ, with 5-10% of trips including one or more sets made on the high seas. The client companies also participate in the tropical tuna longline fishery, mainly operating in and around the Marshall Islands EEZ. This fishery does not catch albacore and is not part of the UoC or considered further in this report.

A client fishing vessel will typically unload 60-80 tonnes after one trip. A reward system is in place for the crew: if more than 50 tonnes is landed then share in the entire landing is increased. Another additional incentive reward is given if landings are > 90 tonnes.

Table 1. Vessels covered by the UoCs.

Vessel Name	FFA VID	IRCS	Flag State	Reg Number	Owner-ship
CFA21	35771	V6P021	FSM	VR0112	CFA
Shen Lian Cheng 883	36512	BZXD94	China	(YUE)CHUANDENG(JI)(2013)FT200025	SZLC
Shen Lian Cheng 884	36513	BZXD95	China	(YUE)CHUANDENG(JI)(2013)FT200030	SZLC
HUA NAN YU 711	36073	BZXD22	China	YUE2010NO.YD000019	CSFC
HUA NAN YU 712	36074	BZXD23	China	YUE2010NO.YD000020	CSFC
HUA NAN YU 716	36238	BZXD24	China	(YUE)CHUANDENG(JI)(2011)FT100020	CSFC
HUA NAN YU 717	36239	BZXD25	China	(YUE)CHUANDENG(JI)(2011)FT100019	CSFC
HUA NAN YU 718	36246	BZXD26	China	(YUE)CHUANDENG(JI)(2011)FT100033	CSFC
HUA NAN YU 719	36247	BZXD27	China	(YUE)CHUANDENG(JI)(2011)FT100034	CSFC
HUA NAN YU 721	36259	BZXD28	China	(YUE)CHUANDENG(JI)(2011)FT100036	CSFC
HUA NAN YU 722	36260	BZXD29	China	YUE(CHUANDENG(JI)(2011)FT100035	CSFC
HUA NAN YU 723	36261	BZXD32	China	(YUE)CHUANDENG(JI)(2011)FT100037	CSFC
HUA NAN YU 731	36435	BZXD33	China	(YUE)CHUANDENG(JI)(2013)FT200009	CSFC
HUA NAN YU 732	36436	BZXD34	China	(YUE)CHUANDENG(JI)(2013)FT200011	CSFC
HUA NAN YU 736	36437	BZXD35	China	(YUE)CHUANDENG(JI)(2013)FT200010	CSFC
HUA NAN YU 737	36481	BZXD36	China	(YUE)CHUANDENG(JI)(2013)FT200020	CSFC
HUA NAN YU 738	36480	BZXD37	China	(YUE)CHUANDENG(JI)(2013)FT200021	CSFC
HUA NAN YU 739	36479	BZXD38	China	(YUE)CHUANDENG(JI)(2013)FT200022	CSFC
Shen Lian Cheng 881	36498	BZXD92	China	(YUE)CHUANDENG(JI)(2013)FT200023	SZLC
Shen Lian Cheng 882	36499	BZXD93	China	(YUE)CHUANDENG(JI)(2013)FT200024	SZLC

3.2.2 Gear

The longline fishing method involves deploying the main line from a large reel, with baited hooks on branch lines attached at regular intervals (Figure 1). In this fishery, the branch lines are 30m long, and the distance between two adjacent branch lines is 30-31.5 meters. Also at regular intervals, floats and float lines are attached, with 30 hooks between two adjacent floats. The floats suspend the main line in the water column at a predetermined depth - the depth of the first hook (the shallowest) 72 m and the depth of the middle hook (the deepest) 310 m. The main lines are 120-130km long, having ~4500 hooks on each. This set-up method for the longlines targets mainly larger tuna at and below the thermocline. The hooks

used are all circle hooks (size 14) - circle hooks are required by Chinese law (Figure 2). Each vessel uses one main line per set, with a soak time of about 13 hours.

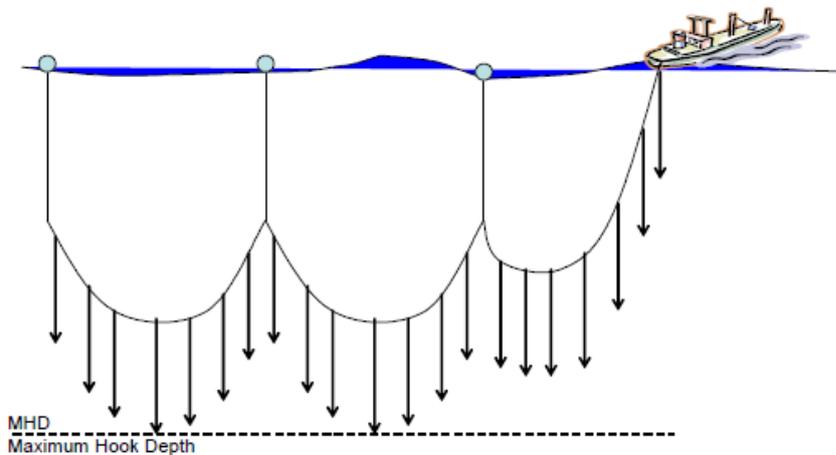


Figure 1. Illustration of set longline. From Kirby & Hobday (2007)

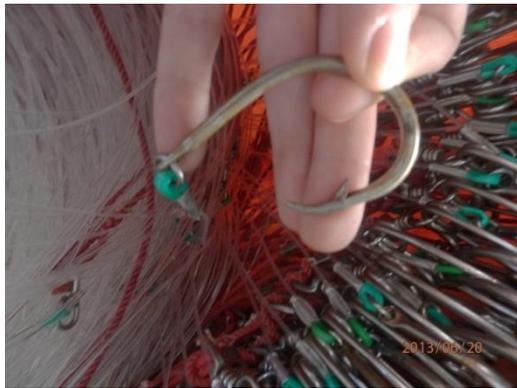


Figure 2. The circle hooks used by the vessels in the UoC. Photo credit: Momo Kochen, ANOVA / Fishing and Living

For bait, the vessels use Indian oil sardine (*Sardinella longiceps*) which is sourced from China and to a lesser extent Oman. Bait is further discussed in Section 3.4.1.4.

3.2.3 Fishing areas

The fishery under assessment takes place within the Cook Islands Exclusive Economic Zone (EEZ) and occasionally in the adjacent high seas – the latter, however, is not part of the Unit of Certification for this assessment. The Cook Islands EEZ borders with Tokelau, American Samoa, and Niue to the west; Kiribati (Line Islands) to the north-east and French Polynesia to the east. Areas of high seas are located immediately to the north and south with a small pocket of high seas to the east. The Cook Islands EEZ covers an area of approximately 1.83 million square kilometres of the central sub-tropical Pacific Ocean, extending between approximately 7-24 degrees South and 168-155 degrees West and including both tropical and sub-tropical areas (Figure 3, Figure 4).



Figure 3. Map of the Cook Islands (from NSDP 2011-2015)

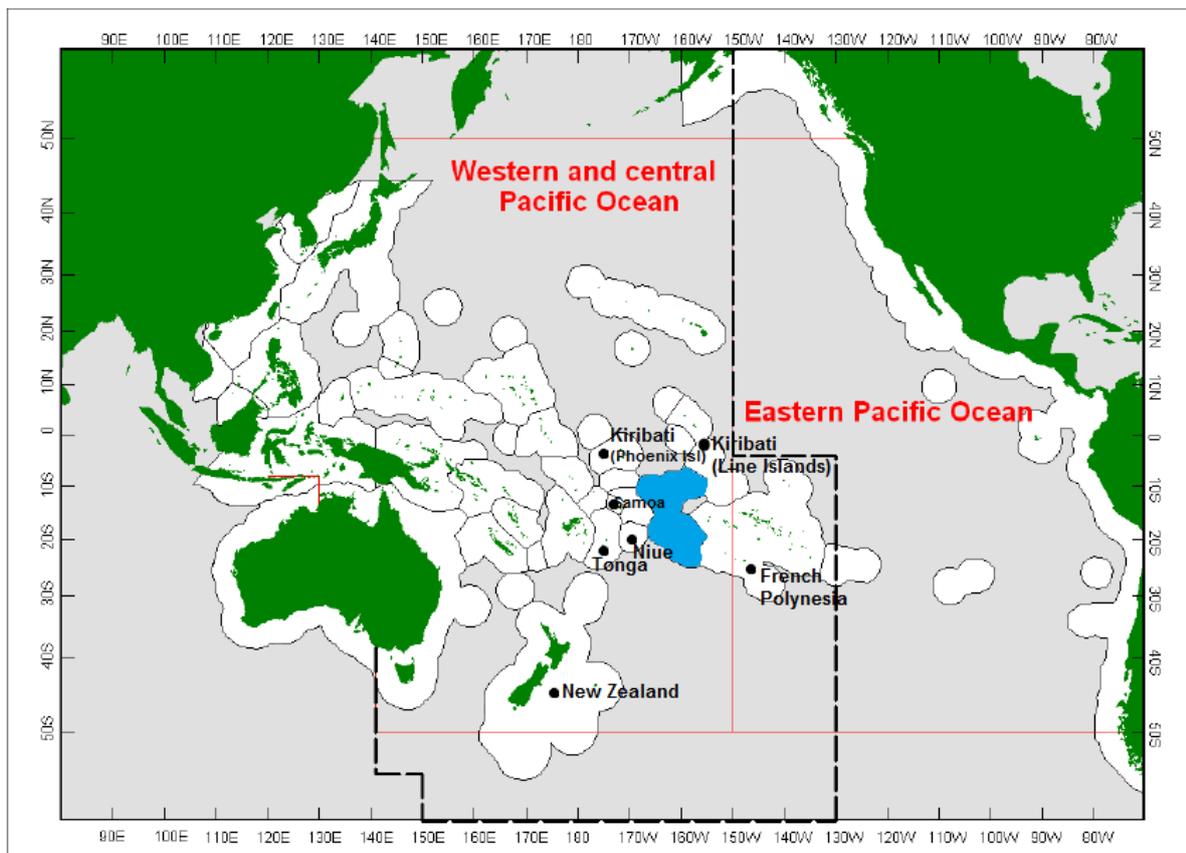


Figure 4. Map showing EEZ delimitation of the Cook Islands in blue (adapted from Harley et al., 2011)

The fishing area used by the client vessels during 2013 is given from VMS traces (Figure 5). Note that these traces amalgamate multiple trips.

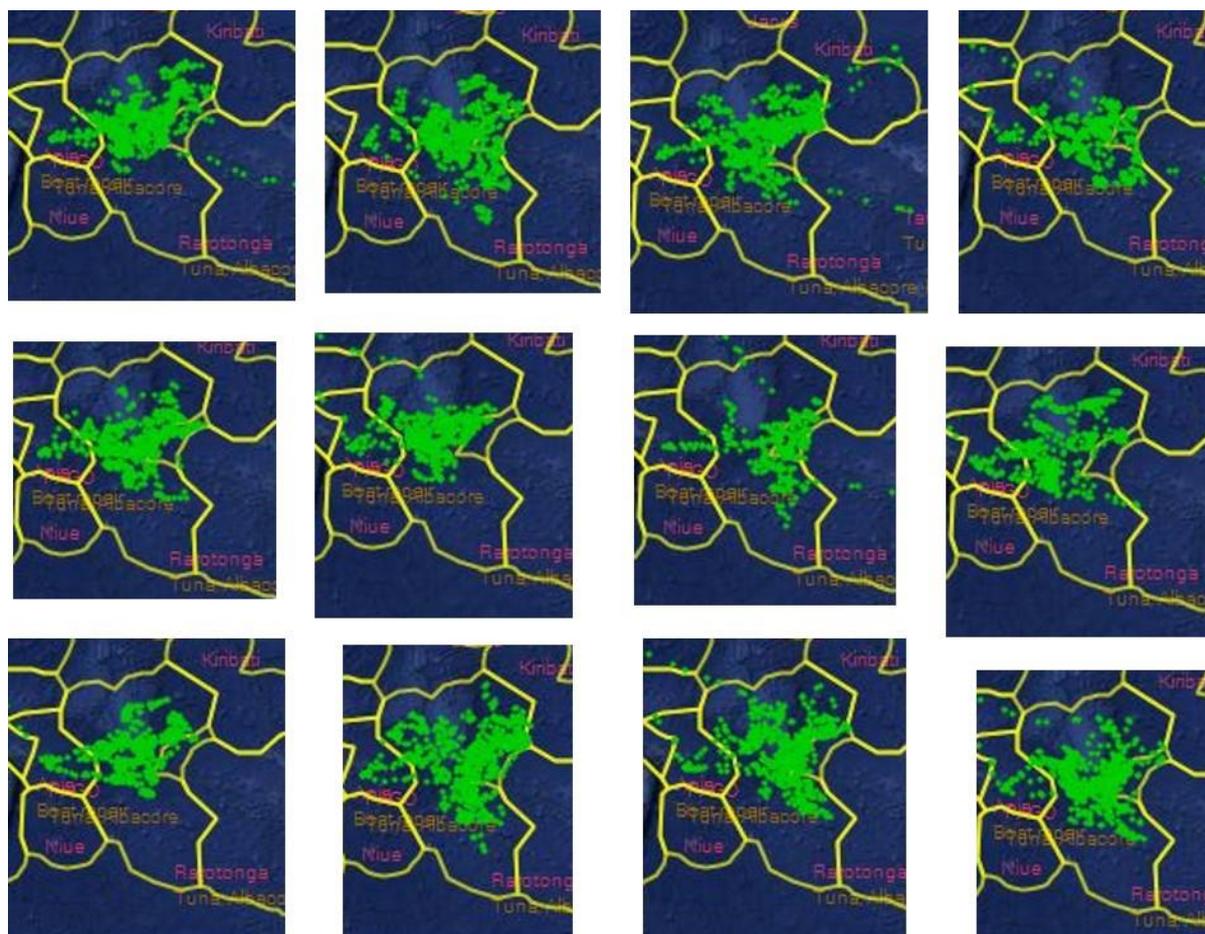


Figure 5. VMS plots from client vessels using the Cook Islands EEZ (2013).

3.2.4 Catch

Catch of albacore and longline effort by the client fleet in the Cook Islands EEZ up to the end of 2013 is given in Table 2. Catch of other species is considered under Principle 2 (Section 3.4). Total albacore catch from the Cook Islands EEZ (as reported to WCPFC) is given in Table 3.

Table 2. Luen Thai Vessel catch of albacore by live weight data (tonnes) and effort (hooks) in the Cook Islands EEZ, 2011-2013. Where an entry is blank, the vessel concerned was not licensed in the Cook Islands for that year.

Vessel Name	Effort (hooks)			Catch (tonnes live weight)		
	2011	2012	2013	2011	2012	2013
CFA 21			697840			205.5
CFA 22		301400	541800		60.5	163.0
CFA 23		310416	489967		71.6	128.3
HUA NAN YU 711	228200	589500	525650	49.8	179.9	114.5
HUA NAN YU 712	134400	823350	631200	23.0	211.5	179.9
HUA NAN YU 716		785523	512653		239.7	114.8

Vessel Name	Effort (hooks)			Catch (tonnes live weight)		
	2011	2012	2013	2011	2012	2013
HUA NAN YU 717		839700	771300		231.3	217.7
HUA NAN YU 718		533178	747300		147.5	183.6
HUA NAN YU 719		781102	557930		194.7	140.6
HUA NAN YU 721		524970	552700		166.5	154.1
HUA NAN YU 722		559200	671600		163.0	186.7
HUA NAN YU 723		607631	552670		159.7	148.0
HUA NAN YU 732			160830			21.7
SHEN LIAN CHENG 760	188800	874230	557100	34.2	259.8	172.7
SHEN LIAN CHENG 761	199850	947530	615500	37.2	266.5	171.1
Total	751250	8477730	8586529	144.2	2352	2302

Table 3. Total reported catch of albacore (tonnes live weight) from the Cook Islands EEZ, total number of albacore licences and client's share of the total albacore catch.

	2011	2012	2013	2014
Total reported albacore catch in Cooks EEZ	6549	10739	7600*	
Total number albacore longline licences	37	63**	59***	36
Client albacore catch in Cooks EEZ	144.2	2352	2302	
Client share of total (%)	1.7	22	30	

* provisional estimate with 10 logsheets remaining to be submitted

** 13 of these were from the BET and SWO Exploratory Program

***4 of these were from the BET & SWO Exploratory Program

3.2.5 Description of management system and legal framework

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

- i. International arrangements, including the Western Central Pacific Fisheries Commission (WCPFC), the tuna RFMO for the Western and Central Pacific Ocean, and its associated bodies.
- ii. The Cooks Islands national government and in particular the Ministry for Marine Resources (MMR).

Two regional agencies play a very significant role in the management system through the provision of technical and other services to their member countries, including Cook Islands. The two key agencies are: i) the **Forum Fisheries Agency (FFA)** and its associated committees, which acts as a forum of common interests and assists its members with the management and development of their tuna fisheries and ii) the **Secretariat to the Pacific Community (SPC)**, which provides stock assessment and other scientific advice to both Cook Islands and its other member countries, as well as acting to provide scientific services to the Commission as per Article 14 of the WCPFC Convention.

In addition to these two agencies, there are a number of other regional organisations related to the south Pacific albacore fishery. Together, they represent a comprehensive, somewhat complex, network of organisations with membership and mandates that have varying

degrees of overlap. A summary table of these organisations and their primary roles and memberships is provided in Table 5.

3.2.5.1 International management framework

Western and Central Pacific Fisheries Commission

The WCPFC was established under the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western Central Pacific Ocean, which is a multilateral agreement having the primary objective of providing for the long-term conservation and sustainable use of highly migratory fish stocks in the Western and Central Pacific Ocean. The WCPFC is the largest of the tuna RFMOs, with over half of the world's tuna catch taken within the Convention Area. These stocks include tunas, billfish and other species listed in Annex I of the 1982 UN Convention, but not sauries (Art. 3.3 of the Convention).

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

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

The Commission has 26 Members, of which most are small island developing states (SIDS). All major coastal and fishing states in the WCPO are Members, except for Vietnam. Current members 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.

Participating Territories are: American Samoa, Commonwealth of the Northern Mariana Islands, French Polynesia, Guam, New Caledonia, Tokelau, Wallis and Futuna.

Several other states are granted cooperating non-member (CNM) status on an annual basis. As CNMs they participate as observers and agree to comply with WCPFC measures in return for being authorised to allow their vessels to fish in the WCPO within set limits. CNM status was granted to Belize, Democratic People's Republic of Korea, Ecuador, El Salvador, Mexico, Panama, Thailand and Vietnam at WCPFC10 in Cairns.

The Commission and its subsidiary bodies were reviewed in 2011 and the overall findings were considered by WCPFC8 in 2012. The review resulted in a significant number of recommendations, many of which have now been addressed. The executive director reports annually to the Commission on progress with addressing outstanding recommendations of the review (for the most recent report see WCPFC10-2013/14).

An independent review of the Commission's science structure and functions (MRAG, 2008) has been conducted, resulting in overhauling of the operation of the Scientific Committee, and adoption of a peer review process and other changes to the data and science functions.

The subsidiary bodies of the Commission provide extensive, detailed reports to the Commission (see for example WCPFC10 2013/17 (SC Summary report) and WCPFC10 - 2013/19 (TCC Summary report)) which include a range of specific advice and recommendations for consideration.

Decision-making is open, with the process, outcomes and basis for decisions recorded in detail in records of Commission sessions and publicly available papers. Consensus is the general rule for decision-making by Commission Members during their annual meetings. If consensus cannot be reached, voting, grounds for appealing decisions, conciliation and review are all part of the established decision-making process, as described in Article 20 of the Convention.

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

The records of Commission meetings show that the Commission takes a wide range of advice and inputs from its subsidiary bodies, members and observers before implementing decisions, including the adoption of conservation and management measures. Scientific advice clearly identifies the extent to which different sources of information have been taken into account. Progressive records of the Scientific Committee and the Commission provide a comprehensive record of the degree to which scientific advice has been incorporated into management decisions (CMMs). Perhaps more significantly, these records and reports to the Commission (e.g. WCPFC10-2013/10 which reported progress with implementing tropical tuna CMM 2013-01) also indicate progress with the effectiveness of these CMMs, as reflected in catch and effort statistics and stock assessments.

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

The Plan addresses four overall research and data collection priorities:

- collection and validation of data from the fishery
- monitoring and assessment of stocks

- monitoring and assessment of non-target associated species and the pelagic ecosystem
- evaluation of existing CMMs and potential management options.

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

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

WCPFC measures relevant to the Cook Islands albacore longline fishery are provided in Table 4 below:

Table 4. WCPFC measures relevant to the Cook Islands Albacore Fishery

Measure	Key relevant features
2010-05 South Pacific Albacore.	<ul style="list-style-type: none"> • Limits of the number of fishing vessels actively fishing for South Pacific albacore in the Convention Area south of 20°S above current (2005) levels or recent historical (2000-2004) levels.
2008-03 Sea Turtles	<ul style="list-style-type: none"> • Implement FAO Guidelines, • Comatose turtles to be brought on board and resuscitation attempted • Proper handling and release techniques and equipment to be applied as per WCPFC Guidelines.
2009-04 Sharks.	<ul style="list-style-type: none"> • Requires full utilisation through retention of carcass • Implement 5% fin to weight ratio • Prohibit retention, transshipment or trading in fins caught in contravention • Encourage live release of sharks in non-target fisheries
2013-01 Bigeye/yellowfin measure (<i>species taken as by-product by the UoC fishery</i>)	<ul style="list-style-type: none"> • Control on FAD sets in purse seine fishery • Closed period for FADs and FAD limits • Ban on high seas FADs (phased in) • Effort restrictions (purse seine and longline) • Purse seine discard ban

Other than 2013-01, these measures represent a response by the Commission to managing longline effort on albacore and to minimize the mortality of sea turtles and sharks. These measures are based on short term, *ad hoc* approaches that have not been successful in halting the increase of fishing effort on southern albacore which has led to catches increasing by 40% between 2005 and 2012 despite the adoption of CMMs in 2005 and 2010 designed to limit entry.

While noting progress with implicit limit reference points for albacore, the current management framework lacks explicit target reference points, TACs, TAEs and harvest

control rules. This need has been acknowledged and two (with a third planned) Management Options Workshops have been convened under the auspices of the Commission to facilitate the development of a comprehensive management framework.

Tokelau Arrangement

The Tokelau Arrangement is a new agreement (agreed 4 July 2014), not yet in force, between South Pacific members of FFA, which provides a cooperative framework for these coastal states to set management measures for albacore within their EEZs. Although the arrangement refers to 'tuna and tuna-like species' the catch of these species is dominated by albacore, to which it in effect relates.

FFA will provide Secretariat services for the Agreement, which foresees that the Parties to the Arrangement will hold an annual meeting to review the stock status of South Pacific albacore (as well as other species if applicable) and apply measures 'necessary for their management and conservation'. Specifically, the meeting will:

- consider relevant data including stock assessments, fisheries information and economic and socio-economic information;
- to consider management measures, which might include i) regulation of effort and/or catch; ii) implementation of a harvest strategy; iii) agreement of precautionary reference points and harvest control rules, as required for the harvest strategy (if they are not regionally agreed); iv) gear restrictions, closed areas or closed season); v) any other measures that seem relevant.
- consider observer, inspection, surveillance and enforcement programmes
- enable cooperation within WCPFC for more effective development and implementation of CMMs
- adopt a budget for tuna management.

More specifically, the Agreement sets out a framework by which a 'Party Total Allowable Catch' (PTAC - TAC for the fishery within the EEZs of contracting parties to the agreement) is established, and divided into national 'PACs'. The PTAC is agreed at the annual meeting, or may be agreed for up to three years at a time. The PTAC is non-species specific – but in practice, as noted above, applies to the South Pacific albacore stock. PACs or part of PACs are transferrable between states by agreement. Rules in relation to joint monitoring and control, in order to implement these PACs and the regional PTAC, remain to be completely defined, but are foreseen to take the form of a joint vessel register, port-to-port monitoring by VMS and electronic logbooks, etc.

Schedule 1 of the draft Agreement sets out an initial proposal for the PTAC and the individuals PACs, based on a combination of each nation's average or highest catch between 2001 and 2012 (with the nations with historically very small catches being allocated a share of 2,500 tonnes) – see Figure 6. Note that since MSY is estimated at ~99,000 tonnes, this arrangement leaves only ~20,000 tonnes available for the high seas fishery, should WCPFC wish to follow up this Arrangement with an overall TAC on the whole stock.

Party	Highest catch 2001-12	Average catch 2001-12	Year (MY 1)	Proportion
			PAC	of TAC
Australia	2,526	578	2,526	3.21%
Cook Islands	10,736	8,602	9,698	12.33%
Fiji	7,294	3,836	7,294	9.27%
Niue	337	0	2,500	3.18%
New Zealand	6,700	3,100	6,700	8.52%
Samoa	4,824	1,730	4,824	6.13%
Solomon Islands	20,879	12,920	14,500	18.44%
Tokelau	252	116	2,500	3.18%
Tonga	1,388	715	2,500	3.18%
Tuvalu	736	569	2,500	3.18%
Vanuatu	8,376	6,500	8,376	10.65%
New Caledonia	1,923	1,716	2,500	3.18%
French Polynesia	4,555	3,407	4,555	5.79%
American Samoa	5,173	2,224	5,173	6.58%
Wallis & Futuna	34	3	2,500	3.18%
TOTAL	75,733	46,016	78,646	

Figure 6. Initial proposal for PTAC and PACs under the Tokelau Arrangement, Schedule 1.

3.2.5.2 Cook Islands management framework

The Ministry of Marine Resources (MMR) of the Cook Islands implements management measures within the Cook Islands EEZ that are consistent with those of the WCPFC.

The conservation, management and development of Cook Islands fisheries is governed by the following legislation:

- Ministry of Marine Resources Act 1984;
- Marine Resources Act (MRA), 2005;
- Longline Fishery Plan 2008;
- Marine Resources (large Pelagic Longline Fishery) Regulations (2012); and
- Distant Water Fishery Plan 2008.

Under Section 6 of the MRA 2005, the albacore fishery within the Cook Islands EEZ is designated as a “large pelagic longline fishery” and deals with fishing for the following species in addition to albacore: bigeye, skipjack, yellowfin and Pacific bluefin tuna; billfish; and other large pelagic species including mahi mahi and wahoo. The fishery is managed under the Large Pelagic Longline Fishery Plan which entered into force on 27th August 2008. Limits on fishing effort and catch and the allocation of fishing rights including catch quantities, effort, time restrictions, fishing areas and fishing gear are provided for in the fishery plan. Fishing in the High Seas requires a separate authorisation to ensure vessels comply with any applicable RFMO requirements.

The team noted some complexity with the current regulatory framework. A replacement for the 2008 Longline Plan (the Marine Resources (Large Pelagic Longline Fishery) Order 2011) was signed by the Minister in 2011, without the 2008 being repealed. Accordingly the 2008 Longline Plan has remained in place.

Cook Islands has taken a comprehensive approach in legislation to the protection of non-target species. The Marine Resources (large Pelagic Longline Fishery) Regulations (2012) requires that NPOAs for seabirds, sea turtles and sharks are complied with at all times.

3.2.5.3 Regional and sub-regional organisations

A summary of the regional fisheries organisations involved in the management of the south Pacific albacore fishery is shown in Table 5.

Forum Fisheries Agency (FFA)

FFA is based in Honiara, Solomon Islands, and has 17 members, including **Cook Islands**. Other members are: Australia, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu and Vanuatu. FFA was established to help countries sustainably manage and develop the fishery resources that fall within their 200 mile EEZs. FFA is an advisory body providing expertise, technical assistance and other support to its members who make sovereign decisions about their tuna resources and participate in regional decision-making on tuna management through agencies such as the WCPFC.

FFA has two major programmes of relevance to the management framework under consideration:

- Fisheries management – providing policy and legal frameworks for the sustainable management of tuna.
- Fisheries operations – supporting monitoring, control and surveillance of fisheries as well as treaty administration, information technology and vessel registration and monitoring.

These programmes provide advice on:

- i) appropriate legal frameworks for national tuna management, including members'
- ii) obligations under various treaties and arrangements;
- iii) appropriate fisheries management frameworks including the incorporation of the principles of ecosystem based fisheries management;
- iv) effective fisheries administration, including access arrangements, licensing of foreign and domestic fishing vessels, governance of fisheries administrations, economic implications of different management systems, and the use of new systems and technologies;
- v) development and implementation of monitoring, control and surveillance systems and effective compliance regimes including the provision of support services including a vessel regional register, VMS and observer programmes; and
- vi) the development of regional co-operation in fisheries management;

FFA also services regional fisheries treaties and arrangements and provides capacity building in the area of fisheries management.

The governing body of FFA, the Forum Fisheries Committee (FFC) provides a valuable forum for the discussion of matters of common interest. FFC (and FFC sub-group) outcomes and subsequent inputs into WCPFC have been instrumental in many of the key conservation and management initiatives agreed in that forum.

Three sub-groups of FFA countries are relevant to the management of the southern albacore fishery. These are:

i) The FFC Sub-Committee on South Pacific Tuna & Billfish (the Southern Committee)

Membership of the Southern Committee comprises: Australia, **Cook Islands**, Fiji, New Zealand, PNG, Samoa, Solomon Islands, Tonga, Tokelau, Tuvalu and Vanuatu. Kiribati, New Caledonia, French Polynesia, American Samoa, Western Pacific Regional Management Council are permanent observers and FFA members are observers. The Committee makes recommendations on issues including the management of southern tunas (including albacore) and billfish to FFC for approval. Their workplan encompasses close to 20 projects that include third-party certification, MCS, management/policy, research & analytical work (e.g. characterisation of the longline fishery, bio-economic analyses).

A number of the FFA proposals on albacore, swordfish, striped marlin, sharks etc., relevant to the fishery under certification, originate from the Southern Committee including proposals for a revised south Pacific albacore CMM, shark CMM and 'eastern pocket' closure. The Southern Committee is developing a south Pacific albacore harvest strategy and a legal instrument underpinning this harvest strategy is currently being negotiated, framed around the Palau Arrangement for purse seine fishing.

ii) Te Vaka Moana

Membership of the Te Vaka Moana (TVM) group (www.tevakamoana.org) comprises: New Zealand, Niue, Samoa, Tonga, **Cook Islands** and Tokelau. The group operates with a New Zealand-funded secretariat and assists its Pacific Island members with a range of initiatives to help inform fisheries management policy choices at the national level. Originally focused on monitoring, control and surveillance (MCS) related matters, TVM has expanded its focus to assist members with the development and expansion of their domestic fisheries to achieve primary objectives of maximising economic benefits within sustainable limits. In addition to MCS, TVM has been active in the area of developing information management systems (data, research), bycatch management and initiatives to maintain and improve the status of the albacore stock. The objectives of TVM are to

1. Strengthen cooperative relationships between the Participants, based on mutual trust and understanding, with the aim of furthering shared goals with respect to the sustainable use of fisheries resources, including increasing the economic benefit that can be derived from fisheries resources and protecting the contribution they make to the food security of communities;
2. Assist with ongoing fisheries related capacity development and enhancing sub-regional capability through enabling the sharing of resources, including fisheries MCS resources;
3. Promote the sharing of information between the Participants with regard to fisheries policy, fisheries management, fisheries development, fishing industry related issues, fisheries science, MCS, and other technical expertise in fisheries;
4. Enhance the ability of the Countries and Territory to cooperate and promote the interests of the sub-region in regional organisations and international fora dealing with fisheries issues, including where appropriate, in collaboration with the FFA and SPC;
5. Promote cooperation between the Participants with regard to MCS, both domestically and on the High Seas, including in seeking to increase the value of fisheries through countering illegal, unregulated and unreported fishing; and
6. Support and strengthen fisheries development initiatives, including via links between the fishing industry sectors.

The TVM group, of which Cook Islands is a member, developed and signed two legal agreements in 2010 (see: <http://www.tevakamoana.org/legal-framework>):

- I. The *Te Vaka Moana Arrangement*, which seeks to build on previous fisheries cooperation between fisheries administrations and lay a foundation for cooperation in fisheries development, management, science, monitoring, MCS and industry development.
- II. The *Te Vaka Toa Arrangement*, which focuses beyond traditional surveillance focussed NTSA's to include cooperation on the full range of monitoring, control, surveillance and enforcement activities needed to support TVM's fisheries management and development aspirations.

Much of the work of TVM takes place through the FFA/FFC and WCPFC.

iii) Parties to the Nauru Agreement (PNA)

The PNA are a grouping of nations with very significant purse seine, as well as tropical longline fisheries. The Nauru Agreement is a subregional agreement on terms and conditions for tuna purse seine fishing licences in the region. The PNA are Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea, Solomon Islands and Tuvalu.

The PNA group established its own office and secretariat in 2009, through the Bikenibeu Declaration. The PNA has driven much of the management reform in the purse seine fishery, including the introduction of an input control system based on vessel day limits (the Vessel Day Scheme (VDS)). The PNA is also working on the development of a zone-based arrangement to limit longline effort based on the VDS. There are some linkages between PNA members and the albacore fishery, given the economic importance of yellowfin and bigeye to the south Pacific albacore longline fishery and the degree to which constraints on purse seine and tropical long line fisheries for these shared species are effective. Further, some PNA states have shown some interest in developing albacore fisheries.

Secretariat of the Pacific Community (SPC)

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

The Oceanic Fisheries Programme (OFP) within the SPC Division of Fisheries, Aquaculture and Marine Ecosystems (FAME) provides Cook Islands and the other Pacific Island members of SPC with scientific information and advice necessary to rationally manage fisheries exploiting the region's resources of tuna, billfish and related species. The OFP also provides, under contract, a range of scientific services to the Commission, as allowed for under Article 13 of the Convention. The OFP has three sections:

- i. *Statistics and Monitoring*: including compilation of catch and effort data, data processing and technical support for port sampling programmes and observer programmes in member countries and territories, training in fisheries statistics and database management, statistical analyses and the provision of statistical support to the WCPFC.
- ii. *Tuna Ecology and Biology*: including analysis of the biological parameters and environmental processes that influence the productivity of tuna and billfish populations, focusing on age and growth, movement and behaviour as observed from classical or electronic data archiving tags, and diet in a more general study devoted to the food web of the pelagic ecosystem; and development of mathematical models to understand environmental determinants of tuna fishery production, including impacts of climate fluctuation.

- iii. *Stock Assessment and Modelling*: including regional stock assessments for the WCPFC, development of tuna movement and simulation models, bioeconomic modelling, and scientific input to national tuna management plans and support for national EAFM analyses, tag-recapture database management. Confidential (to SPC and national governments) National Tuna Fisheries Status Reports are also produced.

Table 5. Summary of regional fisheries organisations and their membership

WCPFC		FFA	Southern Committee of FFA	TVM	PNA	SPC
<i>Tuna RFMO – management of stocks throughout their range in the Convention area (WCP-CA)</i>		<i>Regional fisheries agency that provides technical advice to members and assists with development and management of tuna fisheries</i>	<i>Group of south Pacific FFA states with common interests in longline fisheries, esp. albacore</i>	<i>Group of south Pacific FFA states with interests in the sub-tropical longline fisheries</i>	<i>Group of FFA states with common interests, primarily in the purse seine sector but also tropical longline fisheries</i>	<i>Regional agency providing scientific advice to member states and territories and the Commission</i>
Members: Australia China C. Taipei Canada <u>Cook Is</u> EU Micronesia Fiji France Japan Kiribati S. Korea Marshall Is. Nauru NZ Niue Palau PNG Philippines Samoa Solomon Is. Tonga	Tuvalu USA Vanuatu Participating : Am. Samoa N. Mariana Is Fr. Polynesia Guam N. Caledonia Tokelau Wallis and Futuna Cooperating : Belize N. Korea Ecuador El Salvador Indonesia Mexico Panama Thailand Vietnam	Australia <u>Cook Is</u> Micronesia Fiji Kiribati Marshall Is Nauru NZ Niue Palau PNG Samoa Solomon Is Tonga Tokelau Tuvalu Vanuatu	NZ Niue Samoa Tonga <u>Cook Is</u> Tokelau Solomon Is Kiribati Fiji Australia Vanuatu PNG Tuvalu	<u>Cook Is</u> NZ Niue Samoa Tokelau Tonga	PNG Solomon Is Palau Tuvalu Nauru Marshall Is Micronesia Kiribati	Am. Samoa Australia <u>Cook Is</u> Micronesia Fiji France Fr. Polynesia Guam Kiribati Marshall Is. Nauru New Caledonia Niue N. Mariana Is. NZ Palau PNG Pitcairn Is. Samoa Solomon Is. Tokelau Tonga Tuvalu USA Vanuatu Wallis and Futuna

3.3 Principle One: Target Species Background

3.3.1 Biology and ecology of the target species

Stock

South Pacific albacore (*Thunnus alalunga*) is an epipelagic (juvenile) and mesopelagic (adult) oceanic species. The management unit is the South Pacific stock of albacore. Two albacore stocks (North and South Pacific) are recognized in the Pacific Ocean based on location and seasons of spawning, low longline catch rates in equatorial waters and tag recovery information (Murray 1994, cited in Hoyle et al., 2012). The South Pacific stock is distributed from the east coast of Australia and archipelagic waters of Papua New Guinea eastward to the coast of South America, and south of the equator to at least 49°S. Although there is some suggestion of gene flow between the North and South Pacific stocks based on an analysis of genetic population structure, migration between stocks is not thought significant enough to affect management. For assessment and management purposes, the north-south boundary between albacore stocks is considered to be the equator, with 140° E taken to be the boundary with the Indian Ocean stock (Akroyd et al., 2012). There is no direct evidence of population structure within the South Pacific Ocean; however, the relevant data are limited. Hoyle et al. (2012) note spatial heterogeneity in some fishery or population characteristics (e.g. most notably growth rates), which suggest that mixing rates across the South Pacific might not be very rapid, irrespective of whether there is effectively a single panmictic spawning population. There is increasing evidence that tropical tuna populations may have more structure than generally assumed (e.g. Kolody et al., 2013), and it would not be surprising if this was the case for albacore as well.

Biology

The species is highly migratory, exploiting widely-spaced feeding and spawning grounds, and stocks are thought to be strongly influenced by large oceanic phenomena such as El Niño (Akroyd et al., 2012). The fish start to mature at ~80cm fork length (FL) (length at 50% maturity ~85cm; Farley et al., 2012), and spawn between 10° and 25°S during the austral summer (Figure 7, Figure 8). Juveniles appear to migrate southwards, presumably in search of food in more productive temperate waters, and are recruited to the surface fishery in the central South Pacific (around the sub-tropical convergence frontal zone at around 40°S) and in New Zealand waters at about 1 year old or ~50cm FL.

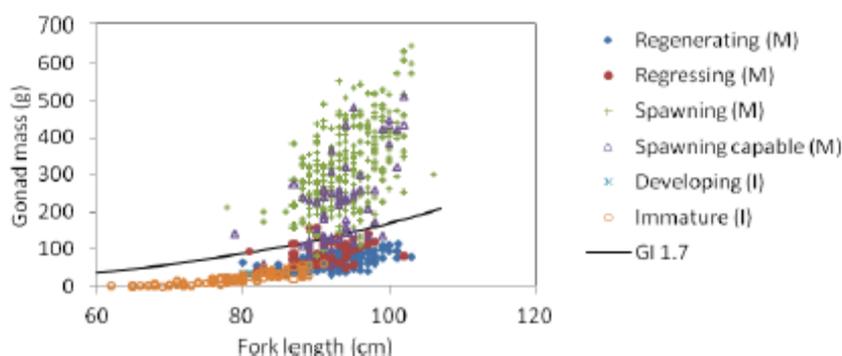


Figure 7. Ovary weight vs FL for albacore by reproductive state (across the whole South Pacific stock). M=mature, I=immature. Line → gonad index of 1.7 – above which assume maturity. From Farley et al. (2012).

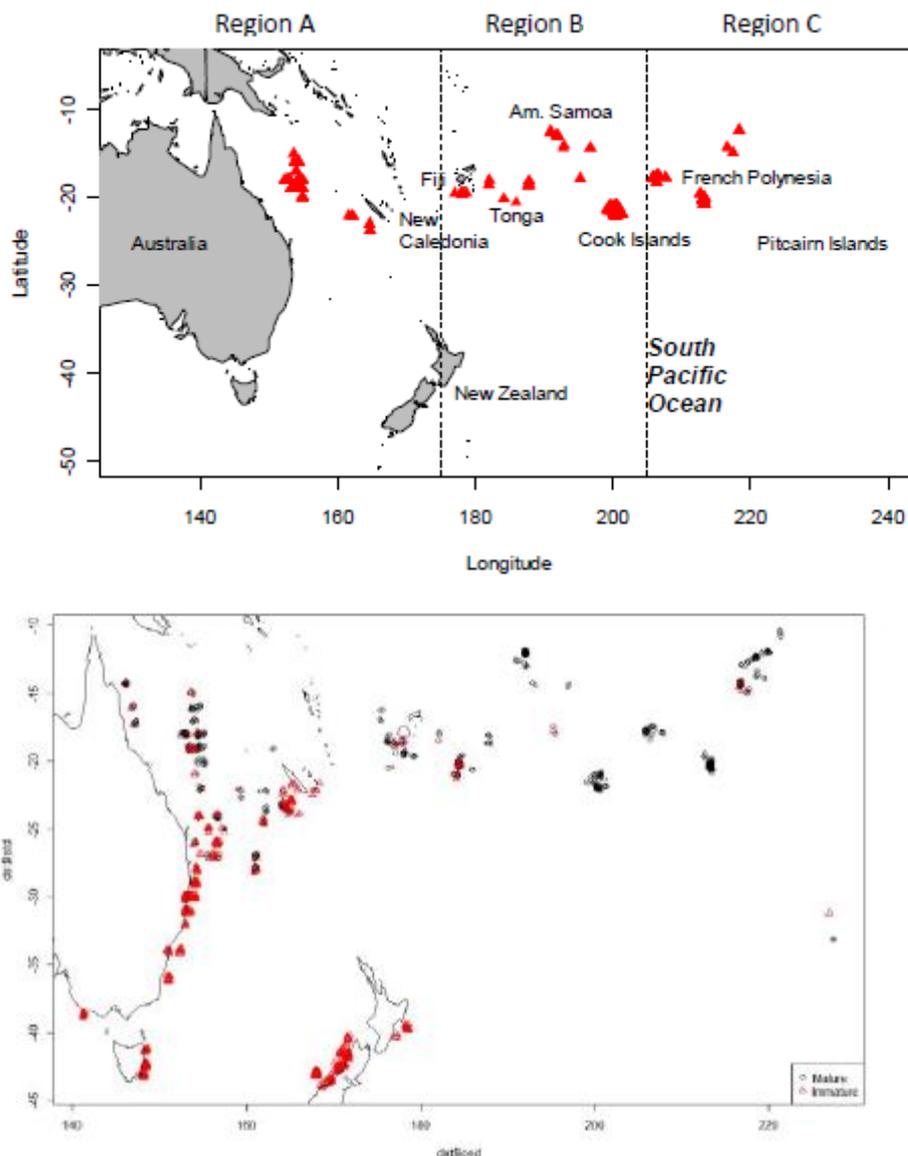


Figure 8. Top: Location of samples of mature (spawning or spawning-capable) female albacore. (Longitude is given in degrees W); Bottom: Sample locations of mature (black) and immature (red) female albacore (Farley et al., 2012).

After this initial migration, the movement of albacore is more uncertain – they may gradually move back north, or may migrate seasonally between tropical and sub-tropical areas, perhaps following the 23-28° isotherm (Langley, 2004, cited in Hoyle et al., 2012). Apparent differences in maturity ogives between northern and southern latitudes suggest that newly mature females migrate north to the spawning grounds, while immature females of the same size remain in more southern latitudes (Farley et al., 2012). Smaller mature females seem to have a shorter spawning period than larger females (starting later and finishing earlier) (Farley et al., 2012).

After the first year, growth rates slow to FL increments of ~10cm per year up to age 4, and slower still thereafter, suggesting that spawning starts at around ages 3-4. Males grow larger than females overall, with the growth curve starting to diverge at approximately the age at maturity (Figure 9). Large sizes classes show a male-dominated sex ratio, which had been thought to be driven by differences in male and female natural mortality rates due to higher costs associated with spawning for females. Sex-specific growth rates, however, may be a

significant factor, since smaller size classes show a female bias – i.e. since females growth more slowly (post-maturity), there is an accumulation of females in the smaller size classes relative to males (Farley et al., 2012).

Albacore also appear to grow faster in the eastern South Pacific than in the west (Figure 10). The reasons for this are unclear; size-specific migration could be a factor. Another hypothesis relates to the difference in thermocline depth, which is shallower in the eastern Pacific where growth rates appear to be higher. It may be that this ‘compresses’ prey into a smaller area, reducing foraging costs (Farley et al., 2012). These differences in growth by sex and by region are of more than academic interest, since the stock assessment turns out to be rather sensitive to assumptions about growth and maturity curves (Hoyle et al., 2012 – see below).

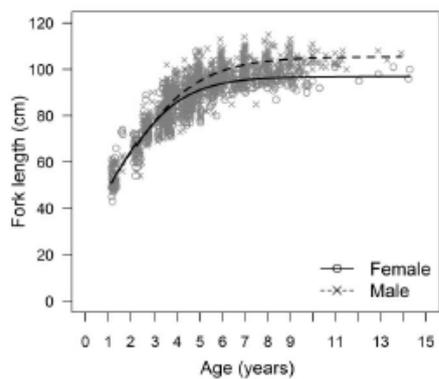


Figure 9. Length at age from otolith and fin spine aging, samples from across the S Pacific for males ($L_{\infty} = 105\text{cm}$) and females ($L_{\infty}=97\text{cm}$). From Farley et al. (2012).

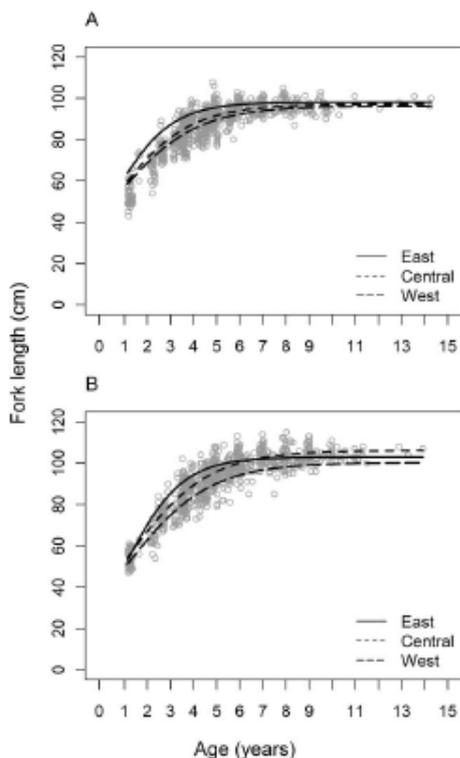


Figure 10. Predicted growth curves from the west, central and east South Pacific, based on longitudinal trends for females (A) and males (B). From Farley et al. (2012).

The longest period at liberty for a recaptured tagged albacore in the South Pacific to date is 11 years (Hoyle et al., 2012). The maximum age estimated by Farley et al. (2012) from readings of 1969 otoliths was 14.3 years.

3.3.2 Other fisheries on the stock

Albacore are mainly targeted by longline fisheries, including both distant-water fleets and locally-based fleets, both large and small scale. There is also a troll fishery for juvenile albacore operating in New Zealand waters and in the central Pacific. There was formally a significant driftnet fishery for albacore, but this fishery has ceased following a UN moratorium on industrial-scale drift-netting. The majority of the catch is taken by the longline fishery, which increased rapidly from 25-30,000 t per year prior to 1998, peaking at >90,000 t in 2009, before apparently declining. Catches from the troll fishery are much smaller – a few thousand tonnes per year at most. Driftnet catches peaked at 22,000 t in 1989, but have not existed since 1991-2 (Hoyle et al., 2012).

Hoyle et al. (2012) provide a list of all the fisheries on the stock which are included in the stock assessment (Table 1 in Hoyle et al., 2012). They include longline fisheries from Japan, Korea, Taiwan, Australia, New Caledonia, Fiji, American Samoa, Samoa, Tonga, French Polynesia and New Zealand, and troll fisheries from New Zealand and the US, as well as (now defunct) driftnet fisheries from Japan and Taiwan.

3.3.3 Reference points

In relation to reference points, there are two separate issues: i) reference points used by stock assessment scientists to evaluate the stock status; and ii) reference points used as part of the management of the fishery (e.g. by triggering management action). These are considered in turn.

Reference points used for stock assessment

Detailed outputs from stock assessment models are generally summarized in terms of key quantitative indicators that succinctly describe the estimated current state of the stock. The states or characteristics of interest typically include catch (yield Y), total biomass (B), spawner potential (spawning stock biomass; SB) and fishing mortality (F). These values are compared to reference points which are derived from a theoretical or historical state of interest, and provide meaningful benchmarks for comparing stock status among fisheries.

The reference points include ‘*MSY*’-related quantities (i.e. Y_{MSY} , B_{MSY} , SB_{MSY} and F_{MSY} represent the theoretical equilibrium Y , B , SB and F that would be observed if all biological and fishery characteristics were stationary and the fishing effort sustained at the level that produced the maximum sustainable yield), and reference points which describe the impact of fishing on the stock. B_0 and SB_0 are the estimated equilibrium biomass and spawning potential before the start of any fisheries. $B_{current,F=0}$ and $SB_{current,F=0}$ represent estimates of the current biomass that would have been observed in the absence of fishing. B_0 is equivalent to $B_{current,F=0}$ for simple theoretical fish populations, but differ when biomass varies due to some cause other than the fishery (e.g. environmental variability affecting recruitment), in which case $B_{current,F=0}$ offers a means to estimate the ‘fishery impact’. B_{init} and SB_{init} are the estimated biomass and spawning potential at the start of the stock assessment time series (1960)¹. These reference values are related to each other as shown in Table 6 for south Pacific albacore.

¹ Note that these terms are all defined in the glossary at the start of the report

Table 6. Reference values used in the Hoyle et al. (2012) stock assessment, as well as some of the ratios between them, for reference. Where applicable, units are '000 tonnes (ratios and F are dimensionless). Where ratios have been calculated by the authors from published data, confidence intervals (CIs) are not estimated. Note that Confidence Intervals here do not have the classical definition – these values represent the percentile from the distribution of the best point estimates (Maximum of the Posterior Density) from 540 models with alternative sets of assumptions.

Reference point or ratio	Median value of output grid	Mean value of output grid	Reference case model run	5% CI	95% CI
Biomass reference points					
B_0	1131	1309	1629	613	2447
$B_{\text{current}, F=0}$	1192	1270	1463	739	2198
B_{init}	1721	2080	2860	463	4546
B_{MSY}	587	664	835	286	1299
B_{MSY}/B_0	0.51	0.50	0.51	0.443	0.55
$B_{\text{current}, F=0}/B_0$	1.05	0.97	0.90		
B_{init}/B_0					
Spawning potential reference points					
SB_0	442	556	721	295	928
$SB_{\text{current}, F=0}$	448	524	618	333	788
SB_{init}	622	831	1130	210	1725
SB_{MSY}	108	126	169	45.7	261
SB_{MSY}/B_0	0.23	0.22	0.23	0.124	0.30
$SB_{\text{current}, F=0}/B_0$	1.01	0.94	0.86		
SB_{init}/B_0	1.41	1.49	1.56		
Other					
F_{MSY}	0.16	0.17	0.16	0.122	0.21
$\text{MSY} (Y_{\text{FMSY}})$	99	108	133	46.6	215

In order to evaluate stock status in relation to these reference points, the various ratio indices are estimated. These indices, and their definitions, are given in Table 7. The indices provide a comparison of the 'current' stock status² to the reference values given above. The most recent estimated values of these indices are given in the next section on stock status.

Table 7. Reference indices used in the evaluation of stock status for albacore. Definition of 'current': average July 2008-June 2010; definition of 'latest': most recent 12 month period available to stock assessment. From Hoyle et al. (2012).

Reference index	Definition
$Y_{\text{Fcurr}} / \text{MSY}$	Equilibrium catch at current rate of fishing mortality relative to maximum sustainable yield (MSY)
$C_{\text{current}} / \text{MSY}$	Current catch relative to MSY
$C_{\text{latest}} / \text{MSY}$	Latest catch relative to MSY
$F_{\text{current}} / F_{\text{MSY}}$	Current fishing mortality relative to fishing mortality producing equilibrium yield MSY
B_{current} / B_0	Current total stock biomass relative to unexploited total biomass
B_{latest} / B_0	Latest total stock biomass relative to unexploited total biomass
$B_{\text{Fcurrent}} / B_0$	Equilibrium stock biomass at current rates of fishing mortality, relative to unexploited total biomass
$B_{\text{current}} / B_{\text{MSY}}$	Current biomass relative to biomass producing MSY as equilibrium yield

² definition of 'current' average of July 2008 to June 2010, as previously given

Reference index	Definition
$B_{\text{latest}} / B_{\text{MSY}}$	Latest biomass relative to biomass producing MSY as equilibrium yield
$B_{\text{Fcurrent}} / B_{\text{MSY}}$	Equilibrium biomass at current rate of fishing mortality relative to biomass producing MSY
$B_{\text{current}} / B_{\text{current,F=0}}$	Current biomass relative to current biomass in absence of fishing (measure of the impact of fishing)
$B_{\text{latest}} / B_{\text{latest,F=0}}$	Latest biomass relative to latest biomass in absence of fishing (measure of the impact of fishing)
$B_{\text{current}} / B_{\text{init}}$	Current biomass compared to biomass at the start of the assessment period (1960)
$SB_{\text{current}} / SB_0$	Current spawning potential (spawner biomass) relative to mean equilibrium unexploited spawning potential
$SB_{\text{latest}} / SB_0$	Latest spawning potential relative to mean equilibrium unexploited spawning potential
$SB_{\text{Fcurrent}} / SB_0$	Equilibrium spawning potential at current rates of fishing mortality relative to unexploited spawning potential
$SB_{\text{current}} / SB_{\text{MSY}}$	Current spawning potential relative to spawning potential at stock biomass producing equilibrium yield MSY
$SB_{\text{latest}} / SB_{\text{MSY}}$	Latest spawning potential relative to spawning potential at stock biomass producing equilibrium yield MSY
$SB_{\text{Fcurrent}} / SB_{\text{MSY}}$	Equilibrium spawning potential at current rates of fishing mortality relative to spawning potential at MSY
$SB_{\text{current}} / SB_{\text{current,F=0}}$	Current spawning potential relative to current spawning potential in the absence of fishing (measure of the impact of fishing)
$SB_{\text{latest}} / SB_{\text{latest,F=0}}$	Latest spawning potential relative to latest spawning potential in the absence of fishing (measure of the impact of fishing)
$SB_{\text{current}} / SB_{\text{init}}$	Current spawning potential relative to spawning potential at the start of the assessment period (1960)

Reference points agreed for management

Work has been ongoing on target and limit reference points by the Scientific Committee (SC) of WCPFC for several years, with limit reference points initially taken as the main priority issue. The report of the 7th Scientific Committee meeting (SC7 2011) proposed a definition for limit reference points as follows:

- defining a state of the stock or fishery which is undesirable and which management action should avoid;
- low probability of breaching the limit reference point;
- management actions should be taken before the fishery is at risk of falling below the limit reference point.

SC7 also recommended that the Commission take a hierarchical approach to identifying limit reference points for the main species, based on the information available on stock dynamics – notably, whether there was good information to estimate the steepness of the stock-recruit relationship (Table 8). (This is a significant source of uncertainty in many stock assessments, including in the most recent assessment for this species, which is discussed in more detail further on in this section.) This approach was endorsed by the Commission at its plenary meeting WCPFC8 (2011). South Pacific albacore is considered to be a level 2 species (along with yellowfin and bigeye; skipjack is considered level 3).

Table 8. The hierarchical approach to defining limit reference points (LRPs), based on information available about stock dynamics, notably stock-recruit steepness (from SC7 2011).

Level	Condition	LRPs
Level 1	A reliable estimate of steepness is available	F_{MSY} and B_{MSY}
Level 2	Steepness is not known well, if at all, but the key biological (natural mortality, maturity) and fishery (selectivity) variables are reasonably well estimated.	$F_{X\%SPR_0}$ and either $X\%SB_0$ or $X\%SB_{current,F=0}$
Level 3	The key biological and fishery variables are not well estimated or understood.	$X\%SB_0$ or $X\%SB_{current,F=0}$

SC8 (2012) recommended a biomass limit reference point for South Pacific albacore (as well as bigeye and yellowfin) to be set at $20\%SB_{current,F=0}$, which was endorsed by WCPFC9 in 2012. $SB_{current,F=0}$ is defined as the ‘*estimated average spawning biomass over a recent period in the absence of fishing*’ (SC8 report, paragraph 298). Discussion of the associated fishing mortality reference point ($F_{X\%SPR}$) was deferred until SC9 (2013).

At SC9, further discussion of the biomass limit reference points related to the definition of a ‘recent period’ (as per the definition of the reference point given above). SC9’s recommendation was to use a 10-year time window (subject to review), up to and including the most recent year used in the stock assessment – this recommendation was endorsed by the Commission during WCPFC10. Another issue was how to deal with recruitment in the estimation of the reference point value – either by estimating it directly in the model, or by scaling it according to the stock-recruit relationship (i.e. the latter case assumes that recruitment would have been higher than the model estimates if there had been no fishery, because the fishery would not have reduced the spawning biomass). Analyses suggested that using the direct estimation approach was consistently less precautionary than the stock-recruit approach, so SC9 recommended the latter method. In relation to the associated fishing mortality reference point, SC9 deferred a decision back to the Commission as to what would be an acceptable level of risk of breaching the biomass reference point (although they considered 5% and 10% in a preliminary analysis). Once this management decision has been taken, analyses can ‘match’ an appropriate level of fishing mortality to the biomass reference point. WCPFC10, however, referred this decision back to the Scientific Committee, requesting them to provide more advice on the implications of different options in relation to risk levels. Currently, therefore, only biomass limit reference points are formally agreed by WCPFC, in the form $20\%SB_{current,F=0}$, where ‘current’ is defined as the most recent 10-year period for which data are available for the stock assessment.

3.3.4 Current stock status

Estimated values of the stock status in relation to reference points from the most recent stock assessment (Hoyle et al., 2012) are given in Table 9 below. Estimates of trends in biomass and fishing mortality relative to MSY reference points are shown graphically in Figure 11 from 1965 to 2010. Hoyle et al. (2012) summarise the outcome of the assessment as follows (for full details of the stock assessment methodology and a discussion of uncertainty in these estimates, see below):

- $F_{current}/F_{MSY}$ has a median estimate of 0.21 (5% and 95% CIs 0.04-1.08), thus it was concluded that there is a **low risk that overfishing is occurring** (Figure 11.).
- $B_{current}/B_{MSY}$ and $SB_{current}/SB_{MSY}$ have median estimates of 1.6 (1.4-1.9) and 2.6 (1.5-5.2) respectively, and therefore the stock is **not in an overfished state** (Figure 11.). SB_{MSY} is estimated to be at a stock biomass of 23% of the unfished level.

- The median estimate of MSY (99,085 mt; 46,560–215,445 mt) is comparable to the recent levels of (estimated) catch from the fisheries (C_{current} 78,664 mt, C_{latest} 89,790 mt)³, although note that confidence intervals are wide.
- There is no indication that current levels of catch are causing recruitment overfishing, particularly given the age selectivity of the fisheries (further details below).
- Longline catch rates are declining, but catches over the last 10 years have been at historically high levels and are increasing (Figure 12, Figure 13). Hoyle et al. (2012) point out that these trends may be significant for management.
- If the fishery continues at current catch rates, then biomass will decline to ~MSY level, and hence catch rates and economic returns will also decline, although not to a point that is biologically unacceptable (although it may be economically unacceptable to some fleets).

Table 9. Estimates of stock status relative to reference points, following the stock assessment indices described above. Colour coding for MSY reference points: green – CIs suggest that current situation (numerator) has a probability of <5% of being on the ‘wrong’ side of reference point (denominator); orange – CIs suggest a probability of >5% but <50% that the current situation is on the wrong side of the reference point. From Hoyle et al. (2012). Note that Confidence Intervals are defined as in Table 6.

Reference index	Median value of output grid	Mean value of output grid	Reference case model run	5% CI	95% CI
$Y_{\text{Fcurr}} / \text{MSY}$	0.70	0.71	0.58	0.37	0.99
$C_{\text{current}} / \text{MSY}$	0.79	0.92	0.58	0.36	1.71
$C_{\text{latest}} / \text{MSY}$	0.90	1.05	0.66	0.41	1.94
$F_{\text{current}} / F_{\text{MSY}}$	0.21	0.33	0.14	0.044	1.08
B_{current} / B_0	0.81	0.81	0.78	0.66	0.96
B_{latest} / B_0	0.80	0.79	0.80	0.62	0.91
$B_{\text{Fcurrent}} / B_0$	0.76	0.73	0.81	0.47	0.90
$B_{\text{current}} / B_{\text{MSY}}$	1.62	1.61	1.51	1.37	1.88
$B_{\text{latest}} / B_{\text{MSY}}$	1.57	1.56	1.55	1.28	1.78
$B_{\text{Fcurrent}} / B_{\text{MSY}}$	1.49	1.45	1.59	0.96	1.81
$B_{\text{current}} / B_{\text{current}, F=0}$	0.82	0.80	0.86	0.62	0.93
$B_{\text{latest}} / B_{\text{latest}, F=0}$	0.80	0.77	0.85	0.56	0.92
$B_{\text{current}} / B_{\text{init}}$	0.57	0.61	0.44	0.37	1.01
$SB_{\text{current}} / SB_0$	0.59	0.59	0.61	0.41	0.76
$SB_{\text{latest}} / SB_0$	0.56	0.56	0.60	0.37	0.72
$SB_{\text{Fcurrent}} / SB_0$	0.56	0.53	0.65	0.26	0.76
$SB_{\text{current}} / SB_{\text{MSY}}$	2.56	2.88	2.58	1.46	5.2
$SB_{\text{latest}} / SB_{\text{MSY}}$	2.38	2.74	2.56	1.33	5.18
$SB_{\text{Fcurrent}} / SB_{\text{MSY}}$	2.39	2.64	2.77	0.94	5.27
$SB_{\text{current}} / SB_{\text{current}, F=0}$	0.63	0.60	0.71	0.35	0.80
$SB_{\text{latest}} / SB_{\text{latest}, F=0}$	0.58	0.56	0.67	0.31	0.77
$SB_{\text{current}} / SB_{\text{init}}$	0.44	0.47	0.36	0.30	0.75

³ ‘Current’ is defined for this stock assessment as the average of July 2007-July 2010, while ‘latest’ is the most recent 12-month period.

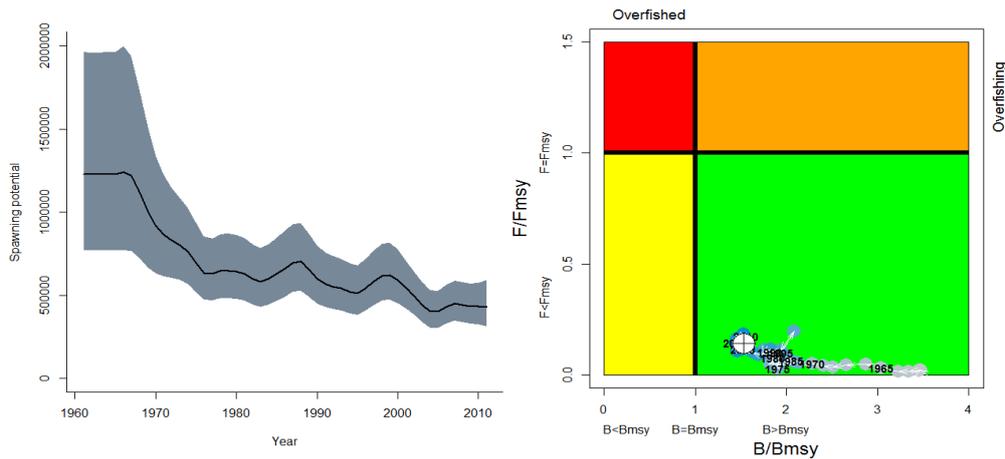


Figure 11. Temporal trend in reference model annual stock status for the model period (starting in 1960). Left: time series of estimates of spawning potential (spawning stock biomass) with estimates of parameter uncertainty in grey. Right: Estimates of stock status relative to B_{MSY} (x-axis) and F_{MSY} (y-axis) reference points. MSY reference points are shown by the black lines dividing the plot into four quadrants. The large white cross is the most recent estimate (2010), and points are labelled at five-year intervals. The last year of the model (2011) is excluded because it is highly uncertain. From Hoyle et al. (2012).

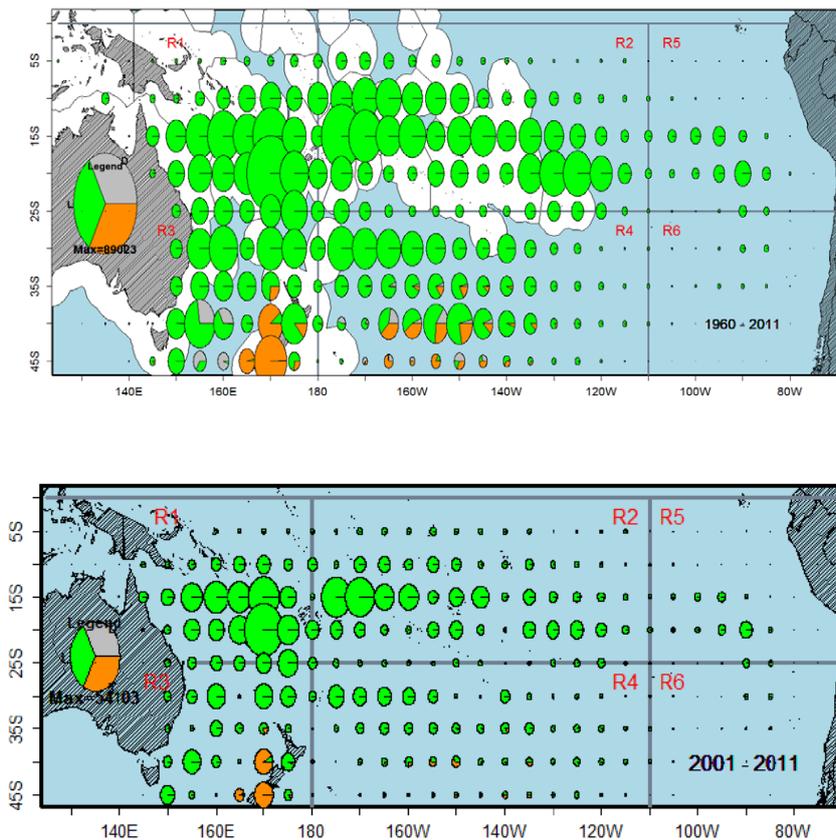


Figure 12. Top: Total annual catch (mt) of South Pacific albacore by fishing method for 1952 to 2011 From WCPFC, 2012. Middle: Map showing distribution of catch 1960-2011 by five degree squares of latitude, by amount (area of circle proportional to total catch in that square), and by gear (green – longline, orange = troll, grey = driftnet). Management regions also shown (Cook Islands EEZ is in region 2). From Hoyle et al. (2012). Bottom: As above but for decade 2001-2011 only.

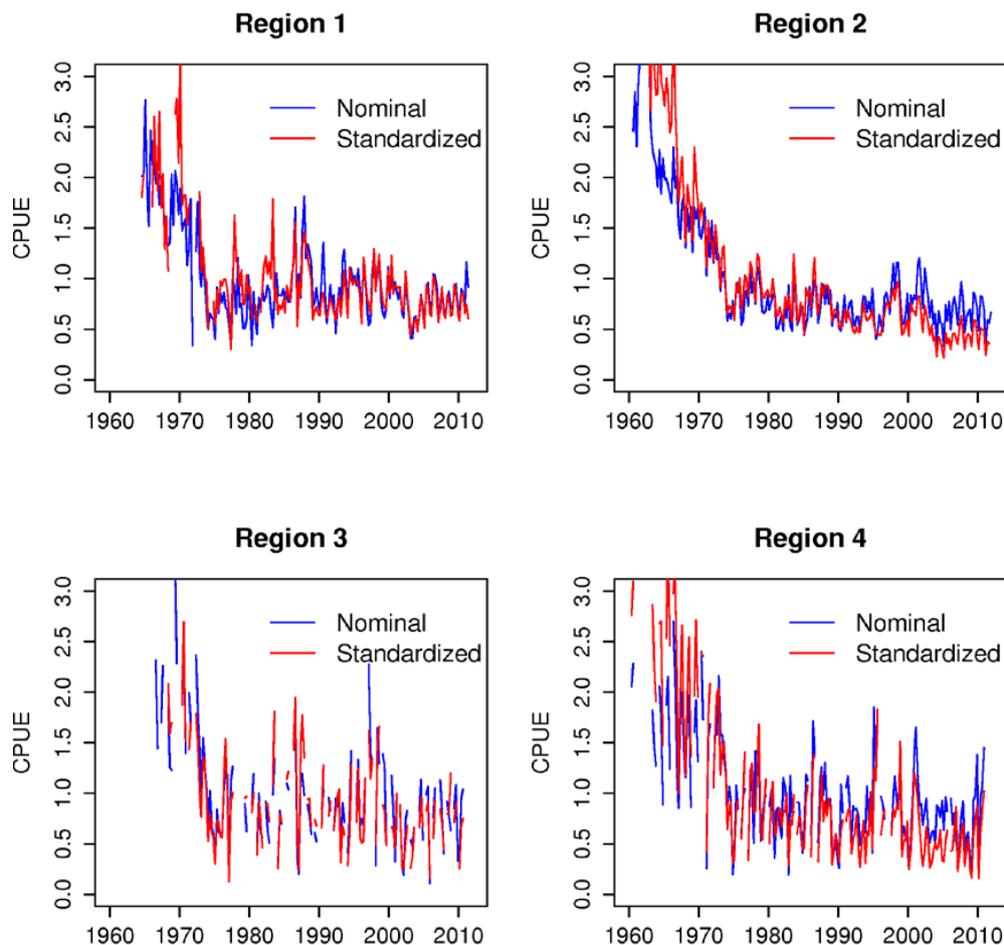


Figure 13: Nominal and standardized CPUE for south Pacific albacore by region (for regions, see Figure 12 above – Cook Islands EEZ is in region 2). From Bigelow and Hoyle (2012).

Although on the face of it the stock status, as evaluated by Hoyle et al. (2012) looks healthy, the decline in catch rates in Region 2 that occurred in the early 2000s have been an enormous cause for concern in the region, as well as leading to economic losses for domestic Pacific fleets (which do not benefit from the same subsidies as some of the distant water fleets, including China's). Although reduction in overall stock biomass has no doubt contributed to catch rate declines (Figure 13), there may also be localised depletion, as suggested by the standardised CPUE trends, which appear to show a decline mainly in Region 2. Changes in catchability may be implicated (Hoyle et al., 2012) – discussed further below.

According to Hoyle et al. (2012) and Harley and Williams (2013), non-standardised CPUE data show a variety of trends by fishery. Leaving aside those where the fishing strategy has altered significantly over time, they note the following:

- Fiji domestic fleet – catch rates increased rapidly in the 1990s before becoming more variable;
- Samoa and American Samoa fleets – catch rates have declined considerably since the early 1990s;
- Tonga – steep decline from the late 1980s onwards;

- French Polynesia – increase in the 1990s, decline since then.
- Japanese longline CPUE in 2012 was ~38% higher than in the period 2007-2011;
- Korean, Chinese and Taiwanese longline CPUE in 2012 was higher than in 2011 but not greatly different from the period 2007-11.

Declines in catch rates within the last decade have been reported anecdotally from several significant domestic longline fisheries (e.g. Fiji, French Polynesia and Samoa) — following periods of relatively high albacore catch (3,000–10,000 mt per year). For the moment, these declines do not show up strongly in the data used for stock assessment, except in Region 2 (Figure 13), but it is important to remember that the data in the stock assessment lags 3 years behind the current situation. The CPUE declines in region 2 could result from environmental variability affecting the local abundance or gear effectiveness in region 2. Or the population structure could be more complicated than generally assumed, in the assessment, e.g. with very “viscous” mixing dynamics, or reasonably discrete sub-populations. Until more is known about fish movements and behaviour, and drivers of spatially-variable patterns of size-frequency and growth (Farley et al., 2012 – see Section 3.3.1), it will be difficult to unpick these patterns.

3.3.5 Recruitment

There is no direct information about recruitment, which is estimated by the stock assessment model as shown in Figure 14. A consideration of the two parts of Figure 15 shows that this estimated decline in recruitment is a significant driver of biomass trends in the stock assessment (i.e. that estimated declines in exploitable biomass due to fishing are not as great as the actual estimated decline in total biomass from the model). Although estimates of recruitment for the last few years show an increasing trend, it is important to note that these estimates, and the role of recruitment variability in the stock dynamics, are very uncertain. (Uncertainties in the stock assessment are considered in detail in Section 3.3.10.) Nevertheless, Hoyle et al. (2012) conclude that there is no indication that current levels of catch are causing recruitment overfishing. The longline fishery selectivities (as determined in part by the area of operation) are estimated to catch very few immature albacore (i.e. most fish at least reach the spawning ground and have the opportunity to spawn before they are vulnerable to the fishery).

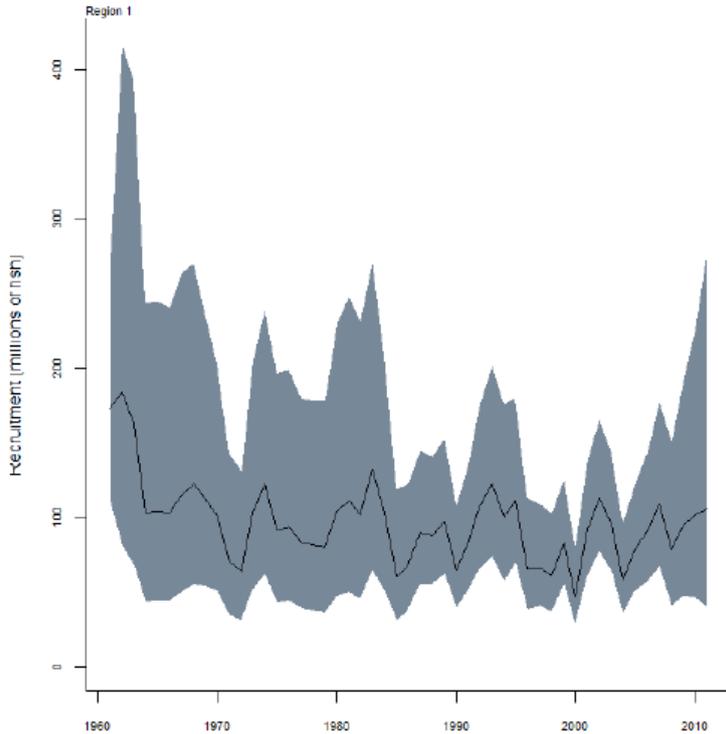


Figure 14. Estimated recruitment over time from the 2012 stock assessment model. Note that the initial decline in recruitment is driven by an attempt by the model to explain declines in CPUE which are not reflected in catches (for which there could be a variety of other explanations) (Hoyle et al., 2012)

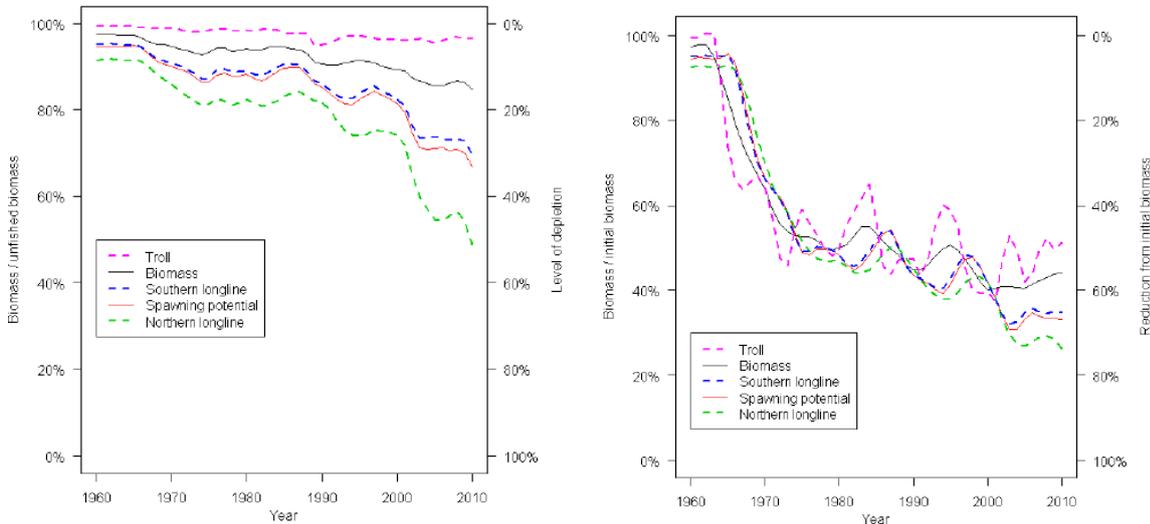


Figure 15. Left: Estimated decline in exploitable biomass (black solid line) and spawning potential (spawner biomass SB) (red solid line) due to the impact of fishing mortality from the troll fishery (pink dashed line), southern longline fishery (regions 3 and 4; blue dashed line) and northern longline fishery (regions 1 and 2; green dashed line), 1960-2010. Right: As above, estimated declines in total biomass relative to initial total biomass B₀. From Hoyle et al. (2012).

3.3.6 Harvest strategy and control rules

There are two strands to the harvest strategy for this fishery: the international component managed under the WCPFC, and the domestic component, managed under the Cook Islands government, Ministry of Marine Resources (MMR). MSC defines a harvest strategy as *'the combination of monitoring, stock assessment, harvest control rules and management actions, which may include an MP or an MP (implicit) and be tested by MSE'* (MSC CR v1.3). The monitoring and stock assessment elements are considered below.

WCPFC albacore harvest strategy

At the level of the South Pacific albacore stock, management is the responsibility of WCPFC. As for all tuna stocks, WCPFC (in 2012) adopted a limit reference point for albacore of $20\%B_{\text{current},F=0}$, as described and defined in Section 3.3.3. No target reference points have been agreed.

The management actions currently in place for South Pacific albacore are set out in CMM-2010-05. Note that this was put in place prior to agreement of the limit reference point, so does not make reference to it. The key element of CMM-2010-05 is that there should be no increase in the number of fishing vessels actively fishing for South Pacific albacore above either 2000-2004 or 2005 levels. However, the CMM specifically allows Pacific Islands (including the Cook Islands) to pursue a responsible level of development of their domestic albacore fisheries over and above these levels. It also requires cooperation on research, as well as annual reporting of catch levels. CMM-2010-05 is set out below:

1. Commission Members, Cooperating Non-Members, and participating Territories (CCMs) shall not increase the number of their fishing vessels actively fishing for South Pacific albacore in the Convention Area south of 20°S above current (2005) levels or recent historical (2000-2004) levels.
2. The provisions of paragraph 1 shall not prejudice the legitimate rights and obligations under international law of small island developing State and Territory CCMs in the Convention Area for whom South Pacific albacore is an important component of the domestic tuna fishery in waters under their national jurisdiction, and who may wish to pursue a responsible level of development of their fisheries for South Pacific albacore.
3. CCMs that actively fish for South Pacific albacore in the Convention Area south of the equator shall cooperate to ensure the long-term sustainability and economic viability of the fishery for South Pacific albacore, including cooperation and collaboration on research to reduce uncertainty with regard to the status of this stock.
4. CCMs shall report annually to the Commission the catch levels of their fishing vessels that have taken South Pacific Albacore as a bycatch as well as the number and catch levels of vessels actively fishing for South Pacific albacore in the Convention area south of 20°S. Initially this information will be provided for the period 2006-2010 and then updated annually.
5. This measure will be reviewed annually on the basis of advice from the Scientific Committee on South Pacific albacore.

The stated objective of CMM-2010-05 is to limit the increase in fishing mortality on the stock for precautionary reasons, due to uncertainties in the stock assessment, despite the fact that the stock has been evaluated to be within MSY reference points.

An analysis of albacore catches by EEZ and by fleet (based on data in WCPFC10-2013-IP02; note: these figures differ from the catch estimates used in the stock assessment, for reasons which are unclear) shows that the objective of CMM-2010-05 is probably not being

met (as measured by changes in albacore catch), nor is it being met either by catches in the Cook Islands EEZ or by catches from the Chinese fleet. In fact, if the Chinese fleet is excluded from the analysis of overall catches, the target is met in terms of catches (Table 10). (Note, however, that the CMM is expressed in terms of vessels actively targeting albacore, not in terms of catch, so that this table does not say anything about implementation or otherwise of CMM-2010-05 for a given fleet. Furthermore, there is a lot of catch north of 20°S, which is also not covered by the CMM. Data are not available in the public domain regarding 'vessels actively targeting albacore'.) Note that the Cook Islands, under the exemption for SIDS, is not required to limit its domestic fleet under CMM-2010-05.

Table 10. Albacore catches (mt) as reported to WCPFC by EEZ (top) and by flag (bottom). Colour-coding: green=catch 2012 is less than either 2005 catch or average catch 2000-4; red=catch 2012 is greater than both. Note that this does not determine directly whether the EEZ or country concerned is meeting CMM-2010-05, since the CMM is defined in terms of active fishing vessels, not catches. (Note: These data come from the WCPFC Year Book 2012 – but these figures are not the same as those used for the stock assessment. The reason for this is not clear.)

by EEZ	Am. Sam.	Aus.	Cooks	Fiji	Kiri-bati	New Cal.	NZ	Fr. Poly.	PNG	Solo-mons	Tok.	Tonga	Tuv.	Van.	High Seas	Total	Total excl. Cooks
2000	625	358		4524	268	885	1334	3463	105	339		858	224	2516	12778	32351	32351
2001	3191	553	9	7294	741	1015	2593	4261	72	170	18	1074	117	2759	22189	50889	50880
2002	5173	503	1092	6218	758	1160	2522	4555	82	1073	190	846	186	2626	28071	59304	58212
2003	3102	389	1840	4035	644	1087	2937	3813	645	931	98	319	52	2799	25722	50773	48933
2004	1905	579	2156	6113	833	1367	1246	2210	1530	2227	128	197	237	3682	23989	49660	47504
2005	2849	616	2282	5596	241	1579	602	2255	2182	2999	31	256	299	6913	22719	52790	50508
2006	4078	2525	1986	5735	303	1348	496	2849	1789	6947		405	8	8303	18405	57554	55568
2007	4428	1866	3634	3667	776	1312	277	3924	1920	4882	252	354	317	5663	15264	51884	48250
2008	2827	1256	2607	4523	254	1484	382	3064	509	8424	144	221	159	6416	20865	55819	53212
2009	3159	1471	5697	5590	721	1611	422	3560	865	11605	26	124	313	6160	27836	72247	66550
2010	2890	706	5905	3759	978	1923	460	3482	806	20862	35	57	186	5279	23997	74087	68182
2011	1959	627	6549	3353	542	1732	418	3223	309	15464	121	41	343	7897	18071	62074	55525
2012	2488	529	10739	4333	1059	1700	267	3590	803	10195	111	1389	738	4619	26537	71145	60406
mean 2000-4	2799	476	1274	5637	649	1103	2126	3660	487	948	109	659	163	2876	22550	48595	47576
2012/2005	0.87	0.86	4.71	0.77	4.39	1.08	0.44	1.59	0.37	3.40	3.58	5.43	2.47	0.67	1.17	1.35	1.20
2012/2000-4	0.89	1.11	8.43	0.77	1.63	1.54	0.13	0.98	1.65	10.8	1.02	2.11	4.52	1.61	1.18	1.46	1.27

by Fleet	Aus.	Cooks	China	Fiji	Japan	Korea	NC	NZ	Fr Pol	PNG	Tonga	Taiwan	USA	Van.	W. Sam.	Total	Total excl. China
2000	381	0	2030	5363	2254	591	895	1344	3473	105	862	9502	1070		4067	32352	30322
2001	591	2	2495	7230	3358	1728	1020	2614	4261	72	1268	12800	3872	655	4820	50890	48395
2002	553	490	2704	7282	2637	2850	1165	2545	4557	82	1189	16057	6104	5275	4223	59306	56602
2003	490	1358	6003	6341	3147	1394	1111	2971	3846	645	611	12187	4258	3180	2253	50775	44772
2004	667	1869	5828	10937	4010	743	1468	1248	2218	1530	182	8313	2614	6237	1233	49659	43831
2005	743	2371	4026	11105	4652	2167	1590	602	2426	2182	283	8610	3058	7648	1263	52790	48764
2006	2591	2223	7115	11477	3371	786	1358	496	2918	1740	414	8590	4146	8001	2113	57552	50437
2007	1925	2644	5424	6984	2806	1035	1324	357	3957	1556	390	8597	5298	6091	3113	51881	46457
2008	1277	2224	15059	9265	2435	1135	1506	382	3068	438	220	7577	3690	4825	2342	55820	40761
2009	1523	1551	20100	12097	2880	1141	1649	422	3560	807	124	11469	3937	7956	2816	72247	52147
2010	745	2423	12951	8745	2464	907	1939	460	3483	791	57	13741	4081	9199	2529	74086	61135
2011	653	2182	11872	7722	2136	443	1736	418	3225	245	34	12772	2752	4621	1414	62078	50206
2012	572	2614	24810	9558	2194	830	1715	266	3594	693	20	11742	3469	6751	2038	71145	46335
mean 2000-4	536	744	3812	7430,6	3081	1461	1132	2144	3671	486,8	822	11772	3584	3837	3319,2	48596	44784
2012/2005	0.77	1.1	6.16	0.86	0.47	0.38	1.08	0.44	1.48	0.82	0.07	1.36	1.13	0.88	1.61	1.35	0.95
2012/2000-4	1.07	3.51	6.51	1.29	0.71	0.57	1.52	0.12	0.98	1.42	0.02	1.00	0.97	1.76	0.61	1.46	1.03

For this report, China provided their Part II reports to the Commission on implementation of CMMs during 2010, 2011 and 2012. The reports note that CMM-2010-05 has been fully implemented by China, in that no additional licences have been issued for albacore south of 20°S. Data were also provided to the Commission as required, including information on high seas catches and catches in the IATTC overlap area.

Overall, given that i) catch rates have reportedly declined (according to stakeholders – see Section 4.4.2), at least in some areas and for some fleets (see discussion above) and ii) that total reported catches were ~35% greater in 2012 than in 2005, it seems plausible to argue that fishing mortality on albacore has increased significantly over the last decade or so, and that CMM-2010-05 has not so far been effective in reversing this trend. The stock status for the moment appears to be healthy, but it is worth noting that the data since June 2011) are not included in the stock assessment. The next stock assessment has not yet been scheduled.

Bearing in mind that it is possible that the next stock assessment will give a less optimistic picture of the stock status of South Pacific albacore, it is therefore worth considering the approach of WCPFC in the past to stocks which decline below their reference points, to evaluate whether there is a reasonable expectation of management action under these circumstances. On this basis, we review briefly the WCPFC harvest strategy for bigeye tuna.

WCPFC bigeye harvest strategy as an example

The agreed limit reference point for central and west Pacific bigeye is the same as for albacore. The most recent stock assessment (Davies et al., 2011), estimated stock status in relation to a variety of reference indices, including $SB/SB_{current,F=0}$ (Table 11). From this assessment (now somewhat out of date), catch and fishing mortality are above MSY levels, but total biomass and spawner biomass are also above MSY levels, with the spawner biomass apparently approaching the limit reference point level ($SB_{current}$ estimated at $23\%SB_{current,F=0}$, LRP at $20\%SB_{current,F=0}$). This means that although the stock status in terms of biomass is fine for now, exploitation rates are most likely not sustainable: the stock is not overfished, but overfishing is occurring (Figure 16).

Table 11. Reference indices used in the evaluation of stock status for bigeye and their estimated value. LRP defined in terms of the final row (in bold) – LRP set at 20% (Davies et al., 2011).

Reference index	Estimated value for bigeye
$C_{current} / MSY^4$	1.84
$F_{current} / F_{MSY}$	1.46
$B_{current} / B_0$	0.44
$B_{current} / B_{MSY}$	1.25
$B_{current} / B_{current,F=0}$	0.29
$SB_{current} / SB_0$	0.35
$SB_{current} / SB_{MSY}$	1.19
$SB_{current} / SB_{current,F=0}$	0.23

⁴ definition of 'current' = average 2006-09

The most recent stock assessment for WCP bigeye (Davies et al., 2011) is summarised as follows:

- Two estimates of MSY are provided, depending mainly on assumptions about long-term recruitment (74,993 t and 131,400 t). Recent catches, although uncertain, are likely to be higher than both these values.
- For all model runs, estimated current fishing mortality (F_{current}) is greater than F_{MSY} . The assessment estimates that a 30% reduction in F from the 2006-09 level is required to bring F to sustainable levels (i.e. at or below F_{MSY}).
- Total biomass and spawner biomass are both estimated to be above the MSY level, with an estimated probability of 13% that SB_{current} is actually below SB_{MSY} . Note, however, that other model runs (using only more recent recruitment estimates) give bigger estimated values for the MSY biomass reference points, and therefore conclude that the stock biomass is already below these reference point levels, and hence that overfishing is already occurring.
- At current rates of fishing mortality, the assessment predicts that the stock would be reduced to an equilibrium biomass of 65% of B_{MSY} (60% of SB_{MSY}) in the long term.
- MSY would increase (reducing the probability of overfishing) if fishing mortality on small fish were reduced.

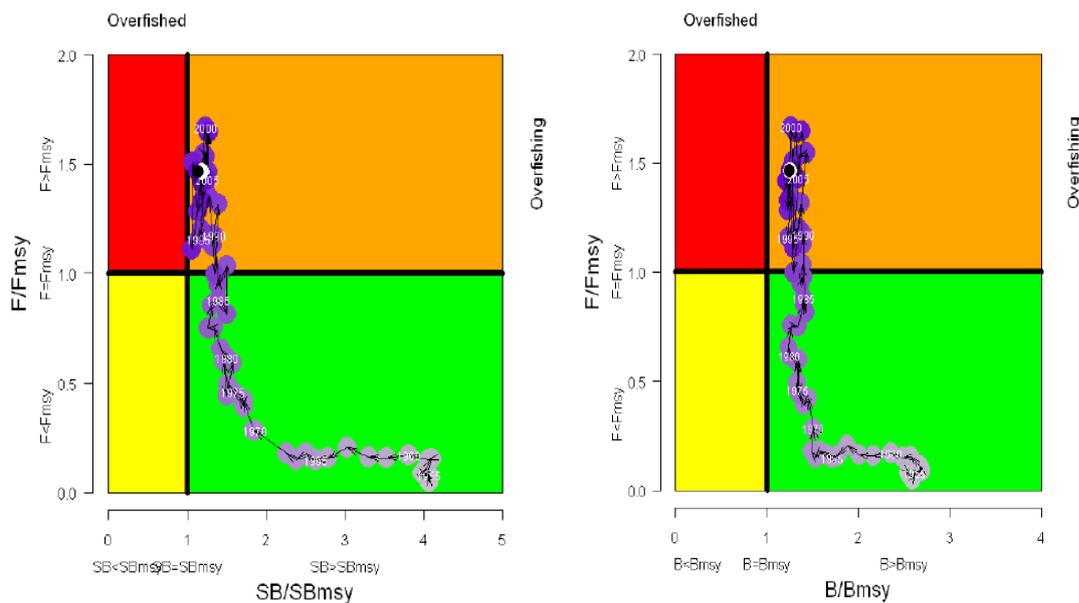


Figure 16. Temporal trend in annual stock status, relative to B_{MSY} (x-axis; left) or SB_{MSY} (x-axis; right) and F_{MSY} (y-axis) reference points, for the model period (1952-2009), colour-coded as for Figure 6 above. The colour of the points is graduated from mauve (1952) to dark purple (2010) and the points are labelled at 5-year intervals. The white circle represents the average for the period 2006-09 and the black circle the 2009 values. From Davies et al. (2011).

The WCPFC harvest strategy for bigeye tuna is set out in CMM-2013-01 (Conservation and Management Measure for bigeye, yellowfin and skipjack tuna in the West and Central Pacific Ocean; replacing CMM-2012-01). The stated objective of CMM-2013-01 for bigeye is the gradual reduction in fishing mortality, to reach $F \leq F_{\text{MSY}}$ by 2017, as was the objective of CMM-2012-01. CMM-2012-01 put in place interim measures for 2013, and stated that for 2014 onwards, the Commission would be required to put in place a multi-year management programme – presumably, this is what is represented in CMM-2013-01. On this basis, it is at least clear that some action has been taken in recognition of the issue of bigeye overfishing.

The main elements of CMM-2013-01 relating to bigeye are as follows:

1. Control on FAD sets

For 2014:

- prohibition on setting on FADs for July, August and September, in EEZs and on the high seas
- for each CCM either a) fourth month of closure (October), b) limit on the total number of FADs set by its vessels

For 2015-16 (subject to agreement on measures to avoid 'disproportionate burden' on SIDS):

- prohibition on setting on FADs for an additional two months (January, February, July, August, September), ensuring that total FAD sets in 2015-16 do not exceed those in 2010-12 (for non-SIDS); or
- three month FAD ban as for 2014, plus limit on total number of FADs set by vessels of that CCM

For 2017 (subject to agreement as above):

- Ban on FAD sets in the high seas, except for Kiribati-flagged vessels in adjacent high seas areas

2. Purse seine effort

- PNA coastal states to restrict effort in their EEZ to 2010 levels (NB: this represents most of the tropical tuna purse seine effort)
- Other coastal states with >1500 days of effort per year over the period 2006-2010 to limit effort in their EEZs to 2001-04 average or 2010 levels
- Other coastal states to establish effort or catch limits consistent with the objectives for each species
- Non-SIDS CCMs to restrict high seas purse seine effort to agreed levels to be reviewed annually
- CCMs other than SIDS and Indonesia not to increase number of freezer purse seiners >24m fishing between 20°N and 20°S over current levels

3. Longline effort

- Catch limits for bigeye by longline for CCMs catching >2000 tonnes per year; CCMs with smaller catches limited to 2000 tonnes per year for 2014-17
- CCMs other than SIDS and Indonesia not to increase number of freezer longliners targeting bigeye over current levels

4. Other

- All skipjack, yellowfin and bigeye to be retained on board purse seiners except in exceptional circumstances
- All purse seiners fishing between 20°N and 20°S to have an observer on board
- CCMs fishing on the high seas shall submit a FAD management plan
- CCMs to 'explore' spatial management
- SIDS permitted to continue to expand their own domestic fleets

Overall, these measures are not likely to add up to a major reduction in fishing effort on bigeye, and they were not greeted by stakeholders with wholehearted enthusiasm: FFA 'reluctantly supported' the draft CMM; PNA, Japan and the Philippines considered that their own proposal would have been more effective, particularly in limiting high seas effort; Papua

New Guinea expressed its 'disappointment'; and environmental NGOs summarised it as 'inadequate' (WCPFC10 2013). Nonetheless, it is a step forward from CMM-2012-01 which put in place only interim measures. The main test will be the Commission's response to the next bigeye stock assessment (one will be presented in 2014, but it may be provisional).

Cook Islands albacore harvest strategy

In addition to this overall strategy for the stock, the Cook Islands has a strategy for managing large pelagic catches in their EEZ (which is part of the UoC for this fishery). The guiding documents are the following:

- Marine Resources Act 2005, which will soon be superseded by a new Act, currently going through approval in the form of the Marine Resources Bill 2013
- Large Pelagic Longline Fishery Regulations (2012)
- Large Pelagic Longline Fishery Plan – the assessment team was provided with a version dated 2007 (apparently finalised in 2008). This version is, however amended within the Regulations (2012), thus generating the Large Pelagic Longline Fishery Plan 2012 which was reported to the Commission in the 2013 Part 2 report. It is not clear, however, whether this document is in day-to-day use within MMR.
- Offshore Fisheries Policy – a general statement of policy objectives and elements for the information of the general public.

The Cook Islands fisheries management framework is considered in more detail under Principle 3 below. Here we consider the implications for the management of the South Pacific albacore stock as it enters the Cook Islands EEZ.

The main practical elements of the Cook Islands harvest control rule for albacore within its EEZ are:

- cap on licences for the large pelagic longline fishery of 50
- catch limit of 8000 tonnes in any four-quarter period, after which the Secretary of MMR '*will review the impact of this level of catch on achievement of the objectives of the Plan, and may reduce the total number of longline licences, or apply appropriate limits to fishing in the fishery waters, which may include time/area closures*'.

Licences: The cap on licences of 50 was previously divided spatially in the Cook Islands EEZ, with a limit of 40 licences to fish in the northern EEZ and a further 10 in the southern EEZ. The southern area is, however, less productive, and has never been of great interest to longline fishers. The spatial division was therefore removed in 2012, resulting in a overall cap of 50, not limited by area. As of May 2014 there are 37 licences for this fishery. In addition, in 2012, 17 exploratory licences were granted for bigeye and swordfish longlining (13 for bigeye and 4 for swordfish), under the regulations for exploratory fisheries (see Regulations 2012). Several (6) of the bigeye vessels, however, were reportedly targeting albacore rather than bigeye. The 17 exploratory licences were therefore not renewed in 2013. This temporary activity in 2012 probably led to the anomalously large albacore catch recorded in the Cook Islands EEZ in 2012 (10,739 tonnes, compared to 6,549 tonnes in 2011 and ~7,600 tonnes (provisional) in 2013).

Catch limit: Although sometimes referred to as a TAC for convenience, the catch limit of 8000 tonnes is not intended as a legal maximum, but rather as a point at which the MMR is required to review the likely consequences of the fishery in relation to the objectives of the management plan (notably long-term sustainability and economic viability of the fishery). With the exception of the short-lived experiment with exploratory licences in 2012, this limit

has not been exceeded since the fishery started reporting to WCPFC (2001), although the total catch for 2013 may come near this limit (estimated in February 2014 at 7,600 tonnes with 10 logsheets remaining to be submitted). It is not clear whether the non-renewal of the exploratory licences was a direct result of the catch limit on albacore being exceeded, or was more the result of the fact that the licencees were not apparently complying with the terms of the licences (to target bigeye rather than albacore).

3.3.7 Information and monitoring

Fisheries-dependent data

The stock assessment is based mainly on fisheries-dependent data: catch, effort and length-frequency in the catch. The fishery-dependent dataset used in the most recent stock assessment (Hoyle et al., 2012) covers the period June 1960 to June 2011 (although for the most part results are given up to the end of 2010), and covers the area from the equator southwards, from 140°E to 70°W – i.e. the entire South Pacific, not just the WCPFC convention area (see Figure 12 above).

Catch and effort data are obtained mainly from the following fisheries:

- Longline: Japan, Korea, Taiwan, Australia, New Caledonia, Fiji, American Samoa and Samoa, Tonga, French Polynesia and New Zealand (catch by number, effort measured in hooks);
- Troll: New Zealand, USA (catch by number, effort measured in days)
- Drift net (historical data): Japan, Taiwan (catch by weight, effort measured in days)

The data come from nominal 5^o-month aggregated data provided by distant-water fishing nations and from logsheet data from domestic longline fisheries. Domestic Pacific island countries have frequently complained that the distant-water fishing nations, including China, should provide more spatially- and temporally-detailed catch and effort data, but they have consistently declined to do so – and in fact this does have implications for the stock assessment, as considered in the discussion of standardisation of the CPUE data. In the case of the Cook Islands, logbook data are verified and adjusted by the MMR in accordance with unloadings and VMS data, if necessary.

The data are further aggregated temporally and spatially within the assessment. In terms of temporal stratification, the longline and driftnet datasets are stratified by quarter (Jan-March, April-June, July-Sept, Oct-Dec), while troll data are stratified by month. In addition, fisheries were divided into discrete time periods, in order to account for changes in selectivity over time (e.g. via technological changes). Spatially, data are stratified into six regions (see Figure 12 above). In terms of latitude, the South Pacific is divided for the purposes of the assessment into two bands with a boundary at 25°S. This accounts for the size difference in fish caught closer to the equator compared to those caught further south, as described previously. In relation to longitude, the assessment area, which previously ran only as far as 110°W, was formerly divided at 180°, in order to get greater consistency in temporal trends in the constituent fisheries (Helu, 2004, cited in Hoyle et al., 2012). This division has been retained, and two extra regions have been added reflecting the addition of the zone from 110° to 70°W in order to cover the whole stock area. This gives rise to the division into six regions as shown above. The Cook Islands EEZ is in region 2.

Length-frequency data were available as follows:

- For distant water fleets (Japan, Korea and Taiwan, and more recently China) most data come from the NMFS port sampling programme at Pago Pago, American Samoa. There are also port sampling data from Taiwanese longliners landing in Fiji. Japan and Taiwan have also provided some length-frequency data from their longliners landing at other ports (Taiwan only from 2003).
- For domestic fleets, data come from domestic port sampling programmes, and/or SPC or domestic observers from Australia, New Zealand, New Caledonia, Fiji, American/Western Samoa, Tonga and French Polynesia.
- For the troll fishery, there are port sampling data from New Zealand, and port sampling of the US fleet from Fiji, American Samoa and French Polynesia.
- For the (former) driftnet fishery, port sampling data have been provided by Japan and New Caledonia.

Note that for the time period prior to 1970, the only size data available are from the Japanese longline fishery.

In order to try and reduce conflict in the assessment between size data and CPUE data (but see below) the size data were weighted according to the proportion of the catch of that fishery coming from that area. If for a given fishery and time period, size data were only available from a geographic area ($10^{\circ} \times 20^{\circ}$) representing less than 30% of the total catch of that fishery during that period, the data were excluded from the analysis. Size data coming from areas more central to the fishery, conversely, were given more statistical weight in the analysis (Hoyle et al., 2012).

For the Taiwan longline fleet, a standardised longline CPUE (i.e. standardized effort within Multifan-CL) was applied in order to remove bias resulting from changes in fishing strategy over time – see description further on.

Fisheries-independent data

The only fishery-independent dataset used in the stock assessment consists of tagging data. This dataset dates from the 1980s and 1990s. A total of 9,691 fish were tagged, all from the southern region (Regions 3 and 4) and mainly juveniles (<80cm, ages 1-4). For the stock assessment, releases were stratified by quarter and size class. There were a total of 138 returns, mainly (57%) from southern longline fisheries, as well as (20%) from the Taiwanese longline fishery in Region 2, and from the troll fisheries. SPC have recently (2009) started a new tagging programme, but the number of returns was not yet sufficient to include it in the 2012 stock assessment.

Biological parameters

Reproductive potential of each age class: Assumed to be a multiple of the proportion of females in that age class (sex ratio), the proportion of females mature at that age, spawning frequency at age for mature females, and fecundity per spawn at age. These are based on empirical data as outlined previously (Farley et al., 2012), and are fixed assumptions in the stock assessment model.

Natural mortality: Previous assessments assumed that the proportion of females declined with age as they do with length, and therefore that females above the age of maturity have increased natural mortality. Recent analysis, however, demonstrates that females grow to a significantly smaller maximum size than males (see above), and that may by itself explain

the change in sex ratio with age. The 2012 stock assessment, therefore, assumed constant natural mortality at age and by sex, and assumed that the sex ratio does not vary with age (as it does with size). Natural mortality was assumed for the purposes of stock assessment to be 0.4; values of 0.3 and 0.5 were also evaluated (see below).

Growth: The von Bertalanffy growth parameters were estimated within the model, although starting values were provided based on data from the New Zealand troll fishery, which provide the best information on growth rates, albeit within a limited geographic range of 165-175°E; growth rates outside this area may be somewhat faster. Fixed, faster growth rates were also used as part of the sensitivity analysis of the stock assessment model (see following section).

3.3.8 Stock assessment model

MULTIFAN-CL

Stock assessments for albacore and other Western Pacific tuna stocks are carried out by the Oceanic Fisheries Programme of the Secretariat of the Pacific Community (SPC), which is the science advisory body to the Western Central Pacific Fisheries Commission. The most recent stock assessment for albacore was conducted in 2012 (Hoyle et al., 2012) using data up to mid-2011.

The assessment uses the integrated stock assessment model known as MULTIFAN-CL. MULTIFAN-CL allows the user to develop a statistical model for fisheries stock assessment, which is age-structured but length-based – i.e. the population dynamics are disaggregated by age, but the model objective function includes a term for the quality of fit between predicted and observed length-frequency data (or weight frequency data). This is more realistic than attempting to estimate age from length outside of the model (i.e. because it admits that the age of large fish is highly uncertain). Two other features of interest in MULTIFAN-CL are that it allows variability in catchability over time, as well as spatial structuring as described in the previous section. Note however that the albacore assessment is not spatially-structured (i.e. the data are spatially-structured to define homogenous fisheries, but the model assumes a single homogenous population)

Multifan-CL is an integrated statistical modelling framework that estimates parameters and derived population states by optimizing an objective function consisting of likelihood components (fitting model predictions and observations), prior probability distributions (expert judgement) and constraining penalties. There is a large degree of flexibility in which model components are fixed or estimated (including biological parameters, fishery characteristics and variances). The best point estimates from the model represent the Maximum Posterior Density, while joint uncertainty in the parameters can be described by the inverse Hessian delta-method.

Standardisation of CPUE data

Standardisation of the CPUE data for this stock assessment model is described in detail in Bigelow and Hoyle 2009. The distant-water fleets show different long-term trends in nominal CPUE estimated from the 5^o-month aggregated data, which is presumed to be due to differences in fishing strategy between fleets and/or over time. In the 2005 assessment (Langley and Hampton 2005), catchability was assumed to be constant for the Taiwanese fleet, which had been targeting albacore in a similar way over a long period. For the Japanese and Korean fleets, catchability was allowed to vary in the model, and the resulting estimates show large changes for these fisheries in catchability over time, which is a potentially significant source of bias in the stock assessment output if not dealt with. For the 2008 assessment, CPUE and catchability were re-analysed based on more detailed

logsheet data from vessels landings at canneries in Fiji and American Samoa. CPUE trends in this dataset were more consistent between fleets, probably because it allowed effort specifically targeting albacore to be separated out from effort targeting primarily other species but taking some albacore as bycatch (i.e. reducing the apparent CPUE for albacore). It is thought that for the Taiwanese fleet, this shift in fishing strategy away from albacore towards bigeye has continued since the late 1990s; therefore, the previous assumption that catchability for this fleet is constant over time is not likely to be true.

In order to get around this, Bigelow and Hoyle (2009) used cluster analysis to separate out the operational datasets targeting bigeye from datasets targeting albacore, based on species composition of the catch. They then standardised this dataset, as well as the entire dataset for Japan and Korea using GLMs, with independent variables of vessel identity, time (year, quarter, month) and space (latitude and longitude). Vessel effects were the key driver of differences between nominal and standardised CPUE, with differences most apparent in regions 1 and 2 (lower latitudes). The standardised dataset is more coherent with nominal CPUE from the domestic fleets than the unstandardised dataset (Figure 17), showing a decline in CPUE since 2002 in regions 1 and 2. (In region 2, the decline is less marked for the Taiwanese than the domestic fleets, and Bigelow and Hoyle (2009) speculate that this might be due to the larger geographic reach of the vessels in this fleet giving greater flexibility.)

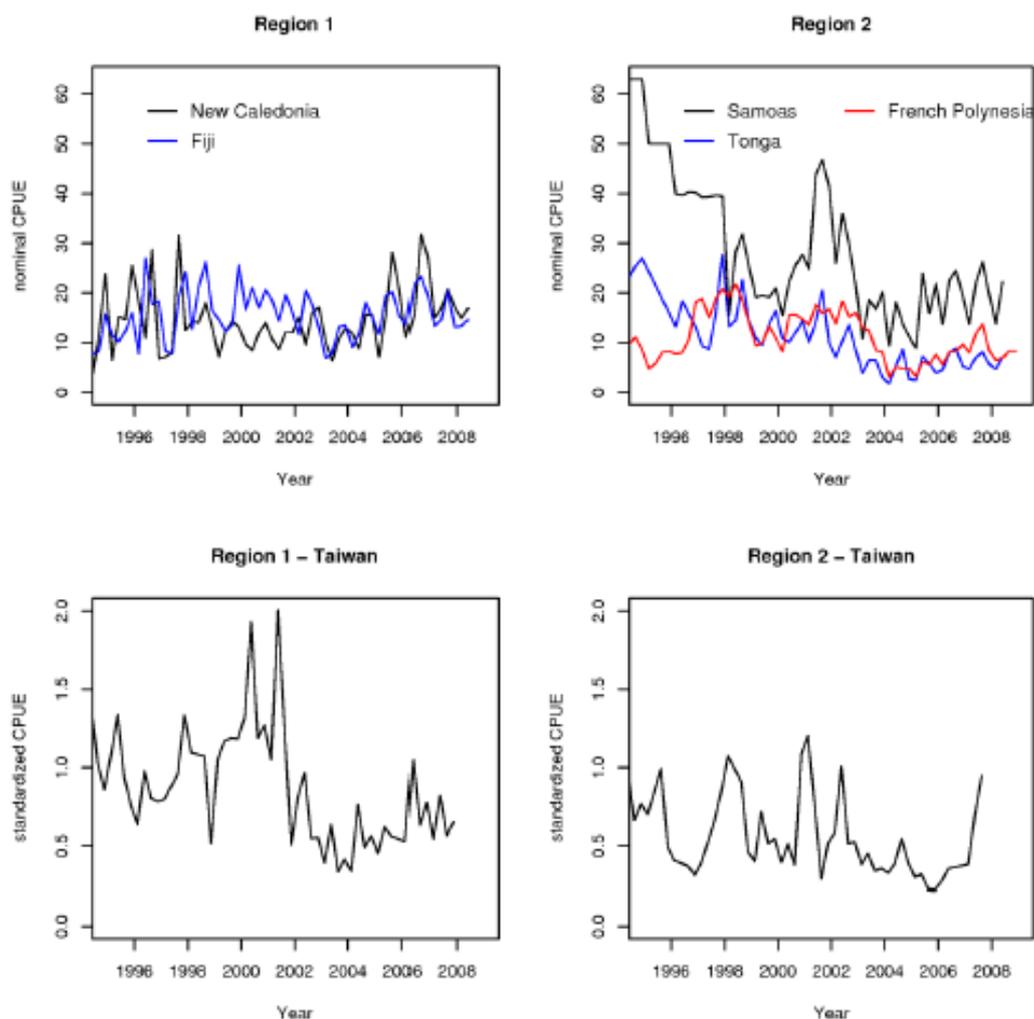


Figure 17. Top: nominal CPUE for various domestic fleets; bottom: standardised CPUE for the Taiwanese fleet targeting albacore; left: region 1, right: region 2. From Bigelow and Hoyle (2009).

Assumptions of the stock assessment

Key assumptions in the stock assessment model are given by Hoyle et al. (2012) as in Table 12.

Table 12. Main structural assumptions used in the base case model for South Pacific albacore (expanded from Table 3 in Hoyle et al., 2012).

Category	Assumption
Catch data	Observation errors are small
Length-frequency data	Normally-distributed; variance determined by sample size and observed frequency; assumptions made about effective sample size ⁵ for each data set, in order that variance can be estimated
Tagging data	Tag numbers in a given stratum (region/quarter/size category) have a Poisson distribution
Tag reporting	Reporting rates are constrained to be equal for all longline fisheries and constant over time, but were allowed to vary by region (reflecting the probability of high reporting closer to the release site); maximum reporting rate constrained at 0.9. (NB: this parameter is actually a composite of tag reporting, tag shedding and tagging mortality.)
Tag mixing	Tagged fish assumed to be randomly mixed with untagged fish after the first year following release
Recruitment	Occurs as a discrete event once each year. Related to spawning potential with a one-year time lag via a Beverton-Holt stock-recruit relationship with steepness=0.8 ⁶ ; but with a weak penalty for deviation from this relationship. Variance set such that recruitment of ~3 times normal would occur on average every ~20 years. (NB: steepness changed from 0.75 to 0.8 for consistency with other tuna stock assessments; 0.65 and 0.95 tested as part of sensitivity analyses.)
Initial population	Has equilibrium age structure in each region based on (assumed) natural mortality and the first three years of fishing mortality
Age and growth	20 annual age classes, with the last representing a plus group ('19 and over'). Mean length for each age class constrained by von Bertalanffy growth curve; mean weight for each age class computed from length-at-age following weight-length relationship derived from available data. Within an age class, length normally distributed with standard deviation proportional to mean length. Mean lengths for ages 2-5 are allowed to deviate from a von Bertalanffy curve.
Selectivity	Constant over time within each fishery, but some fisheries are split into several time periods, to account for apparent differences in selectivity between these time periods. Selectivity coefficients for the last two age classes are constrained to be equal. Selectivity for longline fisheries was allowed to vary by quarter, to account for strong seasonal variation in the length of fish caught. Hoyle et al. (2012) note that selectivity functions are an influential component of the model, because of its importance as a driver of expected length-frequency distributions, which are an important component of the overall log-likelihood function.
Catchability	Seasonal variation in catchability for troll and driftnet fisheries. For the

⁵ The issue of effective sample size arises because the samples used to derive length-frequency estimates are generally neither random nor independent.

⁶ The definition of steepness is the ratio of equilibrium recruitment at 20% of unexploited spawning biomass to equilibrium recruitment at unexploited biomass – i.e. for a steepness of 0.8, recruitment at 20%B₀ would be equal to 80% of recruitment at B₀.

	Taiwan longline fishery, where effort is based on standardised CPUE, catchability is estimated separately for each season. Non-standardised fisheries have random deviations in catchability applied every 12 months, constrained by a log-normal distribution. Sensitivity analysis for effort creep of the Taiwanese fishery (0.5% per year) was incorporated via changes in catchability (note: changes in vessels is already accounted for under the standardisation of the CPUE).
Effort	Effort deviations are constrained by a prior distribution (for non-standardised fisheries). For the time period 1965-1975, the rapid decline in CPUE cannot be fully explained by a decline in biomass, according to the model estimates of biomass. Steep declines in CPUE at the start of a fishery can also be explained by a decline in catchability: e.g. by removal of the more catchable individuals, learned avoidance behaviour and genetic selection towards lower catchability. To deal with this reduction in CPUE, constraints on effort deviates in the model before 1975 were reduced, to allow estimated biomass to decline more slowly than CPUE. An alternative scenario with a constant constraint throughout was run as a sensitivity analysis.
Natural mortality	Fixed and constant over time and ages, with mean = 0.4. Previous stock assessments attempted to allow the model to estimate M, but this was not found to be particularly successful. Higher natural mortality for younger age groups was also tried in previous assessments but not found to make a significant difference to management parameters in the model output. M=0.3 and 0.5 were run as sensitivity analyses.
Movement	Not included in this model – fish are assumed to mix fully across all the regions

Interpretation of the stock assessment

Various ancillary analyses were run to provide the advice required for management. These were as follows:

- evaluation of fishery impact via estimate of $B_{\text{current},F=0}$ and $SB_{\text{current},F=0}$ and related parameters (as described above); this was done by re-running the model with the estimated model parameters fixed and $F=0$;
- yield analysis: calculation of equilibrium catch and biomass for a given vector of relative age-specific fishing mortalities – the F -vector at which equilibrium yield is maximised gives MSY (maximum equilibrium yield) and B_{MSY} (equilibrium biomass giving MSY) for the specified selectivity assumptions.

3.3.9 Stock assessment outcome

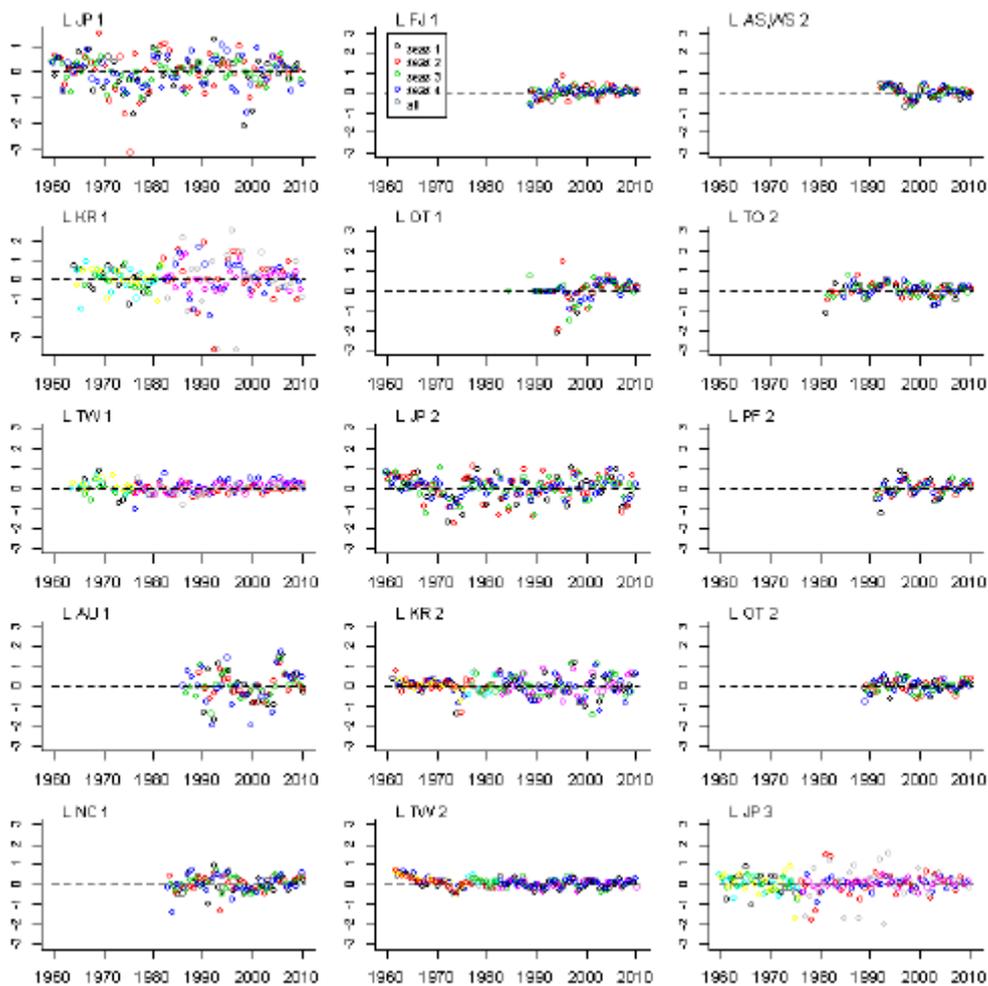
Fit diagnostics

As noted above, the performance of the model is evaluated by comparing predicted (output) to observed data – this was done with catch, effort, length-frequency and tagging data. Results are summarised by Hoyle et al. (2012) as follows:

- *Catch estimates in the model are constrained not to deviate far from the observed catch; the main case in which deviates were observed was in the standardised fisheries (Taiwan, Japan and Korea longline) in cases where standardised CPUE estimates are also constrained.*
- *Tagging data are relatively uninformative in the model, because the number of tag returns is low, and because the model can vary fishery-specific tag reporting rates to*

fit the data. In general, the model estimates of tag return rates over time fit the data reasonably well.

- Comparisons of observed and predicted proportions of fish in each length class in the catch (by fishery and quarter) show some patterning in the residuals for some of the distant water fisheries, apparently driven by the increasing size in the length-frequency data, which is difficult to explain. Likewise, residual trends are apparent in some domestic fisheries, which may coincide with changes in fishing strategy (e.g. in the main target species) (note that this is dealt with in the model via changes in the selectivity parameter, allowing these data to be down-weighted). Non-random sampling of either the catch or the population may also be a factor in some cases. Hoyle et al. (2012) note that further analysis of the length-frequency data is required to make sense of these patterns.
- The consistency of the model with observed effort data can be evaluated via plots of effort deviations (expected as compared to observed) over time (Figure 18). There is generally no temporal trend in effort deviates with time (although there is often a seasonal trend), suggesting that the model is a reasonably good fit to the effort data, with the exception of Taiwanese, Japanese and Korean longline fisheries prior to 1975, which were given a low weighting in the model and therefore allowed to deviate without much penalty.



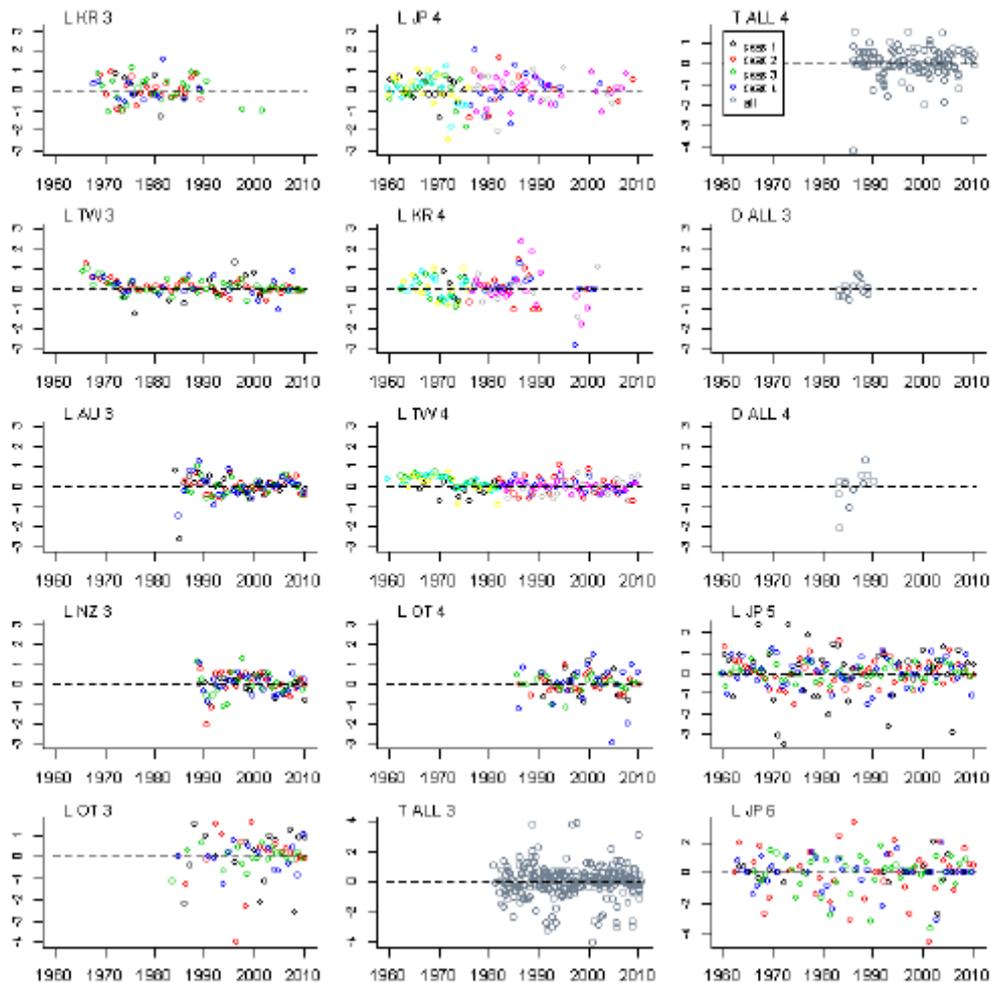


Figure 18. Quarterly effort deviates (predicted compared to observed) over time for each of the fisheries in the analysis. L=longline, T=troll, D=driftnet, JP=Japan, KR=Korea, TW=Taiwan, AU=Australian, FJ=Fiji, NZ=New Zealand, AS,WS=American and Western Samoa, TO=Tonga, PF=French Polynesia, NC=New Caledonia, OT=other, ALL=all. From Hoyle et al. (2012).

Alternative scenarios and changes to the model

Sensitivity analyses were run to consider the impact of different assumptions on model output and uncertainty. All possible combinations of each set of factors were considered. The various scenarios and the outcome of these analyses are summarised in Table 13. The changes made to the model since the previous assessment, and the consequences for the assessment output, are summarised in Table 14. It is clear that model assumptions and choices made during model design and analysis can have significant impacts on model output and conclusions about stock status – these different scenarios must therefore be taken seriously in the analysis of stock status (see above).

Table 13. Scenarios considered in the sensitivity analysis and their outcome (Hoyle et al., 2012).

Feature	Reference case scenario	Other scenarios considered	Outcome
Steepness	0.8	0.65, 0.95	Little impact on dynamics or model fit but big impact on MSY-related parameters ($F_{\text{current}}/F_{\text{MSY}}$ varied by a factor of three). Higher steepness → more optimistic assessment of stock status.
Growth curve	Estimated in the model	Fixed, incorporating variation based on longitude and/or sex	Significant changes to recruitment, biomass and management parameters. Changes that resulted in larger size of adult fish (e.g. higher L_{max}) resulted in more pessimistic estimates of F/F_{MSY} and SB/SB_{MSY} .
Effort creep	none	0.5% per year	Introduction of effort creep increased the rate of biomass decline, as would be expected, and made estimates of B/B_{MSY} slightly more pessimistic.
Natural mortality (M)	0.4	0.3, 0.5	Higher M resulted in higher estimates of recruitment and biomass, but similar estimates of spawning potential. Lower M resulted in slightly more pessimistic outcomes, because it implies a less productive stock.
CPUE data	All regions	Western regions (1 and 3) only; Eastern regions (2 and 4) only	Moderate impact on biomass estimates but little impact on management parameters.
CPUE data before 1975	Down-weighted	Weighting estimated from the CPUE standardisation	Negligible effect on estimates of management parameters.

Table 14. Changes made to the assessment model for the 2012 assessment as compared to the 2008 assessment and their consequences for model output (Hoyle et al., 2012).

Change	Consequence
New version of MULTIFAN-CL	Similar result
New catch and effort data added	Moderate increase in biomass estimates, due to significant increases in estimates of catches, including during periods covered by previous assessments
New length-frequency data added (Taiwan, 2003 onwards)	Increased biomass estimates by changing the growth curve and selectivity estimates. Some large fish in the recent Taiwanese data may have been influential.
Steepness changed to 0.8	Did not affect biomass or recruitment trends but increased estimates of MSY by ~8%
New standardised CPUE series	The new time series shows a steeper initial decline but a less steep recent decline – the biomass output trend reflects this change to some extent.
Approach to modelling early	Had little effect on biomass estimates after the mid-

Change	Consequence
CPUE	1970s, nor on management parameters
Natural mortality (M)	Very little impact on biomass estimates but slight increase in recruitment estimates
Sex ratio at age adapted based on the changes in M above	Gave more influence to older fish in the population in terms of spawning potential, but since their numbers are low relative to younger fishing, the overall effect was low.
Spawning potential at age adjusted based on new biological data	Gave more influence to younger fish (the reverse impact to the above). No effect on biomass or recruitment estimates.
Size data restratified to match spatial distribution of catches	Steepened the decline in the biomass trend
Lognormal bias adjustment	Did not significant affect the population trend but increased estimates of MSY by ~4%.

3.3.10 Stock assessment issues and uncertainties

The authors of the stock assessment (Hoyle et al., 2012) note that considerable improvements have been made to the model structure and inputs over the last few years, as set out above. In particular, the standardisation of the CPUE data (the most informative input to the model, aside from total catches) has likely made this dataset a better reflection of underlying trends in biomass. However, early steep declines in CPUE are likely to reflect changes in catchability as well as biomass, as noted previously, and there are concerns about how well one can standardise any commercial CPUE series. The incorporation of recent biological work on growth is also a significant step forward.

A key remaining problem is that despite restratification of the length-frequency data, it continues to conflict with the CPUE data. The authors note that some of the length-frequency data are poor quality, with spatial sampling bias and likely variability in selectivity due to spatial and temporal variability in fleet activities (and possibly albacore distributions). The weighting of the length-frequency data in the model had to be reduced in order to get a model fit to CPUE trends without predicting long-term trends in recruitment (for which there is no evidence). This resulted in lower estimates of biomass and higher estimates of fishing pressure, so could be considered a precautionary approach – but nonetheless remains a key source of uncertainty in the stock assessment.

The sensitivity analyses suggested that all management parameters were sensitive to assumptions about growth, steepness and natural mortality, with biomass-related management parameters also sensitive to assumptions about effort creep and the choice of CPUE time series. Median values for the key MSY-related reference indices are given in

A potentially important source of uncertainty that has not been explicitly addressed relates to albacore population connectivity in the South Pacific Ocean. The assumed unit stock is spread over an area of more than 50 million km², with spawning observed across a vast area. At least two observations are consistent with a population that is not rapidly mixing: i) CPUE trends appear to differ somewhat by region, and ii) different regions appear to have different growth rates (not just different size composition). Whether or not the aggregate population mixes at a rate that ensures genetic homogeneity, there may be structure at a level that is relevant for management. This uncertainty has not been explicitly examined. However, there is enough spatial coherence in the data and fishery distribution to at least qualitatively suggest that if sub-populations exist, they are probably being exploited in a reasonably similar way.

Table 15. under the different assumptions tested in the sensitivity analysis, and biomass trends under these assumptions are shown in Figure 19. It is important to note, however, that these analyses change just one parameter at a time, keeping the other assumptions fixed at the reference model values. The structured uncertainty grid component of the sensitivity analyses evaluated the changes in model output resulting from every possible combination of these parameter values – the full result set is, however, not presented, since it would be much too large. In their discussion of this issue, Hoyle et al. (2012) identify key sources of uncertainty as follows:

- Steepness, as so often, is an intractable source of uncertainty in this assessment. Over the range 0.65-0.95, $F_{\text{current}}/F_{\text{MSY}}$ varied by a factor of three, while the median value of SB_{MSY}/SB_0 ranged from 8% to 34%.
- Model output was highly sensitive to the assumed growth curve, and Hoyle et al. (2012) recommend additional work in this area – particularly in relation to modelling approaching incorporating spatial and sex-specific growth rates. Alternatively, a model that is directly age-based (rather than calculating age from size data within the model) may be more robust to assumptions about growth curves.
- Effort creep relating to new vessels is accounted for in the CPUE standardisation, but additional effort creep is also likely (e.g. via technology to detect fronts with aggregations of fish, or to target larger fish). Incorporating effort creep had some impact on biomass ratios although less on fishing mortality ratios.
- The model was sensitive to assumptions about average natural mortality – because this partially controls the productivity of the stock. Like steepness, natural mortality is difficult or perhaps impossible to estimate accurately.
- Overall, the sensitivity analysis, taking all possible combinations of the various parameters included (see Table 13) showed a very broad range of variation in estimates of biomass, fishing mortality and management parameters – showing that the model still has a significant amount of structural uncertainty. This does not include parameter uncertainty, nor does it include a variety of other assumptions (e.g. in relation to catchability, selectivity, variation of natural mortality with age etc.).

While the model dynamics showed considerable sensitivity to many assumptions, the key conclusions about the stock status relative to management reference points were very robust.

A potentially important source of uncertainty that has not been explicitly addressed relates to albacore population connectivity in the South Pacific Ocean. The assumed unit stock is spread over an area of more than 50 million km², with spawning observed across a vast area. At least two observations are consistent with a population that is not rapidly mixing: i) CPUE trends appear to differ somewhat by region, and ii) different regions appear to have different growth rates (not just different size composition). Whether or not the aggregate population mixes at a rate that ensures genetic homogeneity, there may be structure at a level that is relevant for management. This uncertainty has not been explicitly examined. However, there is enough spatial coherence in the data and fishery distribution to at least qualitatively suggest that if sub-populations exist, they are probably being exploited in a reasonably similar way.

Table 15. Median values of some of the reference indices used in management under different assumptions. G2-7 = different growth models, S1 steepness = 0.65, S3 = 0.95, Cr2=0.5% effort creep per year, EC2=estimated weighting for early CPUE, M1 M=0.3, M2=0.5, CPUE2=CPUE from regions 1 and 3 only, CPUE3 = CPUE from regions 2 and 4 only.

Model	$F_{\text{current}}/F_{\text{MSY}}$	$B_{\text{current}}/B_{\text{MSY}}$	$SB_{\text{current}}/SB_{\text{MSY}}$
2012 reference case model	0.14	1.51	2.56
G2	0.69	1.68	1.95
G3	0.35	1.66	2.49
G4	0.43	1.70	2.35
G5	0.26	1.62	2.62
G6	0.10	1.61	2.93
G7	0.10	1.55	2.87
S1	0.36	1.50	1.95
S3	0.11	1.74	3.95
Cr2	0.21	1.59	2.48
EC2	0.21	1.62	2.54
M1	0.38	1.56	2.09
M3	0.11	1.65	2.95
CPUE2	0.21	1.71	2.78
CPUE3	0.21	1.55	2.37

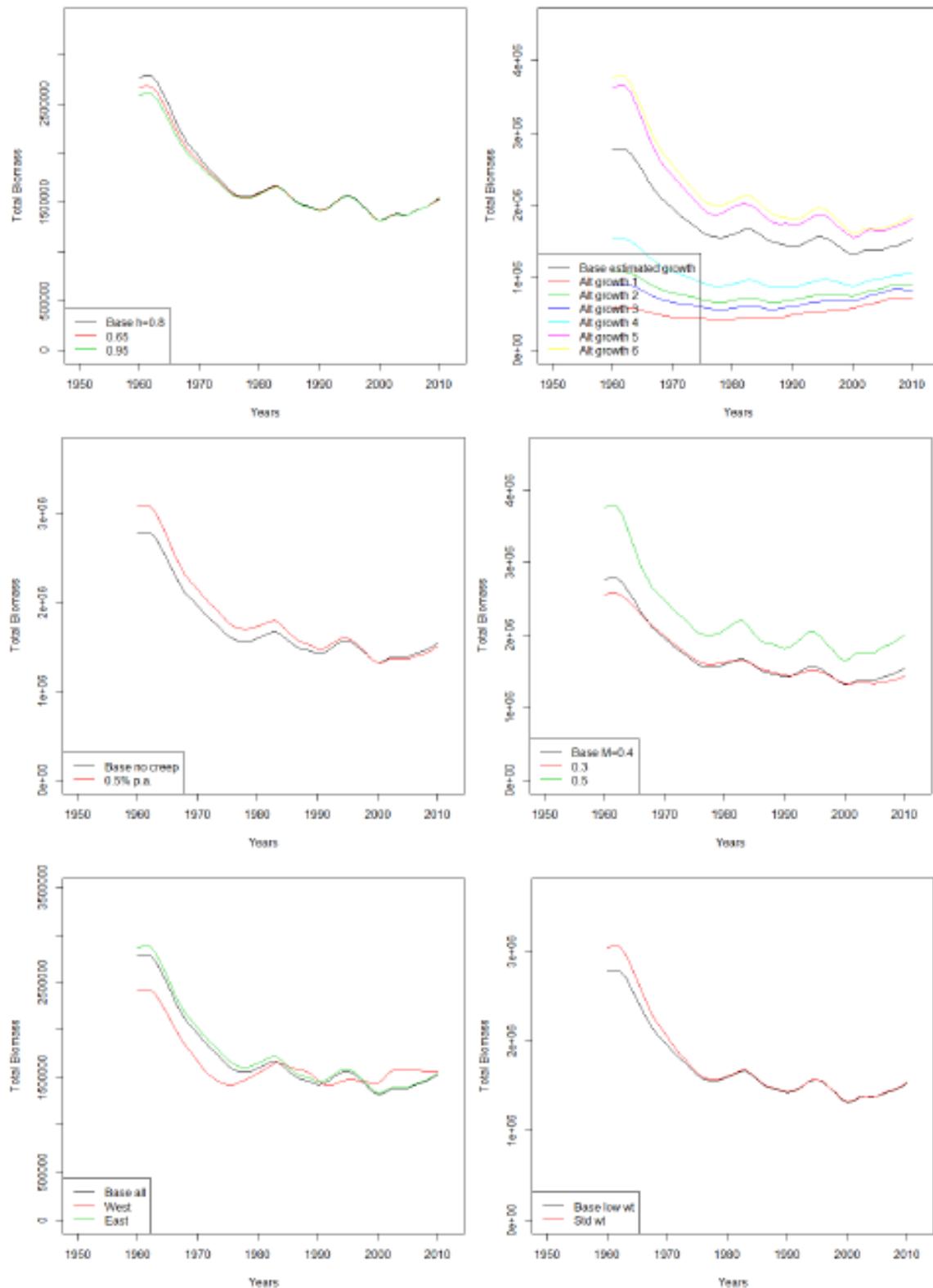


Figure 22: Total biomass through time under alternative structural assumptions about 1) steepness, 2) growth, 3) effort creep, 4) natural mortality, 5) CPUE, and 6) early CPUE.

Figure 19. Trends in total biomass through time estimated by the model under alternative structural assumptions: 1. steepness, 2. growth, 3. effort creep, 4. natural mortality, 5. CPUE by region and 6. early CPUE. Base case (reference model) in black throughout.

3.3.11 Key LTL species

Albacore, having an estimated trophic level of 4.3 (FishBase) is not considered a key low trophic level (LTL) species under the MSC definition.

3.4 Principle Two: Ecosystem Background

This section of the report outlines the fishery's potential impacts on the wider ecosystem. Five key components are considered to cover the range of potential ecosystem elements that may be impacted by the fishery. These are:

- (i) Retained, non-target species: species that are retained by the fishery (usually because they are commercially valuable or because they are required to be retained by management rules).
- (ii) Bycatch (discarded) species: organisms that have been taken incidentally and are not retained (usually because they have no commercial value).
- (iii) ETP species: Endangered Threatened or Protected species
- (iv) Habitats: the habitats within which the fishery operates
- (v) Ecosystem: broader ecosystem elements such as trophic structure and function, community composition, and biodiversity.

Under each of those five components, particular attention was paid to:

- (i) Outcome: the status of the impact or the risk that the fishery poses to that component.
- (ii) Management: the management strategy for the component.
- (iii) Information: the monitoring and information available to inform the outcome and management of the component.

3.4.1 Retained species

The principal data source used to determine retained species in this fishery are the SPC logbooks. Aboard each licensed vessel, SPC fishing logbooks are completed, detailing estimated volume (tonnes) and number of individuals of retained catch per species, as well as time and coordinates of the sets. These data are typically collected and processed by the MMR which involves verification and adjustment of the dataset in accordance with unloadings and VMS data before forwarding to the SPC for use in stock assessments and associated analyses. At the time of assessment however, only the estimated (unadjusted) data were available. The team considered these data in light of other available datasets (observer data and unloadings data showing processed volumes) and concluded that the logbook data provided the best representation of species composition.

In the MSC context, "main" retained species are typically identified as those species which constitute over 5% of the total catch, or which can be considered as vulnerable, or of particularly high value to the fisher. In this assessment, vulnerable or valuable species were designated as 'main' if they made up more than 2% of the total catch.

Table 16 shows the retained species for the LTFV albacore longline fleet for 2012 and 2013. The species representing on average over 5% of landings across 2012 and 2013 are, other than albacore, bigeye (6.58%), yellowfin (8.42%) and blue marlin (6%). Below the 5%

threshold, wahoo was the only species making up more than 2% of the total catch; however this species is fast growing and early maturing and considered 'Least Concern' by IUCN (Collette et al., 2011). It is also not specifically targeted by the fishermen and therefore not considered as either 'vulnerable' or of particular 'value'. As such this species was not considered further under 'main' retained species.

Table 16. Retained catch aboard all LTFV vessels in the UoC, shown as volume (tonnes) and % composition for 2012 and 2013 (from SPC logbook data provided by the MMR).

Species		Retained catch		% catch composition		
		2012	2013	2012	2013	Average
ALB	Albacore (<i>Thunnus alalunga</i>)	2352.287	2597.035	72.64	72.57	72.60
BET	Bigeye (<i>T. obesus</i>)	264.37	178.689	8.16	4.99	6.58
YFT	Yellowfin (<i>T. albacares</i>)	253.888	322.371	7.84	9.01	8.42
MLS	Striped marlin (<i>Kajikia audax</i>)	0	0.03	0.00	0.00	0.00
BUM	Blue marlin (<i>Makaira nigricans</i>)	169.503	242.193	5.23	6.77	6.00
BLM	Black marlin (<i>Istiompax indica</i>)	0.47	0	0.01	0.00	0.01
SWO	Swordfish (<i>Xiphias gladius</i>)	23.839	24.932	0.74	0.70	0.72
SFA	Indo-Pacific sailfish (<i>Istiophorus platypterus</i>)	10.586	15.783	0.33	0.44	0.38
LAG	Moonfish/Opah (<i>Lampris guttatus</i>)	4.431	5.879	0.14	0.16	0.15
OIL	Oilfish (<i>Ruvettus pretiosus</i>)	8.056	17.351	0.25	0.48	0.37
DOL	Mahi mahi (<i>Coryphaena hippurus</i>)	8.263	53.96	0.26	1.51	0.88
WAH	Wahoo (<i>Acanthocybium solandri</i>)	62.336	93.989	1.92	2.63	2.28
OTH	Other	80.253	26.483	2.48	0.74	1.61
Total		3238.282	3578.695			

The following sections explore the available information on the main retained species in terms of outcome status, management and information.

3.4.1.1 Bigeye (*Thunnus obesus*)

Bigeye tuna are a tropical and sub-tropical species with a circumglobal distribution. The biology of the species is closely related to that of yellowfin, in that they are relatively fast growing, and reach a maximum size of ~200 cm. Tag recapture data indicate that significant numbers of bigeye reach at least eight years of age; the longest period at liberty for a recaptured bigeye tuna tagged in the western Pacific at about 1-2 years of age is currently 14 years (Davies et al., 2011). Their behaviour is also similar to that of yellowfin, with juvenile and small adult bigeye schooling at the surface, sometimes mixed with other tunas, and often associating with floating objects, while adult bigeye tend to stay in deeper waters below the thermocline. The diet of bigeye tuna comprises a wide variety of fishes, cephalopods and crustaceans. There is some uncertainty about the stock structure of this species, with little information available on the extent of mixing across the central Pacific Ocean. Genetic analysis has failed to reveal significant evidence of widespread population subdivision and tagging data are ambiguous about spatial stock structure in that some individual migrations of over 4,000 nautical miles have been detected over periods of one to several years. Most tags, however, are recovered much closer to the tagging point and currently, stock assessments of bigeye tuna are routinely undertaken for the WCPO and EPO separately (Davies et al., 2011). The species is an important component of tuna fisheries throughout the Pacific Ocean, being the most valuable species of tropical tuna, weight for weight. Bigeye are taken by both surface gears (mostly as juveniles) and longline

gear (as adults). They are a principal target species of both the large, distant-water longline fleets, as well as the smaller, fresh sashimi longline fleets based in several Pacific Island countries and Hawaii.

According to Harley and Williams (2013) the total bigeye catch for the WCPO in 2012 was 163,418 tonnes, which is a 2% increase over 2011 and a 7% increase over the 2007-11 average. The longline fishery accounted for approximately 48% of the global catch, at 78,338 t which is similar to the 2011 level and showed a 3% decrease compared to 2007-11. Purse seine catches, representing 42% of the total catch at 69,164t were down 2% on 2011 but up 16% on 2007-11 (see Figure 20). Note, however, that there remains considerable uncertainty regarding the accuracy of purse-seine catch estimates, with logsheet data considered to be an underestimate of the true catch (Davies et al., 2011). Some other smaller fisheries also take bigeye, including small, coastal purse seine and pole-and-line fisheries in Japan and artisanal mixed-gear fisheries in the Philippines and Indonesia (Davies et al., 2011).

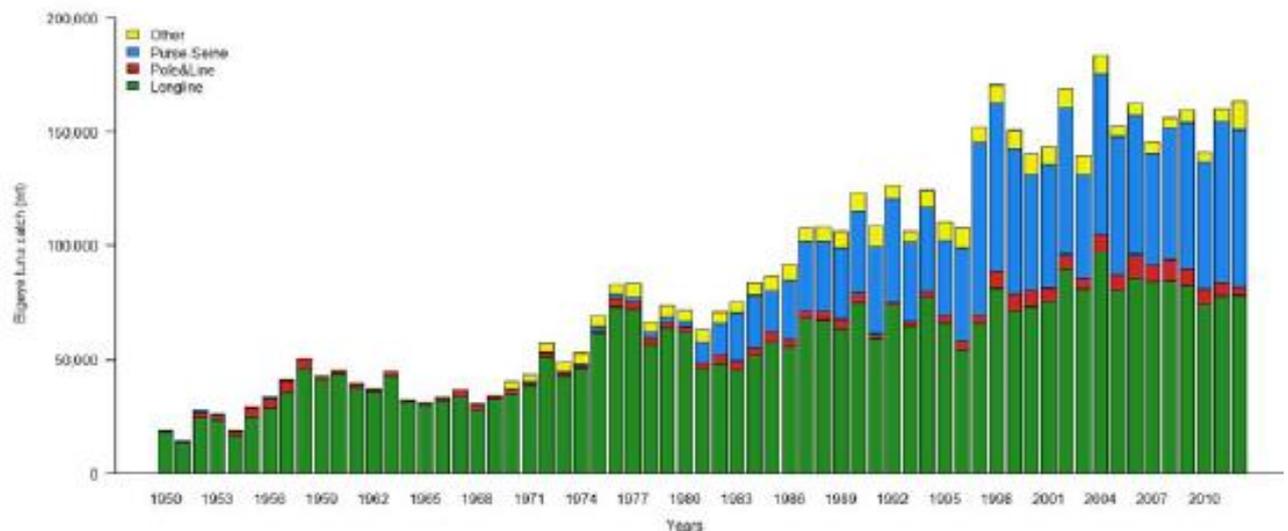


Figure 20. Bigeye tuna catch by gear and year for the WCPFC-convention Area (from Harley and Williams, 2013).

In the Cook Islands EEZ, bigeye represents a small proportion of the total catch, accounting for approximately 10% of catches since 2002, mostly reported from the northern EEZ. In 2010 the MMR launched an exploratory fishing programme for bigeye tuna and swordfish, which was ceased in 2013. There is currently no targeted fishery for bigeye in the Cook Islands.

Outcome:

The stock assessment for bigeye is carried out by the Oceanic Fisheries Programme of the Secretariat of the Pacific Community (SPC). Stock assessments are carried out on a regular basis and are documented in Hampton et al. (2004, 2005 and 2006), Langley et al. (2008), Harley et al. (2009), and Harley et al.(2010) (references cited in Davies et al. (2011)). The most recent stock assessment was presented in Davies et al. (2011), based on the integrated stock assessment model known as MULTIFAN-CL, structured by age, geographical region and fishery, and integrating fisheries-dependent data (catch, effort,

length-frequency and weight-frequency data) with the results of biological research and tagging programmes, particularly the Pacific Tuna Tagging Programme (PTTP). The 2011 stock assessment can be summarised as follows:

- Two estimates of MSY are provided, depending mainly on assumptions about long-term recruitment (74,993 t and 131,400 t). Recent catches, although uncertain, are likely to be higher than both these values – i.e. current catch levels on the stock are probably not sustainable in the long term.
- For all model runs, estimated current fishing mortality (F_{current}) is greater than F_{MSY} (the fishing mortality resulting in equilibrium yield of MSY). The assessment estimates that a 30% reduction in F from the 2006-09 level is required to bring F to sustainable levels (i.e. at or below F_{MSY}). **The assessment concludes that overfishing is occurring for this stock** (Figure 21).
- Total stock biomass (B) and spawning stock biomass (SB – the biomass of the part of the population above the size at maturity) are both estimated to be above the MSY level ($B_{\text{current}} / B_{\text{MSY}} = 1.34$, $SB_{\text{current}} / SB_{\text{MSY}} = 1.37$), with an estimated probability of 13% that SB_{current} is actually below SB_{MSY} . **This means that the stock is not yet considered to be overfished** (Figure 21). Note, however, that other model runs (using only more recent recruitment estimates) give bigger estimated values for the MSY biomass reference points, and therefore conclude that the stock biomass is already below these reference point levels, and hence that overfishing is already occurring.
- However, at current rates of fishing mortality, the assessment predicts that the stock would be reduced to an equilibrium biomass of 65% of B_{MSY} (60% of SB_{MSY}) in the long term. This leads the authors to conclude that the stock is approaching an overfished state.
- The authors also note that estimates of MSY would rise (reducing the probability of overfishing) if fishing mortality on small fish were reduced.

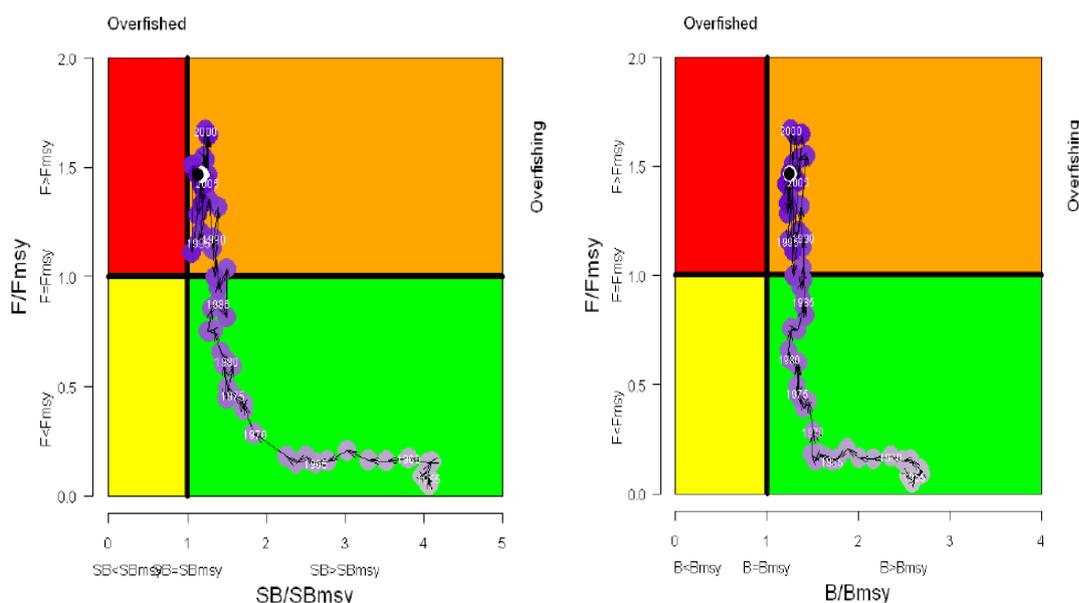


Figure 21. Temporal trend in annual stock status, relative to BMSY (x-axis; left) or SBMSY (x-axis; right) and FMSY (y-axis) reference points, for the model period (1952-2009). Green=not overfished, no overfishing, yellow=overfished but no overfishing, orange=not overfished but overfishing, red=overfished and overfishing. The colour of the points is graduated from mauve (1952) to dark purple (2010) and the points are labelled at 5-year intervals. The white circle

represents the average for the period 2006-09 and the black circle the 2009 values. From Davies et al. (2011).

In 2012, WCPFC formally adopted a biomass limit reference point for bigeye (as for albacore and yellowfin), set at 20% of the average annual total biomass over a recent period in the absence of fishing ($SB_{\text{current}, F=0}$) (see Section 3.3.3, Reference Points). In the reference case model, Davies et al. (2011) estimated $B_{\text{current}, F=0}$ as 2,161,465 tonnes and B_{current} at 623,121 tonnes. $B_{\text{current}} / B_{\text{lim}}$ is therefore 1.44.

Management

Management of the WCPO bigeye stock is the responsibility of the WCPFC and the harvest strategy (for bigeye as well as for yellowfin and skipjack) is set out in CMM 2013-01. The CMM recognises that bigeye is currently subject to overfishing and seeks to reduce fishing mortality (F) so that the stock is - at a minimum - maintained at MSY.

Key measures include the following:

- Reductions in the use of FADs in the purse seine fishery (including a three-month closure for the setting of FADs in July, August and September in all EEZs and on the high seas),
- As an additional FAD measure for 2014, each CCM must either extend the FAD ban by another month (i.e. including October) or limit the total number of FAD sets by its vessels to a pre-agreed amount (see CMM). Further measures will be introduced during 2015 and 2016, including a further extension of the ban or further reductions in the number of FADs set. For 2017, a ban on setting FADs on the high seas is also foreseen (although alternative measures may be decided on at the 2014, 2015 or 2016 annual meetings),
- Effort controls via the PNA Vessel Days Scheme within the EEZ of PNA Coastal States, and effort limits for non-SIDS CCMs on the high seas and in all other EEZs,
- Bigeye catch limits for non-SIDS from 2014 to 2017 which decrease annually (except for Indonesia). Note that this measure does not apply to CCMs having caught over 2,000 mt in 2004 which are instead limited to an annual bigeye catch of 2,000 tonnes from 2014 to 2017,
- Purse seine vessels fishing in EEZs and on the high seas within the area bounded by 20°N and 20°S should retain on board and then land or transship at port all bigeye, skipjack, yellowfin tuna.
- Capacity management for non-SIDS (except Indonesia), requiring purse seine vessels larger than 24m with freezing capacity between 20N and 20S and longline vessels with freezing capacity or ice-chilled targeting bigeye tuna not to increase above current levels. The reduction in capacity would be carried out through a capacity management work plan. Note that this measure does not restrict the ability of SIDS to construct or purchase vessels from other CCMs for their domestic fleets.

Further measures relate to reporting measures on catch levels and FAD sets, monitoring and control, FAD management plans for use of FADs on the high seas, juvenile tuna catch mitigation research, and exploration of spatial management approaches

Information

Information supporting the harvest strategy for the main retained tuna species including bigeye and yellowfin is provided by each CMM to the SPC/OFP which manage and process

the data for use in stock assessments and associated analyses with the output scientific advice used by the WCPFC, other regional or sub-regional organisations (e.g., FFA, PNA) and individual SPC members to manage the fishery. The data include fisheries-dependent data structured by flag state, region of operation and gear-type obtained through vessels, observers, port samplers and agents (e.g. catch and effort data, unloadings data, port sampling data, transshipment data, size composition data and observer data based on 5% coverage of the longline fleet and 100% coverage of the purse seine fleet in the WCPFC convention area), as well as tagging data, oceanographic data and data from biological research undertaken by CCMs and SPC.

3.4.1.2 Yellowfin (*Thunnus albacares*)

Yellowfin tuna are a highly migratory and relatively fast growing species with an essentially tropical/sub-tropical distribution and usually inhabiting the upper 100m of the water column (above the thermocline). There is some indication that mixing between the western and eastern Pacific may be restricted, based on analysis of genetic samples and tagging data. For management purposes, therefore, they are divided into two stocks – the Western and Central Pacific stock (under consideration here) and the Eastern Pacific stock. Juvenile yellowfin are first recruited to commercial fisheries (mainly surface fisheries in Philippines and eastern Indonesia) at a few months of age (Langley et al., 2011). They grow quickly to a maximum length of ~180 cm FL, probably in only a few years – however, growth rates are uncertain and may vary significantly by area in the western Pacific. Tagging data suggest that many adults reach at least 4 years of age, with the longest period at liberty for a recaptured tagged yellowfin in the western Pacific currently 6 years. FishBase suggests a maximum age of ~9 years.

Yellowfin tuna are an important component of tuna fisheries throughout the WCPO, and are harvested with a wide variety of gear types, from small-scale artisanal fisheries in Pacific Island and southeast Asian waters to large, distant-water longliners and purse seiners that operate widely in equatorial and tropical waters. The total annual catch in the WCPO has increased from ~100,000 t in 1970 to 655,672 tonnes in 2012, which represents a 22% increase in relation to the 2007-11 average (Harley and Williams, 2013). The industrial purse-seine fishery is known to account for a large proportion of the total catch (61% in 2012), but there remains considerable uncertainty about the purse seine catch, with concerns about significant under-reporting of yellowfin catch. In 2001-2004, the longline catch averaged 75,712 tonnes. In 2010 and 2011, the catches were 75,582 tonnes and 75,393 tonnes respectively - in 2012 they fell below the 2001-2004 average to 65,582 tonnes, making up 10% of the total WCPO catch (Harley and Williams, 2013) (Figure 22). Most of the catch of yellowfin is taken in western equatorial areas of the WCPO, although the centre of gravity of the fishery shifts eastwards during El Nino years. Purse seiners catch a wide size range of yellowfin tuna, whereas the longline fishery takes mostly adult fish (Langley et al., 2011).

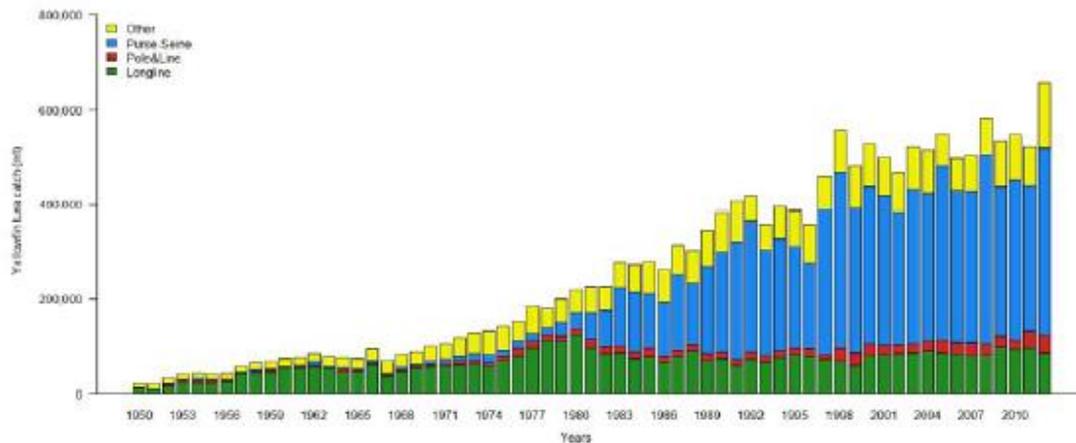


Figure 22. Yellowfin tuna catch by gear and year for the WCPFC-convention Area (from Harley and Williams, 2013).

Outcome:

WCPO yellowfin stock assessments are carried out by the Oceanic Fisheries Programme of the Secretariat of the Pacific Community (SPC). The first assessment was conducted in 1999 and assessments were conducted annually until 2007. The most recent assessments are documented in Hampton and Kleiber (2003), Hampton et al. (2004, 2005 and 2006) and Langley et al. (2007 and 2009) (references cited in Langley et al. (2011)). The most recent stock assessment was conducted in 2011 by Langley et al. (2011) which uses the integrated stock assessment model known as MULTIFAN-CL, structured by age, by geographical region and by fishery, and integrating fisheries-dependent data with the results of biological research and tagging programmes, particularly the Pacific Tuna Tagging Programme (PTTP). The 2011 stock assessment can be summarised as follows:

- The fishing mortality reference point $F_{current} / F_{MSY}$ is estimated to be 0.56-0.90 and it was concluded that it is very likely that **overfishing is not occurring**. Biomass reference points $B_{current} / B_{MSY}$ and $SB_{current} / SB_{MSY}$ are estimated to be above 1.0 and, therefore, the stock is most likely **not in an overfished state** (Figure 23).
- Stock status indicators are sensitive to the assumed value of steepness for the stock-recruitment relationship (i.e. the measure of the extent to which recruitment depends on stock biomass). A value of steepness greater than the default value of 0.8 (0.95 – recruitment relatively independent of stock biomass) yields a more optimistic stock status and estimates considerably higher potential yields from the stock. Conversely, for a lower (0.65) value (recruitment more dependent on stock biomass), the stock is estimated to be approaching the MSY-based fishing mortality and biomass thresholds (Figure 23).
- Biomass is estimated to have reduced steadily over time, reaching a level of about 50-55% of unexploited biomass (a fishery impact of 45-50%) in 2006-2009. This represents a moderate level of stockwide depletion although the stock biomass remains considerably higher than the MSY-based reference point (B_{MSY} / B_0 of approximately 0.35-0.40).
- Depletion is considerably higher in the equatorial region 3 where recent depletion levels are approximately 0.30 for total biomass (a 70% reduction from the unexploited level). If stock-wide over-fishing criteria are applied at the level of model

regions, the conclusion is that region 3 is fully exploited and the remaining regions are under-exploited. This analysis of course depends on levels of long-distance migration and mixing within the stock.

- Using estimates of MSY via model options, under equilibrium conditions, the predicted yield estimates (YF_{current}) are very close to the estimates of MSY indicating that current yields are at or above the long-term yields available from the stock. While estimates of current fishing mortality are generally below F_{MSY}, any increase in fishing mortality would most likely occur within region 3 — the region that accounts for most of the catch. This would further increase the levels of depletion here. Recent recruitment is estimated to be lower than the long-term average (approximately 85%). Trends in biomass are generally consistent with the underlying trends in recruitment.

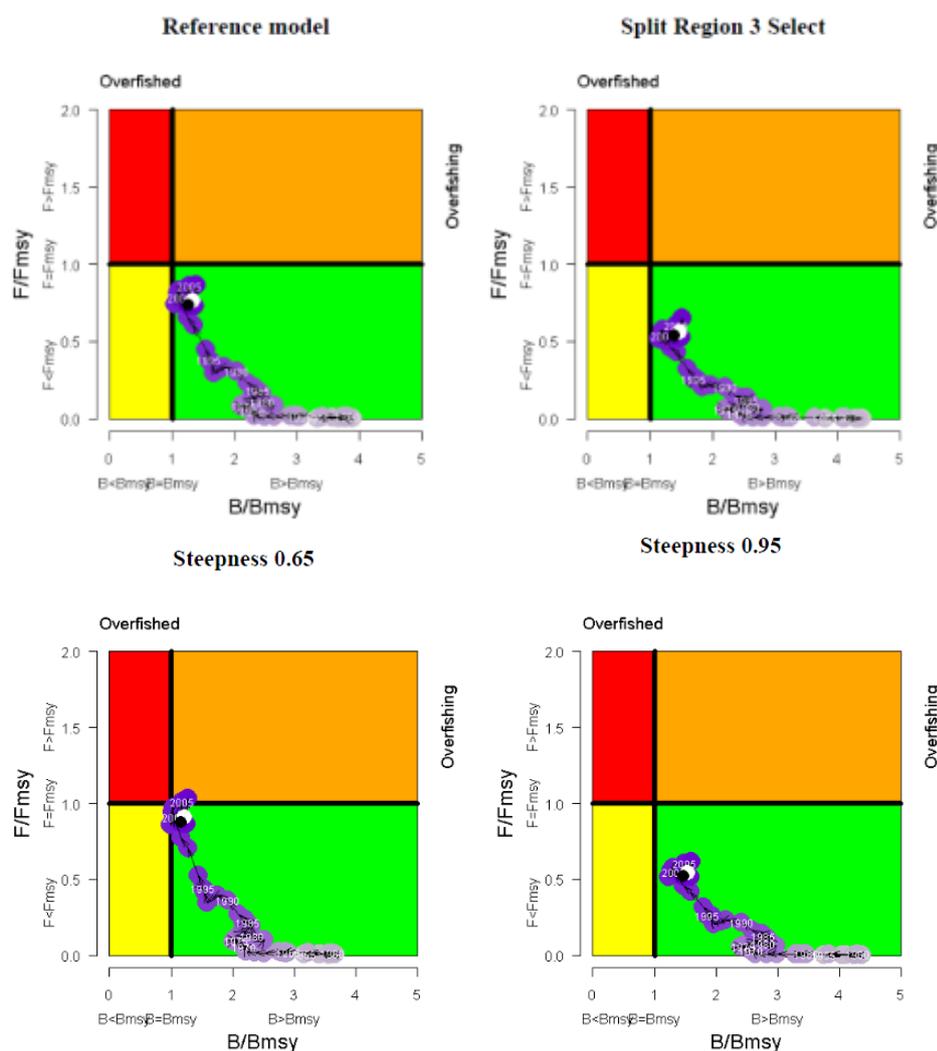


Figure 23. Temporal trend in annual stock status, relative to BMSY (x-axis) and FMSY (y-axis) reference points, for the model period (1952–2010). The colour of the points is graduated from mauve (1952) to dark purple (2010) and the points are labelled at 5-year intervals. The white circle represents the average for the period 2006–09 and the black circle the 2009 values. Top left = model used to provide scientific advice; top right = alternative spatial structuring; bottom left = lower steepness (0.65); bottom right = higher steepness (0.95). From Langley et al. (2011).

As for bigeye, the WCPFC formally adopted a biomass limit reference point for yellowfin in 2012, set at 20% of the average annual total biomass over a recent period in the absence of fishing ($SB_{\text{current}, F=0}$). In the reference model, Langley et al. (2011) estimated $B_{\text{current}, F=0}$ as 3,563,564 tonnes and B_{current} at 1,881,625 tonnes. $B_{\text{current}} / B_{\text{lim}}$ is therefore estimated at 2.64.

Management

As for bigeye, management of WCPO yellowfin is the responsibility of the WCPFC through CMM-2013-01, which recognises that yellowfin is being fished at capacity and seeks to reduce fishing mortality (F) so that the stock is - at a minimum - maintained at MSY. The key management measures have been explained in Section 3.4.1.1; however for yellowfin, the following additional measure applies:

- Yellowfin catches by purse seine catches should not be increased. Note that this doesn't apply to SIDS.

Information:

As per bigeye, see Section 3.4.1.1.

3.4.1.3 Blue marlin

Blue marlin (*Makaira nigricans*) is a cosmopolitan species found primarily in tropical and subtropical epipelagic waters of the Pacific, Indian, and Atlantic Oceans. Its latitudinal range changes seasonally, expanding northwards and southwards in the warmer months and contracting towards the equator in colder months. Blue marlin typically inhabit the warmer waters above the thermocline, where they feed on squid, tuna-like species, crustaceans, and cephalopods, rarely descending into deeper waters (Collette et al., 2011). Long distance movements within the Pacific are currently not well understood and although most tag-recapture data from the Pacific NMFS Cooperative Billfish Tagging Program indicate relatively little movement from the original tag-release locations (Sippel et al., 2013), this could be a biased result due to an extremely low recapture rate for the species (0.6%). In the Pacific, no evidence of population structuring has so far been detected and blue marlin is therefore considered to have a single stock within the Pacific Ocean (ISC BILLWG, 2013).

From a commercial fisheries perspective, blue marlin is one of the most important bycatch species in the high seas fisheries of the Pacific and is taken in pelagic tuna longline fisheries, as well as driftnet, harpoon, and purse seine fisheries (ISC BILLWG, 2013). Trends in total reported blue marlin catches in the Pacific for the last 4 decades are shown in Figure 24. During the 1970s, the average annual reported catch of blue marlin in the Pacific Ocean amounted to about 12,302 tonnes, of which 68% was taken by the Japanese distant-water and offshore longline fleets and about 20% by the Taiwanese longline fleets. Despite several drops in catch levels, total catches have increased through the 1980s and 1990s, peaking at 25,509 tonnes in 2003. During this period, the Japanese and Taiwanese offshore longline fleets accounted for the most significant catches. Despite Pacific-wide decreases in effort in the Japanese offshore longline fleet, leading to a decline in total catches in 1996 - 1999, the increasing trend in catches from the Taiwanese and other longline fisheries (e.g. Korea, China, Indonesia, French Polynesia) as well as increasing catches in the purse seine fishery, has meant that catches have remained at a level of approximately 18,000 tonnes (ISC BILLWG, 2013).

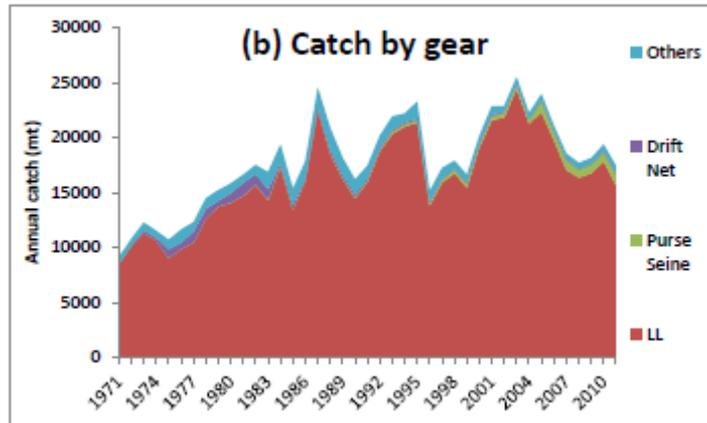


Figure 24. Catch (tonnes) of Pacific blue marlin by year and gear type. The ‘Other’ category refers to miscellaneous gears including bait, net, trap, and coastal fisheries (from ISC WGBILL, 2013).

Outcome:

The first international billfish assessment was conducted in 1977 at the billfish stock assessment workshop using limited biological information and fishery data (NMFS 1978); few and infrequent assessments had been conducted on billfish since then. The ISC Marlin Working Group was established in 2002 and merged with ISC Swordfish Working Group to form the ISC Billfish Working Group (ISC BILLWG) in 2007. The most recent assessment for blue marlin, based on a single Pacific Ocean stock, was conducted by the ISC BILLWG in 2013, using Stock Synthesis, based on a sex-specific, size-based, age-structured and integrated stock assessment model. The data used in the assessment included new life history information as well as updated fishery-specific catches, length and weight measurements, and abundance indices derived from logbooks or observer data compiled for 1971-2011 (ISC BILLWG, 2013).

The findings of the assessment can be summarised as follows:

- Estimates of population biomass and female spawning biomass exhibited a long-term decline during 1971 - 2011.
- Estimated relative fishing mortality (F/F_{MSY}) and fishing intensity ($(1-SPR)/(1-SPR_{MSY})$) gradually increased from the early 1970s to the early 2000s and declined in the most recent years (2009-2011). Current fishing mortality was defined by the BILLWG as the average of estimates for 2009-2011 to account for uncertainty and fluctuation of estimates of recent years.
- No target or limit reference points have been established for the Pacific blue marlin stock under the auspices of the WCPFC. Compared to MSY-based reference points, the current (2011) spawning biomass is 29% above SSB_{MSY} and the current fishing mortality (average across 2009-2011) is inferior to F_{MSY} and $1-SPR_{MSY}$ by 19% and 6%, respectively. Therefore, the blue marlin stock in the Pacific Ocean currently is not being overfished and is not in an overfished state (Figure 25).

Based on the results of the stock assessment the stock is not currently overfished and is not experiencing overfishing.

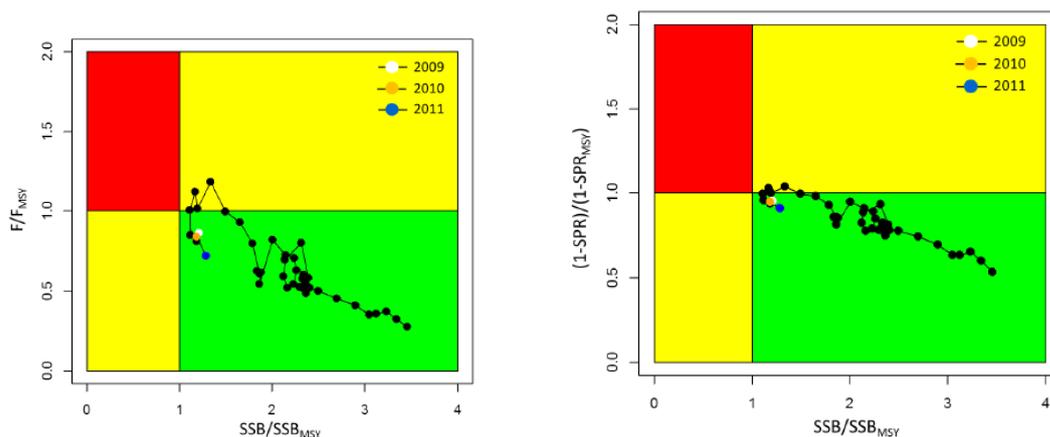


Figure 25. Kobe plots of the trends in estimates of relative fishing mortality (average of age 2+) and female SSB (right), and estimates of relative fishing intensity and female SSB (left) for Pacific blue marlin (*Makaira nigricans*) during 1971-2011. From ISC BILLWG (2013).

Management

There is no specific CMM relating to blue marlin - the species is instead managed through the 2005 Resolution on Non-Target Fish Species (Resolution-2005-03) which encourages CCMs to “avoid to the extent practicable, the capture of all non-target fish species that are not to be retained. Any such non-target fish species that are not to be retained, shall, to the extent practicable, be promptly released to the water unharmed”.

Information

While a lack of biological, ecological and fisheries-dependent data had been identified in previous assessments for blue marlin, significant advances have been made since those assessments were completed, particularly in relation to blue marlin biology, including improved understanding of the growth of juveniles, sex-specific growth rates of adults, length at 50 percent maturity, and age- and sex-specific estimates of natural mortality rates (ISC BILLWG, 2013).

Fisheries-dependent data continue to suffer from misidentification issues between reported catches of blue, black and striped marlin. This is reportedly also the case for longliners operating in Cook Islands waters, including the LTFV fleet, although it is highly likely that most catches of marlin are in fact blue marlin.

3.4.1.4 Bait

In addition to the main retained species listed above, bait species should also be considered under this component. The selection of bait in this fishery depends on a number of factors including market conditions. Although in previous years the client group used several species of fish and squid for bait, in 2012 and 2013 the fleet only used Indian oil sardine (*Sardinella longiceps*) which it sourced from China and to a lesser extent Oman. The amount of bait purchased by LTFV in 2012 and 2013 was 2,297 and 2,688 tonnes respectively.

The Indian oil sardine is a highly migratory small pelagic fish found around the coasts of south-west India, and eastwards to the Andaman Islands, Sri Lanka, North Borneo, the Philippines and the Seychelles (Andrews et al., 2008). The species grows rapidly, matures early, and is highly fecund. The Indian oil sardine is one of the most important commercial species in Indian fisheries and is targeted with ring nets, pelagic trawls, gillnets and purse seines with the main commercial concentrations of the species situated off the coast of

south-west India and especially Kerala. Mohandas (1997) identified four populations of *S. longiceps*; however, stock structure for this species is uncertain.

Population size for *S. longiceps* is highly erratic and susceptible to environmental fluctuations, with FAO catch statistics indicating large-scale annual fluctuations in the landings of this species. Rohit and Bhat (2003) carried out a study on the biology, growth and stock structure of the Indian oil sardine along the Mangalore-Malpe coast, based on investigations made during 1997-98 to 2001-02. The study concluded that the oil sardine was underexploited and that the yield could be optimised by increasing effort by 21%. Currently, fishery output and population parameters are being monitored by the Central Marine Fisheries Research Institute (CMFRI) and used as a proxy for stock survey (Andrews et al., 2008). According to these statistics the fishery thrived in the 1920s, with landings of over 57,000 tonnes in the 1923-24 season, followed by a decline over the following 22 years to a minimum of less than 500 tonnes in the mid-1940s. The fishery revived in the 1950s, with landings of around 10,000 tonnes per annum, and has grown considerably since, to a fishery landing over 400,000 tonnes in 2003 (Andrews et al., 2008). In 2010 and 2011, the fishery's estimated landings were approx. 488,000 and 609,000 tonnes respectively, representing ca. 16% of total marine landings in India (CMFRI, 2012). Analysis of catch data for those years further indicates that the average length at capture exceeded the size at maturity and optimum size for exploitation for the species (CMFRI, 2012). This, in addition to the life history characteristics of the species (broadcast spawner, fast growth and short life span) suggests that the Indian oil sardine is likely to be within biologically safe limits. Furthermore, the use of *S. longiceps* as bait in the fishery under assessment represents a fraction of the total landings at less than 1%.

3.4.2 Discards

The information on discards in this fishery is based on observer data held by the SPC as discards are generally not recorded in the logsheets. For the purpose of this assessment, the original observer reports were viewed, and data on the length, weight, condition, sex and fate of discarded species were obtained. To determine the proportion of discarded species vs the total catch, only 2013 observer data were used. This is because the Shark Sanctuary was implemented in December 2012. From then onwards there has been a requirement to discard all shark and ray species - as such, only the 2013 data are representative of the current situation. During 2013, eight observer trips were carried out, aboard eight different vessels, out of 81 LTFV trips within the CK EEZ, representing 9.8% observer coverage of LTFV trips. The aggregated data on discards for those trips (as provided by the SPC) is shown in Table 17. In this context, bycatch species are considered 'main' if they make up more than 5% of the total catch or are particularly vulnerable. In this assessment, vulnerable species were designated as 'main' if they made up more than 2% of the total catch. None of the species listed make up more than either 2% or 5% of the catch and none were therefore considered as 'main' bycatch species. Species of particular conservation concern are marked in bold and are addressed under the component 'ETP Species' in Section 3.4.3.

Table 17. Bycatch species for the LTFV fleet as per 2013 observer data

Species	Number	% of total catch
ESCOLAR	260	1.58
PELAGIC STING-RAY	204	1.24
ALBACORE	172	1.04
SHORTSNOUTED LANCETFISH	142	0.86
OILFISH	122	0.74
YELLOWFIN	112	0.68

Species	Number	% of total catch
SLENDER SUNFISH	87	0.53
BLUE SHARK	61	0.37
SHORT FINNED MAKO SHARK	42	0.26
SILKY SHARK	42	0.26
BIGEYE	41	0.25
GREAT BARRACUDA	40	0.24
OCEANIC WHITE-TIP SHARK	37	0.22
SKIPJACK	37	0.22
SICKLE POMFRET	36	0.22
SNAKE MACKEREL	35	0.21
LONGSNOUTED LANCETFISH	34	0.21
MAHI MAHI / DOLPHINFISH / DORADO	34	0.21
WAHOO	20	0.12
SHORT-BILLED SPEARFISH	18	0.11
LONG FINNED MAKO SHARK	17	0.10
SWORDFISH	12	0.07
PELAGIC THRESHER SHARK	8	0.05
OMOSUDID	7	0.04
BLUE MARLIN	6	0.04
ATLANTIC POMFRET / RAY'S BREEM	4	0.02
GIANT MANTA	4	0.02
STRIPED MARLIN	4	0.02
BARRACOUTA (SNOEK)	3	0.02
BIGEYE THRESHER SHARK	3	0.02
OARFISHES NEI	3	0.02
SAILFISH (INDO-PACIFIC)	3	0.02
CHILEAN FLAT OYSTER	2	0.01
CRESTFISH	2	0.01
LEATHERBACK TURTLE (NEW FAO)	2	0.01
SNAKE MACKERELS AND ESCOLARS	2	0.01
BIRD (UNIDENTIFIED)	1	0.01
BLACK MACKEREL	1	0.01
BOTTLENOSE DOLPHIN	1	0.01
CROCODILE SHARK	1	0.01
DEVIL MANTA RAY (MOBULA NEI)	1	0.01
FALSE KILLER WHALE	1	0.01
GIZZARD SHAD (KONOSHIRO)	1	0.01
LOGGERHEAD TURTLE	1	0.01
RAZORBACK SCABBARDFISH	1	0.01
Grand Total	1667	10.13

3.4.3 Protected species interacting with the fishery

The available information for this fishery on Endangered, Threatened and Protected (ETP) species also stems from SPC observer records as the majority of interactions with ETP species (except sharks in 2013) are not recorded in logbooks. Although this is a requirement under the large Pelagic Longline Fishery Regulations (2012), the MMR confirms that interactions with ETP species are not consistently reported by the crew. Since the implementation of the Shark Sanctuary, shark discards are being recorded; however, as explained further on, the audit team identified some issues with misidentification of sharks in the logsheets.

For the purpose of identifying the ETP species which are likely to interact with this fishery, the 2012 and 2013 discard data were taken into account, corresponding to a total of 13 observer trips and an average observer coverage of 9.8% (2013) for the LTFV fleet. The list of ETP species of concern to this assessment is provided in Table 18, with the numbers observed during each trip and the corresponding fate code. An explanation of the fate codes is provided in Table 19. The species fall under four categories: seabirds, sea turtles, sharks and rays, and cetaceans; each of which is discussed in the following sections.

Table 18. List of ETP species encountered by the LTFV fleet. Based on 2012 - 2013 observer data provided by the SPC.

Species	2012		2013	
	No.	Fate	No.	Fate
Bird (unidentified)	1	DPA	1	DUS
Turtles				
Green turtle	1	RCC		
Leatherback turtle			2	1 DPA; 1 DPQ
Loggerhead turtle			1	DPA
Sharks and rays				
Bigeye thresher shark	14	DUS	3	DCI
Blue shark	193	13 DOR; 173 DUS; 1 RHG; 5 RPT; 1 RWW	61	20 DCF; 41 DUS
Bronze whaler shark	4	DUS		
Crocodile shark			1	DUS
Devil Manta Ray (<i>Mobula nei</i>)			1	DCF
Giant manta			4	1 DVF; 3 DUS
Grey reef shark	2	1 DOR; 1 RPT	1	RWW
Long-finned mako shark	2	DOR	17	14 DCF; 1 DSO; 2 DUS
Oceanic white-tip shark	15	1 DCF; 1 DFR; 4 DOR; 9 DUS	37	9 DCF; 28 DUS
Pelagic stingray	221	2 DOR; 1 DSD; 216 DUS; 1 RPT; 1 RWW	206	204 DUS; 2 RWW
Pelagic thresher shark	1	DUS	8	5 DCF; 3 DUS
Raja rays <i>nei</i>	2	DOR	1	RWW
Torpedinidae, Narkidae rays	1	RCC		
Shark fins	1	DUS		
Short-finned mako shark	23	2 DOR; 21 DUS	42	13 DCF; 29 DUS
Silky shark	47	DUS	42	8 DCF; 34 DUS
Silber-tip shark	1	RWW		

Common thresher shark	1	RWW		
Cetaceans				
Bottlenose dolphin			1	DPU
False killer whale			1	DUS

Table 19. Explanation of fate codes provided in SPC observer reports

Fate code	Description
DUS	Discarded - uneconomic species
DPA	Discarded alive
DOR	Discarded - other reason
RHG	Retained - headed and gutted
RPT	Retained - partial
RWW	Retained - whole
RCC	Retained - for crew consumption
DCF	Discarded - cut free
DFR	Discarded - fins retained
DSD	Discarded - shark damage
DCI	Not in SPC Observer Database
DSO	Discarded - struck off close
DPU	Species of special interest - unknown condition
DVF	Discarded - vessel fully loaded
DPQ	Discarded - poor quality

3.4.3.1 Seabirds

LTFV operators report that although seabirds are often seen from the vessels, they rarely interact with the fishing gear and are almost never hooked (Momo Kochen, Fishing and Living). Table 18 indicates that the fishery interacted with two seabird specimens across all observed trips; on both occasions the animal in question was released; alive in 2012 but with an unknown fate in 2013. Several species of seabirds that are present in the WCPO may be vulnerable to capture in longline fisheries and a number of these have been designated as 'near threatened' to 'critically endangered' on the IUCN red list (see Table 20). There is no explicit national protection status for seabirds in the Cook Islands. CMM-2007-04 issued by the WCPFC on the implementation of the FAO International Plan of Action on Seabirds (IPOA-Seabirds) applies to fisheries operating south of 30 degrees South and north of 23 degrees North. This CMM therefore does not apply to the Cook Islands EEZ or its adjacent High Seas. Furthermore, in its NPOA-Seabirds for the Cook Islands, the MMR reports that based on logbook data, 33 million hooks had been set since 2001 with no reports of seabird bycatch. According to the MMR, this information is supported by observer reports and interviews with vessel operators (NPOA-Seabirds).

In accordance with the International Plan of Action on Seabirds (IPOA-Seabirds), the Cook Islands have prepared a National Plan of Action for Reducing Incidental Catch of Seabirds (NPOA-Seabirds). The plan covers flag vessels involved in longline, trawl and troll

operations in the Pacific and Indian oceans and plans to fish for krill in Antarctica. In the Cook Islands EEZ and adjacent High Seas, the plan is implemented through the Cook Islands Large Pelagic Longline Fishery Plan, which requires vessels to record any encounters with seabirds (live or dead) and report this to the MMR. Vessels are also required to comply with any applicable national or international measures to protect seabirds when fishing beyond the Cook Islands EEZ (Marine Resources Large Pelagic Longline Fishery Regulations, 2012).

Table 20. Seabird species potentially vulnerable to capture in WCPO longline fisheries with IUCN status (from Watling, 2002).

Common name	Species	IUCN status
Black-footed Albatross	<i>Phoebastria nigripes</i>	Near threatened
Laysan Albatross	<i>Phoebastria immutabilis</i>	Near threatened
Wedge-tailed Shearwater	<i>Puffinus pacificus</i>	Least concern
Short-tailed Albatross	<i>Phoebastria albatrus</i>	Vulnerable
Pink-footed Shearwater	<i>Puffinus creatopus</i>	Vulnerable
Flesh-footed Shearwater	<i>Puffinus carneipes</i>	Least concern
Sooty Shearwater	<i>Puffinus griseus</i>	Near threatened
Short-tailed shearwater	<i>Puffinus tenuirostris</i>	Least concern
Christmas Shearwater	<i>Puffinus nativitatis</i>	Least concern
Newell's Shearwater	<i>Puffinus newelli</i>	Endangered
Heinroth's Shearwater	<i>Puffinus heinrothi</i>	Vulnerable
Dark-rumped/Hawaiian Petrel	<i>Pterodroma phaeopygia/sandwichensis</i>	Critically endangered/vulnerable
Juan Fernandez Petrel	<i>Pterodroma externa</i>	Vulnerable
Murphy's Petrel	<i>Pterodroma ultima</i>	Near threatened

An analysis by Watling (2002), based on interviews with WCPO industry stakeholders and observer data, indicates that although seabird interactions with longline vessels operating in tropical and subtropical areas of the WCPO are very rare (except in the Hawaii-based longline fisheries) this does not preclude the possibility of highly threatened seabird populations being impacted. The findings of this study were supported by Gilman (2006) who evaluated seabird bycatch in the WCPO longline fisheries based on the following:

- Quantitative information on seabird bycatch in longline fisheries operating in the WCPO, based on SPC/OFP observer data for tropical and subtropical Pacific pelagic longline fisheries, representing 0.8% of total effort from 1995-2005, distributed across seasons and covering many of the areas within the WCPO, particularly in the EEZs of Forum Fisheries Agency Members
- Comparison of the distributions of seabird species known to be vulnerable to capture in longline fisheries in other regions to the distribution of longline effort in the tropical and subtropical WCPO;
- Fishermen interviews;
- Identification of tropical and subtropical Pacific seabird species susceptible to longline capture based on the characteristics of seabird species that are captured in temperate zone longline fisheries.

Gilman (2006) concluded that existing observer data are currently insufficient to support a conclusion with any high level of certainty that no pelagic longline fisheries operating in the tropical Pacific Islands region could be contributing to existing or cause future seabird population declines.

A risk assessment has since been conducted by Filippi et al. (2010) which compared the distribution of seabirds and their likelihood of capture in relation to longline fishing effort in the WCPFC area. The study used a Productivity-Susceptibility Analysis (PSA) to identify the areas of greatest risk of occurrence and impacts of bycatch, the species of greatest concern for population level impacts and the fisheries which contributed the greatest risk. The resulting areas of likely species-level effects of fishing in the WCPFC Convention Area are shown in Figure 26.

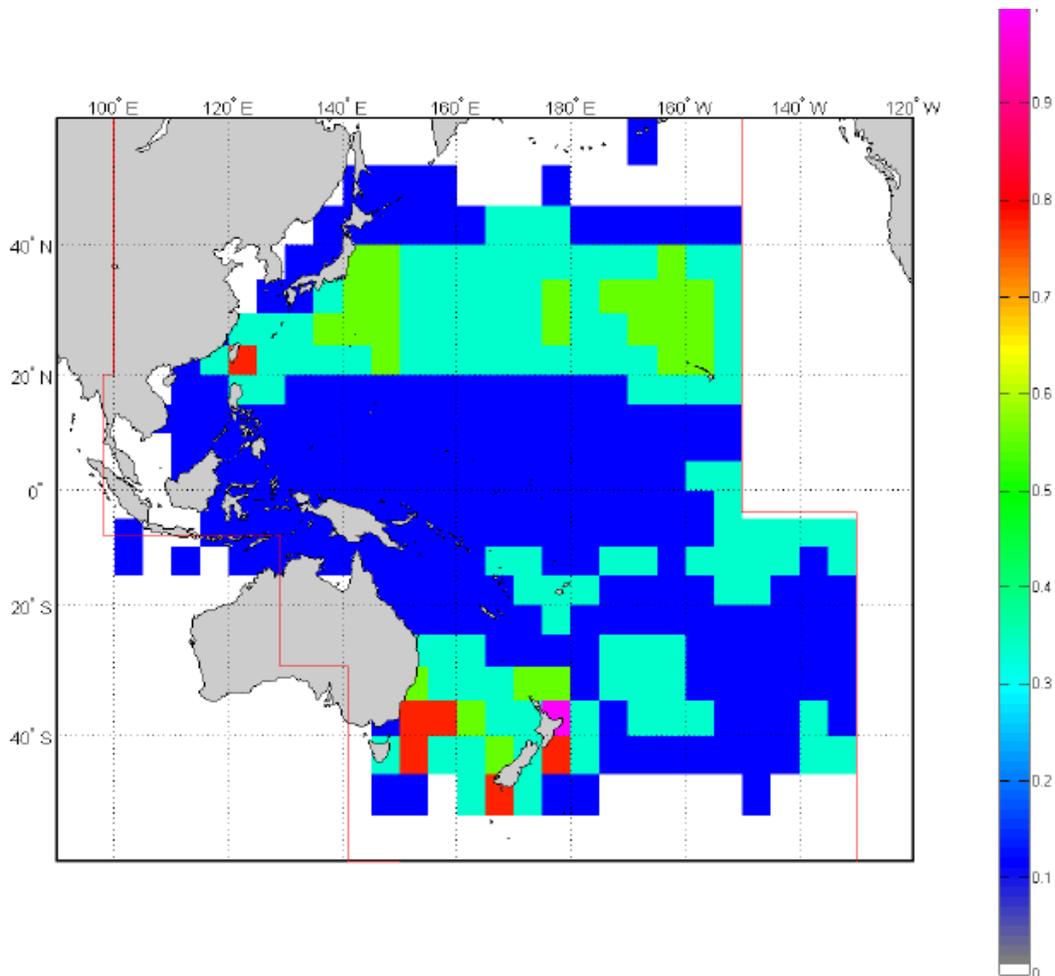


Figure 26. Areas of likely species-level effects of fishing in the WCPFC Convention Area. Highest risk areas - pink, Medium-high - orange; Medium – green; Medium-low – pale blue; Low – dark blue; Negligible risk – White. From Filippi et al. (2010).

Based on the above information, as well as updated best practice advice from the Agreement for the Conservation of Albatrosses and Petrels (ACAP), the Scientific Committee has recommended that the WCPFC revise the current CMM for seabirds. Birdlife International (2012) subsequently reviewed CMM-2007-04 and made recommendations for the scope of the updated CMM in the WCPFC. For the fishery under assessment, the following recommendation is relevant:

“The WCPFC conservation measures should be updated to require best practice mitigation (see CMM-2007-04) be applied in these additional risk areas especially from 25°S – 30°S but also 20°N-40°N to provide consistency with other tuna RFMO CMMs.”

The southern hemisphere 25°S latitudinal line passes just inside the EEZ of the Cook Islands, with 0.06% of the EEZ overlapping with the proposal to extend CMM to 25°S. As such, it is likely that some amendments to the NPOA-Seabirds will be required. However, for

the fishery under assessment, which takes place in the Northern waters of the Cook Islands, these revisions to the CMM are unlikely to have an effect.

3.4.3.2 Sea turtles

Three species of sea turtle were encountered in the observer reports: green turtle, *Chelonia mydas* (1 individual, consumed by the crew in 2012); loggerhead turtle, *Caretta caretta* (1 individual, released alive in 2013); and leatherback turtle, *Dermochelys coriacea* (2 individuals, one released alive and one discarded and reportedly of poor quality, which is here assumed to have died).

There is no explicit national protection status for sea turtles in the Cook Islands and turtles can in fact be harvested in the outer islands. Four species of marine turtle are known to occur in the archipelago: the green turtle, hawksbill turtle (*Eretmochelys imbricata*), leatherback turtle and loggerhead turtle. The two former species are present in Cook Islands territorial waters throughout the year, while *D. coriacea* is predominantly known from offshore fisheries reports and *C. caretta* has only been reported from Palmerston Atoll (White, 2012). Note, however, that this is likely to be an under-representation as the Cook Islands are generally considered as data-deficient with respect to sea turtles. Wallace et al. (2010) defined 58 sea turtle Regional Management Units (RMUs) globally, comprising multiple nesting sites, nesting populations and breeding populations, defining core distribution areas that are considered optimal for assessing the conservation status of marine turtles and for management applications (Gilman et al., 2013). The fishery under assessment overlaps with the five RMUs listed in Table 21 and shown in Figure 27 (note that the RMUs are continually updated as new stock information becomes available - for the latest map, see this link: <http://seamap.env.duke.edu/swot>). All of the species shown in Table 21 are listed under Appendix I of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) and Appendices I and II of the CMS (Convention on the Conservation of Migratory Species of Wild Animals, or the Bonn Convention).

Outcome

An assessment of the conservation status of marine turtle RMUs by Wallace et al. (2011) evaluated the risk level of each RMU based on a range of population parameters (e.g., population size, recent and long-term population trends, rookery distribution and vulnerability, genetic diversity) and the degree of threats (e.g. bycatch, coastal development, pollution and pathogens, climate change) impacting each RMU (Wallace et al. 2011; Wallace et al. 2013). Wallace et al. (2013) further evaluated the relative bycatch impacts across different fishing gears across sea turtle RMUs globally. The study found that longlines were most frequently found to have the highest bycatch impact scores for individual RMUs, but this result was likely due to the higher availability of longline records than for other gear types and in general, mortality rates in longlines, with the exception of bottom-set longlines, were significantly lower than mortality rates in most nets and trawls. The relative impacts of bycatch to marine turtle populations depend on the magnitude, mortality rates, and reproductive values of individuals affected relative to amounts of fishing effort (Wallace et al., 2013); therefore, a threat that incurs high mortality and occurs in areas of high density of reproductively valuable individuals will have a negative population-level impact. In this context, fisheries operating in near-shore areas overlapping with high-use areas for turtles are more likely to negatively affect turtle populations than offshore fisheries operating in low-use areas. The resulting risk and threat levels for each RMU considered here are shown in Table 21. The *C. caretta* and *L. olivacea* (olive ridley) RMUs were ranked amongst those at the highest risk of longline bycatch; the other three species were considered at the lowest risk. Wallace et al. (2013) however, did acknowledge the imbalanced distribution of available

marine turtle bycatch data among gear categories and geographic regions, which directly affects the ability to adequately and quantitatively assess relative bycatch impacts across gear types and populations.

Table 21. Sea turtle Regional Management Units that overlap with the fishery under assessment (from Wallace et al., 2010). RMU risk and threat level (from Wallace et al., 2011), longline bycatch impact (from Wallace et al., 2013), IUCN and conservation instruments are also shown.

Species	Common name	RMU (and overlap with Cooks EEZ)	RMU risk and threat level (from Wallace et al., 2011)	IUCN status	Conservation instruments
<i>Caretta caretta</i>	Loggerhead	South Pacific (overlaps entirely)	High risk High threat High bycatch impact	Endangered	CITES Appendix I CMS Appendix I & II
<i>Chelonia mydas</i>	Green turtle	Pacific south central (partial overlap)	Low risk Low threat Low bycatch impact	Endangered	CITES Appendix I CMS Appendix I & II
<i>Dermochelys coriacea</i>	Leatherback	Western Pacific (partial overlap)	High risk Low threat Low bycatch impact	Critically endangered (West Pacific Ocean subpopulation)	CITES Appendix I CMS Appendix I & II
<i>Eretmochelys imbricata</i>	Hawksbill	Pacific south central (overlaps entirely)	High risk High threat Low bycatch impact	Critically endangered	CITES Appendix I CMS Appendix I & II
<i>Lepidochelys olivacea</i>	Olive Ridley	Western Pacific RMU (overlaps entirely)	Low risk High threat High bycatch impact	Vulnerable	CITES Appendix I CMS Appendix I & II

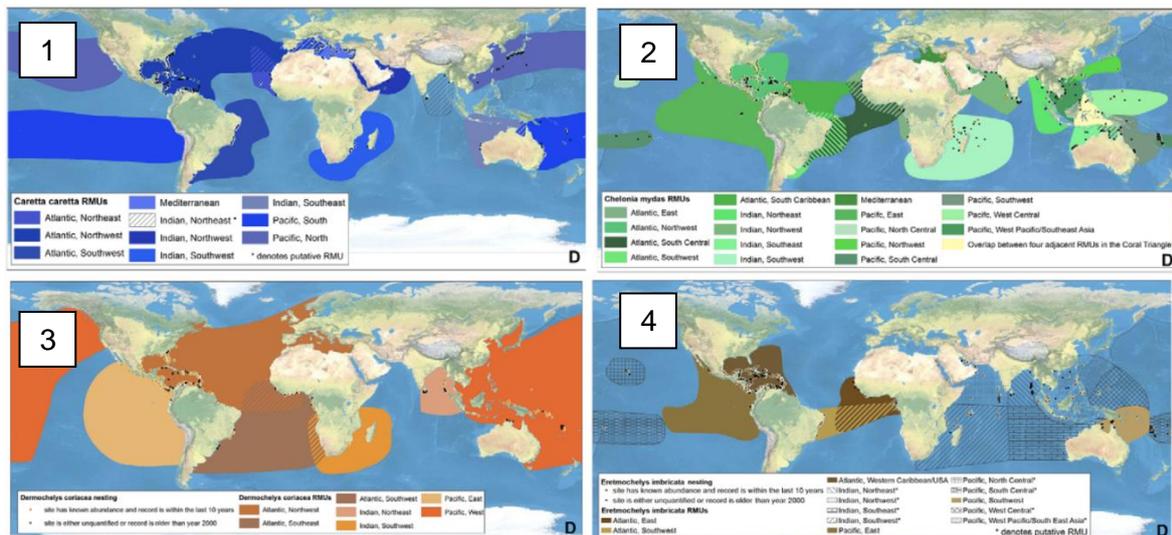




Figure 27. Sea turtle Regional Management Units according to Wallace et al. (2012). The fishery under assessment overlaps with the *Caretta caretta* south Pacific RMU (1), *Chelonia mydas* Pacific south central RMU (2), *Dermochelys coriacea* Western Pacific RMU (3), *Eretmochelys imbricata* Pacific south central (4) and *Lepidochelys olivacea* Western Pacific RMU (5).

A review of turtle bycatch in the Western and Central Pacific Ocean was undertaken by the South Pacific Commission on behalf of the Secretariat for the Regional Environment Programme in 2001 (Anon, 2001). The review concluded that deep day sets in the Western South Pacific (10°S - 35°S) typical of those in the American Samoa-based albacore longline fishery had the lowest rate of interaction, while shallow sets in the Western Tropical Pacific (10°N - 10°S) accounted for the highest interaction rates (NPOA-Turtles). In an ecological risk assessment (ERA) for species caught in WCPO tuna fisheries, Kirby (2006) further found that turtles most frequently encountered in longline fisheries were juvenile and were mostly alive on haulback. For turtles, effective conservation measures can therefore also be directed at treatment post-capture as the survival of these live but probably distressed and fatigued animals may depend on the crew dehooking the turtle without damaging it, and then allowing it to recuperate (Kirby, 2006).

Management

At regional level, the WCPFC has issued CMM-2008-03 on the conservation and management of sea turtles, requiring the implementation of the FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations, which include the use of wide circle hooks; using fish rather than squid for bait; and setting hooks deeper than turtle abundant depths (40–100 m). The CMM also details reporting requirements for CCMs and best practice guidelines to ensure the survival of captured sea turtles. For longline vessels, the CMM specifically requires that operators carry and use line cutters and de-hookers to handle and promptly release sea turtles caught or entangled and, where appropriate, carry and use dip-nets. CCMs with longline fisheries other than shallow-set swordfish fisheries are furthermore urged to:

- Undertake research trials of circle hooks and other mitigation methods in those longline fisheries;
- Report the results of these trials to the Scientific Committee and Technical and Compliance Committee.

At national level, the Cook Islands MMR has developed a National Plan of Action for Sea Turtle Bycatch Mitigation (NPOA-Turtles), implementing the FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations as well as the Regional Action Plan for Sea Turtle Bycatch Mitigation implemented by FFA member countries on 1 July, 2008. The NPOA sets

out a program of actions that aims to improve knowledge of fishing practices and interactions over time through collection and monitoring of fishery data, research and trials of mitigation measures, and establishes current “best practice” mitigation methods for implementation.

The Cook Islands longline Fishery Plan (2008) includes the following measures to reduce seaturtle mortality: “fishers will have to adopt the use of circle hooks in all fishing activities, as well as follow the ‘Releasing hooked turtles’ guidelines on how to care for and release live hooked marine turtles. Any further requirements by RFMO conservation and management measures, as well as under the marine turtle NPOA, will also have to be adopted. Marine turtle encounters (live or dead) must be recorded and reported to MMR.”

An image of the circle hooks employed by LTFV longline vessels is shown in Figure 28. Circle hooks are also compulsory by Chinese law, so all the boats are equipped with these (Momo Kochen, Fishing and Living). In the last two years, the main bait species has been *Sardinella longiceps* and no use of squid has been reported for that time period. A site visit carried out by Fishing and Living aboard LTFV vessels in Pago Pago found that all lines aboard all vessels examined had circle hooks. Although de-hooker packs (including line cutter, dip net and three types of de-hookers) were present aboard these vessels, there were indications of inconsistent use of these packs. Turtles are most often just cut loose and not de-hooked as they are too difficult to land; any turtles caught are often not identified to species level, and incidents are most often not reported to the MMR. In this respect, it was found that training and division of responsibilities amongst crew aboard LTFV vessels with regard to sea turtles was not well defined.

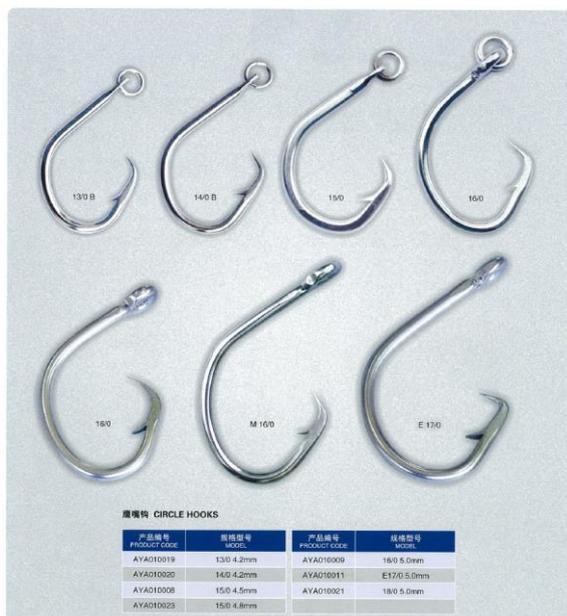


Figure 28. Image of circle hooks employed by LTFV vessels

Other activities carried out at national level include the distribution of mitigation tools and education awareness materials to vessels and the implementation of a hook-exchange programme in the domestic longline fishery to encourage the trial and use of circle hooks. A turtle mitigation program has also been initiated through the NOAA *Sea Turtle Conservation, Management, Mitigation and Outreach* project which has been in place since May 2008. Following this project, a MMR-run initiative is being set up which includes:

- Workshops to advance the skills of trainers as well as observers;
- Industry outreach activities involving vessel operators in Rarotonga and American Samoa with an annual mitigation workshop to update operators on the progress of

the program as well as any new techniques. New operators that enter the longline fishery will also be required to undertake training as the need arises;

- The provision of mitigation information, data forms and equipment to vessel operators;
- Ongoing communication and cooperation with regional organizations and NOAA with respect to information updates, the development the gathering, processing and distribution of data; training of trainers and supply of equipment and expertise as required;
- Tagging and release of turtles.

The MMR continues to work closely with the regional agencies involved with turtle mitigation as part of its wider work on species of special interest. The Secretariat of the Pacific Community (SPC) has already provided turtle identification cards and de-hooking guides which have been distributed to vessel operators. A relationship has also been developed with the Secretariat of the Pacific Regional Environment Programme (SPREP) with regards to tagging. In general the plan is to maintain close communications and cooperation with the regional bodies to ensure the best possible mitigation methods are practiced and that accurate and timely information is available to all stakeholders. The Offshore Division of the MMR will furthermore conduct annual visits to PagoPago in order to inspect licensed vessels including with respect to turtle mitigation. We understand that this has recently not been the case due to limited MMR capacity; however additional resources are being deployed in the near future which should facilitate Pago Pago-based inspections.

Information

Little is known about sea turtle abundance and population structure in the Cook Islands archipelago; for this reason the Cook Islands Turtle Project was set up in association with PICI. The project consists of an ongoing research programme with the aim of collecting baseline data on sea turtle distribution, stock/ management unit identity, migration patterns, size classes, habitat use and nesting activities, for use in developing suitable conservation and management options for the Cook Islands Government (White, 2011). Other ongoing research includes the Marine Turtle Satellite Tracking programme, which is a collaborative undertaking by SPREP, the Marine Turtle Research Programme (NOAA, National Marine Fisheries Service, Pacific Islands Fisheries Science Centre, Hawaii), and member countries.

3.4.3.3 Sharks and rays

Sharks and rays are considered under ETP species rather than as bycatch because they are protected under the Marine Resources (Shark Conservation) Regulations 2012 which provide the regulatory framework for the Cook Islands Shark Sanctuary, in force since December 2012. As of 2013, shark discards in particular are recorded in the vessel logbooks during each trip; these data have been summarised in Table 22 and provide a quantitative estimate of the number of sharks discarded for each species. As previously mentioned, however, 2012 and 2013 observer data were also considered to allow for a more precautionary determination of the likely ETP species interacting with this fishery (see Table 18). A comparison of both tables indicates some discrepancies between the species recorded by the crew and those recorded by the observer in 2013 - silky sharks in particular were not mentioned in the logbook data but did occur in relatively important numbers in the observer data (42 ind. in 2013). As such, it is highly likely that some sharks have been misidentified by the crew.

Table 22. List of shark species encountered in the LTFV 2013 logbook data and their IUCN status.

Common name	Scientific name	IUCN	Number discarded in 2013
Blue shark	<i>Prionace glauca</i>	Near-threatened	1,369
Oceanic whitetip	<i>Carcharhinus longimanus</i>	Vulnerable*	145
Shortfin mako	<i>Isurus oxyrinchus</i>	Vulnerable	38
Longfin mako	<i>I. paucus</i>	Vulnerable	
Thresher shark	<i>Alopias spp.</i>	Vulnerable	13

* Entry into CITES Appendix II foreseen for September 2014

Sharks were identified as the highest-risk group in an ecological risk assessment for pelagic longline fisheries in the WCPO by Kirby (2006). The following sections will explore the key shark and ray species in more detail. Those species which were present in low numbers in the observer data in Table 18 are not discussed further. These include: bronze whaler shark (4 ind.); crocodile shark (1 ind.); devil manta ray (1 ind.); giant manta (4 ind.); grey reef shark (3 ind.); and silver-tip shark (1 ind.).

a. Blue shark

This species is one of the most prolific shark species and is distributed throughout the WCPO, including tropical waters (Clarke, 2011). It is a major bycatch of longline and driftnet fisheries, particularly from nations with high-seas fleets and is also taken by sport fishermen, particularly in the United States, Europe and Australia (Stevens, 2009). The blue shark was categorized as being at “medium” ecological risk for deep longline sets (Kirby & Hobday, 2007). Kirby (2006), however, concluded that the species is relatively low risk as it is one of the most fecund shark species.

In the southern hemisphere, catch rate trends for blue shark declined until 2003 and then increased to mid-1990s levels. Catch estimates in number based on observer data indicate removals have dropped by at least 50% in the past decade (Clarke, 2011). Two assessments for blue shark were planned for 2012/13: an assessment for blue shark in the South Pacific and another for blue shark in the North Pacific. The latter assessment was undertaken through SPC’s involvement through the ISC. For blue shark in the South Pacific, issues with lack of access to South Pacific catches outside the convention area and the complexity and ranges of quality and coverage of the mix of data sources available, has meant that no stock assessment was carried out in 2013 (OFP, 2013). However, Rice and Harley (2013a) did undertake analyses of observer, operational logsheet and aggregate catch and effort data for the period 1990-2011 to come up with potential catch time series and abundance indices for use in future stock assessments. The analysis focused on estimated CPUE and catch from longline fisheries; not including catches in purse seine fisheries as these are considered to be very low compared to longline catches (Rice and Harley, 2013a). The catch estimates in the early years of the 1990-2011 period are all quite uncertain and there is a large variation in the catch estimates throughout the 1990s; however the majority of approaches used in the analysis indicate that catch estimates are likely to be in the 90,000-180,000 mt range (note that this is significantly lower than the estimates derived from SPC-held raised logbook data which were over 500,000 mt in the last 4 years of the study period). The standardised observer-based catch estimates as shown in Figure 29 were put forward as the dataset with the highest quality; however catch trends derived from aggregated reported data and the logsheet standardized should also be included as sensitivities to capture the differences in the magnitude and trend of the region-specific catch estimates. Observer-based CPUE estimates for region 1 (which includes the UoC) show a decline in nominal CPUE (blue line Figure 30) although this trend is reversed when the effect of variables other than year is taken into account (red line in Figure 30). At this stage no actual conclusions can be drawn about the stock status of this species, except that trends in

nominal CPUE are not likely to be informative about stock status. However the data presented by Rice and Harley (2013) suggest slight WCPO-wide increases in both blue shark catch and CPUE trends.

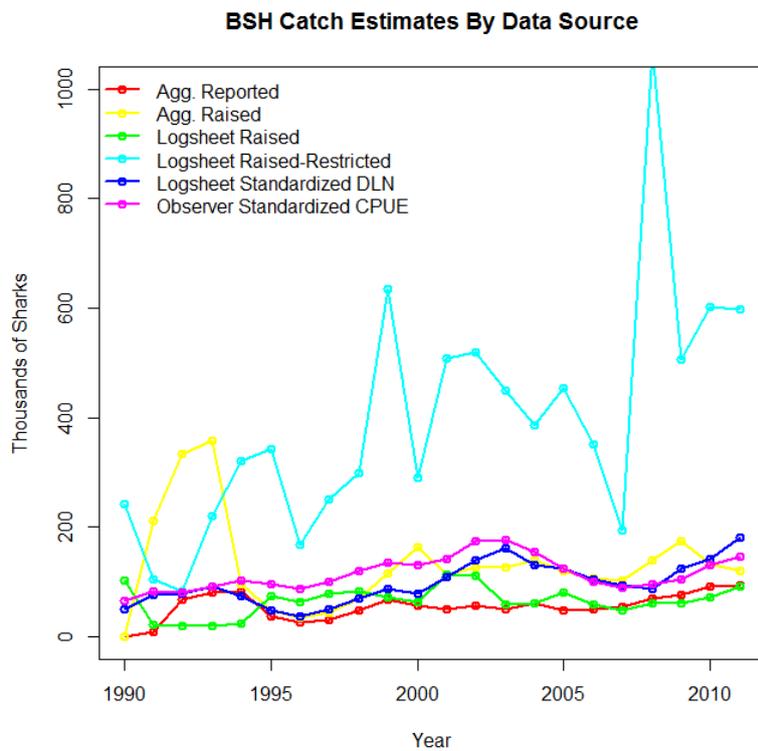


Figure 29. Comparison of catch estimates in 1000's of sharks by data source and estimation method. The standardised observer-based catch estimates (purple) were put forward as the dataset with the highest quality. From Rice and Harley (2013).

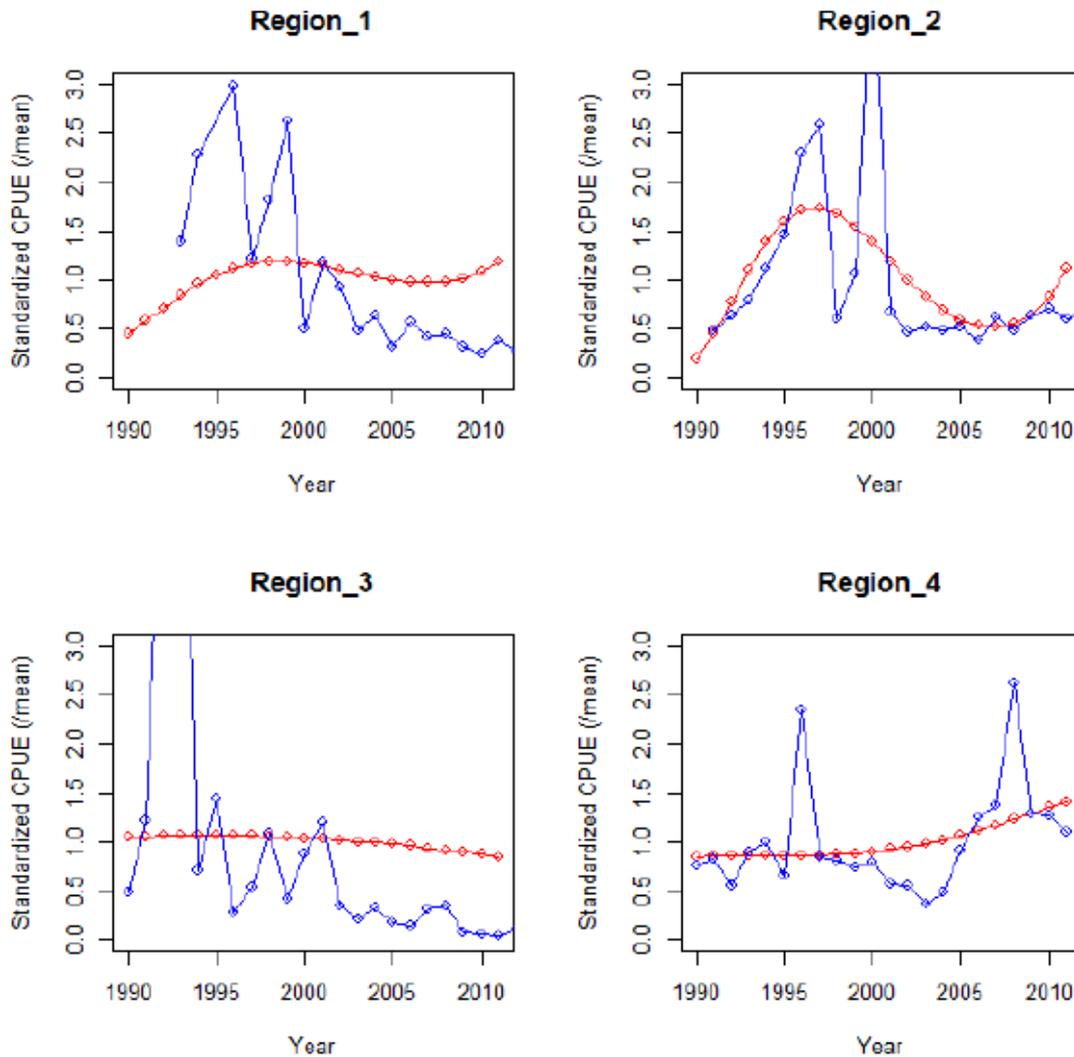


Figure 30. Nominal CPUE (blue) and basis spline year effects (red) from the delta lognormal (DLN) estimation of CPUE based on observer data. Each series is standardised to its mean. From Rice and Harley (2013). Note: UoC is included in Region 1.

Oceanic whitetip

This formerly widespread and abundant large oceanic shark is subject to fishing pressure virtually throughout its range. Oceanic whitetip sharks are most often caught as bycatch in the Pacific tuna longline and purse seine fisheries, though some directed mixed species (sharks and tunas/billfish) fisheries do exist (Rice and Harley, 2012). The tuna longline fleet, which mainly catches juvenile OWT (<170 cm) is thought to have the greatest impact (based on fishing mortality) on the stock due to the overall effort and catch estimates have been decreasing steadily since 1997 mainly due to the sustained decline in longline catch rate (Rice and Harley, 2012). The species is considered to be of low fecundity (Rice & Harley, 2012), making it particularly vulnerable to fishing pressure, and was categorized as being at “medium” ecological risk for both deep and shallow long-line sets (Kirby & Hobday, 2007). The species qualifies for inclusion in CITES Appendix II because it is overexploited for its fins, which are highly valued in international trade (CITES, 2013). Its CITES listing is anticipated for September 2014.

A stock assessment for this species was carried out by Rice and Harley (2012), which considered a single WCPO-wide stock for assessment purposes. The assessment used a Stock Synthesis model and was based on predominantly observer-based catch, effort and length- frequency data. The authors acknowledged difficulties in carrying out the assessment due to the limited CPUE data, reported landings, total mortality and minimal information on the life history and biology; however notwithstanding the difficulties inherent in the input data, the catch, CPUE, and size composition data all showed consistent declines over the period of the model (1995- 2009). The stock status was reported in relation to MSY-based reference points (although actual reference points have yet to be considered by the WCPFC in the management of this species): estimated fishing mortality was found to have increased to levels far in excess of F_{MSY} ($F_{CURRENT} / F_{MSY} = 6.5$) while estimated spawning biomass declined to levels far below SB_{MSY} ($SB_{CURRENT} / SB_{MSY} = 0.153$) (see Figure 31). On that basis it is concluded that overfishing is occurring and that the stock is overfished.

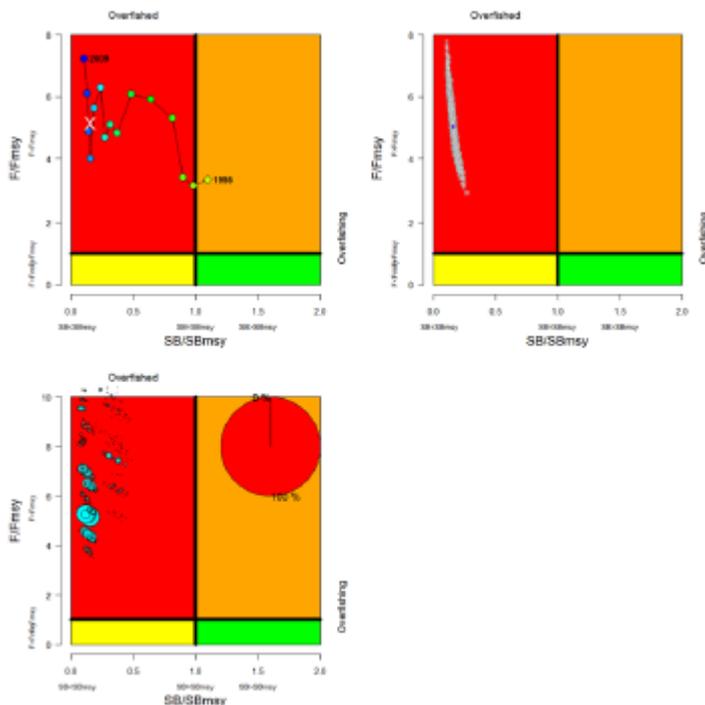


Figure 31. Kobe plots indicating annual stock status, relative to SB_{MSY} (x-axis) and F_{MSY} (y-axis) reference points. These present the reference model for the period 1995–2009 (top left panel), the statistical uncertainty based on the MCMC analysis for the current (average of 2005-2008) status (top right panel, blue dot indicates current estimates), and based on the current (average of 2005- 2008) estimates for all 648 models in the grid (bottom panel). In the bottom panel the size of the circle is proportional to the weight (plausibility) of the model run. Note that the y-axes range differ in the last graph (From Rice and Harley, 2012).

The 2012 stock assessment promoted the adoption of CMM 2011-04 which bans the retaining on board, transshipping, storing and landing of oceanic whitetip sharks and requires all oceanic whitetip sharks to be released in a manner that results in as little harm to the shark as possible. Other requirements covered by the CMM include requirements on data provision, provision of guidance and training on species identification and shark handling techniques for SIDS, and provisions for the collection of biological samples by observers (on OWTs that are dead on haulback only).

Mako

The shortfin mako is found over a similar range as the blue shark but at much lower abundances; the longfin mako is less well-studied, less often encountered and less fecund (Reardon et al., 2006) with a more tropical and offshore distribution. Both species were categorized as being at “medium” ecological risk for deep longline sets (Kirby and Hobday 2007; Clarke, 2011). Catch estimates in number based on observer data indicate removals have dropped by approximately 50% in the past decade with median estimates for 2006 ranging from ~50,000 to 250,000 individuals (Lawson 2011 and Clarke 2009 cited in Clarke, 2011).

For shortfin mako, analyses to determine stock status and the impact of fishing on this species in the WCPO have been inconclusive (Clarke, 2011) although the distribution of the species overlaps with many intensive pelagic fisheries in the WCPO. Given the declines observed where shortfin makos are heavily fished in the north Atlantic, declines in the WCPO are likely based on continuing high levels of exploitation. The Indo-west Pacific subpopulation of shortfin mako is classified as ‘Vulnerable’ with a ‘decreasing’ population on the IUCN Red List (Cailliet et al., 2009).

Similarly for longfin mako, stock status is unknown for the WCPO and worldwide (Clarke, 2011). The species is of conservation concern due to its apparent rarity, large maximum size, low fecundity, and bycatch in intensive oceanic fisheries (Compagno, 2001 in Reardon et al., 2006). The global population of longfin mako is classified as ‘Vulnerable’ on the IUCN Red List (Reardon et al., 2006).

Thresher sharks

All members of the genus *Alopias*, the thresher sharks, are listed as Vulnerable on the IUCN Red List globally because of their declining populations. These downward trends are the result of a combination of slow life history characteristics, hence low capacity to recover from moderate levels of exploitation, and high levels of largely unmanaged and unreported mortality in target and bycatch fisheries (Goldman et al., 2009). Threshers are poorly studied as a group, and even more poorly known on a species-by-species basis (Clarke, 2011). The most frequently encountered thresher shark is the bigeye thresher (*A. superciliosus*) which shows a particular area of interaction with longline fisheries south of Hawaii. The common thresher (*A. vulpinus*) is most often encountered by longline fisheries off Australia and New Zealand. Like the common thresher, the pelagic thresher (*A. pelagicus*) is infrequently encountered. The latter species is most often found near 10° N latitude. All of the thresher species interact only rarely with purse seine fisheries (Clarke et al., 2011). All three species were categorized as being at “medium” ecological risk for deep longline sets (Kirby and Hobday 2007).

To date, no clear catch trends have been identified for the group which is due to the species’ divergent but not necessarily distinct distributions as well as low sample sizes (Clarke et al., 2011). A significant decrease in median size was identified for threshers in tropical areas, most of which are expected to be bigeye threshers (Clarke et al., 2011). Clarke (2011) cites two recent studies which present the first integration of thresher life history traits with measures of fishing pressure in the WCPO. The first study by Liu et al. (2006) used a spawning per recruit analysis to assess pelagic threshers in eastern Taiwan waters concluding that the stock was slightly overexploited and a reduction in fishing effort was needed (Clarke, 2011). A more recent study by Tsai et al. (2010) in the north-western Pacific concluded that the stock is overexploited (Clarke, 2011). Catch estimates indicate removals have been stable in the past decade with median estimates for 2006 ranging from ~65,000 to 750,000 individuals (Lawson 2011 and Clarke 2009 cited in Clarke, 2011).

Silky shark

Silky sharks are a circumtropical species found in tropical waters of the Pacific Ocean (Rice and Harley, 2013b). In comparison to the other four key shark species previously mentioned, they have a more narrow distribution, centred in the northwest of the WCPO, between 0°S, 165°E (Clarke, 2011). This is a low-productivity species (Rice and Harley, 2013b) and Kirby and Hobday (2007) categorized it as being at “medium” ecological risk for both deep and shallow longline sets. Silky sharks are one of the most commonly caught sharks in the tropical tuna fisheries, comprising the largest proportion of the shark catch in both longline and purse seine fisheries in the western tropical WCPO (Clarke et al., 2011). They are predominantly as bycatch although some targeted fisheries are likely to exist, given the high value of shark fins and their abundance in the shark fin trade (Clarke et al. 2005, 2006, cited in Rice and Harley, 2013b).

An updated stock assessment was carried out in 2013 by Rice and Harley (2013b), using a Stock Synthesis age-structured, spatially aggregated and two-sex model and taking into account catch, effort and size composition data for the period 1995 to 2009. The assessment assumed a single WCPO-wide stock for the species, and broadly divided the fisheries affecting the stock into four fleets: two composed of longline vessels (bycatch and target) and two purse seine fleets (associated and un-associated sets). Note however that the longline fishery is attributed as having the greatest impact on the stock, due to its overall increasing effort. The assessment suffered from numerous biases, including lack of catch data for the Philippines and eastern Indonesia, historical targeting of silky sharks in PNG waters and more generally, a limited understanding of silky sharks biology, ecology and movement patterns (Bonfil, 2008; Clarke et al., 2005, 2006, all cited in Rice and Harley, 2013b). Information on the movements, migration and distribution of silky sharks in the Pacific was therefore inferred from previous, globally distributed studies (see Rice and Harley, 2013b).

In their assessment, Rice and Harley (2013b) found that size composition data showed consistent declines over the period of the model (1995-2009), coupled with increasing fishing mortality, and a recently declining CPUE trend. The increase in fishing mortality rates appeared to be driven mainly by the increased effort in the longline fleet and F remained substantially above the F_{MSY} level, with $F_{current}/F_{MSY} = 4.48$ for the reference case model. The authors therefore concluded that overfishing of silky sharks is occurring. As for biomass, B was estimated to be lower than the B_{MSY} level for the reference case model, and $SB_{current}/SB_{MSY}$ was estimated at 0.70 for the reference case model. It was therefore considered highly likely that the stock is in an overfished state.

For silky shark in particular, CMM-2013-08 applies. In acknowledgment of the fact that the WCPO silky shark stock is overfished and that overfishing is occurring, the CMM is similar to the one for oceanic whitetip (CMM-2011-04) and bans the retaining on board, transshipping, storing and landing of silky sharks and requires all silky sharks to be released in a manner that results in as little harm to the shark as possible. Other requirements covered by the CMM include requirements on data provision, provision of guidance and training on species identification and shark handling techniques for SIDS, and provisions for the collection of biological samples by observers (on silky sharks that are dead on haulback only).

Pelagic stingray

The pelagic stingray (*Pteroplatytrygon violacea*) is widespread, with an almost circumglobal distribution, throughout tropical and subtropical areas of the Pacific, Atlantic and Indian Oceans (Baum et al., 2009). It is listed as of ‘Least Concern’ on the IUCN Red List. In the northeast and eastern central Pacific there appear to be two discrete populations: one migrating from eastern Pacific equatorial waters to off the California coast, and a second

central Pacific population that migrates northwards, sometimes as far as Japanese and British Columbia waters (Ebert 2003 in Baum et al., 2009). This suggests that the species may have a fairly complicated population structure; however very little is currently known about either population structure or abundance. Pelagic longlines for tuna and billfish constitute one of the major threats to this species, which is mostly caught as bycatch - again, however, there is very little information about the exact extent of this. Ferrari and Kotas (2013) examined hook selectivity of the pelagic stingray in southwestern Atlantic pelagic longline fisheries and found higher catches with 'J' hooks (9/0, 10 degrees offset) than with circle hooks (18/0, 10 degrees offset) circle hooks. It was therefore concluded that circle hooks could reduce the longline bycatch of this species.

Management

At regional level, shark catches are managed by WCPFC through the Conservation and Management Measure for Sharks (CMM-2010-07) which requires CCMs *inter alia* to implement, as appropriate, the FAO International Plan of Action for the Conservation and Management of Sharks (IPOA Sharks) and advise the Commission on their implementation of the IPOA Sharks and/or the status of their National Plans of Action for the Conservation and Management of Sharks. The latter should include measures to minimize waste and discards from shark catches and encourage the live release of incidental catches of sharks. The CMM further requires that any retained catches of sharks are fully utilised and that the fin to body weight ratio should be no more than 5%. For oceanic white-tip sharks and silky sharks specifically, CMM-2011-04 and CMM-2013-08 apply (see previous discussions).

At national level, sharks catches are managed primarily through the Marine Resources (Shark Conservation) Regulations 2012 which provide the regulatory framework for the Cook Islands Shark Sanctuary, established in December 2012. Note however that these regulations did not repeal the Cook Islands' National Plan of Action-Sharks (set up under the Marine Resources Act of 2005) which currently remains in force - although the Shark Sanctuary (SS) regulations take priority where there is conflict between the two.

The objective of the Cook Islands NPOA-Sharks is to "Seek and promote a rational approach, based on scientific evidence and application of the precautionary principle, to the conservation, management and optimal utilisation of shark resources in order to maintain stocks at sustainable levels and protect the biological diversity of the marine environment". Under the NPOA, the following management strategies are adopted (only those not covered by the SS regulations are shown) :

- a. Ban on catches of whale sharks, basking sharks or great white sharks, and no deployment of fishing gear when these species are known to be in the vicinity of fishing operations
- b. Commercial fishing is prohibited within 12 nautical miles of the outer reef of any island of the Cook Islands and 24 nautical miles from Rarotonga to protect reef sharks.
- c. All commercial licenses shall explicitly reference, and make binding upon the licensee, the requirements contained in the NPOA-Sharks.

The Cook Islands Marine Resources (Shark Conservation) Regulations 2012 applies to all elasmobranchs, including sharks, rays and skates and chimaeras (hereafter 'shark') and affects all commercial fishing activities within the CI EEZ. The regulations prohibit the following:

- to capture, target or otherwise intentionally engage in fishing for any shark

- to remove the fins, or otherwise mutilate or injure, any shark
- to chum for, or otherwise, add substances to the water to attract any shark
- Any sharks must be immediately released in a way that affords the greatest chances of survival - no shark, or any part of shark may be retained on board
- any trade in shark products is forbidden.
- No vessels may use or possess on board wire leaders or trace wire.

At company level, all captains and crew of pelagic longline vessels owned by LTFV and subsidiary companies must abide by the LTFV policy on sharks which states the following:

- No use of gear designs designed to catch sharks: (i) no attaching branchlines directly to floats; (ii) only monofilament used for leaders (no use of more durable material such as wire or multifilament nylon).
- No retention of any species of sharks or rays (including shark fins or other parts of sharks and rays), including no transshipping, landing or trading any sharks or rays.
- Record all required information in logbooks, including the number of each species of sharks and rays caught, and their haul back disposition (alive or dead upon retrieved to the vessel) for each haul, as accurately as possible and safely obtainable.
- When notified, participate in periodic training courses in shark species identification to improve logbook records, and training to employ best practice handling and release practices for sharks and rays to increase the probability of their post-release survival.

The policy applies to fishing in domestic waters and on the high seas. LTFV operates a zero tolerance of non-compliance with these measures and provisions are made for a LTFV surveillance team to search all vessels upon arriving and prior to departing port. Where infractions are identified, domestic government penalties are applied. Furthermore, all LTFV vessels are provided with gear by the central office and vessels are not permitted to purchase their own gear. When LTFV adopted the above policy, all J-shaped (J and tuna) hooks were removed from the gear, and replaced with circle hooks; all wire leaders were also removed and branchlines were rebuilt to only use monofilament leaders. Operators have received training from the MMR to complete the current 2009 version of the SPC logbook forms, including recording all caught and discarded sharks and rays on the form.

Information

Information on shark bycatch in the WCPO longline fisheries generally suffers from under-reporting of commercial landings with minimal information regarding the targeting and fate of sharks encountered in the fisheries, as well as identification of the species concerned. Prior to 1990 there is very little information on shark catches and what is available is not species-specific but just generic 'shark'. Since then there has been an increase in the reporting of sharks, both generic and species-specific, but when longline effort over the past ten years is considered, less than a third of it is associated with species-specific estimates of catch – and for these it is not clear whether discards are included or not (Harley et al., 2013). Data on shark catch and effort at regional level is therefore mostly based on observer data held by the SPC; however with observer coverage for the longline fishery set at a minimum of 5% by the WCPFC, these data are also an underrepresentation.

In December 2010 a Shark Research Plan (SRP) developed by the Secretariat of the Pacific Community-Oceanic Fisheries Programme (SCP-OFPP) was approved by the Commission

and extended for a further three years at WCPFC9 in 2012. The SRP has the following components (Harley et al., 2013):

- Phase 1: assessments to be undertaken with existing and available data;
- Phase 2: coordination of research efforts to supplement biological and other assessment-related information; and
- Phase 3: improvement of data from commercial fisheries.

Under the SRP, there have been several important areas of progress since SC8 including, for the species of concern to this assessment:

- Development of potential catch and CPUE series for blue shark in the South Pacific and the potential to conduct a full stock assessment for SC10 in 2014;
- Analysis of potential mitigation options for silky and oceanic whitetip sharks for WCPFC9 and SC9;
- Distribution of 400 shark identification guides to longline vessels operating from the ports of 8 small island developing states, although further work to enhance the identification of sharks and therefore improvement in shark data is recommended (Harley et al., 2013).

The status of the species considered in this assessment with respect to stock assessment analysis under the SRP is summarised in Table 23..

Table 23. The status of the species considered in this assessment with respect to stock assessment analysis under the SRP. Adapted from Harley et al. (2013).

Species	Assessment	Status
Blue shark	2013/2014	SPC to conduct assessment for southern hemisphere. ISC has undertaken an assessment for the North Pacific.
Longfin mako	2012/2013	Data deficient. To be combined with shortfin mako
Oceanic whitetip shark	2011/2012	SPC assessment conducted for SC8
Shortfin mako	2013/2014	SPC proposes to conduct assessment for mako sharks in the South Pacific. ISC undertaking an assessment for mako sharks in the North Pacific.
Common thresher	2013/2014	It is not clear if sufficient species specific data will be available for a full assessment
Pelagic thresher		
Bigeye thresher		

As a result of the SRP, a coordinated review of all Pacific shark tagging data was recommended to understand the extent and usefulness of existing information and the need for further work in WCPO shark research. The Shark TAGging Information System (STAGIS) was subsequently launched in 2011 and is hosted on the SPC-OFP website for free public access. The database contains meta-data (i.e. data about data) for approximately 200 shark tagging studies, i.e. more than 80,700 tags deployed on over 60 shark species in the Pacific Ocean providing information on shark movement, habitat use, growth and natural mortality. The project was set up with the aim to support the SPC in its stock assessments of the WCPFC key shark species and highlight issues for further research, facilitate research collaboration, and identify critical habitats (<http://www.spc.int/ofp/shark/index.php>).

An important part of the SRP is collaboration with other agencies to maximize the efficiency of the resources available for shark science and stock assessment. Three main collaborations have occurred during 2011-13 with the ISC, the IATTC, CSIRO in Australia, and NMFS in the United States (Harley et al., 2013). Clarke et al. (2011c) (cited in Harley et

al., 2013) provided a comprehensive summary of shark data holdings by SPC and WCPFC and data submissions to WCPFC with respect to the new requirements to submit shark catches and updated information is now available annually through the online accessible WCPFC Data Catalogue (<http://www.wcpfc.int/wcpfc-data-catalogue>)(Harley et al., 2013).

In conjunction with the Data Collection Committee Report (a joint SPC/FFA initiative) an expanded logsheet form was recently developed which allows the collection of data for all key shark species (note that thresher sharks are not separated to species). These forms are being increasingly used by coastal states in the region and have been translated into English, Japanese, Korean, Spanish, and Mandarin (Harley et al., 2013).

In the Cook Islands EEZ, the following monitoring strategies are adopted as part of the NPOA-sharks (in force since October 2012):

- Updated WCPFC shark species-specific logsheet reporting formats are made a condition of all fishing licenses.
- The MMR provides all relevant catch, biological and other data to the WCPFC in accordance with established WCPFC Data Rules annual submission deadlines. MMR will in addition also conduct its own annual assessments on shark bycatch.
- The provisions of WCPFC CMM 2009-06 Conservation and Management Measure on Regulation of Transshipment should be referenced in all commercial licenses and made binding upon the licensee.
- A target observer coverage of 20% has been set for the pelagic longline fisheries and should be attained no later than as of 1 January 2013 and maintained at the target level or higher in each subsequent calendar year. Opportunities to expand observer coverage through electronic/ remote monitoring should be pursued whenever practical.
- Observers should be encouraged to annotate notes on release methods on their observer data sheets and summarize their experience in observer reports. MMR should work with and encourage SPC to develop more specific shark fate and condition codes, based on these notes, which provide more detail on shark handling practices and their effects.
- (In order to generate more data for future assessment of the effects of deepwater trawling on deepsea sharks, MMR should specify catch and biological data reporting requirements for these fisheries and undertake periodic assessment of the data with particular reference to whether the fishery is being operated in a sufficiently precautionary manner.)

Also under the Cook Islands NPOA-sharks, the following research and policy development strategies are adopted:

- Appointment of a shark NPOA-Advisor to provide guidance to MMR on its shark conservation and management policies with scope to engage a shark advisory board comprising of an independent Chairperson with experience in shark conservation science and policy as well as fisheries management; an MMR representative; and representatives from local non-governmental organizations and fishing industry representatives.
- Cooperation with the WCPFC and IATTC, directly or through SPC and/or FFA, to provide input to the development and review of national and regional shark stock assessments, reference points and appropriate management plans and mitigation measures.

- Opportunities to develop national capacity to undertake basic shark-specific analyses and assessments will be pursued.

Finally, the NPOA-sharks outlines the following education and awareness-raising strategies:

- Shark materials and content will be added to annual awareness workshops conducted for sea turtles. These workshops are required to be attended by all vessel operators based in the Cook Islands and Pago Pago, and should be attended by fishers from other fleets, observers, MCS personnel and other interested parties as practicable.
- Shark species identification guides produced by SPC and/or others should be publicized and made available either in printed or digital format.
- Development of a shark portal on the MMR website containing links to this NPOA-Sharks, relevant WCPFC Shark Research Plan documents, other publications of scientific or policy interest, and any local news items to educate and inform the general public on matters of shark conservation interest, as well as to increase transparency in fisheries management in the Cook Islands. Opportunities to allow for feedback from stakeholders on issues of relevance will also be pursued.

3.4.3.4 Cetaceans

The 2012 and 2013 observer reports recorded two interactions with cetaceans, one with a bottlenose dolphin (likely to be the Indo-Pacific species, *Tursiops aduncus*) and one with a false killer whale (*Pseudorca crassidens*) - both were discarded with an unknown status and were probably linked to depredation. Both species are listed as data-deficient on the IUCN Red List and listed in Appendix II of CITES.

Very few estimates on bottlenose dolphin have been made in this region and population trends are unknown. In fisheries, this species tends to be more at risk from gill nets and purse seines rather than pelagic longlines (Hammond et al., 2012). False killer whales are occasionally hooked in longline fisheries, presumably as they are removing fish from the hooks (Taylor et al., 2008). Although abundance has been estimated in some regions (the coastal waters of China and Japan (16,000, CV=26%), the northern Gulf of Mexico (1,038, CV = 71%), the U.S. EEZ of Hawaii (268, CV=108%) and the eastern tropical Pacific (39,800, CV=64%) (all reviewed in Taylor et al., 2008), the estimates are highly uncertain and population trends are unknown (Taylor et al., 2008).

Regarding management, there is no specific CMM relating to cetacean bycatch in WCPO longline fisheries. Bycatch is instead managed under the Cook Islands' Marine Resources (Longline Fishery) Regulations 2008 which states that "Fishers will be required to avoid the capture, and release unharmed, to the extent practicable, non-target species that are not to be retained."

3.4.4 Habitats

The Cook Islands consist of 15 islands that extend over 1,500 km of ocean in a north-south direction (Figure 32). The EEZ contains numerous seamounts and is dominated by a large, centrally-located submarine plateau, broadly bounded by the islands of Nassau, Pukapuka, Rakahanga and Manihiki in the northern EEZ (north of 15°S). The southern EEZ (south of 15°S) has fewer seamounts, with most of the area comprising water with depths of >3,000 m. (MMR, 2012 - Shark NPOA). The longline fishery takes place predominantly in the northern EEZ where the plateau rises from a depth of over 4,000 m to approximately 2,000 m. Based on the gear descriptions provided in Section 3.2.2, the longline is highly unlikely to interact with benthic features at those depths. This fishery is therefore not expected to directly impact benthic habitats.

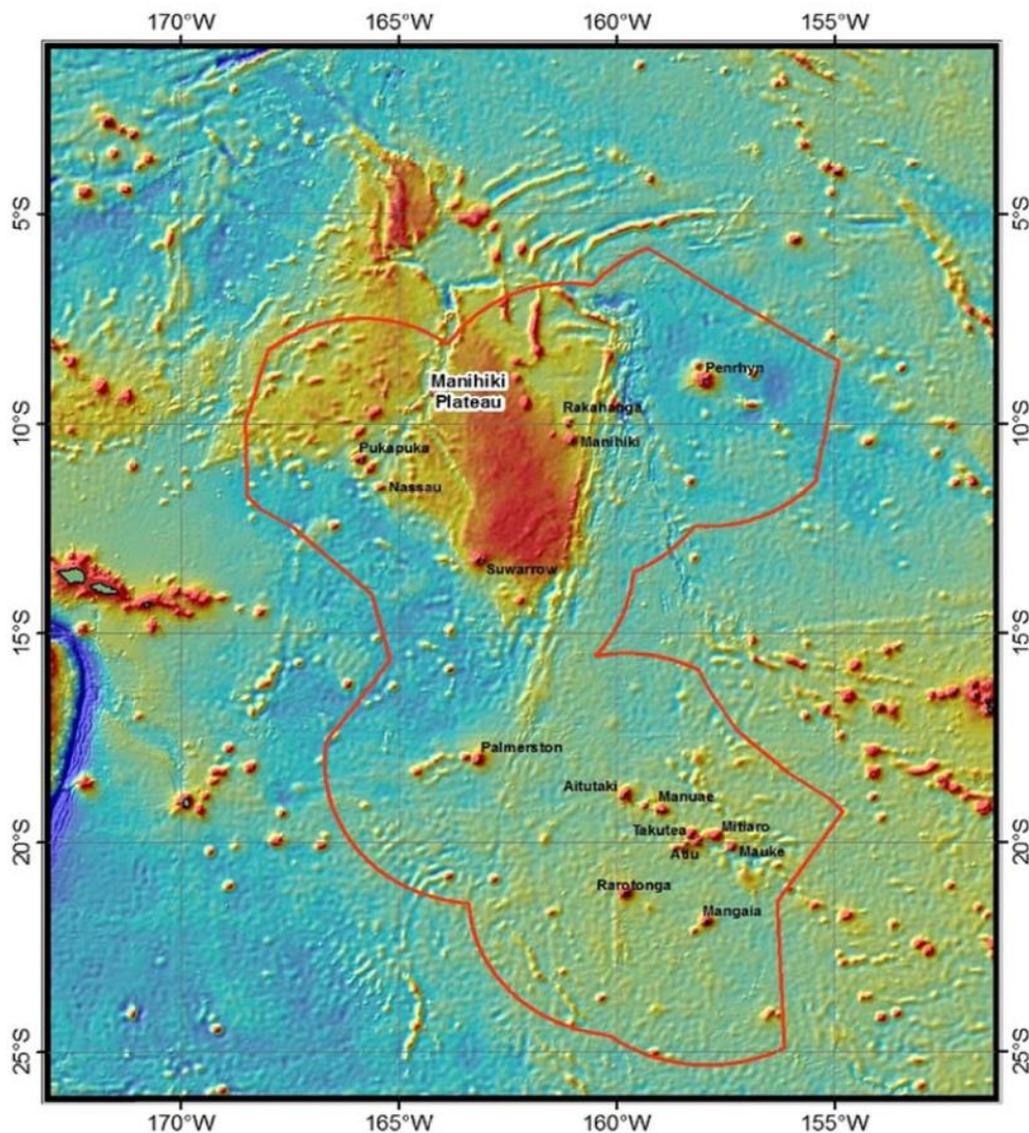


Figure 32. The Cook Islands EEZ showing key topographical features. The northern EEZ (north of 15°S) is dominated by a large, centrally-located submarine plateau, rising from a depth of over 4,000 m to approximately 2,000 m. The southern EEZ (south of 15°S) has fewer seamounts, with most of the area comprising water with depths of >3,000 m (image provided by MMR)

Another issue which needs to be considered is the issue of unobserved mortality due to ghost fishing by discarded or lost fishing gear which may consist of monofilament and/or hooks. Currently, information on the proportion of hooks that are lost at sea (via bite-offs of terminal tackle or loss of complete branchlines) is not collected on logbook or observer forms. Records of the number of terminal tackle or branchlines that are lost per set/trip/year per vessel are therefore not available. However, lost pelagic longline gear is only likely to continue to fish as long as bait remains on the hooks. Bait tends to be stripped relatively quickly off the hooks and as such, the mortality rate associated to lost longlines is usually low (Macfadyen et al., 2009).

3.4.5 Ecosystem

Oceanographic conditions vary widely within the 1,830,000 km² Cook Islands EEZ due to its wide latitudinal range: the northern EEZ is characterized by relatively high sea surface temperatures (SSTs) that display little seasonal variation. The northern EEZ is also characterised by a generally westerly flow of water due to the influence of the south equatorial current. In contrast, the southern areas of the EEZ display stronger seasonality with typically easterly current flows due to the influence of the south tropical counter current (NPOA sharks, 2012). The South Pacific Subtropical Gyre Province (SPSG), in which the EEZ is situated (Figure 33) is created by anticyclonic atmospheric circulation, and is a key driver affecting nutrient availability in the water column. The generally nutrient-poor waters of the SPSG Province are characterised by downwelling and low nitrate concentrations in deeper waters (Lehodey et al., 2011). Net primary production is low, particularly in summer when there is the formation of a marked thermocline. Although local upwelling around islands can result in small areas of enriched surface productivity, it is generally considered that the SPSG Province does not provide prime feeding areas for tuna (Bell et al., 2011). In the Cook Islands, however, it was found that surface waters in the north-eastern portion of the EEZ become relatively productive during the second and third quarters of some years. This is particularly true in years under the influence of La Niña, due to the extension of the nutrient-rich 'cold tongue' from the upwelling system in the equatorial eastern Pacific. These nutrient rich waters are thought to support the relatively high catch rates of albacore and other fish species in the northern EEZ. The influence of the cold-tongue on the productivity of these waters, however, is reduced during strong El Niño periods.

As is the case for Pacific Island Countries and Territories (PICTs) in general, the Cook Islands are particularly susceptible to the effects of climate change (Hills et al., 2011). In addition to the seasonal, inter-annual and decadal variability in the WCPO (e.g. the El Niño Southern Oscillation - ENSO), projected changes in the marine environment of the CI EEZ over the coming decades include increases in sea surface temperature, sea level rise, ocean acidification, increases in precipitation and more frequent and more intense storms (Hills et al., 2011). Furthermore, increases in the intensity of the SPSG expect to lead to further reductions in nutrient supply as downwelling conditions intensify (Bells et al., 2011). The availability of the nutrients that underpin the food web for tuna, together with suitable water temperatures and dissolved oxygen levels, determine the distribution and abundance of tuna and other large oceanic fish across the WCPO (Lehodey et al., 1998; Lehodey et al., 2003 - both cited in Le Borgne et al., 2011). Projections using SEAPODYM modelling on how these food webs are likely to change by 2035 and 2100 under low and high emissions scenarios - as defined by the Intergovernmental Panel on Climate Change (IPCC) - suggest a potential increase in catches of skipjack tuna in the CI EEZ in 2035 and 2100, relative to the 20-year average (1980–2000) (Lehodey et al., 2011). Catches of bigeye tuna, however, are projected to decrease under both scenarios in 2035 and 2100 (Lehodey et al., 2011). Although modelling for yellowfin tuna and albacore is still in progress, the trends for yellowfin are expected to be similar to those for skipjack, whereas albacore are expected to move poleward and to be more abundant at the edges of the SPSG Province (Bells et al., 2011).

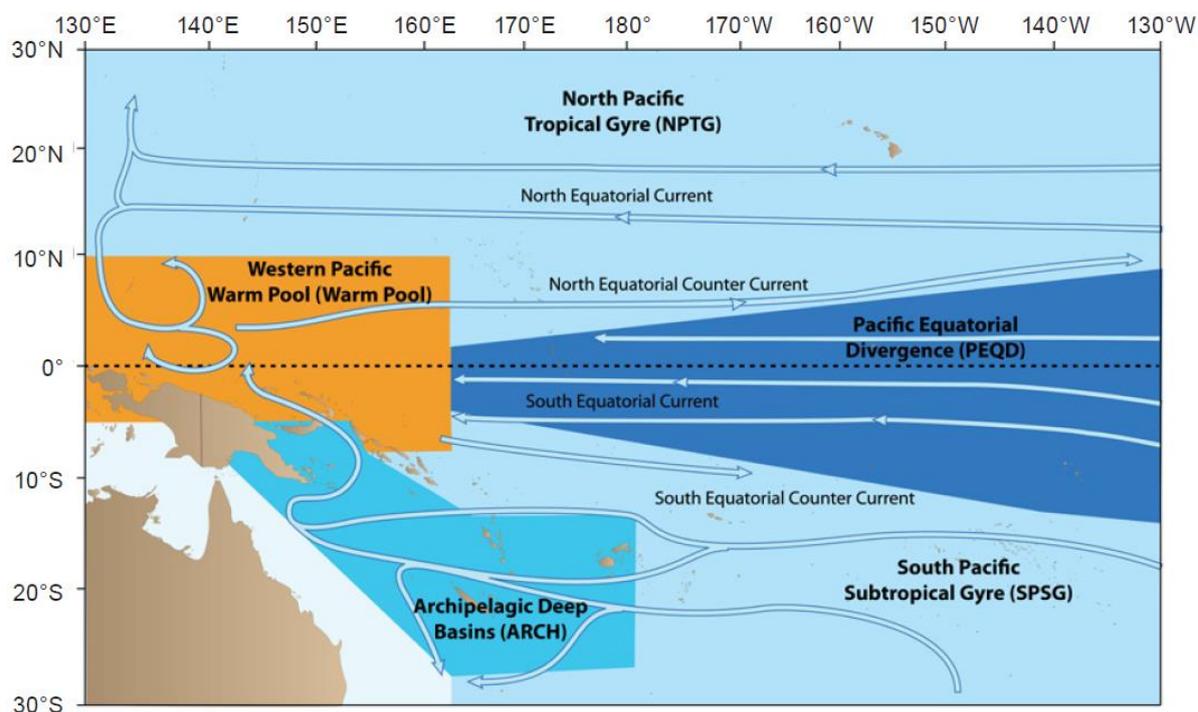


Figure 33. The five ecological provinces of the tropical Pacific Ocean. The South Pacific Subtropical Gyre is shown in the bottom right of the image (from Le Borgne et al., 2011).

Outcome

Albacore is a high-trophic level species and considered a second tier apex predator below sharks, swordfish, marlin and billfish (Kitchell et al., 1999). In general, tunas are perceived as very effective generalists as they are opportunistic carnivores with high degrees of trophic interaction and diet overlap (Kitchell et al., 1999). There is, however, a growing body of evidence that exploitation by tuna fisheries creates substantial and sustained changes in both the target populations and a diversity of other species in the affected ecosystems (Botsford et al. 1997, Fogarty and Murawski 1998, Jennings et al. 1999, Stevens et al. 2000, Jackson et al. 2001 - all cited in Schindler et al., 2002). Amongst these changes, trophic cascades are among the best-known examples, involving strong predator effects propagating downwards through food webs resulting in inverse patterns in abundance across two or more trophic links and potential simplification of oceanic systems through the removal of functional groups (Baum and Worm, 2009). Empirical evidence for top-down control in oceanic ecosystems such as the WCPO has been sparse (Baum and Worm, 2009) and research into the ecosystem-level impacts of Pacific tuna fisheries remains ongoing.

Sibert et al. (2006) analysed all available fisheries data for the Pacific (including catch, fishing effort, size composition, and tagging data) using integrated stock-assessment models to provide estimates of fishery impacts on population biomass, size structure, and trophic status of major top-level predator stocks including albacore. The analysis showed that exploited WCPO yellowfin and bigeye declined steadily to levels near MSY while skipjack tuna and blue shark increased slightly, and albacore fluctuated in both directions. The trophic level of the catch was found to have decreased slightly, with no detectable decrease in the trophic level of the population. It was therefore concluded that while fisheries impacts on top-level predators have been substantial, they have not been catastrophic and the

overall impacts on the Pacific Ocean ecosystem were considered to be minor (Sibert et al., 2006). It is important to note, though, that this study is entirely based on fisheries-dependent data which undoubtedly introduces some bias into the analysis.

In their study on cascading top-down effects of changing oceanic predator abundances, Baum and Worm (2009) focused on predator–prey relationships and top-down control of prey abundance or biomass by conducting a systematic literature review in ISI Web of Science for 1998 to 2008. Recent research where top-down control has been identified included three studies focusing on the Central North Pacific using Ecosym dynamic models (Kitchell et al., 2006) as well as comparative analyses of 1950s survey data and more recent catch data (Ward and Myers, 2005). All studies identified a decrease in predator abundance triggered by exploitation, resulting in a mesopredator release, i.e. an increase in medium-sized vertebrate predator populations following removal of their predators. Food web responses to simulated removals of single apex predators depended on their overall predation rates and degree of dietary overlap with other predators - for example, the removal of blue shark was found to have minimal effect since reduced predation by this species could be compensated for by highly productive yellowfin tuna (Schindler et al. 2002, cited in Baum and Worm, 2009). In addition, simultaneous exploitation of predator and prey species could override this mesopredator release (Shepherd & Myers 2005, cited in Baum and Worm, 2009). Also in the North Pacific, a more recent analysis of catch rates for the 13 most abundant species caught in the deep-set Hawaii-based longline fishery over the past decade (1996–2006) provided evidence of a top-down response (Polovina et al., 2009). Catch rates for apex predators such as blue shark, bigeye and albacore tunas, shortbill spearfish and striped marlin declined from 3 to 9% per year while catch rates for 4 mid-trophic species, mahimahi, sickle pomfret, escolar, and snake mackerel increased by 6 to 18% per year (Polovina et al., 2009 and 2013). This study was continued by Polovina et al. (2013) who showed that these observations from the Hawaii-based longline fishery were consistent with and could be explained by a dynamic size-based ecosystem model, suggesting that size-based predation is the dominant mechanism in structuring the subtropical pelagic ecosystem, or at least the upper trophic levels caught in the deep-set fishery. As such, a reduction of fishes above the size that is fully exploited by the fishery increases the abundance of organisms from about the size of full entry to the fishery down to about 2 orders of magnitude in size - it was found however that this cascading effect did not go beyond a certain size level and that smaller micronekton and plankton were not affected (Polovina et al., 2013).

In yet another study, Allain et al. (2012) constructed a trophic mass-balance ecosystem model of the Warm Pool pelagic ecosystem (i.e. the area of the Western Pacific bounded by the 28°C sea surface temperature isotherm) using Ecopath with Ecosim software. The authors demonstrated that the ecosystem responds to both top-down and bottom-up processes, and has the characteristics of a complex form of ‘wasp-waist’ structure where the majority of the system’s biomass is comprised of mid-trophic level groups. Significant complexity was further added through the effects of climate change, including increased sea surface temperature leading to changes in ocean stratification dynamics and changes in the depth of the thermocline. On their own and not taking into account fisheries pressure, these drivers have the ability to cause large and unpredictable changes to the biomasses of groups in both higher and lower trophic levels, and thus change the overall integrity of the ecosystem structure.

An important caveat in interpreting the results of these simulation studies, however, is the fact that virtual experiments including Ecosim models are constrained by the quality and quantity of data used in their development as well as the choice of model assumptions made. For example, Ecosim’s vulnerability parameter, which can be estimated or assumed, determines how available prey is to its predator(s) and hence the strength of top-down control. These studies also take little to no account of non-consumptive effects, i.e. those

that induce changes in prey behaviour, growth, or development, which can play an important role in predator–prey dynamics and could improve the understanding through how oceanic top-down control operates (Baum and Worm, 2009). Further complexity is added by other interactions with, for example, seabirds: while reduced longlining may lower seabird bycatch, it may also diminish the opportunities for seabirds to forage on discards. Then again, reduced fishing pressure may increase foraging opportunities for seabirds by increasing the abundance of prey species. A mechanism that should also be mentioned in this context is ‘subsurface predator facilitated foraging’ in which large pelagic species, such as tunas, drive forage fish into surface waters, making them available to surface predators - this mechanism is of particular importance here as it is one of the primary means by which tropical seabirds forage (Maxwell and Morgan, 2013). Although the mechanism is well studied in the Eastern Tropical Pacific (Au & Pitman 1986, Spear & Ainley 2005, Spear et al. 2007 - all cited in Maxwell and Morgan, 2013), it has been largely unstudied in the WCPO (Maxwell and Morgan, 2013).

While the above is by no means an exhaustive literature review, the picture that emerges is complex and made even more complex through the ongoing effects of climate change which in itself can act as a driver in trophic control (Baum and Worm, 2009). Despite the range of findings presented in these studies, it is highly likely that the tuna longline fishery is having some degree of impact on ecosystem structure and functioning. It is therefore important to determine how much predator abundance can be altered before cascading effects occur, and whether there are clear thresholds for large-scale ecosystem transformation (Baum and Worm, 2009). The size-based model developed by Polovina et al. (2013) did not suggest any obvious threshold in changes to an ecosystem size structure that could serve as a management target. In the absence of clear guidance from the scientific literature, the team considered biomass at MSY to be a suitable trigger, below which irreversible ecosystem impacts might be expected. At the scale of the UoC, it is highly unlikely that the fishery under assessment would lead to irreversible ecosystem impacts. At a regional scale, the latest stock assessment for albacore suggests that the stock is healthy. On this basis, it is considered unlikely that the albacore fishery will disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.

Management

The 1995 FAO Code of Conduct for Responsible Fisheries has been developed as a reference framework for sustainable fisheries addressing ecosystem considerations, principles and goals needed for an Ecosystem Approach to Fisheries Management (EAFM). The FAO code states that fisheries management should ensure the conservation not only of target species, but also sympatric non-target species (Allain et al., 2011). This resolution is now explicit in WCPFC measures, although tuna fisheries remain managed on single-species basis. The WCPFC’s application of the FAO code extends to the highly migratory fish species including tuna through CMM-2013-01 on the management of bigeye, yellowfin and skipjack and CMM-2010-05 on the management of albacore (the harvest strategies for albacore and bigeye in particular have been discussed in detail under Principle 1, see Section 3.3.6), as well as to the management of non-target species, in particular through Resolution 2005-03 on Non-Target Fish Species.

Furthermore, the FFA has since 2005 started in-country EAFM work to generate EAFM reports that will provide the basis for the development of operational and/or tuna management plans. To assist member countries implement EAFM, the FFA have developed a Pacific Islands Forum Fishery Agency EAFM Framework. This framework comprises a number of stages, which lead to the eventual identification and prioritization of issues related to the current state of tuna resources, environment and social-economics (Figure 34). This then leads to the eventual programming of priority activities into operational framework and

action plans. The process takes into account ecosystem considerations in the management of tuna fisheries. A schematic diagram of the FFA EAFM processes detailing the four main stages of scoping, issues identification, issues prioritization and risk assessment and management system is outlined below. To date, EAFM reports have been done for the Cook Islands, Federated States of Micronesia, Palau, Tonga and Vanuatu.

Although the Cook Islands have incorporated some policies on bycatch and ecosystem issues through the various NPOAs, they have yet to implement the findings of the EAFM report.

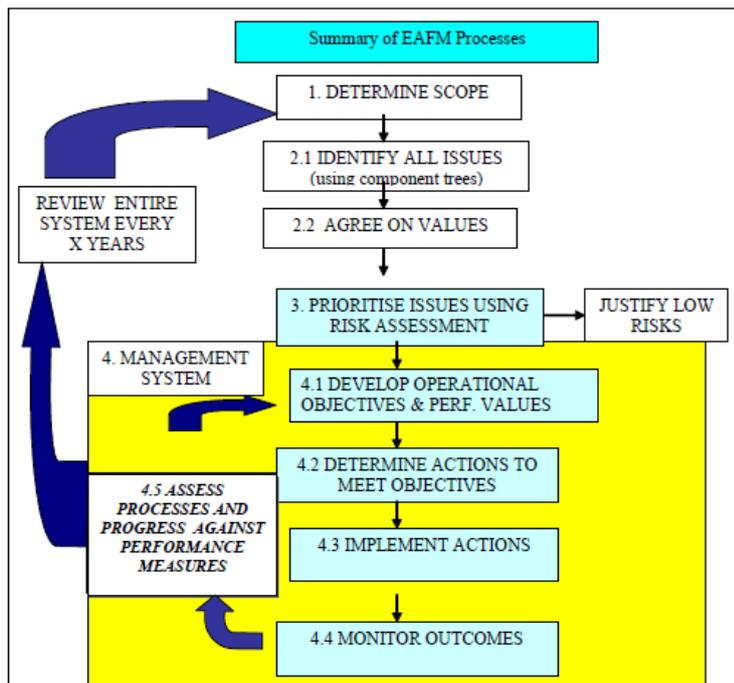


Figure 34. The FFA EAFM framework (Fletcher, 2007; Sauni and Amos, 2008)

Information

There is increasing effort by a range of organizations to collect detailed data on the structure of the Pacific Ocean pelagic ecosystem. This effort occurs through observer programmes (e.g. bycatch composition and quantities), trophic analyses (e.g. stomach contents, stable isotopes), and mid-trophic level sampling (e.g. acoustics and net sampling of micronekton and zooplankton). Allain et al. (2011) discuss a number of projects which contribute to EAFM. These include but are not limited to:

- The International IndiSeas project (www.indiseas.org), which has developed and continues to develop data-based indicators on the status of exploited marine ecosystems. The pelagic ecosystems of the Pacific Ocean are currently not included in the IndiSeas project; however, there is opportunity for involvement in the near future under a new phase of the project which started in 2011. The lessons learned from IndiSeas should be followed for those indicators developed for application on the tuna fisheries in the Pacific.

- Regional Observer Programme: although data obtained under this programme suffer from a number of ailments, including biases introduced through operational changes caused by changes in target species as well as regulatory changes, and historically low coverage, recent improvements in the programme including 100% coverage in the purse seine fishery

from 2010 and a minimum of 5% coverage in the longline fishery from 2012 should improve the quantity and quality of data available.

- Based on diet data, four food-web models (ETP-Eastern Tropical Pacific, CNP-Central North Pacific, Pacific Warm pool, and ETBF-Australian Eastern Tuna and Billfish Fisheries developed with the Ecopath with Ecosim (EwE) modelling tool and three qualitative models have been constructed to characterise pelagic ecosystems in specific regions throughout the Pacific Ocean.

- The dynamic system model SEAPODYM application to the albacore fisheries in the South Pacific. The model has the potential to provide additional information for the management of tuna species. In particular, due to the spatial characteristic of the model, SEAPODYM could provide information of percentage of available biomass and average monthly biomass available at EEZ level as well as results on recruitment. Future work will be focused on improving the forecasting module of SEAPODYM to assess the potential consequences and robustness of different fishing policies under different scenarios of climate variability at global and national level.

Another important tool in this context is the Bycatch mitigation information system (BMIS) which is the result of a WCPFC project to centralise and make readily available, information on the mitigation and management of bycatch in WCPO. The database is a reference and educational tool that supports the Commission's responsibilities with regard to the sustainable management of non-target, or bycatch, species in WCPO fisheries targeting highly migratory species, including tuna and billfish (Fitzsimmons, 2011). The BMIS was launched on the WCPFC web site in February 2011 and its content can be easily shared among CCMSs and other stakeholders. Its content is continually updated (see <http://bmis.wcpfc.int/index.php>).

Finally, the Kobe By-catch Technical Working Group (KBTWG) was established in 2009 with the aim of supporting, streamlining, and seeking to harmonize the by-catch related activities of Ecosystems/By-catch working groups across RFMOs and feeding its findings through to those RFMOs. The TWG's terms of reference include (from Nicol et al., 2013):

- a. Identify, compare and review the data fields and collection protocols of logbook and observer by-catch data being employed by each Tuna RFMO. Provide guidance for improving data collection efforts (e.g., information to be collected) and, to the extent possible, the harmonization of data collection protocols among Tuna RFMOs.
- b. Identify species of concern that, based on their susceptibility to fisheries and their conservation status, require immediate action across Tuna RFMOs. Review all available information on these species and identify their data needs.
- c. Review and identify appropriate qualitative and quantitative species population status determination methods for by-catch species.
- d. Review data analyses to identify all fishery and non-fishery (e.g. oceanographic and physical) factors contributing to by-catch, taking into account the confidentiality rules of each RFMO.
- e. Review existing by-catch mitigation measures including those adopted by each Tuna RFMO and consider new mitigation research findings to assess the potential utility of such measures in areas covered by other Tuna RFMOs taking into consideration differences among such areas.

- f. Review and compile information on by-catch research that has been already conducted or is currently underway to delineate future research priorities and areas for future collaboration.
- g. The duration of the WG will depend on the needs and requests of the Tuna RFMOs.

The TWG's current workplan includes harmonisation of tuna RFMO fishing data, harmonisation of identification guides, by-catch research priorities and collaborative work, information sharing through the BMIS, facilitation of Risk Assessments (sharks as the priority), funding sources, and compliance with data reporting requirements (Nicol et al., 2013).

3.4.6 Issues of concern

The audit team reviewed 2012 and 2013 observer reports and noted frequent infringements against Marpol regulations due to the dumping at sea of plastics, metals, chemicals, and old fishing line. The exact frequency of these types of incidents is unknown and therefore the impact cannot be estimated. While there is no provision in the MSC standard to assess this type of activity against the scoring guideposts, any fishery proclaiming to provide the best environmental choice in seafood (through the MSC logo) should be discouraged from any form of dumping at sea. The team acknowledges that this is a widespread problem across global fisheries; however **it is recommended that incidents of dumping at sea are demonstrably reduced.**

3.5 Principle Three: Management System Background

3.5.1 Jurisdictions in the area of operation

While the fishery under consideration operates both within the Cook Islands EEZ and in adjacent high seas areas, the UoC does not include the high seas element of the fishery. There are two major jurisdictional areas in which the south Pacific albacore fishery operates: the zones (EEZs) of FFA member countries and the high seas:

In-zone

There are significant FFA member country EEZ fisheries for albacore, with around 60% of the albacore catch taken from within these zones. Despite a number of attempts, there has been no agreement reached on an overall catch cap (or allocation) for in-zone catches of FFA member countries, as has occurred for the PNA purse seine skipjack fishery.

Bigeye and yellowfin tuna are recognised to be an important economic element of the albacore longline fishery. The majority of catch of these species is taken in the equatorial region and in particular within the EEZs of PNA member countries. Increasing catches of albacore have been taken north of 20° south, including within the EEZs of FFA member countries.

High seas

There are significant catches of albacore from areas adjacent to Cook Islands, although there the ability to spatially discriminate catches from logbook data is constrained as discussed under Principle 1.

Overall, therefore, the Principle 3 assessment considers i) the 'in-zone' element of the regional management framework (including WCPFC CMMs, and regional cooperation via FFA and other organisations grouping the southern states – Southern Committee and TVM) and ii) the Cook Islands management system for their EEZ. High seas fisheries management is not considered.

3.5.2 Legal framework

The main fisheries law of the Cook Islands is the Marine Resources Act 2005. This is a 56-page document containing ten parts:

- Part 1: fisheries conservation, management and development
- Part 2: fishing and related activities
- Part 3: conservation measures
- Part 4: licensing
- Part 5: monitoring, control and surveillance
- Part 6: jurisdiction and evidence
- Part 7: sale, release and forfeiture of retained property
- Part 8: miscellaneous
- Part 9: regulations
- Part 10: general

Some of the important and distinguishing features of the Act include the following provisions:

Authority: The Ministry of Marine Resources has the principal function of, and authority for the conservation, management, development of the living and non-living resources.

Designated fisheries and management plans: The Executive Council can declare a fishery as a designated fishery where, having regard to scientific, social, economic,

environmental and other relevant considerations, it is determined that such fishery: (a) is important to the national interest; and (b) requires management measures for ensuring sustainable use of the fishery resource. A fishery plan for the management of each designated fishery in the fishery waters is to be prepared by the Secretary, and kept under review. Each fishery plan shall:

- identify the fishery;
- describe the status of the fishery;
- specify management measures to be applied to the fishery;
- specify the process for the allocation of any fishing rights provided for in the fishery plan;
- make provision in relation to any other matter necessary for sustainable use of fishery resources.

The management measures in such plans have the full force and effect of regulations promulgated under the Act.

Development of CMMs occurs at the Commission level with implementation through national legislation.

As previously stated, the team noted some complexity with the current regulatory framework. A replacement for the 2008 Longline Plan (the Marine Resources (Large Pelagic Longline Fishery) Order 2011) was signed by the Minister in 2011, without the 2008 being repealed. Accordingly the 2008 Longline Plan has remained in place.

Cook Islands has taken a comprehensive approach in legislation to the protection of non-target species. The Marine Resources (large Pelagic Longline Fishery) Regulations (2012) requires that NPOAs for seabirds, sea turtles and sharks are complied with at all times.

3.5.3 Stakeholders (fishery and non-fishery)

For a full list of stakeholders see Appendix 7.

The Cook Islands Government

Through a range of legislations/regulations, the Cook Islands Government manages the albacore fishery (See 1.1.1 in Section 3.2.5.2) under the auspices of the MMR. The Government does not have a commercial interest in the fishery and manages access to commercial operators using vessels over 10m via a licensing regime and associated legislation.

The commercial sector

The commercial sector comprises both domestic and foreign vessels including the client fishing enterprise. Owing to a lack of infrastructure and logistics, there is no significant processing sector in Cook Islands, other than an active locally based company (Ocean Fresh), which processes product for sale in the local market. The Government is keen to grow the processing sector and the Act and Regulations allow for preferential access to the fishery for companies which land locally and can demonstrate investment in local processing infrastructure.

Currently, there are 36 vessels licensed under the 2008 Longline Plan. 23 of these are foreign vessels (22 Chinese flag and one FSM flag), which are licensed under access agreements and 10 are domestic (Cook Islands flag). All 33 vessels land into American Samoa (Pago Pago) and 3 land locally, but are not considered to target albacore.

The Cook Islands Tuna industry Association (CTIA) was active in 2006 - 2009, but has since ceased to become operational. Luen Thai, through its subsidiary Huanan Fisheries (Cook Islands) is a member of the Cook Islands Commercial Fishing Association.

The Pacific Islands Tuna Industry Association (PITIA)

The Pacific Islands Tuna Industry Association (PITIA) is effectively an association of associations with the membership consisting of the **Cook Islands**, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu.

With its membership covering 14 Pacific Island countries and several national industry associations, PITIA provides information and services to its members to encourage information and engagement of industry in key policy decisions affecting their businesses.

Specific objectives of PITIA, as laid out in the Founding Agreement of 2004, include:

- providing a united voice for the Forum Island Countries' domestic tuna fishing and associated industries;
- facilitating and encouraging the promotion of the economically and biologically sustainable use of tuna and tuna-related resources by Forum Island Countries' domestic tuna fishing and associated industries in the region: and
- undertaking, co-ordinating and promoting liaison and negotiations with national, regional and international bodies and other entities having an interest in or an effect on the fishing or associated industries of the Forum Island Countries.

PITIA is very active in the regional albacore fishery and attends regional meetings (FFC, WCPFC, TVM etc.) to represent the interests of its members. PITIA and its members have been very critical of the expansion of effort in the albacore fishery and the impact of subsidised fleets on catch rates and the economics of the locally based longline fleet region-wide, and especially in Fiji, providing comment through the Fiji Tuna Boat Owners Association FTBOA). In theory, the CTIA is the national association represented on the PITIA Board of Directors but as noted above, this Association is no longer active and does not have input into PITIA.

Several companies from around the region associated with PITIA (Fiji Fish, Solander Pacific, Hangton Pacific Company, Pacific Sunrise Fishing, Apia Export Fish Packers, Prime Fish Exports) are active in the south Pacific Albacore fishery and have registered concern over the prospect of MSC certification for subsidised fisheries.

The non-government organisation (NGO) sector

There is an active environmental NGO community with an interest in the Cook Islands and broader regional tuna fishery. Two locally-based eNGOs are particularly active in advocating for conservation and management issues in the fishery. These are the Pacific Islands Conservation Initiative Trust (PICIT) and Te Ipukarea Society. Issues of particular interest to these groups are compliance with the shark sanctuary and transparency with respect to vessel licensing. Both groups raised concerns with the team during the site visit. At the regional level, a number of international eNGOs are active advocates in issues associated with the fishery and include the following: World Wildlife Fund for Nature, Greenpeace Australia Pacific, the Pew Environmental Group, Shark Advocates International and Birdlife International. Two 'coalition' NGOs are stakeholders in the fishery. These are: i) The International Seafood Sustainability Foundation (ISSF), which has taken an active interest in initiatives for third party accreditation of tuna fisheries. The ISSF is a global partnership of scientists, tuna processors and environmental NGOs that works with RFMOs to undertake science-based initiatives for the long-term conservation and sustainable use of tuna stocks, reducing bycatch and promoting a healthy marine ecosystem ii) Fishing and Living, a collaboration between Anova Food (LLC), USAID, WWF and governments at all levels established to promote sustainable fishing and enhanced living conditions for communities engaged in the fishing industry. Fishing and Living promote the use of Fishery Improvement Programmes (FIPs) to address conditions that arise from MSC assessment.

The small-scale/artisanal sector

Artisanal and community fishers are represented by the Cook Islands Fishing Association (CIFA) which is an umbrella national association made up of member associations of individual islands and representing artisanal community fishers. The CIFA is directly concerned with the interaction between the UoC fishery and the artisanal sector. This association participates at a national policy level advocating for and representing the interests of small scale and artisanal fishers in Rarotonga and the outer islands (especially outer island member associations). Through assistance provided by FFA/SPC, the CIFA has actively participated in regional forums on small-scale fisheries development discussion (e.g. the FAO Pacific Islands Regional Consultation on the Development of Guidelines for Securing Sustainable Small-Scale Fisheries (SSF)).

MSC Client Groups

A number of other fisheries based on southern albacore have either achieved MSC certification (NZ Albacore Tuna Troll Fishery and the Fiji Albacore longline fishery) or are in various stages of seeking certification. The respective client groups in these fisheries are either working on fisheries improvement plans or Client Action Plans, including a range of Principle 1 related activities. During a meeting in Bangkok on 21 May 2014, MSC client groups from both southern albacore and tropical longline fisheries met and agreed to form, or expressed interest in the formation of the 'WCPO Tuna MSC Principle 1 Alignment Group'⁷. This group will, among other objectives, seek to influence progress on TRPs, and harvest strategies/control rules for southern albacore at the Commission and through the Management Options Workshop (MOW) process and work on FIPs to meeting MSC certification conditions.

3.5.4 Consultation processes in the fishery

Organisations and individuals directly involved in the management process, and with whom consultation is required includes commercial entities, eNGOs and NGOs, and recreational fishers. There are regular discussions with bilateral fishing partners licensed to fish in the Cook Islands EEZ.

The MMR provides a range of opportunities for affected parties to have input into the management system, including through public notices in the press and consultation with stakeholders, which have been mostly driven by the stakeholders themselves. There is evidence that the Department is willing to engage on issues of concern to stakeholders including bilateral partners and domestic stakeholders.

The 2008 Management Plan requires that the Secretary shall organise consultations with key stakeholders at least once a year to discuss matters related to the management and regulation of fishing, including licensing, fisheries development initiatives and the social and economic impacts of large pelagic fishing. These consultations have not been convened.

A further requirement for statutory consultation exists through the Licensing Committee: if the number of applications for fishing licenses at any point exceeds the license number limit (now 50 vessels), a Licensing Committee will be established under Part 3 of the 2008 Longline Plan in order to provide transparent advice to the Minister and the Secretary on the granting of additional licenses in accordance with terms of reference to be determined by the Minister. The Committee is required to include representatives of agencies such as Crown Law and Ministry of Finance and Economic Management (MFEM) as well as MMR.

While the Department does consult with stakeholders on a range of issues, including through the process of public notices in the local press, consultation processes appear to be reactive

⁷ <https://sites.google.com/site/seafoodcompaniestunamanagement/home/21-may-2014-meeting-FIP-MSC-Aligning-P1>

(to concerns) rather than pro-active through structured discussion of intended management actions and reporting of fishery activity. In the past, MMR Annual reports were sent to stakeholders i.e. government departments and industry but generally not the public. Quarterly reports were prepared, but were more tailored to the requirements of the Ministry of Finance and Economic Management/Statistics Office and MMR. The Department is moving to ensure the wider distribution (including on a website) of quarterly and annual reports on the longline fishery and as of 2013 MMR started putting a summarised version of the quarterly reports in the local Cook Islands newspaper each quarter. Feedback from stakeholders suggests that current consultation processes are not of a standard expected.

The WCPF Convention provides information on the functions, roles and responsibilities of member states and the committees formed under Commission control (SC and TCC) in relation to consultative processes. The Commission and its committees have well defined operating procedures and terms of reference, and the roles and responsibilities of members and non-members are well defined in the Convention, in the Rules of Procedure and in relevant CMMs.

The Commission Secretariat facilitates effective engagement by stakeholders. Attendance at Commission and related meetings (including SC and TCC) are comprehensive and meaningful involvement and interaction in the cooperative management of the albacore fishery.

Attendance at WCPFC meetings and through regional cooperation at FFC and the Southern Committee has expanded understanding of the functions, roles and responsibilities of national jurisdictions and WCPF Commission and the components of the management structure. The Commission is active in assisting and facilitating the regular and timely provision of fisheries information.

The Commission actively uses information from the fishery and its member states to inform fisheries management discussions and the formulation of management measures, as demonstrated by reports and outcomes of WCPFC meetings.

Additional opportunities for consultation with other SIDS having south Pacific Albacore fisheries are provided through the FFA/FFC and associated committees.

3.5.5 Decision-making processes

Serious issues in the fishery are generally identified by SPC stock assessment and other reports at the regional level, and addressed through decisions taken under national fisheries legislation. Commission decision-making processes are based heavily on Scientific Committee reports on the status of target and non-target species and respond to serious issues, such as the overfishing, and suspected overfished, status of bigeye.

WCPFC decision-making processes are open, seek to apply the precautionary approach and best available information and are well documented. The WCPFC has a consensus-based decision-making process, with provision for a two-chambered voting process requiring a 75% majority in both chambers if all efforts to reach a decision by consensus have been exhausted (Rule 22, WCPFC Rules of Procedure). From the meeting records, it is evident that the voting provision has not been used for deciding on conservation and management measures. In addition, there are provisions for a decision to be reviewed by a review panel at the request of a Member. (WCPF Convention, Article 20, (6-9)) The WCPF Convention (Art. 6) also requires the application of the precautionary approach and the use of a Scientific Committee to ensure that the Commission obtains the best scientific information available for its consideration and decision-making.

For Cook Islands, there are clear requirements on decision-making under the 2005 Act. Article 4 (a) i) of the 2005 Act requires that decisions are based on the best scientific advice available in seeking MSY (as qualified by relevant environmental and economic factors) and b) that the precautionary approach should be applied to the management of the fishery.

There is evidence that decision-making processes utilise best available information (e.g. in setting the vessel cap).

Decision-making processes within the MMR are described in the 2008 Longline Plan and 2012 regulations, which place certain obligations on the Secretary or his delegate in relation to taking decisions on fisheries management measures, including the licensing of vessels and vessel caps. The vessel cap and catch monitoring indicates that Cook Islands maintain a responsible level of development of their fisheries for South Pacific Albacore as required by CMM 2010-05, paragraph 2. For non-target species, the issue of shark mortality has resulted in the establishment of the Shark Sanctuary and the banning of wire traces.

The CAB was advised that in 2012 a decision was taken to increase license numbers above the nominated vessel cap under the authority of the Secretary, without the establishment of the Licensing Committee prescribed under the 2008 Plan and Regulations.

3.5.6 Objectives for the fishery

Long-term objectives for fisheries within the waters of the Convention area, including the south Pacific albacore fishery are found within the WCPF Convention text. Under Article 2 the Commission has the objective to 'ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stocks within the Convention area, consistent with UNCLOS and UNSFA. Article 5 provides principles and measures for achieving this conservation and management objective. Article 10(c) provides the explicit long-term objective of 'maintaining or restoring populations'... 'above levels at which their reproduction may become seriously threatened'. Article 5 (c) explicitly requires CCMs to apply the precautionary approach and Article 6 outlines the means by which this will be given effect, including through the application of the guidelines set out in Annex II of UNSFA. These guidelines provide additional objectives to guide decision-making, including the use of target reference points to meet management objectives and the adoption of fisheries management strategies to ensure that target reference points are not exceeded on average. Evidence that these objectives are guiding, or are beginning to guide decision-making is provided in various reports of the Commission.

The WCPF Convention contains what are essentially a set of (at times countervailing) objectives in the form of criteria to guide decision-making with respect to the development of allocation criteria and subsequent allocation of total allowable catch or effort within the Convention area (Article s10 (1) f and 10 (3)). The list of possible criteria provides a range of objectives reflecting the interests of both SIDS and major fishing nations.

At national level, the principle objective of the Marine Resources 2005 Act is to *provide for the sustainable use of the living ... marine resources for the benefit of the people of the Cook Islands*. Part 1(7) of the 2008 Longline Fishery Plan provides more detailed long-term objectives for the fishery and includes both biological and economic objectives:

- a) to provide for the sustainable use of large pelagic fish resources for the benefit of the people of the Cook Islands;
- b) to ensure the long-term sustainability of the large pelagic longline fishery,
- c) to mitigate the impact of fishing on non-target species;
- d) to develop and maintain the economic viability of the large pelagic longline fishery and associated fishing industry, including the development of the Cook Islands domestic fleet and onshore processing in the Cook Islands
- e) to ensure that Cook Islands meets its international environmental and fisheries obligations, and position Cook Islands for equitable participation in the regional tuna fisheries;
- f) to protect traditional and small scale commercial inshore fishers;
- g) to protect the integrity of government revenue; and

h) to fulfill the purposes and principles in the Act.

There is no long-term target catch or catch rate level as represented by a TAC or an MEY-based target reference point.

The 2013 Offshore Fisheries Policy provides additional objectives including sustainable resource management through sound biological principles. The NPOA for sharks defines the objective in implementing the plan as “seeking and promoting a rational approach, based on scientific evidence and application of the precautionary principle, to the conservation and management of shark resources”. The subsequent declaration of the Shark Sanctuary has further strengthened this objective.

3.5.7 Rights of access to the fishery

From 2001-2008 when the CI government was attempting to rejuvenate the fishery, there was a strong dependence on demise charter arrangements whereby foreign vessel owners and investors could participate in the fishery by making their vessels available to Cook Islands boat owners under demise charter arrangements. These arrangements were controversial and also declared in breach of the public Monies Act and were abolished. The team was advised that a form of charter arrangement was used for the bigeye exploratory fishing venture in 2011 as allowed for under the 2008 Longline Fishery Plan and Section 5 of the MRA 2005. Under this venture (the Bigeye and Swordfish Exploratory Fishery Program) 13 vessels were licenced to target bigeye and 4 vessels were licenced to target swordfish.

Currently all fishing vessels measuring 10 meters or more in length are required to be licensed to be able to fish in the Cook Islands EEZ. For the tuna longline fleet, the number of licenses is limited to 40 vessels fishing north of 15°S and 50 vessels for the entire EEZ (Marine Resources Large Pelagic Longline Fishery Regulations 2012). All access licenses for foreign vessels, including the LTFV fleet are issued subject to a license fee and a 12-month access agreement that sets out the terms and conditions for fishing access. Following initial granting of a licence, renewal for a period of up to four years is possible providing the vessel being licensed is in operation and has not contravened any rules or regulations. These terms and conditions follow the regionally agreed minimum terms and conditions and include requirements relating to the maintenance of catch logs, reporting requirements, VMS, observers and closed areas and also include provisions for fishing in areas beyond national jurisdiction. All vessels licensed under bilateral access agreements are required to be registered on the FFA Regional Register.

Domestic vessels, which are defined by nature of being flagged to Cook Islands are also licenced on an annual basis with a set of terms and conditions which are less comprehensive than those applied to foreign vessels.

The Secretary of the Ministry of Marine Resources monitors the quarterly level of fishing effort and catch. If it is determined that the level of commercial longline catch in the fishery waters exceeds 8,000 metric tonnes in any four-quarter period, the impact of this level of catch on achieving the objectives of the Fishery Plan will be reviewed and measures put in place as required. This may include a reduction of the number of longline licenses, or the application of appropriate limits to fishing in the north, which may include time/area closures. If it is considered to be in the interest of the sustainability or economic viability of the commercial pelagic longline fishery, additional limits may be put in place, subject to Minister approval and stakeholder consultation via a Licencing Committee.

3.5.8 Management regulations and measures

Under Section 6 of the MRA 2005, the albacore fishery within the Cook Islands EEZ is designated as a “large pelagic longline fishery” and deals with fishing for the following

species in addition to albacore: bigeye, skipjack, yellowfin and Pacific bluefin tuna; billfish; and other large pelagic species including mahi mahi and wahoo, The fishery is managed under the Large Pelagic Longline Fishery Plan which entered into force on 27th August 2008. Limits on fishing effort and catch and the allocation of fishing rights including catch quantities, effort, time restrictions, fishing areas and fishing gear are provided for in the Marine Resources (Large Pelagic Longline Fishery) Regulations 2012. These include:

- A 50 vessel limit (now understood to be no more than 40) which may fish in the northern waters of the Cook Islands EEZ.
- Review of the vessel limit when a catch limit is triggered
- Protection of non-target species including seabirds, turtles and sharks.
- Licensing criteria and requirements
- Regulation of transshipment
- Closed areas
- Penalties for breach or regulation

Fishing in the High Seas requires a separate authorisation to ensure vessels comply with any applicable RFMO requirements.

3.5.9 Monitoring, control and surveillance (MCS)

Cook Islands has a comprehensive MCS system in place using a modern fisheries patrol vessel for at-sea inspections, VMS, port inspections, observers and logbook and other reporting requirements.

The catch associated with the UoC is almost exclusively landed in American Samoa (Pago Pago), although landings also take place in Rarotonga (CI) and Papeete (French Polynesia). The high volume of landings in Pago Pago poses a significant challenge to port inspection and there is a relatively low level of port inspections (currently around 11% of the LT and other vessels fishing in Cooks Islands waters and landing in Pago Pago were inspected in the 17 months to June 1 2014). This will, however, change in the near future. MMR has recently established the Cook Islands Fisheries Field Office (CIFFO) in Pago Pago, which will be permanently staffed to enable an expanded programme of port inspections and debriefing of observers. Long-term plans are to have four staff based in the office. To provide additional support to MCS operations in American Samoa, Cook Islands has MOU arrangements with the US National Marine Fisheries Service (NFMS) and US National Oceanic and Atmospheric Administration (NOAA) covering cooperation in compliance operations. In Rarotonga, a catch manifest is sent to the authorities prior to entry into port and quayside inspections are carried out for 100% of the landings. Inspections involve verification of the hold quantities and a sub-sample (~20%) of unloadings is checked. French Polynesia is part of the European Union (as an overseas collective of France) and all landings are therefore subject to EU regulations and controls.

The current level of observer coverage for the LTFV fleet (~15% as confirmed by MMR) exceeds the regional average, and is likely to increase with the opening of the CIFFO.

The Cook Islands national fisheries MCS system is linked to regional (FFA and WCPFC) MCS systems including the harmonisation of Terms and Conditions of Access, a regional VMS system and the Regional Register of Foreign Fishing Vessels and a range of regional MCS cooperation programmes, including the Niue Treaty and the Agreed Minute of Cooperation in MCS between the US and FFA member states.

The FFA has developed a regional monitoring, control and surveillance strategy which includes regional cooperation to control fishing in the region, including Cook Islands. The

strategy was endorsed by Forum Fisheries Committee Ministers in July 2010 and is being actively implemented.

3.5.10 Review of the management plan

The 2008 Management plan (Paragraph 24) is explicit with respect to the requirement for biennial review. In undertaking such a review of the Plan, the Secretary is required to:

- Take account of a range of issues including the objectives of the Act, effectiveness of data collection, MCS arrangements and conservation and management measures, the economic status of the fishery and the levels of fees and charges.
- consult with **key stakeholders** prior to making any recommendation to the Minister as a result of the review
- provide the minister with recommendations regarding the amendment, revocation or continuation of the Fishery Plan.

It is not clear if this process has been followed as required under the Plan. That said, it is clear some review of the 2008 plan has occurred, with the passing of the Marine Resources (Large Pelagic Longline Fishery) Order 2011, which included the new Large Pelagic Longline Fishery Plan 2011. However, as noted previously, the 2008 Plan was not repealed and remains in force, pending the passing of the Marine Resources Bill 2014, which will introduce a new Fisheries Act.

WCPFC does not have a regular programme of external review. However, in 2008 the Commission agreed that an independent performance review be undertaken, which was completed in 2011. A schedule of responses and actions were developed in response and the recommendations of the review were considered by WCPFC9 in 2012. A recent Independent Review of the Commission's Transitional Science Structure and Functions suggested periodic external review of the stock assessments. This has been adopted by the WCPFC.

4. Evaluation Procedure

4.1 Harmonised Fishery Assessment

For this assessment, harmonisation is required with:

- Fiji albacore longline fishery (P1, P2, P3 – regional and stock)
- PNA skipjack purse seine (the parts of P3 that apply to the general regional framework)
- New Zealand albacore troll fishery (P1, P3 – regional and stock)
- AAFA South Pacific albacore fishery reassessment (P1, P3 - regional and stock)

Although technically not an MSC full assessment, this evaluation also took into account the findings of Powers and Medley (2013) who conducted a review of all global tuna fisheries against the MSC standard (P1, P3 – regional and stock).

In none of the cases significant discrepancies were found with the other assessments. Where a different scoring guidepost (SG) was met in this fishery, the underlying cause has been explained, as shown in Table 24. Note that score differences within a SG are not elaborated upon. Where appropriate, the latest surveillance reports were also reviewed; particularly in relation to Principle 1.

Note that in accordance with the MSC Certification Requirements v1.3 (Annex CI), there are specific requirements in relation to harmonisation between overlapping fisheries, including regarding harmonisation of conditions and condition milestones and timelines. Where possible, the conditions of relevant PIs have been harmonised with the other assessments; these relate in particular to the conditions under P1 (see Appendix 1). To ensure that the client can realistically achieve the given milestones, the allocated timelines are more generous than they would have been with full harmonisation. This approach takes into account the work already undertaken by the client to date, including the establishment of the WCPO Tuna MSC Principle 1 Alignment Group in 2014.

Table 24. Comparison of scores given in similar fishery assessments

PI	This fishery	Fiji albacore longline (2012)	Powers and Medley (2013)	NZ albacore troll (2011)	PNA skipjack purse seine (2011)	AAFA South Pacific albacore (2012)	Comments on differences, if any
1.1.1	100	100	100	100	N/A	100	N/A
1.1.2	75	75	75	75	N/A	70	N/A
1.2.1	65	70	80	80		80	<p>Since the other assessments have been conducted, there have been concerns over declining catch rates in South Pacific albacore and an increase in catch and effort from 2009 to 2012 has been acknowledged at SC9. The team was of the opinion that the harvest strategy has not been fully successful in constraining effort and thus stabilising the fishing impact on this stock. This assessment also considered the harvest strategy for bigeye which is not being implemented in a fully effective and timely way. A lower score was therefore awarded. See Evaluation table 3 - PI 1.2.1 for full rationale.</p> <p>In the latest annual surveillance report for the Fiji albacore fishery, this issue was also raised by the auditors. Although this PI was not rescored, the authors made the recommendation that FTBOA are encouraged to provide support for the adoption of a revised CMM in the coming year which includes provisions to deter the continuing influx of vessels to albacore fishing grounds south of the equator, as well as limits on catches in the high seas and overlap areas to 2006-2010 levels, and zone-based catch limits for CCMs which prevent growth in some fisheries but allow for it in others (see http://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/pacific/fiji_albacore_tuna_longline/assessment-downloads-1/20140325_SR_TUN288.pdf).</p>
1.2.2	60	60	60	60	N/A	60	N/A
1.2.3	80	80	80	80	N/A	90	N/A
1.2.4	85	85	85	85	N/A	85	N/A

PI	This fishery	Fiji albacore longline (2012)	Powers and Medley (2013)	NZ albacore troll (2011)	PNA skipjack purse seine (2011)	AAFA South Pacific albacore (2012)	Comments on differences, if any
2.1.1	80	65	N/A	N/A	N/A	N/A	In addition to the three main retained species identified in this assessment (yellowfin, bigeye and blue marlin), main retained species for the Fiji assessment include blue shark, short-finned mako, silky shark, oceanic whitetip shark, opah and swordfish, i.e. species for which stock assessments have either not been carried out or for which stock status does not meet the SG80 level - this explains the lower score in the Fiji assessment. See Evaluation table 7 - PI 2.1.1 for full rationale of this assessment.
2.1.2	80	75	N/A	N/A	N/A	N/A	The shark management strategy in the Fiji fishery was not always being adhered to at the time of assessment; hence the lower score. See Evaluation table 8 - PI 2.1.2 for full rationale of this assessment.
2.1.3	80	75	N/A	N/A	N/A	N/A	In the Fiji fishery there was insufficient detail to assess ongoing mortalities to all bycatch shark species at the time of assessment; hence the lower score. See Evaluation table 9 - PI 2.1.3 for full rationale of this assessment.
2.2.1	80	80	N/A	N/A	N/A	N/A	N/A
2.2.2	80	85	N/A	N/A	N/A	N/A	N/A
2.2.3	80	90	N/A	N/A	N/A	N/A	N/A
2.3.1	75	85	N/A	N/A	N/A	N/A	For the fishery under assessment, data on ETP species were only available via observer reports which represent less than 20% coverage. Interactions with ETP species are rarely reported on by the crew, with the exception of sharks, although for the latter there are problems of underreporting (possibly due to misidentification). Based on this the team could not conclude that the effects of the fishery are 'known', required to meet the SG80 level. In the Fiji assessment, the available information was considered to be sufficient for a score of 80. See Evaluation table 13 - PI 2.3.1 for full rationale of this assessment.
2.3.2	75	90	N/A	N/A	N/A	N/A	The main difference with the Fiji assessment is that for the LTFV

PI	This fishery	Fiji albacore longline (2012)	Powers and Medley (2013)	NZ albacore troll (2011)	PNA skipjack purse seine (2011)	AAFA South Pacific albacore (2012)	Comments on differences, if any
							fishery there was insufficient evidence that the management strategy for sea turtles was being implemented successfully. A lower score was therefore awarded. See Evaluation table 14 - PI 2.3.2 for full rationale of this assessment.
2.3.3	65	60	N/A	N/A	N/A	N/A	N/A
2.4.1	100	100	N/A	N/A	N/A	N/A	N/A
2.4.2	100	100	N/A	N/A	N/A	N/A	N/A
2.4.3	95	100	N/A	N/A	N/A	N/A	N/A
2.5.1	80	80	N/A	N/A	N/A	N/A	N/A
2.5.2	80	80	N/A	N/A	N/A	N/A	N/A
2.5.3	85	85	N/A	N/A	N/A	N/A	N/A
3.1.1	85	95	95	95	95	95	N/A
3.1.2	75	85	85	95	95	100	For the fishery under assessment there is no evidence at national, Cook Islands level that consultation processes regularly seek and accept relevant information. Feedback from stakeholders suggests that current consultation processes are not of a standard expected. There is no evidence to suggest or explanations given as to whether the information gathered from interested parties within the Cook Islands is used or not. This explains the lower score. See Evaluation table 23 - PI 3.1.2 for full rationale.
3.1.3	100	90	100	80	90	100	N/A
3.1.4	60	100	80	80	80	80	The primary cause for the lower score in this fishery is the concern that without an effective control on effort and with the expansionist plans and subsidies of the People's Republic of China in place, P1 and P2 outcomes may be adversely impacted. See Evaluation table 25 - PI 3.1.4 for full rationale.
3.2.1	90	80	80	70	70	100	N/A
3.2.2	75	85	80	90	70	90	For the fishery under assessment, there is evidence at national level that decision-making processes are not always transparent or responsive to serious issues. This explains the lower score. See

PI	This fishery	Fiji albacore longline (2012)	Powers and Medley (2013)	NZ albacore troll (2011)	PNA skipjack purse seine (2011)	AAFA South Pacific albacore (2012)	Comments on differences, if any
							Evaluation table 27 - PI 3.2.2 for full rationale.
3.2.3	85	70	80	90	85	90	For the Fiji fishery, there was evidence that sanctions were not being consistently applied at the time of assessment. For this fishery, this was not flagged up as an issue. See Evaluation table 28 - PI 3.2.3 for full rationale.
3.2.4	80	80	90	80	90	100	N/A
3.2.5	80	80	70	80	80	80	N/A

4.2 Previous assessments

There have been no previous assessments of this fishery.

4.3 Assessment Methodologies

The assessment methodology is given in Table 25.

Table 25. Assessment methodology used.

Version of Certification Requirements used	1.3
Version of Full Assessment Reporting Template used	1.3
Default assessment tree used with adjustments?	No
Details of adjustments made	N/A

4.4 Evaluation Processes and Techniques

4.4.1 Site Visits and consultations

Two site visits were held during the assessment process. The first site visit was held in Cairns, Australia in December 2013, simultaneously with WCPFC10. The timing of the site visit provided an excellent opportunity to meet with a wide range of stakeholders (see Table 26). A second site visit was held in Rarotonga, Cook Islands in February 2014, where discussions were held with local stakeholders (see Table 27).

Table 26. Consultees and other participants in the Cairns site visit (2 - 5 December 2013)

Name	Role / organisation	Type of consultation
Tony Beeching	WCPFC	Met during site visit
Graham Pilling	SPC	Met during site visit
Alfred Bubba Cook	WWF	Met during site visit
Peter Trott	WWF	Met during site visit
Seremaia Tuqiri	WWF	Met during site visit
Ben Ponia	Cook Islands Ministry of Marine Resources, Secretary	Met during site visit
Andrew Jones	Cook Islands Ministry of Marine Resources, Senior Fisheries Officer, Offshore Division	Met during site visit
Georgia Langdon	Cook Islands Ministry of Marine Resources, Senior Fisheries Officer, Data Manager	Met during site visit
Tupou Naitilima	PITIA	Met during site visit
Peter Williams	SPC	Met during site visit
Amanda Nickson	Pew	Met during site visit
Adam Baske	Pew	Met during site visit
Momo Kochen	Anova Seafoods / Fishing and Living	Met during site visit
Dave Marx	Te Vaka Moana	Met during site visit
Ian Freeman	FFA	Met during site visit
Karen Baird	Birdlife International	Met during site visit
Shelley Clark	Independent consultant	Met during site visit
Susan Jackson	ISSF	Met during site visit

Name	Role / organisation	Type of consultation
Sam Chou	LTFV	Met during site visit
Joe Murphy	LTFV	Met during site visit
Eric Gilman	LTFV	Met during site visit
George Chiu	LTFV	Met during site visit
Derrick Wang	LTFV	Met during site visit
Bill Holden	MSC	Observer

Table 27. Consultees and other participants in the Rarotonga site visit (3 - 6 February 2014)

Name	Role / organisation	Type of consultation
Ben Ponia	Cook Islands MMR, Secretary	Met during site visit
Andrew Jones	Cook Islands MMR, Senior Fisheries Officer, Offshore Division	Met during site visit
Georgia Langdon	Cook Islands MMR, Senior Fisheries Officer, Data Manager	Met during site visit
Mathilda Miria-Tairea	Cook Islands MMR, Director of Policy and Legal Policy and Legal Division	Met during site visit
Kelvin Passfield	Te Ipukarea Society	Met during site visit
Stephen Lyon	Pacific Islands Conservation Initiative (PICI)	Met during site visit
Josh Mitchell	Ministry of Foreign Affairs (formerly with MMR)	Met during site visit
Ocean Fresh Ltd. (Mrs Doherty)	Landholdings Ltd, operates 2 CI-based longline vessels	Met during site visit, viewed unloading of vessel
Vincent Dong	Huanan Fishery (Cook Islands) Co.,Ltd.	Met during site visit
Bill Holden	MSC	Observer

At key stages of the assessment process, stakeholders were contacted and provided with an opportunity to comment (for a full list of stakeholders, please see Appendix 7). Stakeholders were contacted at the following stages:

- i) Fishery announcement - 17/09/2013
- ii) Assessment team and timeline - 17/09/2013 (Note that an amended timeline was submitted on 03/06/2014)
- iii) Assessment team confirmation (31/09/2013) (Note that stakeholders were informed of Dale Kolody's addition to the team on the 20th May 2014)
- iv) Use of default assessment tree and possible use of Risk-Based Framework (22/10/2013)
- v) Cairns site visit notification (31/10/2013)
- vi) Rarotonga site visit notification (19/12/2013)
- vii) Proposed peer reviewers (10/07/2014)

Discussions were held with a number of stakeholders via email (see Table 28).

Table 28. Other stakeholders contacted throughout the assessment

Name	Role / organisation	Type of consultation
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Name	Role / organisation	Type of consultation
Michael White	Zoologist, Tongareva Atoll	Correspondence via email
Reuben Tylor	Independent stakeholder	Correspondence via email
Jim Andrews	Independent expert	Correspondence via email regarding bait species
Radhika Kumar	Fiji Tuna Boat Owners Association (FTBOA)	Correspondence via email
Don Syme	TVM	Correspondence via email

4.4.2 Stakeholder comments during evaluation

A part of the site visits focused on providing information to the team about the fishery, rather than expressing views. Rather than outlining the wealth of information obtained during these meetings, the information has been incorporated into the report and referenced as appropriate. Several stakeholders did, however, make specific comments about the fishery in question (both during the site visits and via email). There was considerable overlap between the comments raised and the key points have been summarised as follows:

- Concern among NGOs about low level of observer coverage for the WCPO longline fleet (at a minimum of 5%, as opposed to 100% for the purse seine fleet). The FFA did comment however that observer training is quite rigorous and observers are generally of good quality.
- Concern about traceability in the fishery under assessment, including to what extent transshipment is occurring and the ability of VMS systems to detect infringements.
- Perceived lack of transparency and data-accessibility (e.g. information on vessel licenses) in the MMR
- Perceived low level of consultation with stakeholders in national level decision-making.
- What is the basis for the Cook Islands cap of 50 longline licenses. Is it a definite cap? Is there a scientific basis for it and how are licenses allocated?
- The issue of subsidies for the Chinese fleet and their impact on exploitation rates and ability to drive over-capacity was frequently raised. Counter arguments were also made in that subsidies do improve the conditions of boats, making them safer and more accessible to observers. Ben Ponia commented that without subsidies offloading in Rarotonga wouldn't be feasible.
- Concern about level of uncertainty in the South Pacific albacore stock assessment and declining catch rates. The ability of the CMM to manage the fishery adequately was questioned.
- For the last ~7 years FFA members have been complaining about the failure of distant water fishing nations to deliver operational data; they only provide aggregated data. Stakeholders feel this is not satisfactory and may be impacting stock assessments and therefore management decision-making. (Note: LTFV provides operational data via the Cook Islands – this is a high seas issue).
- The SPC expressed a general view that LTFV is basically compliant and cooperative and seem to have good relations with coastal states where they work.

- At least in the recent past, the Cook Islands played a prominent role for albacore management in the region
- Key concern that the assessment is fully harmonised with the Fiji albacore assessment, including the timeline for conditions if possible
- Pew expressed their view that MSY should be considered a limit reference point
- WWF commented that transparency and opening of decision-making at WCPFC is gradually being eroded
- Concern raised about bycatch monitoring, catch levels of bigeye and yellowfin and whether blue and striped marlin catches are being properly identified.
- Concern about implementation of CMMs into actions on the ground
- It was noted that through the Shark Sanctuary, the Cook Islands have stronger regulations in place for sharks than other Pacific Island States, such as Fiji.
- Concern about the sustainability of the bait used in the fishery.
- Concern whether the CMMs on seabirds and seaturtles (e.g. protocol for handling and release) is properly being implemented.
- Some concern was raised over previous MSC certifications and the integrity of the MSC standard as a whole
- High seas fishing: great concern about this, especially China
- Concern about ongoing investigation into MMR corruption allegations (note that this investigation is currently still ongoing, as of June 2014)
- Some concern was raised about consistency in the application of sanctioning by the MMR and to what extent decisions to sanction are at the discretion of the secretary
- A comment was raised by Dr Michael White of Tongareva Atoll in relation to the use of albacore as subsistence by atoll communities.

4.4.3 Evaluation Techniques

a) Media announcements

MEP selected two media outlets: Cook Islands News and the MSC website. Cook Islands News was selected to reach predominantly local stakeholders while the MSC press release targeted a wide range of stakeholders within the sustainable seafood industry. The combination of both ensured that key stakeholders were notified of this fishery's announcement.

b) Methodology for information gathering

Information for the assessment was gathered during the site visits and in separate correspondence with individual stakeholders. The MMR were key in providing most of the operational information on the fishery and were very cooperative throughout the assessment process. The assessment was constrained to a degree in that not all LTFV vessels could be visited. A site visit in Pago Pago was, however, carried out by Momo Kochen on behalf of the NGO Fishing & Living who visited a number of LTFV vessels and carried out interviews with crew. This site visit provided valuable insight into the vessels' operations and to what extent Cook Islands regulations (e.g. with regard to turtles) are adhered to.

c) Scoring process

Scoring was partly completed during the site visit and partly completed afterwards. Some Principle 2 information was lacking during the site visit (for reasons outside the control of the assessment team or the client) and PIs 2.2.1 - 2.3.3 were therefore mainly scored after the site visit, by remote discussion.

The scores were decided as follows:

How many scoring issues met?	SG60	SG80	SG100
All	60	80	100
Half	FAIL	70	90
Less than half	FAIL	65	85
More than half	FAIL	75	95

Note that where there is only one scoring issue in the SG, the issue can be partially scored – in this case the team used their judgement to determine what proportion of it was met, e.g. at the 100 level, a small part met = 85, about half met = 90, nearly all met = 95.

d) Decision rules for final outcome

The decision rule for MSC certification is as follows:

- No PIs scores below 60;
- The aggregate score for each Principle, rounded to the nearest whole number, is 80 or above.

The aggregate score for each Principle is calculated by taking the average score for each section followed by the average of all the section scores (see Section 6).

e) Scoring elements

The set of scoring elements that were considered in each outcome PI in Principles 1 and 2 are listed in Table 29. Note that for this assessment there was only one P1 species (South Pacific albacore) so only P2 species are listed.

Table 29. Scoring elements

Component	Scoring elements	Main/not main	Data-deficient or not
2.1 - Retained species	Bigeye	Main	No
	Yellowfin	Main	No
	Blue marlin	Main	No
	Bait (<i>Sardinella longiceps</i>)	Main	No
2.3 - ETP species	Seabirds	N/A	No
	Sea turtles	N/A	No
	Sharks and rays	N/A	No
	Cetaceans	N/A	No

5 Traceability

5.1 Eligibility Date

The target eligibility date (TED) was originally set as the date of certification. Following review of the fishery's traceability systems (see further on), this date was subsequently changed to the 27th June 2014 so that south Pacific albacore caught during the 2014 fishing season, which terminates in November would be eligible to carry the MSC logo once the fishery is certified. As long as the fishery has not been certified, south Pacific albacore caught after the 27th June 2014 can be sold as UMAF (Under MSC Assessment Fish).

(REQUIRED FOR PCR ONLY)

1. The report shall include:
 - a. The actual eligibility date.
 - b. The rationale for any difference in this date from the target eligibility date

5.2 Traceability within the Fishery

a) Tracking, tracing and segregation systems within the fishery

Aboard all vessels within the Unit of Certification, the retained catch is processed on board (removal of gills, guts, tails and fins) and then quick-frozen before storage in the freezer. The SPC logbook is completed in terms of estimated volume (tonnes) and number of individuals of retained catch per species, as well as time and coordinates of the set. Additionally a Chinese tuna fisheries logbook is also completed by the crew (Momo Kochen, Fishing & Living, 2013).

No transshipment takes place in this fishery. Along with other FFA member countries, the Cook Islands prohibit transshipment at sea unless special authorisation is granted. All transshipment is required to take place at a designated port and any vessel wishing to land or tranship is required to provide 24 hours' notice of its intention to do so.

At each point of landing, LTFV keep records of all unloadings from each vessel, including weights, VMS tracks and catch composition (note that no distinction is made between BET, YFT and SKJ in these records). The fish are marked at the weighing station with boat number, date and species. Fish can therefore be traced back to the vessel but not to individual sets. No distinction is further made between sets made at the high seas and those made within the Cook Islands EEZ. Note, however that VMS records can be matched to logbook entries for set starts. Approximately quarterly the VMS compliance is checked on unloading vessels. LTFV also have their own vessel tracking system, and vessel tracks can be checked at all times by MMR. Sets carried out on the high seas can be identified in this way. After unloading, the traceability tag follows the fish from the container to the place of processing, most often a cannery, where it changes ownership (Momo Kochen, Fishing & Living, 2013).

Landings are made in Pago Pago (American Samoa), Rarotonga (Cook Islands) and Papeete (French Polynesia). In Pago Pago, there is currently a relatively low level of port inspections (currently around 11% of the LTFV and other vessels fishing in Cooks Islands waters and landing in Pago Pago were inspected in the 17 months to June 1 2014). This will, however, change in the near future. MMR has recently established the Cook Islands

Fisheries Field Office (CIFFO) in Pago Pago, which will be permanently staffed to enable an expanded programme of port inspections and debriefing of observers. Long-term plans are to have four staff based in the office. To provide additional support to MCS operations in American Samoa, Cook Islands has MOU arrangements with the US National Marine Fisheries Service (NFMS) and US National Oceanic and Atmospheric Administration (NOAA) covering cooperation in compliance operations. In Rarotonga, a catch manifest is sent to the authorities prior to entry into port and quayside inspections are carried out for 100% of the landings. Inspections involve verification of the hold quantities and a sub-sample (~20%) of unloadings is checked. French Polynesia is part of the European Union (as an overseas collective of France) and all landings are therefore subject to EU regulations and controls.

The team considered that LTFV management in conjunction with the MCS systems used by the CI MMR constitutes a robust traceability management system, enabling certified product to be traced back to the point of landing. Note that LTFV are currently trialling a barcoding system which would enable traceability to set level; the company aims to implement the system through 2014/15.

b) Risk of substitution of certified products with non-certified products

LTFV vessels target albacore both inside the Cook Islands EEZ and on the high seas and only the former are part of the UoC. Fishing in the EEZ makes up ~95% of LTFV trips and is reportedly rarely combined with high seas fishing. However, traceability currently only goes as far as the vessel that caught the fish and not to set level or fishing area. It is therefore not possible to determine which catch came from the high seas or the EEZ. While control measures are in place to detect when a vessel enters international waters (the MMR is alerted by the VMS system) and at sea inspections are carried out, there is no clear system in place that prevents substitution of certified product with non-certified product. **Therefore, any trips which include ventures into the high seas area shall be classed as non-MSC certified.** As previously mentioned, VMS records can be matched to logbook entries for set starts. LTFV also have their own vessel tracking system, so vessel tracks can be checked at all times. Finally, whenever a vessel switches off its VMS system, this is automatically investigated by the MMR.

c) Points of landing

The distance between the prime fishing grounds in the north and the major national port at Avatiu (Rarotonga) results in much of the catch being delivered to ports outside the Cook Islands. LTFV vessels land predominantly Pago Pago (American Samoa), although landings also take place in Papeete (French Polynesia) and Rarotonga (CI). Product landed in Pago Pago and Rarotonga is transported to China for processing (in plants owned by LTFV) after which it goes on to European markets where ownership changes. Product landed in Papeete is destined for European markets directly and changes ownership after the point of landing. There is no risk of mixing MSC with non-MSC product after landing as 1) albacore caught during a trip is either MSC or non-MSC as previously explained and 2) after unloading the albacore is loaded into sealed containers.

5.3 Eligibility to Enter Further Chains of Custody

South Pacific albacore caught by the vessels listed in Table 1 within the Cook Islands EEZ and after the 27th June 2014 will be eligible to enter further chains of custody, pending the outcome of this evaluation. However, any trips which include ventures into the high seas area shall be classed as non-MSC certified.

Separate chain of custody certification will be required after the point of landing. Note that ownership does not change at this point in all cases (processing plant in China are owned by LTFV); however those facilities will be subject to separate CoC certification.

There are three eligible points of landing:

- Pago Pago, American Samoa
- Rarotonga, Cook Islands
- Papeete, French Polynesia

5.4 Eligibility of Inseparable or Practically Inseparable (IPI) stock(s) to Enter Further Chains of Custody

There are no IPI stocks involved in this assessment.

6 Evaluation Results

6.1 Principle Level Scores

Table 30. Final Principle Scores

Principle	Score
Principle 1 – Target Species	80.6
Principle 2 – Ecosystem	83.0
Principle 3 – Management System	80.8

6.2 Summary of Scores

Principle 1		Principle 2		Principle 3	
1.1.1	100	2.1.1	80	3.1.1	85
1.1.2	75	2.1.2	80	3.1.2	75
1.2.1	70	2.1.3	80	3.1.3	90
1.2.2	60	2.2.1	80	3.1.4	60
1.2.3	80	2.2.2	80	3.2.1	90
1.2.4	85	2.2.3	80	3.2.2	75
		2.3.1	75	3.2.3	85
		2.3.2	75	3.2.4	90
		2.3.3	75	3.2.5	80
		2.4.1	100		
		2.4.2	100		
		2.4.3	95		
		2.5.1	80		
		2.5.2	80		
		2.5.3	85		

6.3 Summary of Conditions

The conditions are summarised in Table 31.

Table 31. Summary of Conditions

Condition number	Condition	Performance Indicator
1	The management system should formally adopt a target reference point for the South Pacific albacore stock which is consistent with maintaining the stock at B_{MSY} or some other measure with similar	1.1.2

Condition number	Condition	Performance Indicator
	intent or outcome. This target reference point should be used for management purposes.	
2	<p>The fishery should put in place a regional harvest strategy, incorporating limit and target reference points (management objectives), a harvest control rule and management actions, such that the strategy is responsive to the status of the stock and the elements of the strategy work together to maintain the stock at or around the target level.</p> <p>The key missing elements of the harvest strategy at present are 1. a target reference point formally adopted by the regional management system, and 2. a well-defined harvest control rule with associated management actions. These issues are also addressed specifically in conditions 1 and 3.</p>	1.2.1
3	The fishery must put in place a well-defined regional-level harvest control rule, and associated management actions (in the form of a CMM or another form as appropriate) which together act effectively to reduce exploitation rates as the limit reference point is approached. The selection of the harvest control rule should take into account the main uncertainties regarding the status of the stock or the impact of the fishery (or other uncertainties if considered important).	1.2.2
4	The occurrence and outcome of all catches of ETP species by LTFV vessels (sharks, seaturtles, seabirds and cetaceans) should be systematically and accurately reported on so that fishery-related mortality on ETP species can be quantitatively determined and the effectiveness of the management strategies can be determined. Where a need has been identified, the collected data should enable further development of management strategies to ensure that the fishery does not hinder recovery of ETP species.	2.3.1, 2.3.3
5	The client should provide evidence that all Cook Islands regulations on fishery interactions with sea turtles are consistently respected and adhered to by LTFV crew so that it can be demonstrated that the fishery does not pose a risk of serious harm to sea turtles, mortality of sea turtles is minimized and the fishery does not hinder recovery of vulnerable sea turtle populations.	2.3.2
6	The client must provide evidence that processes at national level are put in place to i) regularly engage with key stakeholders to seek and accept relevant information, and ii) demonstrate that the information obtained from such engagement has been duly considered.	3.1.2
7	<p>The client should demonstrate that the subsidies identified by FFA and acknowledged by the client do not lead to perverse incentives that are inconsistent with achieving the outcomes expressed by MSC principles 1 and 2;</p> <p>Or</p> <p>Implement a harvest strategy that includes strengthened harvest control rules that are more responsive to increasing effort in the albacore fishery, such that the impact of subsidies is restricted to lowering the operating costs of subsidized fleets, rather than acting as an incentive to increase effort.</p>	3.1.4
8	By working with the relevant Cook Islands management agencies, the client should demonstrate i) that decision-making processes at national level respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions and ii) that information on fishery performance and management action at national level is	3.2.2

Condition number	Condition	Performance Indicator
	available to stakeholders on request, and that explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	

6.3.1 Recommendations

The audit team reviewed 2012 and 2013 observer reports and noted frequent infringements against Marpol regulations due to the dumping at sea of plastics, metals, chemicals, and old fishing line. The exact frequency of these types of incidents is unknown and therefore the impact cannot be estimated. While there is no provision in the MSC standard to assess this type of activity against the scoring guideposts, any fishery proclaiming to provide the best environmental choice in seafood (through the MSC logo) should be discouraged from any form of dumping at sea. The team acknowledges that this is a widespread problem across global fisheries; however it is recommended that incidents of dumping at sea are demonstrably reduced.

6.4 Determination, Formal Conclusion and Agreement (REQUIRED FOR FR AND PCR)

1. The report shall include a formal statement as to the certification determination recommendation reached by the Assessment Team about whether or not the fishery should be certified.

(Reference: CR 27.16)

(REQUIRED FOR PCR)

2. The report shall include a formal statement as to the certification action taken by the CAB's official decision-makers in response to the Determination recommendation.

6.5 Changes in the fishery prior to and since Pre-Assessment

A pre-assessment was conducted for this fishery in 2013, Since then, several activities have been carried out to improve the fishery's performance vis-à-vis the MSC standard:

(i) The client and MMR have been working, during 2014, to establish a 'train-the-trainer' workshop (also see the client action plan, Appendix 6). Materials for the training workshop are available online at

<https://sites.google.com/site/seafoodcompaniestunamanagement/home/training-materials-for-longline-fishers>.

The client, using donor grant funding, developed new handling and release guides for cetaceans and elasmobranchs as there were no pre-existing guides for longline fisheries. The client is collaborating with SPC to develop a new English/Chinese version of the SPC species ID guide. Contractor Mike McCoy has been hired by the client to develop the training syllabus, and to lead two workshops (to be attended by LTFV, MMR staff and fishers), the first on 20 August 2014, and the 2nd in mid-2015.

(ii) Both the client and MMR participated in the inaugural meeting of the MSC P1 regional alignment group, on 21 May 2014 in Bangkok. The "WCPO Tuna MSC Principle 1 Alignment Group" is comprised of client groups of fisheries certified and under assessment against the Marine Stewardship Council (MSC) standard and of participants of Fishery Improvement Projects (FIPs) for fisheries for albacore, bigeye and yellowfin tunas in the Convention Area of the Western and Central Pacific Fisheries Commission (WCPFC), and other stakeholders. The Group's purpose is to disseminate information, and coordinate and align policy activities of relevant MSC client groups and participants of FIPs related to sub-regional and regional management of fisheries for albacore, bigeye and yellowfin tunas in the Convention Area of the WCPFC. The client, in collaboration with the New Zealand Tuna Management Association, developed a joint letter submitted to the WCPFC Secretariat calling for updated terms of reference are developed for the third Management Objectives Workshop (MOW3). For more information on the MSC P1 regional alignment group, see https://sites.google.com/site/seafoodcompaniestunamanagement/home/wcpo_tuna-p1_alignment.

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Appendices

Appendix 1 Scoring and Rationales

Performance Indicator Scores and Rationale

Evaluation table 1 - PI 1.1.1

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Guided post	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
	Met?	Y	Y	Y
	Justification	<p>The most recent stock assessment (Hoyle et al., 2012) gives median estimates for $B_{current}/B_{MSY}$ and $SB_{current}/SB_{MSY}$ of 1.6 (5% and 95% CIs 1.4-1.9) and 2.6 (5% and 95% CIs 1.5-5.2) respectively (percentiles are defined in Table 6 of the main report). The median estimate for $F_{current}/F_{MSY}$ is 0.21 (5% and 95% CIs 0.04-1.08). The median estimate of MSY is 99,085 mt (5% and 95% CIs 46,560–215,445 mt), which is comparable to recent catches (2012 catch reported to WCPFC = 71145 mt, from stock assessment C_{latest} (July 2010-July 2011) = 89790, $C_{current}$ (July 2007-July 2010 average) = 78664 mt. These results are consistent with the previous stock assessments in 2009 and 2011. Note, however, that confidence intervals on estimates of MSY from the stock assessment are wide.</p> <p>The stock assessment model estimates trends in recruitment over time as shown in Figure 1 below. The initial decline in recruitment is an attempt by the model to deal with the early observed steep decline in CPUE, which cannot be fully explained within the model by a decline in biomass. Hoyle et al. (2012) note that there are other explanations for this pattern which are perhaps more likely: notably a decline in catchability arising from removal of the most catchable individuals from the population, learned avoidance behaviour and/or genetic selection for traits which reduce catchability. Similar rapid initial declines have been observed in CPUE of several tuna populations and the cause remains uncertain (e.g. Walters (2003), Hampton et al. (2005)). The authors conclude that there is no evidence that the fishery is having any impact on recruitment. WCPFC-SC8, in their review of the assessment, agree with this conclusion.</p>		

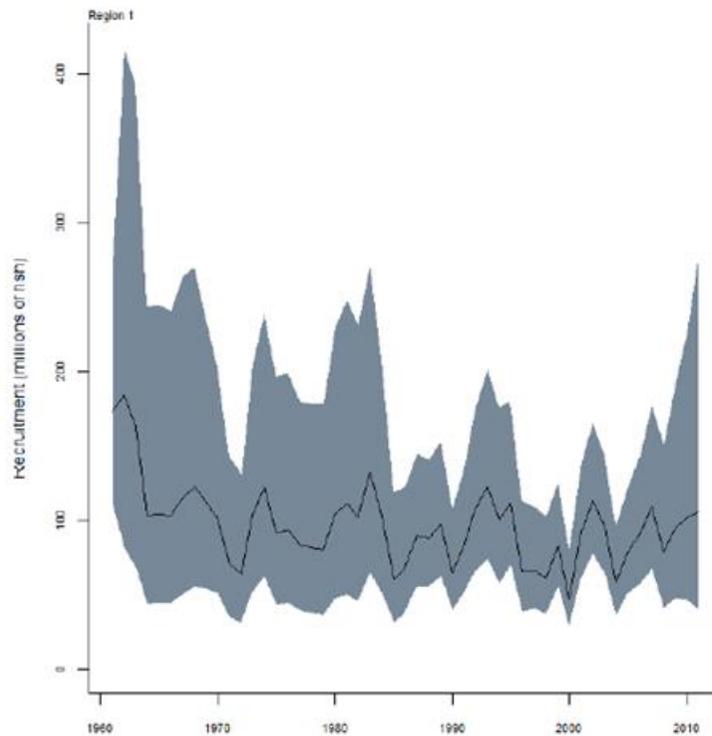


Figure 1. Estimated trends in recruitment from the most recent stock assessment model, with 5% and 95% CIs.

Reference points relating to spawner biomass give a more quantitative idea of the current spawning potential of the stock ($SB_{current}$ and SB_{latest} defined as above; $SB_{Fcurrent}$ equilibrium spawner biomass at current levels of F relative to unfished level (SB_0), MSY level (SB_{MSY}), the level with fishery impact removed ($SB_{current,F=0}$) and with the estimated initial value in the time series (SB_{init}) (Table 1). The SB as estimated in this way has a high probability of being above the MSY level; >95% for $SB_{current}$ and SB_{latest} , and <95% but >50% for $SB_{Fcurrent}$. In addition, none of the sensitivity analyses (at least singly) resulted in a median estimate of $SB_{current}$ which was below SB_{MSY} (lowest estimated of $SB_{current}/SB_{MSY} = 1.95$) (Table 2).

Table 1. SB-related reference indices. Colour-coding for MSY reference indices: green – 5% CI indicates a >95% probability that the value estimating current stock status (the numerator) is greater than SB_{MSY} ; orange – 5% CI indicates that the probability is <95% (although not a great deal less in this case). (Note CI definitions in Table 6 of the text)

Reference index	Median value of output grid	Mean value of output grid	Reference case model run	5% CI	95% CI
SB_{MSY} / SB_0	0.28	0.22	0.23	0.12	0.30
$SB_{current} / SB_0$	0.59	0.59	0.61	0.41	0.76
SB_{latest} / SB_0	0.56	0.56	0.60	0.37	0.72
$SB_{Fcurrent} / SB_0$	0.56	0.53	0.65	0.26	0.76
$SB_{current} / SB_{MSY}$	2.56	2.88	2.58	1.46	5.2
SB_{latest} / SB_{MSY}	2.38	2.74	2.56	1.33	5.18
$SB_{Fcurrent} / SB_{MSY}$	2.39	2.64	2.77	0.94	5.27
$SB_{current} / SB_{current,F=0}$	0.63	0.60	0.71	0.35	0.80
$SB_{latest} / SB_{latest,F=0}$	0.58	0.56	0.67	0.31	0.77
$SB_{current} / SB_{init}$	0.44	0.47	0.36	0.30	0.75

Table 2. Median estimates of $SB_{current}/SB_{MSY}$ under alternative scenarios run as part of the sensitivity analysis of the stock assessment model (the details of the different models are explained in the main body of the report, Section 3.3.8).

Model	$SB_{current}/SB_{MSY}$	Model	$SB_{current}/SB_{MSY}$
2012 reference case model	2.56	S1	1.95
G2	1.95	S3	3.95
G3	2.49	Cr2	2.48
G4	2.35	EC2	2.54
G5	2.62	M1	2.09
G6	2.93	M3	2.95
G7	2.87	CPUE2	2.78
		CPUE3	2.37

Finally, the age-selectivity of albacore fisheries of the WCP (dominated by longline fisheries) is relevant to consider. Figure 2 (from Langley and Hampton 2005, reprinted in Moloney 2007) shows the composition of a theoretical albacore cohort by weight at age, showing that the proportion of the stock that is vulnerable to longline fishing is above the age at maturity. This does not mean that it is impossible for fishing to impair recruitment, but clearly it is less likely under these circumstances. The exact form of the relationship varies with the assessment assumptions, but the general result is qualitatively consistent.

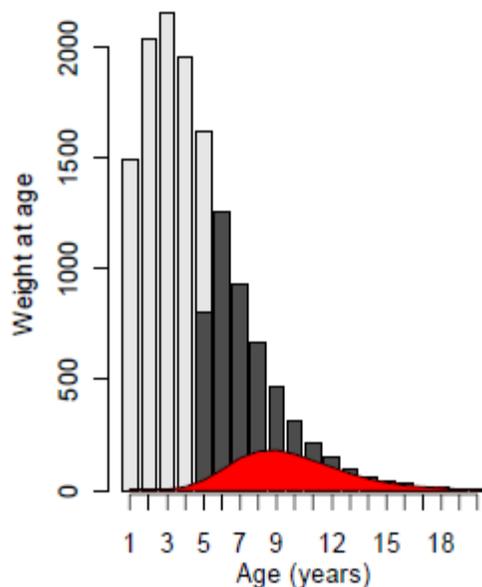


Figure 2. Composition of a theoretical albacore cohort, by weight at age. White columns = immature, grey = mature, red = available to the longline fishery.

In summary, the team considered the following:

- There is a probability of ~95% that spawner biomass is above the level giving MSY.
- The best estimate of current total biomass is also above the MSY level with >95% probability; current fishing mortality is estimated to be below the MSY level but with <95% probability; catches are approximately at the MSY level (noting, however, that confidence intervals in these estimates are very wide).
- Estimates of recruitment from the stock assessment model show an initial decline, which is, however, very uncertain and subject to multiple explanations. Since then have been fluctuating without trend – the most recent (~5 year) trend (or fluctuation) has been upwards.
- The main fisheries on this stock (longline fisheries) target animals above the median age at maturity.
- The stock assessment was considered by the WCPFC Scientific Committee to be credible ('SC endorsed the assessment results as the best available science for the basis of management'; SC8 report).

On this basis, the team concluded that there is a high degree of certainty that the stock is above the point at which recruitment would be impaired.

b	Guided post		The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.																																																																																																																								
	Met?		Y	Y																																																																																																																								
	Justification	<p>For management purposes, no single target reference point has been agreed (this issue is considered further under 1.1.2, 1.2.1 and 1.2.2 below). For the purposes of the stock assessment, the stock status is evaluated against a variety of reference points, including MSY-based reference points (B_{MSY}, SB_{MSY}, F_{MSY}), as well as B_0 and SB_0 (equilibrium total and spawner biomass without fishing) and $B_{current,F=0}$ and $SB_{current,F=0}$ (removal of the 'fishery impact').</p> <p>Estimates of the stock status relative to these reference points are given in Table 3. Taking again the MSC definition of 'high degree of certainty' as a 95% confidence level, these estimates suggest that there is a high degree of certainty that current total biomass is above the MSY level, and likewise for spawner biomass, with the exception of current spawner biomass measured as $SB_{Fcurrent}$ (as discussed above). Current fishing mortality is estimated to be below F_{MSY}, but with less than 95% confidence (although close).</p> <p>Table 3. Estimates of stock status relative to reference point levels from the most recent stock assessment (Hoyle et al., 2012). Colour coding for MSY reference points as Table 1 above. See text for CI definition.</p> <table border="1"> <thead> <tr> <th>Reference index</th> <th>Median value of output grid</th> <th>Mean value of output grid</th> <th>Reference case</th> <th>5% CI</th> <th>95% CI</th> </tr> </thead> <tbody> <tr> <td>$F_{current} / F_{MSY}$</td> <td>0.21</td> <td>0.33</td> <td>0.14</td> <td>0.044</td> <td>1.08</td> </tr> <tr> <td>$B_{current} / B_0$</td> <td>0.81</td> <td>0.81</td> <td>0.78</td> <td>0.66</td> <td>0.96</td> </tr> <tr> <td>B_{latest} / B_0</td> <td>0.80</td> <td>0.79</td> <td>0.80</td> <td>0.62</td> <td>0.91</td> </tr> <tr> <td>$B_{Fcurrent} / B_0$</td> <td>0.76</td> <td>0.73</td> <td>0.81</td> <td>0.47</td> <td>0.90</td> </tr> <tr> <td>$B_{current} / B_{MSY}$</td> <td>1.62</td> <td>1.61</td> <td>1.51</td> <td>1.37</td> <td>1.88</td> </tr> <tr> <td>B_{latest} / B_{MSY}</td> <td>1.57</td> <td>1.56</td> <td>1.55</td> <td>1.28</td> <td>1.78</td> </tr> <tr> <td>$B_{Fcurrent} / B_{MSY}$</td> <td>1.49</td> <td>1.45</td> <td>1.59</td> <td>0.96</td> <td>1.81</td> </tr> <tr> <td>$B_{current} / B_{current,F=0}$</td> <td>0.82</td> <td>0.80</td> <td>0.86</td> <td>0.62</td> <td>0.93</td> </tr> <tr> <td>$B_{latest} / B_{latest,F=0}$</td> <td>0.80</td> <td>0.77</td> <td>0.85</td> <td>0.56</td> <td>0.92</td> </tr> <tr> <td>$B_{current} / B_{init}$</td> <td>0.57</td> <td>0.61</td> <td>0.44</td> <td>0.37</td> <td>1.01</td> </tr> <tr> <td>$SB_{current} / SB_0$</td> <td>0.59</td> <td>0.59</td> <td>0.61</td> <td>0.41</td> <td>0.76</td> </tr> <tr> <td>SB_{latest} / SB_0</td> <td>0.56</td> <td>0.56</td> <td>0.60</td> <td>0.37</td> <td>0.72</td> </tr> <tr> <td>$SB_{Fcurrent} / SB_0$</td> <td>0.56</td> <td>0.53</td> <td>0.65</td> <td>0.26</td> <td>0.76</td> </tr> <tr> <td>$SB_{current} / SB_{MSY}$</td> <td>2.56</td> <td>2.88</td> <td>2.58</td> <td>1.46</td> <td>5.2</td> </tr> <tr> <td>SB_{latest} / SB_{MSY}</td> <td>2.38</td> <td>2.74</td> <td>2.56</td> <td>1.33</td> <td>5.18</td> </tr> <tr> <td>$SB_{Fcurrent} / SB_{MSY}$</td> <td>2.39</td> <td>2.64</td> <td>2.77</td> <td>0.94</td> <td>5.27</td> </tr> <tr> <td>$SB_{current} / SB_{current,F=0}$</td> <td>0.63</td> <td>0.60</td> <td>0.71</td> <td>0.35</td> <td>0.80</td> </tr> <tr> <td>$SB_{latest} / SB_{latest,F=0}$</td> <td>0.58</td> <td>0.56</td> <td>0.67</td> <td>0.31</td> <td>0.77</td> </tr> <tr> <td>$SB_{current} / SB_{init}$</td> <td>0.44</td> <td>0.47</td> <td>0.36</td> <td>0.30</td> <td>0.75</td> </tr> </tbody> </table> <p>Considering the sensitivity analyses for the stock assessment (Table 4), the median output for the different scenarios tested (albeit taken individually)</p>			Reference index	Median value of output grid	Mean value of output grid	Reference case	5% CI	95% CI	$F_{current} / F_{MSY}$	0.21	0.33	0.14	0.044	1.08	$B_{current} / B_0$	0.81	0.81	0.78	0.66	0.96	B_{latest} / B_0	0.80	0.79	0.80	0.62	0.91	$B_{Fcurrent} / B_0$	0.76	0.73	0.81	0.47	0.90	$B_{current} / B_{MSY}$	1.62	1.61	1.51	1.37	1.88	B_{latest} / B_{MSY}	1.57	1.56	1.55	1.28	1.78	$B_{Fcurrent} / B_{MSY}$	1.49	1.45	1.59	0.96	1.81	$B_{current} / B_{current,F=0}$	0.82	0.80	0.86	0.62	0.93	$B_{latest} / B_{latest,F=0}$	0.80	0.77	0.85	0.56	0.92	$B_{current} / B_{init}$	0.57	0.61	0.44	0.37	1.01	$SB_{current} / SB_0$	0.59	0.59	0.61	0.41	0.76	SB_{latest} / SB_0	0.56	0.56	0.60	0.37	0.72	$SB_{Fcurrent} / SB_0$	0.56	0.53	0.65	0.26	0.76	$SB_{current} / SB_{MSY}$	2.56	2.88	2.58	1.46	5.2	SB_{latest} / SB_{MSY}	2.38	2.74	2.56	1.33	5.18	$SB_{Fcurrent} / SB_{MSY}$	2.39	2.64	2.77	0.94	5.27	$SB_{current} / SB_{current,F=0}$	0.63	0.60	0.71	0.35	0.80	$SB_{latest} / SB_{latest,F=0}$	0.58	0.56	0.67	0.31	0.77	$SB_{current} / SB_{init}$	0.44	0.47	0.36	0.30	0.75
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likewise suggests that there is a high probability under a range of scenarios that current biomass is significantly above the MSY level. This includes the different growth scenarios, which have a significant impact on biomass trends in the model output, as discussed in the main body of the report (Section 3.3.8) (although they also have an influence on estimates of B_{MSY} , which may explain why the overall influence on B relative to B_{MSY} is relatively small).

Table 4. Median estimates of $B_{current}/B_{MSY}$ under alternative scenarios run as part of the structured uncertainty analysis (The first entry represents a single model, all subsequent entries represent the median from the subset of 540 models that include the indicated option; the details of the different model options are explained in the main body of the report, Section 3.3.8).

Model	$B_{current}/B_{MSY}$
2012 reference case model	1.51
G2	1.68
G3	1.66
G4	1.70
G5	1.62
G6	1.61
G7	1.55
S1	1.50
S3	1.74
Cr2	1.59
EC2	1.62
M1	1.56
M3	1.65
CPUE2	1.71
CPUE3	1.55

Trends in total stock biomass over recent years, as well as trends in F, relative to MSY reference points, are shown in Figure 3 for the best point estimates of the reference case. Although stock assessments have changed over this period, and catches have increased in recent years, the information available suggests that stock biomass has been well above MSY reference point levels since assessments began; with fishing mortality likewise below MSY levels.

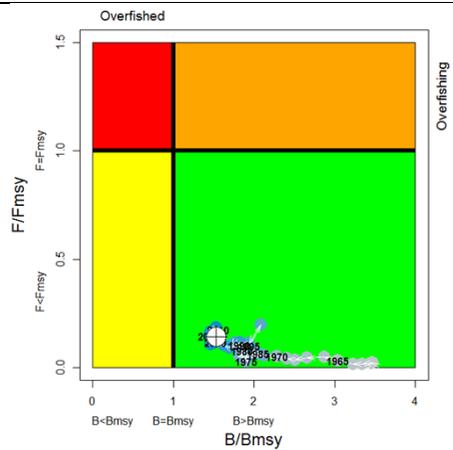


Figure 3. Reference case trends in biomass and fishing mortality relative to MSY reference points over time.

Overall, the team considered on this basis that there is a high degree of certainty that the stock has never been below the target reference point (taken to be B_{MSY}).

References

Hoyle et al., 2012
 Moloney, 2007
 Walters, 2003
 Hampton et al., 2005
 WCPFC-SC8 report. 2012

Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Target reference point	B_{MSY}	587,000 t (median estimate) 835,200 t (ref. model)	$B_{current}$ 1,028,983 t (median), 1,263,700 (ref. model) $B_{current}/B_{MSY} = 1.62, 1.51$
	$0.5SB_{current,F=0}$	224,144 t, 308,974 t	$SB_{current}/SB_{current,F=0} = 0.63, 0.71$
	$0.4SB_{current,F=0}$	179,315 t, 247,179 t	$SB_{current}/(0.5SB_{current,F=0}) = 1.26, 1.42$
	$0.5B_0$	565,500 t, 814,500 t	$SB_{current}/(0.4SB_{current,F=0}) = 1.58, 1.76$
	$0.4B_0$	452,400 t, 651,600 t	$B_{current}/B_0 = 0.81, 0.78$
Limit reference point	$0.2*SB_{current,F=0}$	226,200 t, 325,800 t	$B_{current}/(0.5B_0) = 1.62, 1.56$ $B_{current}/(0.4B_0) = 2.03, 1.95$ $SB_{current}/(0.2SB_0) = 3.16, 3.52$
OVERALL PERFORMANCE INDICATOR SCORE:			100
CONDITION NUMBER (if relevant):			N/A

Evaluation table 2 - PI 1.1.2

PI 1.1.2		Limit and target reference points are appropriate for the stock		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	Met?	Y	Y	
	Justification	<p>For management purposes, only a biomass limit reference point is formally agreed by WCPFC for this stock, in the form $20\%SB_{current,F=0}$, where 'current' is defined as the most recent 10-year period for which data are available for the stock assessment.</p> <p>This reference point was agreed after the most recent stock assessment was carried out; the stock assessment reports an estimate of $SB_{current,F=0}$, (Hoyle et al. (2012) given above in PI 1.1.1) but apparently not with the same definition of <i>current</i>. Nonetheless, the team felt that if not identical, it was reasonable to assume that this parameter would be close to the limit reference point value. .</p> <p>A target reference point has not been formally agreed by WCPFC, although the issue is under discussion. Two Management Objectives Workshops (MOW) have been convened and funded by the Commission with the objective of developing harvest strategies, including reference points, for key WCPFC tuna species including albacore. MOW2 in November 2013 considered the use of MEY as a target reference point and a range of stock (and economic) conditions, relative to the current stock status, to achieve it. The FFA Southern Committee is also actively considering the development of a target reference point for albacore.</p> <p>The stock assessment estimates stock status in relation to MSY reference points (B_{MSY}, SB_{MSY} and F_{MSY} – figures given in PI 1.1.1 above). These can be considered by analogy with bigeye tuna to be implicit target reference points, since in the case of bigeye tuna, the stated objective of CMM-2013-01 (and CMM-2012-01) is the gradual reduction in fishing mortality, to reach $F \leq F_{MSY}$ by 2017. The WCPFC Scientific Committee, however, has expressed a preference for an alternative limit reference point to avoid the uncertainties associated with estimating MSY-based options (discussed below). It seems most likely, therefore, that target reference points will be agreed in relation to some measure of the unfished state of the stock, as has been the case for the limit reference point – most likely $SB_{current,F=0}$, although other options might be B_0, $B_{current,F=0}$ and SB_0. In any case, these values are all estimated as part of the stock assessment, with figures given above. (Target reference points currently (mid-2014) under consideration for bigeye, yellowfin and skipjack are in the range $40-60\%B_{current,F=0}$, and it is likely that the Commission will take the same approach with albacore, as it has for the limit reference point.)</p>		

b	Guide post		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.
	Met?		Y	Y
	Justification	<p>In the most recent stock assessment, the limit reference point, $20\%SB_{\text{current},F=0}$, equates to ~75-80% of SB_{MSY} (taking median estimates, $LRP/SB_{\text{MSY}}=0.83$, taking the reference model $LRP/SB_{\text{MSY}} = 0.73$), and ~20% of SB_0 (0.20, 0.17).</p> <p>MSC note that a default limit reference points for a stock not requiring additional precaution could be appropriately set as $20\%B_0 \sim 50\%B_{\text{MSY}}$. Because the WCPFC reference point is expressed in spawner biomass rather than total biomass, it is difficult to evaluate how it relates to the default option given by MSC, but the team noted that a limit reference point of 20% of SB_0 is usually more precautionary than a limit of 20% of B_0 (because biomass of older age classes declines more rapidly under a given level of fishing mortality). For the same reason, however, SB_{MSY} tends to be a smaller proportion of SB_0 than B_{MSY} is of B_0, so B vs SB MSY reference point are more difficult to compare in this way (in this case, $SB_{\text{MSY}}/SB_0 = 0.24, 0.23$ under the most recent stock assessment; Hoyle et al. (2012)). WCPFC have deliberately steered away from MSY-based reference points for level 2 and level 3 stocks (including all the main commercially-exploited species) because uncertainty in the stock-recruit relationship leads to larger uncertainties in estimates of MSY-related parameters than in other (e.g. depletion-based) reference point options (details given in Section 3.3.3 of the main report). Nonetheless, based on the above analysis, the team concluded that the limit reference point has been set at a precautionary level.</p> <p>In relation to impairing reproductive capacity (recruitment, specifically) the team noted that there has been considerable discussion within the Scientific Committee around the issue of how recruitment should be dealt with in estimating the value of the limit reference point. Two options were considered: one where recruitment estimates were adopted directly from the model, and one where recruitment was scaled according to the stock-recruit relationship (i.e. recruitment expected to be somewhat higher in the absence of fishing). The latter option was found to be consistently more precautionary, and was the option selected by the Scientific Committee and endorsed by the Commission. On this basis, the team felt that relevant precautionary issues had been considered, and that SG100 is met.</p>		
c	Guide post		The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
	Met?		N	N
	Justification	There is no explicit target reference point agreed by WCPFC for use in management (as opposed to use in the stock assessment process), although the issue is under discussion. This scoring issue is not met at the SG80 level.		

d	Guide post		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	
	Met?		Not relevant	
	Justification	Albacore are not a low-trophic level species		
References		Hoyle et al., 2012 SC7, SC8 and SC9 reports MOW2-WP/01 Potential target reference points that consider profitability of fleets : South Pacific Albacore longlining as an example		
OVERALL PERFORMANCE INDICATOR SCORE:				75
CONDITION NUMBER (if relevant):				1

Evaluation Table for PI 1.1.3 – not applicable, see PI 1.1.1 for details

Evaluation table 3 - PI 1.2.1

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	Y	N	N
	Justification	<p>MSC defines a harvest strategy as ‘the combination of monitoring, stock assessment, harvest control rules and management actions, which may include an MP or an MP (implicit) and be tested by MSE’ (MSC CR v1.3).</p> <p>For the assessment of this fishery, we consider the management strategy at two levels: WCPFC and Cook Islands, noting that WCPFC is the most important from the point of view of the whole stock.</p> <p>The elements of the WCPFC harvest strategy are the following:</p> <ul style="list-style-type: none"> • data collection on the stock and fishery (considered in detail in PI 1.2.3 below) • stock assessment process (considered in detail in PI 1.2.4 below) • limit reference point (explicit) and target reference point (implicit) (discussed in detail in PI 1.1.2 above) • harvest control rule (CMM-2010-05) (considered in detail in PI 1.2.2 below) • monitoring of implementation of CMM-2010-05 via data gathering and Part 2 reports to the Commission <p>This management strategy is reviewed annually during the Commission meeting.</p> <p>Given that the stock status of South Pacific albacore is healthy, as it has been since stock assessments started (see PI 1.1.1 Figure 3), the efficacy of the harvest strategy for South Pacific albacore has not been tested. However, Hoyle et al. (2012) noted that if the fishery continued with current fishing mortality rates (estimated to mid-2011), the biomass was predicted to decline to ~MSY levels; i.e. taking the fishery to levels around likely target reference points. Fishing effort on albacore has increased considerably since CMM 2010-05 was implemented, however, particularly above 20°S, where there is no CMM in place. Even with the current stock status well above likely target levels, there are already concerns about declining catch rates and the economic viability of some albacore fisheries, as discussed in Section 3.3 of the main report. Catches of South Pacific albacore do, however, appear to have stabilised since 2010, albeit at a relatively high level compared to historic catches (Table 10). On this basis, it is reasonable to argue that the harvest strategy has not been 100% successful in stabilising the fishing impact on the stock, although it has most likely had some effect in slowing the increase in fishing mortality. Nonetheless, the stock status is still healthy. It is also worth noting that the longline fishery targets albacore above the size at maturity, so is impacting potential recruitment less, even at high exploitation rates, than, say the purse seine bigeye fishery. In addition, the Tokelau Arrangement, once implemented, will provide a more clearly defined harvest strategy, at least within EEZs. On this basis, the team felt that SG60 is met.</p>		

Table 1. Total South Pacific albacore catches as reported to WCPFC (data taken from WCPFC10-2013-IP02) (Note: these catch data are lower than those reported in the stock assessment, for reasons which remain unclear. It is assumed that the trends, which are of concern here, are indicative.)

Year	Total catch (t)
2000	32351
2001	50889
2002	59304
2003	50773
2004	49660
2005	52790
2006	57554
2007	51884
2008	55819
2009	72247
2010	74087
2011	62074
2012	71145

It is impossible to evaluate what might happen in the future, should the stock status decline to target levels or below. One line of evidence is to consider the harvest strategy put in place for bigeye, where the most recent stock assessment considers that although the stock is not overfished, overfishing is likely to be occurring (i.e. $B > BMSY$ but $F > FMSY$). The details of the harvest strategy for bigeye over the last few years, as set out in CMMs 2012-01 and 2013-01 are given in Section 3.3.6 of the main report. In this case WCPFC has been somewhat responsive to the state of the stock, (although they could have acted faster), but several WCPFC members, and NGOs, expressed their disappointment at the weakness of the response. On this basis, the team concluded that SG80 is not met, because the harvest strategy is not, or is insufficiently, responsive to the status of the stock. The team were not confident based on past form that, should albacore stock status be revealed at the next stock assessment to be approaching or below target levels, the WCPFC would be able to stabilise or decrease fishing mortality in a fully effective and timely way. SG80 is therefore not met in relation to the regional harvest strategy.

The Cook Islands harvest strategy involves limiting the number of licences to 50, and total catch to 8,000 tonnes (although the 8,000-tonne limit is not a limit so much as a trigger for considering whether the management of the fishery is sustainable). The 8,000 tonne limit was exceeded only in 2012, as a result of vessels given exploratory bigeye licences that targeted albacore instead. As a result, this experiment was stopped. China reports that it has complied with CMM-2010-05 in full. . These harvest strategies, however, cannot deal with the status of the stock as a whole – the regional harvest strategy is therefore the most relevant in this case.

b	Guide post	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Y	Y	N
	Justification	<p>Currently, the efficacy of the harvest strategy has not been fully tested, because the stock status has always been, and remains good. Concerns around the stock centre mainly on maintaining economically viable catch rates; while this is a serious issue, in biological terms, fishing mortality and catches are consistent with exploiting the stock at ~the MSY level (see PI 1.1.1). Since there is no evidence that the stock status is in jeopardy in the short-term, it is difficult to reject SG80 with a conclusion that the harvest strategy is failing to achieve the fundamental management objectives.</p> <p>In terms of management actions, the key element of the harvest strategy at the regional level is the implementation of CMM 2010-05, which caps the number of (non-SIDS) vessels targeting albacore south of 20°. Although this has not succeeded in capping effort overall, it does at least limit effort in relation to the immature part of the stock. At the Cook Islands level, the team noted the precautionary catch limit of 8000 tonnes of albacore in the EEZ, and that action was taken in relation to the exploratory licences when this cap was breached. (However, the regional level harvest strategy is the most relevant here.) Once the Tokelau Arrangement is implemented, it will strengthen the harvest strategy at regional level, although applying only to EEZs.</p> <p>Overall, the team concluded 1. that management objectives (in terms of stock status) are being achieved and 2. there is evidence (as given above) that the harvest strategy has made at least some contribution to that. Thus SG80 is met. For SG100, the harvest strategy has not been fully evaluated, and although the stock is at target levels, other factors than the harvest strategy (e.g. economic limitations on the fishery) have most likely played a significant role. The score is therefore 80..</p>		
c	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	Monitoring of the fishery for the purposes of stock assessment is considered in PI 1.2.3 below. Monitoring of the implementation of the harvest strategy (notably CMM-2010-05) is carried out via self-assessment by CCMs, included in their Part 2 reports submitted to WCPFC annually. The Part 1 reports contain basic information about their fishery (licensed vessels, landings etc.).		

d	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			N
	Justification	The harvest strategy is reviewed annually by the Scientific Committee and by WCPFC plenary meeting. It is not clear, however, that it is always 'improved as necessary'. For example, the 2013 Scientific Committee meeting (SC9) concluded (paragraph 172) ' <i>The current CMM 2010-05 appears not to be effective in constraining effort in the subtropics (south of 20° S)</i> '. Nevertheless, no change was made to CMM-2010-05 by WCPFC10. A provision for annual review of scientific and other data and adjustment of the PTAC and other management elements as required is a central element of the Tokelau Arrangement, but this has not happened as yet.		
e	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	This issue is only considered here if sharks are a target species of the fishery under assessment. Otherwise the issue is considered under Principle 2 (as in this case).		
References		Hoyle et al., 2012 WCPFC10-2013-IP02 CMM-2010-05 CMM-2012-01 and 2013-01 WCPFC10 report		
OVERALL PERFORMANCE INDICATOR SCORE:				70
CONDITION NUMBER (if relevant):				2

Evaluation table 4 - PI 1.2.2

PI 1.2.2		There are well defined and effective harvest control rules in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Y	N	
	Justification	<p>For the WCPFC harvest strategy, the harvest control rule is set out in CMM-2010-05 (South Pacific albacore), which can be summarised as follows:</p> <ol style="list-style-type: none"> 1. CCMs shall not increase the number of their fishing vessels actively fishing for South Pacific albacore in the Convention Area south of 20°S above current (2005) levels or recent historical (2000-2004) levels. 2. The provisions of paragraph 1 shall not prejudice the legitimate right of SIDS CCMs to pursue a responsible level of development of their fisheries for South Pacific albacore. 3. CCMs that actively fish for South Pacific albacore in the Convention Area south of the equator shall cooperate to ensure the long-term sustainability and economic viability of the fishery, including on research. 4. CCMs shall report annually to the Commission catch levels of South Pacific Albacore (including bycatch) as well as the number of vessels actively fishing for South Pacific albacore in the Convention area south of 20°S. <p>The objective of CMM-2010-05 is to stabilise fishing mortality and catch rates for South Pacific albacore as a precautionary measure, since although the stock status is above likely target levels, catch rates are currently lower than they were a decade ago, and lower than desired for economic reasons . It is important to note, however, that the stock status is far above the limit reference point ($SB_{current} = 3-3.5$ times higher than the limit reference point – see PI 1.1.1), Although SC9 concluded that CMM-2010-05 did not appear to be meeting its objective (see above), we can again argue by analogy with bigeye that there is reasonable evidence that action will be taken when the stock falls below target levels i.e. that CMM harvest control rules will be adapted to take stronger action as reference point levels are approached or exceeded. Nonetheless, this approach cannot be described as ‘well-defined pre-agreed rules’, nor can it be said to ‘ensure’ that the exploitation rate is reduced.</p> <p>The Tokelau Arrangement sets out a more clearly defined harvest control rule (the PTAC implemented via transferrable national quotas), but it is a little early to say that this is ‘in place’ (it is still in draft form as of July 2014). It is also not yet clear how the parties will react to information from the stock assessments – there is nothing in the arrangement as yet requiring that the PTAC be adjusted according to the outcome of stock assessments in any pre-agreed way, although it does allow for the parties to agree reference points and harvest control rules in the future.</p>		

		On this basis, we would conclude SG60 is met, but SG80 is not.									
b	Guide post		The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules takes into account a wide range of uncertainties.							
	Met?		N	N							
	Justification	While the stock assessment considers a wide range of uncertainties, CMM-2010-05 is expressed in terms of capping the number of fishing vessels actively targeting albacore. This approach only indirectly addresses the actual objective (stabilising catch rates and/or fishing mortality). There is a large degree of uncertainty in how effective the CMM would be even if perfectly implemented, e.g. a limited number of vessels can still greatly increase fishing mortality by increasing the number of days spent fishing, the number of sets per day, the number of hooks per set, the efficiency of targeting, etc.. Furthermore SIDS fleets are not constrained, nor are any fleets north of 20°S, and by-catch is exempt. The Tokelau Arrangement is aiming to implement a harvest control rule which is both more clearly defined and less uncertain in terms of its implementation, at least within EEZs, but in practice how it works remains to be seen.									
c	Guide post	There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.							
	Met?	Y	N	N							
	Justification	<p>If implemented appropriately, CMM2010-05 limits the increase in vessels targeting albacore flagged to distant water fishing nations and domestic developed countries (Australia, New Zealand and the USA), because SIDS have an exemption to be allowed to expand their domestic fisheries if desired. Albacore catches (as reported to WCPFC) suggest that over the last two years, catches by vessels flagged to these countries ('non-SIDS') account for ~60% of the catch (Table 1, next page).</p> <p>Table 1. Albacore catches (t) as reported to WCPFC, with percentage of catch from vessels flagged to countries subject to CMM-2010-05. (Note: as per comments previously, this may not include the full catch.)</p> <table border="1"> <thead> <tr> <th>Year</th> <th>non-SIDS</th> <th>SIDS</th> <th>% non-SIDS</th> </tr> </thead> <tbody> <tr> <td>2000</td> <td>17172</td> <td>14765</td> <td>54</td> </tr> </tbody> </table>			Year	non-SIDS	SIDS	% non-SIDS	2000	17172	14765
Year	non-SIDS	SIDS	% non-SIDS								
2000	17172	14765	54								

		2001	27458	19328	59		
		2002	33450	24263	58		
		2003	30450	19345	61		
		2004	23423	25674	48		
		2005	23858	28868	45		
		2006	27095	30244	47		
		2007	25442	26059	49		
		2008	31555	23888	57		
		2009	41472	30560	58		
		2010	35349	29166	55		
		2011	31046	21179	59		
		2012	43883	26983	62		
		<p>Of course, this does not mean that no action has been taken by SIDS. The Tokelau Arrangement sets out provisions for a PTAC across South Pacific EEZs, implemented as transferrable quotas, and this, once implemented, should act to control catches in EEZs. In addition, individual domestic fleets, such as Fiji (which had the third largest landings of albacore of any flag state, after China and Taiwan) are committed to taking action in support of the harvest strategy as part of their MSC certification. The Cook Islands has demonstrated willingness to comply with the spirit of the CMM by halting the experimental bigeye fishery.</p> <p>On this basis, as long as CMM-2010-05 is implemented, it might be somewhat effective in restraining increases in catch and fishing mortality. So far, however, it has not achieved this objective, as noted by the Scientific Committee (SC9 – see above). The impact of the Tokelau Arrangement cannot yet be evaluated.</p> <p>Again arguing by analogy with bigeye, there is evidence that as reference point levels are approach and exceeded, the Commission can be expected to take stronger action to restrain effort (e.g. as per CMM-2012-01 and CMM-2013-01). Again, however, the evidence that these CMMs will be effective is lacking. We argue that the SG60 level is met, but not SG80.</p>					
	References	WCPFC10-2013-IP02, CMM-2010-05, CMM-2012-01 and 2013-01					
OVERALL PERFORMANCE INDICATOR SCORE:						60	
CONDITION NUMBER (if relevant):						3	

Evaluation table 5 - PI 1.2.3

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Y	Y	N
	Justification	<p>The following information is available, and is used as part of the harvest strategy – notably to inform the stock assessment model:</p> <p>1. Fishery-dependent information</p> <p><u>Catch, effort and CPUE</u>: It is a requirement for all CCM fisheries to provide catch and effort data to WCPFC – this is either in the form of logsheet data (from most coastal states) or aggregated by month/50 squares (from most distant water fishing states). The logsheet data is raised to best estimates of total catch by SPC-OFP, to account for missing data. CPUE data are standardised as described in detail in the main report (Section 3.3.8). Data go back to 1960, although as expected, historical data are more sparse and generally less reliable than more recent data. It is often not clear what the relevant factors are for effective catch rate standardization, and they may not be recorded in the logbooks.</p> <p><u>Length-frequency data</u>: Length-frequency data comes from various port sampling programmes and some observer reports, and goes back to 1962. These data are weighted in the stock assessment according to spatial representation, to account for differences in length-frequency by geographic region.</p> <p><u>Fleet composition</u>: Each CCM provides information to WCPFC annually on their active fleet, in their Part 1 reports. For albacore specifically, it is a requirement of CMM-2010-05 to inform the Commission annually of the number of vessels actively targeting albacore.</p> <p>2. Fishery-independent information</p> <p><u>Size and age data</u>: There has been considerable recent work on age and growth (Farley et al., 2012), which demonstrated that females grow slower than males after the age of maturity, rather than having higher natural mortality as previously supposed. This has informed the most recent stock assessment (Hoyle et al., 2012), although further work has been recommended on growth curves.</p> <p><u>Natural mortality</u>: Estimating natural mortality is always a big problem, although the detailed information on age and growth cited above has shed some light on apparent gender differences. Previous tagging work has not provided enough data to estimate M; however, SPC has recent started a new tagging programme.</p> <p><u>Environmental data</u>: The Ocean Fisheries Programme of SPC undertaken environmental research as part of their ecosystem monitoring programme, focusing particularly on potential environmental drivers of tuna population dynamics.</p>		

3. Information inferred from the stock assessment

A significant range of information relating to stock status comes as the output of the stock assessment. This is described in detail above, but includes estimates of stock abundance, fishery impact etc., as required for SG100.

4. Data gaps

Stock Structure - the south Pacific albacore fishery is assessed and managed as a single stock. However, the growth curve estimates and conflicting CPUE trends suggest that (longitudinal) mixing may be relatively limited. Suggestive evidence for population structure is emerging for the tropical tunas (e.g. Kolody et al., 2013), and it would not be surprising if similar evidence was uncovered for albacore as well. Observer coverage (providing external verification of logbook data and information about discards) is low, particularly for the longline fishery and particularly on the high seas.

Williams 2013 identified data gaps (for all key species, rather than albacore in particular) as follows:

- Vietnamese domestic fleet: no annual catch data provided;
- Philippines and Indonesian fleets: catch data not broken down by gear type; operation (logsheet) data not provided;
- Taiwanese fleet: no operational data, aggregated effort data or size data prior to 2004; likewise for the Japanese coastal fleet up to the present data; likewise for the Japanese pole and line fleet prior to 1972;
- Several countries may have historical data which has not been identified
- Historical estimates of coverage rates from logsheets and port sampling are missing in some cases;
- Some key (distant water) fleets provide only aggregated rather than operation level data – this is identified as a constraint on stock assessments, and on the use of more details spatial models such as SEAPOPDM.

Overall, given the size and complexity of the fishery, the range and comprehensiveness of the data available is impressive and improving all the time. Nonetheless, these data gaps do constrain stock assessments – as does bias and lack of precision in some of the data sets, particularly historical data (discussed in the main report Section 3.3.10). Perhaps more importantly, the stock assessment continues to rely on commercial CPUE as an index of stock abundance, and although these data are carefully analysed and standardised as far as possible, there are no fishery-independent data sets with which they can be compared, while issues such as spatial and temporal changes in catchability remain problematic. On this basis, the team concluded that SG80 is met, but SG100 is not met. .

b	Guide post	Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	Y	Y	N
	Justification	<p>Fishery removals are monitored by individual CCMs via logsheets and port sampling, and are required to be submitted to the Commission annually, in the form of estimates of total catch plus catch and effort data broken down by gear and either aggregated (50 squares by month) or (preferably) at operational level (individual logsheets). Despite some gaps in this data set noted above, coverage is pretty good overall. This catch, effort and CPUE data set is the key indicator for stock assessment. Other key fisheries data which support management are length-frequency data (collected via port sampling and observer programmes) and tag returns. Biological data is also collected via research programmes.</p> <p>Formal stock assessments have taken place every few years (2009, updated in 2011, 2012. In between formal stock assessments, SPC provide some information on trends in fishery indicators (total catch, nominal CPUE, catch at length and at weight), to guide management (Harley and Williams 2013).</p> <p>On this basis, the team felt that SG80 was met. SG100 is not met, for the following reasons:</p> <ul style="list-style-type: none"> • The characteristics of tuna longline CPUE are often poorly understood and it is unclear how successful most effort standardization analyses are or how to properly represent the uncertainties. • some data gaps remain in fishery-dependent data (see above); • some key fleets provide only aggregated data; • the requirement to 'raise' logsheet data by estimates of total catch (to account for missing logsheets) results in some loss of precision; • historical data is often lacking in precision; • there are concerns about biased sampling in some data sets (e.g. length-frequency data – see discussion in Hoyle et al. (2012)) • although the frequency of stock assessments is reasonable, they are not carried out with 'high frequency' (i.e. not always updated annually); <p>it is not completely clear how robust the management is to uncertainty – the management system is still a work in progress.</p>		

c	Guide post		There is good information on all other fishery removals from the stock.	
	Met?		Y	
	Justification	The stock assessment covers all fishery removals from the stock, and despite some data gaps (notably Vietnam, also Philippines, Indonesia and some smaller coastal fleets), overall the data coverage is quite comprehensive. Where data gaps exist, the WCPFC Secretariat and SPC are working to support and develop data collection systems (see information in Williams, 2013).		
References	Farley et al., 2012 Hoyle et al., 2012 SC9 report Williams, 2013 Information on OFP environmental / fisheries research: http://www.spc.int/OceanFish/en/ofpsection/ema/environmental-research/78-oceanographic-variability/115-oceanographic-variability			
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				N/A

Evaluation table 6 - PI 1.2.4

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post		The assessment is appropriate for the stock and for the harvest control rule.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.
	Met?		Y	N
	Justification	The stock assessment is described in detail in the main report, Sections 3.3.8 and 3.3.9. The model which has been developed for the stock assessment is complex and sophisticated, and takes into account the biology of the species (e.g. by incorporating the results of research into age and growth by sex and region, maturity and fecundity at size and age etc.). The model is able to estimate a variety of reference points which are or might be used as limit and target reference points for management (see discussion under PI 1.1.2 above). However the assessment is critically dependent on commercial CPUE as a relative abundance index, and the effectiveness of standardization methods is poorly understood. Furthermore, it is not clear that the spatial connectivity issues are properly represented in a spatially-aggregated model that covers >50 000 000 km ² .		
b	Guide post	The assessment estimates stock status relative to reference points.		
	Met?	Y		
	Justification	The output of the stock assessment in relation to reference points is given in the rationale for PI 1.1.1 above.		

c	Guide post	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Y	Y	Y
	Justification	The stock assessment attempts to reduce uncertainties and biases in input data sets (e.g. via stratification in space and time, and via standardisation using GLM). It also includes a detailed exploration of uncertainties in the model assumptions, via sensitivity analyses for various different model options (growth curves, natural mortality, steepness, effort creep and different treatment of the CPUE data set). The model uses a statistical framework to estimate states and parameters conditional on a suite of structural assumptions and the data. The model outputs the best (Maximum Posterior Density) point estimates, along with estimates of uncertainty for desired parameters. The most recent assessment emphasizes the uncertainty in point estimates conditional on a broad range of alternative fixed assumptions, rather than the parameter estimation uncertainty estimated conditional on individual models. As a consequence, the probabilistic stock status statements do not have the classical probabilistic interpretation, but are actually expected to provide a broader and more realistic representation of uncertainty than classical approaches.		
d	Guide post			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			N
	Justification	<p>Exploration of alternative hypotheses via sensitivity analyses is considered above. The stock assessment has been updated progressively: structural changes in the most recent assessment (Hoyle et al., 2012) include the following:</p> <ul style="list-style-type: none"> • change in steepness of stock-recruit relationship; • changes to standardisation of key CPUE data series; • new approach to modelling early CPUE; • new natural mortality curve and changes to sex ratio at age and spawning potential at age, following new biological data; • size data restratified by spatial distribution of catches, to remove bias; • lognormal bias adjustment; • updated version of MULTIFAN-CL. <p>Hoyle et al. (2012) made an impressive effort to evaluate a range of structural assumptions, and the results demonstrated that the key stock status conclusions are very robust to this range of assumptions (and their interactions). However in such a large and complex fishery it is inevitable that unresolved issues will remain (e.g. conflicts between CPUE and length-frequency data, sensitivity to intractable issues such as estimates of natural mortality and steepness etc.), although much impressive work has been done, these issues are not fully dealt with, and remain a priority for consideration in future work. Therefore we conclude that SG100 was not fully met.</p>		

e	Guide post		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Y	N
	Justification	The stock assessment is internally peer reviewed within the WCPFC system (by the Scientific Committee). A process of formal external peer review has been started and applied to some WCPFC stock assessments (e.g. bigeye) but not so far this one, although aspects of the methodology have been published in peer-reviewed journals (e.g. Hampton and Fournier, 2001).		
References	Hoyle et al., 2012 Hoyle and Langley, 2007 Hampton and Fournier, 2001			
OVERALL PERFORMANCE INDICATOR SCORE:				85
CONDITION NUMBER (if relevant):				N/A

Evaluation table 7 - PI 2.1.1

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	Y	Y	N
	Justification	<p>See Section 3.4.1 of the main report.</p> <p>Main retained species are bigeye, yellowfin and blue marlin. Note that the bait species (<i>Sardinella longiceps</i>) is also considered under this component</p> <p>Bigeye: only one limit reference point has been formally adopted for this species for management purposes (endorsed by WCPFC9 in 2012, see Section 3.3.3) set at 20% of the average annual total biomass over a recent period in the absence of fishing ($SB_{current, F=0}$). According to the latest stock assessment (Davies et al., 2011) $B_{current} / B_{lim}$ is estimated at 1.44; $B_{current}$ is therefore well above the limit reference point. Furthermore, there is an estimated probability of only 13% that $SB_{current}$ is actually below SB_{MSY} - as such, it is both likely and highly likely that this species is within biologically based limits and SG80 is met. Nevertheless, overfishing is occurring ($F_{current} > F_{MSY}$ for all model runs) and SG100 is therefore not met.</p> <p>Yellowfin: as for bigeye, only one limit reference point has been formally adopted for this species for management purposes (endorsed by WCPFC9 in 2012, see Section 3.3.3): $B_{lim} = 0.2 SB_{current, F=0}$. According to the latest stock assessment (Langley et al., 2011) $B_{current} / B_{lim}$ is estimated at 2.64; $B_{current}$ is therefore well above the limit reference point. For all model runs, $F_{current} / F_{MSY}$ is estimated to be below 1 and biomass reference points $B_{current} / B_{MSY}$ and $SB_{current} / SB_{MSY}$ are all estimated to be above 1. There is therefore a high degree of certainty that overfishing is not occurring and the stock is not in an overfished state. As such, SG100 is met.</p> <p>Blue marlin: no target or limit reference points have been established for this species. Compared to MSY-based reference points, the current (2011) spawning biomass is 29% above SSB_{MSY} and the current fishing mortality (average across 2009-2011) is inferior to F_{MSY} and $1-SPR_{MSY}$ by 19% and 6%, respectively. Therefore, the blue marlin stock in the Pacific Ocean currently is not being overfished and is not in an overfished state. There is therefore a high degree of certainty that the species is within biologically based limits and is fluctuating around its target reference points. SG100 is met.</p> <p>S. longiceps: stock structure for this species is uncertain and no recent stock assessments have been conducted. Rohit and Bhat (2003) did, however, carry out a study on the biology, growth and stock structure of the Indian oil sardine along the Mangalore-Malpe coast, based on investigations made during 1997-98 to 2001-02. The study concluded that the oil sardine was underexploited and that the yield could be optimised by increasing effort by 21%. Currently, fishery output and population parameters are being monitored by the Central Marine Fisheries Research Institute (CMFRI) and used as a proxy for stock survey (Andrews et al., 2008). Analysis of catch data for 2010 - 2011 indicates that the average length at capture exceeded the size at maturity and optimum size for exploitation for the species (CMFRI, 2012). This, in addition to the life history characteristics (broadcast spawner, fast growth and short life span) suggests that the Indian oil sardine is highly likely to be within biologically safe limits. Furthermore, the use of <i>S. longiceps</i> as bait in the fishery under assessment represents a fraction of the total landings at less than 1% (see section 3.4.1.4). SG80 is therefore met.</p> <p>SG100 includes all retained species. Other retained species include other species of billfish, opah, wahoo and mahi mahi. There is also a category 'other' in the data, suggesting that all retained species are not completely identified. Some of these species have no stock assessment or reference points and their stock status is unknown. Therefore, SG100 is not met. The overall score for this scoring issue is 80.</p>		

b	Guide post			Target reference points are defined for retained species.
	Met?			N
	Justification	MSY-based reference points are used in the stock assessments for the three species; however they have not been formally adopted as part of a management strategy for these species. In addition, several of the retained species (since 'main' is not specified here) have no reference points (e.g. wahoo, opah, mahi mahi). This scoring issue is therefore not met.		
c	Guide post	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	None of the main retained species are considered to be outside biologically based limits (see scoring issue a) - no measures are therefore required at this stage. Both SG60 and SG80 are met.		
d	Guide post	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
	Met?	Y		

	Justification	Formal stock assessments have been carried out for the three main retained species and despite a degree of uncertainty in each stock assessment, the status of each species is well known. For the bait species, <i>S. longiceps</i> , no formal stock assessments are carried out and the species is not managed through harvest control tools. Monitoring is, however, carried out through proxies based on catch data and population parameters by the CMFRI, which indicates that the species is likely to be within biologically safe limits. Stock status is therefore sufficiently known to enable management action if required. The fishery's use of <i>S. longiceps</i> as bait also corresponds to less than 1% of the total catch of this species and is unlikely to cause the species to be outside biologically based limits or hinder its recovery. SG60 is met.
References	Davies et al., 2011 Langley et al., 2011 ISC WGBILL, 2013 Andrews et al., 2008 CMFRI, 2012	
OVERALL PERFORMANCE INDICATOR SCORE:		80
CONDITION NUMBER (if relevant):		N/A

Evaluation table 8 - PI 2.1.2

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
	Met?	Y	Y	N
	Justification	<p>Yellowfin and blue marlin received a score of 100 in PI 2.1.1. (scoring issue a) – as such, the term ‘if necessary’ applies to these species and management as described under SG60 and SG80 is not required. SG80 is therefore met by default for these species.</p> <p>Bigeye (as is yellowfin) is managed through CMM-2013-01. The management strategy is explained in detail in Section 3.3.6 and 3.4.1.1. The CMM recognises that bigeye is currently subject to overfishing and seeks to reduce fishing mortality (F) so that the stock is - at a minimum - maintained at MSY. The CMM includes measures on FAD reduction, effort control, catch limits and capacity management. These measures should be considered to form at least a partial strategy, expected to keep bigeye at MSY levels. SG80 is therefore met.</p> <p>For <i>S. longiceps</i>, management by the CMFRI currently consists of monitoring of stock status through proxies based on fishery output and size composition data. While the species remains above biologically based limits, the monitoring activities can be regarded as constituting a partial strategy. As previously mentioned, the fishery’s use of <i>S. longiceps</i> as bait also corresponds to less than 1% of the total catch of this species and is unlikely to cause the species to be outside biologically based limits or hinder its recovery. SG80 is therefore met.</p> <p>There is, however, no strategy in place to manage all retained species – SG100 is therefore not met.</p>		
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N
	Justification	<p>For bigeye, the CMM-2013-01 has only just come into force and its effectiveness can therefore not yet be assessed. Pilling et al. (2013), however, did carry out a review of the implementation and effectiveness of key management measures for tropical tuna (as outlined in CMM 2008-01 and subsequent CMMs), using the most current data and stock assessments available. The study concluded that although tropical purse seine effort had not decreased, bigeye catches did decrease strongly during FAD closure periods and there was an overall decline in bigeye longline catch in comparison to the 2001 – 2004 average. Although the study also pointed out that the length of the FAD closure may not be sufficient for overfishing to be completely eliminated by 2018, there is some objective basis for confidence in the effectiveness of this partial strategy –while the level of confidence is enough for bigeye to meet SG80, this is not the case for SG100. SG80 is met.</p> <p>As far as the assessment team is aware, there has been no review of the effectiveness of the management strategy for the bait species, <i>S. longiceps</i>. The fact that the species is currently considered to be within biologically based limits provides some confidence that management is working. SG80 is</p>		

		therefore met; however, there is insufficient information available for SG100 to be met.		
c	Guide post		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	For bigeye, Pilling et al. (2013) show a decline in catch during FAD closure periods, suggesting that CMM-2013-01 (or its predecessor) is being implemented. CCMs of WCPFC report annually on their implementation of each CMM to the Commission, although these reports (Part 2 reports) are confidential. The team considered that this constituted 'some evidence' but not 'clear evidence' for bigeye. Likewise for <i>S. longiceps</i> , the stock status provides some evidence of successful management. Overall, SG80 is met, but not SG100.		
d	Guide post			There is some evidence that the strategy is achieving its overall objective.
	Met?			N
	Justification	In the absence of an overall management strategy for retained species, this scoring issue is not met.		
e	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	This fishery takes place in a Shark Sanctuary (see Section 3.4.3.3) and no sharks can be retained. Sharks are, however, discarded and this is further discussed under component 2.3 (ETP species).		
References	CMM-2013-01 Pilling et al., 2013			
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				N/A

Evaluation table 9 - PI 2.1.3

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	<p>For the fishery under assessment, the principal data source used to quantify main retained species are the SPC logbooks, detailing estimated volume (tonnes) and number of individuals of retained catch per species. These data are typically collected and processed by the MMR which involves verification and adjustment of the dataset in accordance with unloadings and VMS data before forwarding to the SPC for use in stock assessments and associated analyses. Note, however, that for blue marlin, the fishery under assessment has had issues with misidentification of blue, black and striped marlin (Section 3.4.1.3). Although most marlin catches in the UoC are likely to be blue marlin, this means the data are probably not as accurate as they could be.</p> <p>At a regional level, information supporting the harvest strategy for the main retained tuna species including bigeye and yellowfin is provided by each CMM to the SPC/OFP which manage and process the data for use in stock assessments and associated analyses with the output scientific advice used by the WCPFC, other regional or sub-regional organisations (e.g., FFA, PNA) and individual SPC members to manage the fishery. The data include fisheries-dependent data structured by flag state, region of operation and gear-type obtained through vessels, observers, port samplers and agents (e.g. catch and effort data, unloadings data, port sampling data, transshipment data, size composition data and observer data based on 5% coverage of the longline fleet and 100% coverage of the purse seine fleet in the WCPFC convention area), as well as tagging data, oceanographic data and data from biological research undertaken by CCMs and SPC.</p> <p>For blue marlin, although there have been significant advances in understanding the species' biology and ecology, historically there has been a lack in biological, ecological and fisheries-dependent data at regional level. Furthermore, the identification issues present in the fishery under assessment also affect fisheries at a regional level.</p> <p>For <i>S. longiceps</i>, the amount of bait used in the fishery annually is known (see section 3.4.1.4).</p> <p>Although a good deal of quantitative information is available for all species concerned, the accuracy of those data could be improved on - for this reason, SG80 is met, but not SG100.</p>		

b	Guide post	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Y	Y	N
	Justification	<p>The information available on this fishery's removals of main retained species and bait usage are sufficient to determine the level of risk the fishery poses to the overall stock status of the species concerned. For bigeye, yellowfin and blue marlin, fisheries-dependent and independent data have been sufficient for use in stock assessments that estimate stock status with respect to biologically based limits. However, for yellowfin and bigeye, there remains some uncertainty in the stock assessments, particularly with respect to purse seine catch estimates and the Philippines and Indonesian fisheries which have the weakest catch, effort and size data. For blue marlin, the lack of sex-specific size data and the simplified treatment of the spatial structure of Pacific blue marlin population dynamics are considered important sources of uncertainty. For these species, SG80 is met but status cannot be estimated with a high degree of certainty – SG100 is not met.</p> <p>As for <i>S. longiceps</i>, the available information on the species, stemming mainly from India (see Section 3.4.1.4) has so far indicated whether it is likely to be within biologically based limits. SG80 is met but not SG100.</p>		
c	Guide post	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N
	Justification	<p>For all main retained species, the available information is sufficient to determine whether the respective stocks are likely to be within biologically based limits and therefore whether or not management action is required. While partial strategies exist for bigeye and yellowfin (CMM-2013-01), a species-specific management strategy for blue marlin and <i>S. longiceps</i> has not been required so far. On this basis, the team considered that SG80 was met for these species. SG100 however is not met as there is no high degree of certainty whether these management approaches are achieving their objective.</p>		
d	Guide post		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		Y	N
	Justification	<p>As above, sufficient information is collected for all main retained species to determine stock status and therefore to detect any increase in risk level. SG80 is met. Monitoring is, however, not conducted for all retained species. SG100 is therefore not met.</p>		
References		<p>Davies et al., 2011 Langley et al., 2011</p>		

	ISC WGBILL, 2013 Andrews et al., 2008 CMFRI, 2012
OVERALL PERFORMANCE INDICATOR SCORE:	80
CONDITION NUMBER (if relevant):	N/A

Evaluation table 10 - PI 2.2.1

PI 2.42.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y	Y	N
	Justification	See Section 3.4.2. Based on 2013 observer data, none of the bycatch species could be qualified as 'main'. SG80 is therefore met by default. However, SG100 is not met as there is not a high degree of certainty that all bycatch species are within biologically based limits.		
b	Guide post	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	Y	Y	
	Justification	No main bycatch species were identified, SG80 is therefore met by default.		
c	Guide post	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	The 2005 Resolution on Non-Target Fish Species (Resolution-2005-03) encourages CCMs to "avoid to the extent practicable, the capture of all non-target fish species that are not to be retained. Any such non-target fish species that are not to be retained, shall, to the extent practicable, be promptly released to the water unharmed". Although rather generic and non-binding, this measure is expected to result in the fishery not causing bycatch species to be outside biologically based limits. SG60 is therefore met.		
References		2005 Resolution on Non-Target Fish Species (Resolution-2005-03)		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				N/A

Evaluation table 11 - PI 2.2.2

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	N
	Justification	See Section 3.4.2. Based on 2013 observer data, none of the bycatch species could be qualified as 'main'. SG80 is therefore met by default. The 2005 Resolution on Non-Target Fish Species (Resolution-2005-03) is the main instrument through which bycatch is managed. This measure however is very generic and does not constitute a real strategy. SG100 is therefore not met.		
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N
	Justification	The same arguments as those given in scoring issue a apply. SG80 is met but not SG100.		
c	Guide post		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	The same arguments as those given in scoring issue a apply. SG80 is met but not SG100.		

d	Guide post		There is some evidence that the strategy is achieving its overall objective.
	Met?		N
	Justification	There is no overall strategy to manage all bycatch species . SG100 is not met.	
References	2005 Resolution on Non-Target Fish Species (Resolution-2005-03)		
OVERALL PERFORMANCE INDICATOR SCORE:			80
CONDITION NUMBER (if relevant):			N/A

Evaluation table 12 - PI 2.2.3

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	None of the bycatch species could be qualified as 'main'. SG80 is therefore met by default. However, bycatch is not consistently reported by the crew in logbooks and observer coverage is relatively low (<20%). Information is therefore not available for all bycatch species and SG100 is not met.		
b	Guide post	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	N
	Justification	The same argument as given in scoring issue a applies. Information is however not available for all bycatch species and outcome status of all bycatch species cannot be determined with a high degree of certainty. SG80 is met.		
c	Guide post	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N
	Justification	As above, SG80 is met		

d	Guide post		Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?		Y	N
	Justification	As above, SG80 is met.		
References	N/a			
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				N/A

Evaluation table 13 - PI 2.3.1

PI 2.3.1		The fishery meets national and international requirements for the protection of ETP species The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species																									
Scoring Issue		SG 60	SG 80	SG 100																							
a	Guide post	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.																							
	Met?	Y	N	N																							
	Justification	<p>SG60:</p> <p>Seabirds: only two specimens were recorded by observers during LTFV trips in 2013 and 2012. This information, in addition to historical information held by the MMR based on observer data, interviews with vessel operators and the risk assessment conducted by Filippi et al. (2010) suggests that known effects of the fishery are likely to be within international requirements for the protection of ETP bird species. SG60 is therefore met for seabirds.</p> <p>Turtles: based on observer data, interactions with sea turtles are also relatively rare (4 specimens encountered in 2 years by observers) and the impacts are likely to be significantly less than those caused by traditional practices in the Cook Islands which includes their consumption. Known effects of the fishery are therefore likely to be within limits of international requirements for the protection of sea turtles. SG60 is therefore met for sea turtles.</p> <p>Sharks: within the Cook Islands EEZ all shark and ray species have to be discarded in accordance with the 2012 Shark Sanctuary regulations. Key discarded shark species are blue shark, oceanic whitetip shark, thresher sharks (not identified to species level), longfin and shortfin mako shark, and silky shark. As of 2013, discards are recorded in logsheets as well as during observer trips. Comparison of both datasets revealed discrepancies, with logsheets likely underestimating shark discards and underrepresenting some species due to identification issues. Observer records, however, present an indication of likely shark discards. The number of sharks observed in 2013 (when the Shark Sanctuary was in force) and raised to cover the entire fishing effort of the entire Cook Islands longline fishery (and not just the vessels include in the unit of certification) is shown in the following table:</p> <p><u>Information on annual discards of shark species</u></p> <table border="1"> <thead> <tr> <th>Species</th> <th>Number of individuals observed (at 9.8% observer coverage)</th> <th>Estimate of the number of individuals captured by extrapolating observed trips to all trips</th> <th>Most recent estimate of individuals captured at the stock level</th> </tr> </thead> <tbody> <tr> <td>Blue shark</td> <td>61</td> <td>622</td> <td>90,000 – 500,000 ind. (Rice and Harley, 2011)</td> </tr> <tr> <td>Oceanic white-tip</td> <td>37</td> <td>378</td> <td>53,700 – 205,800 ind. (Rice and Harley, 2012)</td> </tr> <tr> <td>Mako (shortfin + longfin)</td> <td>17</td> <td>174</td> <td>50,000 – 250,000 ind. (Clarke, 2011)</td> </tr> <tr> <td>Thresher</td> <td>53</td> <td>541</td> <td>65,000 – 750,000 ind. (Clarke, 2011)</td> </tr> <tr> <td>Silky</td> <td>42</td> <td>429</td> <td>238,500 – 633,800 ind. (Rice and Harley, 2013b)</td> </tr> </tbody> </table>			Species	Number of individuals observed (at 9.8% observer coverage)	Estimate of the number of individuals captured by extrapolating observed trips to all trips	Most recent estimate of individuals captured at the stock level	Blue shark	61	622	90,000 – 500,000 ind. (Rice and Harley, 2011)	Oceanic white-tip	37	378	53,700 – 205,800 ind. (Rice and Harley, 2012)	Mako (shortfin + longfin)	17	174	50,000 – 250,000 ind. (Clarke, 2011)	Thresher	53	541	65,000 – 750,000 ind. (Clarke, 2011)	Silky	42	429
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		<p>From the above table it is apparent that the number of sharks caught by the UoC is a very small portion of all those taken at the stock level. It is therefore unlikely to have a stock-level effect. SG60 is therefore met for sharks.</p> <p>Cetaceans: 2 interactions were recorded in the observer reports for 2012 and 2013, involving one bottlenose dolphin and one false killer whale. Both species are considered as data deficient by IUCN and abundance estimates are highly uncertain (see section 3.4.3.4). Based on the observer data, however, interactions with cetaceans are likely to be rare and are in most cases likely to be related to non-lethal depredation events. Known effects of the fishery are therefore likely to be within limits of international requirements for the protection of cetaceans. SG60 is therefore met for cetaceans.</p> <p>SG80</p> <p>In order to meet “the effects of the fishery are known” under SG80, interactions of this fishery with the aforementioned species should be estimated with an improved degree of certainty.</p> <p>Interactions with ETP species are rarely recorded by LTFV crew and observer coverage is considered too low to preclude the possibility of highly threatened seabird populations being impacted by the fishery (see Section 3.4.3.1). The same is true for sea turtles, for which at least the loggerhead and olive ridley RMUs overlap entirely with the Cook Islands EEZ and are considered to be at high risk from bycatch in longlines (see Section 3.4.3.2). Some turtle populations may be sufficiently depleted that apparently small levels of bycatch may have an impact at the population level. For sharks, there have been considerable improvements in the provision of discard data in logsheets from 2013; however comparison with observer records indicates problems with underreporting and misidentification remain. Although interactions with cetaceans are likely to be rare, here also, improved reporting would enable a better estimate of this fishery’s impacts on the species concerned. Although the effects of the fishery are highly likely to be within the limits of national and international protection requirements, the assessment team felt that the effects of the fishery are not known, <i>sensu strictu</i>. SG80 is therefore not met.</p>		
b	Guide post	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Y	Y	N
	Justification	The direct effects of the fishery have been considered in scoring issue a above and are highly unlikely to create unacceptable impacts on the ETP species discussed. SG80 is met. However, the quality (including quantity) of data available on ETP interactions and the status of affected taxa is considered insufficient to provide a high degree of confidence in this statement. SG100 is therefore not met.		
c	Guide post		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y	N
	Justification	Observer data indicate that on most occasions ETP species are released alive but with uncertainty in the probability of post-release survival. While survival rates of sharks in particular are difficult to estimate and while it is clear that some practices can be improved on (see PI 2.3.2), it is highly unlikely that this fishery creates unacceptable impacts on the species concerned. SG80 is therefore met. However, as previously stated, because the effects of fishery are not accurately quantified, there is no high degree of confidence in this statement. SG100 is therefore not met.		
References	Observer data (Section 3.4.2)			
OVERALL PERFORMANCE INDICATOR SCORE:				75

CONDITION NUMBER (if relevant):	4
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Evaluation table 14 - PI 2.3.2

PI 2.3.2		The fishery has in place precautionary management strategies designed to:		
		<ul style="list-style-type: none"> • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species. 		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	There are measures in place that minimise mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Y	Y	N
	Justification	<p>Seabirds: In accordance with the International Plan of Action on Seabirds (IPOA-Seabirds), the Cook Islands have prepared a National Plan of Action for Reducing Incidental Catch of Seabirds (NPOA-Seabirds), implemented through the Cook Islands Large Pelagic Longline Fishery Plan, which requires vessels to record any encounters with seabirds (live or dead) and report this to the MMR. CMM-2007-04 issued by the WCPFC on the implementation of the FAO International Plan of Action on Seabirds (IPOA-Seabirds) applies to fisheries operating south of 30 degrees South and north of 23 degrees North and does not apply to the Cook Islands EEZ. Following a risk assessment conducted by Filippi et al. (2010) and updated best practice advice from the Agreement for the Conservation of Albatrosses and Petrels (ACAP), recommendations have been made to produce a more precautionary CMM, applying to additional risk areas from 25°S – 30°S and 20°N-40°N. The southern hemisphere 25°S latitudinal line passes just inside the EEZ of the Cook Islands, with 0.06% of the EEZ overlapping with the proposal to extend CMM to 25°S. As such, it is likely that some amendments to the NPOA-Seabirds will be required. However, for the fishery under assessment, which takes place in the Northern waters of the Cook Islands, these revisions to the CMM are unlikely to have an effect. Based on this information, the assessment team concluded that CMM and the NPOA constitute a strategy which is designed to be highly likely to achieve international requirements for the protection of bird species. SG80 is therefore met for seabirds. The Cook Islands' NPOA however does not go above and beyond the CMM requirements on the basis that EEZ is situated in a low-risk zone. As such, SG100 is not met.</p> <p>Turtles: At regional level, the WCPFC has issued CMM-2008-03 which is detailed in Section 3.4.3.2 and covers numerous measures including mitigation methods to reduce the capture of sea turtles and to increase post-release survival chances as well as reporting requirements and a provision for CCMs to carry out research on mitigation methods. The CMM has been adopted by the Cook Islands through its NPOA-Sea turtles, implementing the FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations as well as the Regional Action Plan for Sea Turtle By-Catch Mitigation implemented by FFA member countries on 1 July, 2008. The NPOA sets out a program of actions that aims to improve knowledge of fishing practices and interactions over time through collection and monitoring of fishery data, research and trials of mitigation measures, and establishes current "best practice" mitigation methods for implementation. The CMM and NPOA have been adopted for the albacore longline fishery through the Cook Islands longline Fishery Plan which also details that any interactions with sea turtles should be recorded and reported to the MMR. The CMM with the NPOA</p>		

		<p>constitutes a strategy which is highly likely to achieve international requirements for the protection of sea turtles. SG80 is therefore met. SG100 requires a comprehensive strategy which aims to go further than the international protection requirements for sea turtles. The audit felt that this was not the case for the fishery under assessment; SG100 is therefore not met.</p> <p>Sharks: for the fishery under assessment, there are four management levels for sharks (see Section 3.4.3.3 for details): 1) at WCPFC level: CMM-2010-07 on sharks; CMM-2011-04 on oceanic white-tips and CMM-2013-08 on silky sharks; 2) at national level via the overarching Shark Sanctuary Regulations; 3) at national level via the NPOA-sharks and 4) at company level through the LTFV policy on sharks. In combination, these measures aim at zero capture and retention of any shark or ray species, with maximisation of the survival of any shark that does get caught. The team considers this to be comprehensive strategy which goes above and beyond national and international requirements; SG100 is therefore met for sharks.</p> <p>For cetaceans, interactions are generally caused by depredation and are thought to be rare for the fishery under assessment. While cetaceans are not specifically addressed in any CMMs for WCPO longline fisheries, they are generally covered under the Cook Islands' Marine Resources (Longline Fishery) Regulations 2008 which states that "Fishers will be required to avoid the capture, and release unharmed, to the extent practicable, non-target species that are not to be retained." On the basis that cetaceans are unlikely to be a problem for the fishery under assessment, the team considered this requirement to constitute a partial strategy and sufficient for SG80 to be met. Should the fishery achieve certification, the level of interactions with cetaceans will be monitored throughout the surveillance process and appropriate action will be taken should the status quo not be maintained. For this scoring issue SG80 is therefore met.</p>		
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Y	Y	N
	Justification	<p>Seabirds: based on the risk-based analysis carried out by Filippi et al. (2010) there is an objective basis for confidence that the management strategy will work. SG80 is therefore met for seabirds.</p> <p>Sea turtles: the CMM requires the implementation of the FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations, which include the use of wide circle hooks; using fish rather than squid for bait; and setting hooks deeper than turtle abundant depths (40–100 m). These guidelines present best-practice of how to reduce interactions between sea turtles and fishing gear and reduce the proportion of caught turtles that are killed as a result of interactions with marine capture fisheries. All measures mentioned have been shown to reduce sea turtle interactions in longline fisheries significantly without compromising catch rates of target species (FAO, 2009). There is therefore an objective basis for confidence that the management strategy will work. SG80 is met for sea turtles.</p> <p>Sharks: the strategy aims at zero capture and retention of any shark or ray species, with maximisation of the survival of any shark that does get caught. As previously stated, this is a comprehensive strategy which goes above and beyond national and international requirements. There is therefore an objective basis for confidence that the strategy will work and SG80 is met for sharks.</p> <p>Cetaceans: the fact that cetaceans are unlikely to be a problem for pelagic longline fisheries and the low level of reported interactions with this fishery provides an objective basis for confidence that the strategy will work. SG80 is therefore met. However, as previously stated, should this fishery be certified, it will be important that interactions are monitored and appropriate action is taken as required during the surveillance programme.</p> <p>No quantitative analysis has been conducted for this fishery for any of the ETP groups concerned which could support high confidence that the management strategies will work. SG100 is therefore not met.</p>		

c	Guide post		There is evidence that the strategy is being implemented successfully. There is clear evidence that the strategy is being implemented successfully.
	Met?		N N
	Justification	<p>Seabirds and cetaceans: the available evidence (anecdotal and observer reports) does not suggest that either seabirds or cetaceans are an issue in this fishery. Where possible, the animals are released alive. The team considered this to be clear evidence that the respective strategies were being implemented successfully. SG100 is therefore met.</p> <p>Sharks: Analysis of the 2013 observer reports indicates that no sharks were retained in the fishery under assessment since the establishment of the Shark Sanctuary, as opposed to the 2012 reports when significant numbers were being retained. At-sea inspection reports also did not reveal any infractions against the Shark Sanctuary. The team considered that the strategy is sufficiently being implemented for SG80 to be met; however as previously mentioned, there remain problems with the reporting of sharks in logbooks which are most likely due to identification issues – SG100 is therefore not met.</p> <p>Turtles: A site visit carried out by Momo Kochen (formerly of Fishing and Living) aboard LTFV vessels in Pago Pago found that although some components of the strategy are being implemented successfully (e.g. use of circle hooks), turtles are most often cut loose and not properly de-hooked; identification is not carried out to species level, and incidents are most often not reported to the MMR. In one instance an observer made mention of a turtle (possibly dead upon haulback) being consumed by the crew. This scoring issue is therefore not met.</p>	
d	Guide post		There is evidence that the strategy is achieving its objective.
	Met?		N
	Justification	Considering the outcome of scoring issue c, SG100 is not met for turtles.	
References		Observer data (Section 3.4.2)	
OVERALL PERFORMANCE INDICATOR SCORE:			75
CONDITION NUMBER (if relevant):			5

Evaluation table 15 - PI 2.3.3

PI 2.3.3		Relevant information is collected to support the management of fishery impacts on ETP species, including: <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and • Information to determine the outcome status of ETP species. 		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Y	Y	N
	Justification	For all ETP species concerned, information gathered through observer reports is sufficient to enable a qualitative evaluation of fishery-related mortality – SG60 is met. The observer data provide some quantitative estimate of the fishery’s interactions with ETP species, albeit with a high degree of uncertainty: the relatively low level of observer coverage (<20%) and particularly the problems with reporting of interactions with sea turtles and sharks by LTFV crew means quantitative estimates for this fishery are likely to be highly uncertain. Particularly for species as silky sharks which were significantly underrepresented in the logbook data.. As such, the team considered that SG80 is met, but not SG100.		
b	Guide post	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y	N	N
	Justification	As above, the information is adequate to broadly understand the impact of the fishery; SG60 is met. However, interactions with ETP species are rarely recorded by LTFV crew and observer coverage is considered too low to preclude the possibility of highly threatened seabird populations being impacted by the fishery (see Section 3.4.3.1). The same is true for sea turtles, for which at least the loggerhead and olive ridley RMUs overlap entirely with the Cook Islands EEZ and are considered to be at high risk from bycatch in longlines (see Section 3.4.3.2). SG80 is not met.		

c	Guide post	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	Y	Y	N
	Justification	For all ETP species concerned, information gathered for this fishery and regionally is adequate to support the relevant CMMs, NPOAs and, in the case of sharks, Shark Sanctuary – SG60 is met. On the basis that full management strategies are currently implemented for the ETP species concerned (see scoring issue a under 2.3.2 (ETP species management)) the team considered that information to date has been sufficient to support those strategies. SG80 is therefore met. In the absence of a comprehensive strategy, however, SG100 is not met.		
References	Observer data (Section 3.4.2) CMMs, NPOAs and Shark Sanctuary Regulations presented and discussed in Section 3.4.3			
OVERALL PERFORMANCE INDICATOR SCORE:				75
CONDITION NUMBER (if relevant):				4

Evaluation table 16 - PI 2.4.1

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Y	Y	Y
	Justification	<p>The longline fishery takes place predominantly in the northern EEZ where the plateau rises from a depth of over 4,000 m to approximately 2,000 m and is therefore highly unlikely to interact with benthic features (also see Section 3.4.4).</p> <p>Lost gear may consist of monofilament and/or hooks and is only likely to continue to fish as long as bait remains on the hooks. Bait is stripped relatively quickly off the hooks and as such, the mortality rate associated to lost longlines is low (Macfadyen et al., 2009).</p> <p>SG100 is therefore met.</p>		
References		Macfadyen et al., 2009		
OVERALL PERFORMANCE INDICATOR SCORE:				100
CONDITION NUMBER (if relevant):				N/A

Evaluation table 17 - PI 2.4.2

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	Y
	Justification	Considering the unlikelihood of this fishery impacting on benthic habitats, management measures should not be required. SG100 is met.		
b	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	Y	Y
	Justification	The fishery takes place in deep oceanic waters as confirmed by VMS data for the fleet as well as observer reports. As this fishery does not interact directly with any benthic habitats, SG100 is met.		
c	Guide post		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	As above, SG100 is met.		
d	Guide post			There is some evidence that the strategy is achieving its objective.
	Met?			Y
	Justification	As above, SG100 is met.		
References		VMS data (Figure 5); observer reports as seen by the team		

OVERALL PERFORMANCE INDICATOR SCORE:	100
CONDITION NUMBER (if relevant):	N/A

Evaluation table 18 - PI 2.4.3

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	Y
	Justification	The presence of seamounts throughout the area fished is known and these are in any case highly unlikely to interact with the pelagic fishing gear. SG100 is met.		
b	Guide post	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	N
	Justification	VMS, logbook and observer data provide reliable data on the spatial extent of the fishing operations – SG80 is therefore met. However, LTFV currently does not monitor the amount of fishing gear lost. Impacts can therefore not be quantified fully. SG100 is not met.		
c	Guide post		Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Changes in habitat distributions over time are measured.
	Met?		Y	Y
	Justification	VMS, logbook and observer data provide reliable data on the spatial extent of the fishing operations and enable any increased risk to habitats to be detected. In the absence of this fishery interacting with benthic features, SG100 is met.		
References		VMS data (Figure 5); observer reports as seen by the team		
OVERALL PERFORMANCE INDICATOR SCORE:				95
CONDITION NUMBER (if relevant):				N/A

Evaluation table 19 - PI 2.5.1

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Y	Y	N
	Justification	<p>Also see Section 3.4.5.</p> <p>The team considered biomass at MSY to be a suitable trigger, below which irreversible ecosystem impacts might be possible. At the scale of the UoC, it is highly unlikely that the fishery under assessment would lead to irreversible ecosystem impacts. At a regional scale, the latest stock assessment for albacore suggests that the stock is being maintained above BMSY level. On this basis, it is considered highly unlikely that the albacore fishery will disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. Likewise, main retained species are within biologically-based limits and a strategy is in place to protect the most commonly caught ETP species (sharks). SG80 is therefore met. There is however limited evidence supporting this conclusion, in terms of direct information about the ecosystem and the impact of albacore longlining upon it. SG100 is thus not met.</p>		
References		See Section 3.4.5		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				N/A

Evaluation table 20 - PI 2.5.2

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	N
	Justification	The FAO code states that fisheries management should ensure the conservation not only of target species, but also sympatric non-target species (Allain et al., 2011). This resolution is now explicit in WCPFC measures, although tuna fisheries remain managed on single-species basis. The WCPFC's application of the FAO code extends to the highly migratory fish species including tuna through CMM-2013-01 on the management of bigeye, yellowfin and skipjack and CMM-2010-05 on the management of albacore (the harvest strategies for albacore and bigeye in particular have been discussed in detail under Principles 1 and 2, see Sections 3.3.6 and 3.4.1.1), as well as to the management of non-target species, in particular through Resolution 2005-03 on Non-Target Fish Species. Work is also underway via in-country EAFM work which is also ongoing in the Cook Islands. The team considered that all the CMMs and NPOAs in conjunction with the Shark Sanctuary constituted at least a partial strategy and that SG80 was therefore met. Although work on the EAFM approach for the Cook Islands is ongoing a plan has yet to be put in place. SG100 is therefore not met.		
b	Guide post	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	The strategy, which consists of a plan, contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem. This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.
	Met?	Y	Y	N
	Justification	The WCPFC and national measures which form the partial strategy all take into account the available information with the expectation that impacts on the ecosystem are restrained (see discussions on CMMs, NPOAs and Shark Sanctuary). SG80 is therefore met. However as the EAFM approach has yet to be implemented in the Cook Islands, SG100 is not met.		

c	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	Y	Y	N
	Justification	Previous discussions on the various CMMs, NPOAs and Shark Sanctuary regulations have established that those measures forming the partial strategy are considered likely to work for the ecosystem components they address. As such, the partial strategy is considered likely to safeguard key elements of ecosystem structure and functioning. Despite this, the team considered that insufficient information was available on the fishery's impact on the respective ecosystem components to warrant a score of 100. SG80 is therefore met, but not SG100.		
d	Guide post		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		Y	N
	Justification	At regional level, the partial strategy has so far succeeded in maintaining target species above BMSY level, considered here as the main trigger point beyond which ecosystem structure and functioning may be affected. There is therefore some evidence that the partial strategy is being implemented successfully. There is however insufficient evidence on key ecosystem indicators to inform on all measures with a high degree of certainty. SG80 is met but not SG100.		
References		Allain et al., 2011		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				N/A

Evaluation table 21 - PI 2.5.3

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	There is increasing effort by a range of organizations to collect detailed data on the structure of the Pacific Ocean pelagic ecosystem. This effort occurs through observer programmes (e.g. bycatch composition and quantities), trophic analyses (e.g. stomach contents, stable isotopes), and mid-trophic level sampling (e.g. acoustics and net sampling of micronekton and zooplankton), as detailed in Section 3.4.5. This information is thought to be adequate to broadly understand the key elements of the ecosystem. SG80 is met.		
b	Guide post	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Y	Y	Y
	Justification	Trophic structure of pelagic ecosystems in the Pacific, including the WCPO, has been characterised using Ecopath and Ecosim models based on diet data. The dynamic system model SEAPODYM, is a model developed for investigating spatial tuna population dynamics, under the influence of both fishing and environmental effects (Lehodey et al., 2013). The continued development and application of the SEAPODYM model to the work of the WCPFC Scientific Committee, including its application to albacore fisheries in the South Pacific, is facilitated through Project 62 which affiliates the independently funded work on SEAPODYM into the SC's work programme (Lehodey et al., 2013). A list of current projects is given in Lehodey et al. (2013). Main interactions between the fishery and the ecosystem have been and are being investigated. SG100 is met.		

c	Guide post		The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	Met?		Y	N
	Justification	Information on target and non-target species (bycatch and ETP species) is gathered by the SPC through logbook data and its regional observer programme. The available information is managed by the Bycatch mitigation information system (BMIS) which acts as a reference and educational tool that supports the WCPFC's responsibilities with regard to the sustainable management of non-target, or bycatch, species in WCPO fisheries targeting highly migratory species, including tuna and billfish (Fitzsimmons, 2011). Furthermore, the Kobe By-catch Technical Working Group (KBTWG) was established in 2009 with the aim of supporting, streamlining, and seeking to harmonize the by-catch related activities of Ecosystems/By-catch working groups across RFMOs and feeding its findings through to those RFMOs. Sufficient information is being gathered to understand the main functions of the ecosystem components. SG80 is therefore met. There remains, however, uncertainty as to the fishery's impacts on those components due to issues with reporting of catches for target and non-target species, as well as relatively low regional observer coverage for the tuna longline fisheries. SG100 is thus not met.		
d	Guide post		Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Y	N
	Justification	As explained in scoring issue c, sufficient information is available to know some of the main fishery's impacts on the ecosystem; however all main consequences are not known - SG80 is met, but not SG100.		
e	Guide post		Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?		Y	N
	Justification	Data collected on the key target and non-target tuna and billfish species in conjunction with the observer data for other, non-target species, and ecosystem modelling are considered sufficient to detect any increase in risk level. SG80 is met. In the absence of a comprehensive strategy for ecosystem management in the region, SG100 is not met.		
References		Lehodey et al., 2013 Fitzsimmons, 2011		
OVERALL PERFORMANCE INDICATOR SCORE:				85
CONDITION NUMBER (if relevant):				N/A

Evaluation table 22 - PI 3.1.1

PI 3.1.1		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 		
Scoring Issue		SG 60	SG 80	SG 100
a	Guided post	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Y	Y	Y
	Justification	<p>Cook Islands has a well-developed national legal system, which closely reflects that of New Zealand and most other English Common Law jurisdictions. A comprehensive national legal framework governing the work of MMR and regulating the longline fishery is provided through the 2005 Fisheries Act, the 2008 Longline Fisheries Plan and the 2013 Regulations. There is some lack of clarity concerning the links between the 2008 plan and the current (2012) regulations which will be addressed under a new Longline Plan that is currently under development.</p> <p>There is an established framework for cooperation with other states and territories, primarily through active membership by Cook Islands of regional (SPC, FFA, TVM and the Southern Committee) and international (WCPFC) fisheries management and research organisations. Effective regional cooperation occurs via SPC and FFA, where regionally (and sub-regionally) supported management initiatives are developed and promoted at the WCPF Commission. Support for management outcomes are provided through i) the collection and sharing of scientific data via a regional logbook and observer programme ii) regular stock assessments carried out by SPC iii) the development and consideration of scientific advice, primarily through the Scientific Committee of the WCPF Commission iv) agreement on matters of common interest between states fishing for albacore, initially at FFA/FFC and then promoted via the WCPF Commission and v) regional MCS initiatives, including a regional VMS and vessel register. While providing for the development of cooperative and compatible regional fisheries management approaches, this framework of cooperation also effectively overcomes the capacity and resource constraints facing the MMR. Cooperation through FFA and the WCPFC has allowed for the development and implementation of sustainable management arrangements for the south pacific albacore fishery as required under the obligations of UNCLOS Articles 63(2), 64, 118, 119, and UNFSA Article 8. The work of SPC as the science provider and the Commission as coordinating secretariat provides a strong framework for cooperation as required under UNSFA Article 10.</p> <p>Cook Islands has signed/ ratified UNCLOS and the UN Fish Stocks Agreement, and was present at the 1995 FAO Conference, during which the FAO Code was unanimously adopted, including the Compliance Agreement. These treaties/agreements are consistent with the current international fisheries law and standards for the management of highly migratory species and ecosystems. Cook Islands has also signed regional agreements, including the FFA Convention and the Niue Treaty, which deals with MCS cooperation.</p> <p>Binding legislation relating to comprehensive international cooperation for the management of the albacore stock exists through the WCPF</p>		

		<p>Convention and the associated CMMs developed by the Commission. Cook Islands has committed to, and has in place, an effective process to give national effect to CMMs developed at the Commission. Through cooperation, a range of Commission committees and processes have been formed to deliver the outcomes under Article 10 of UNSFA and the Convention, including CMMs. Allocation of TACs and TAEs as envisaged under Article 10.3 of the Convention has been partially achieved.</p> <p>On the basis of the above, SG100 is met.</p>		
b	Guidepost	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent_mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery.	The management system incorporates or subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective.
	Met?	Y	Y	N
	Justification	<p>Article 31 of the WCPF Convention provides for adoption of the procedures for the peaceful settlement of disputes laid out in Part VIII of UNSFA and Part XV of UNCLOS. Annex 2 of the WCPFC Convention allows for the establishment of a Review Panel to review decisions of the Commission. The dispute resolution provides for a transparent mechanism for dispute resolution at the Commission.</p> <p>National disputes relating to the fishery can be dealt with through the provisions of the Cook Islands Arbitration Act 2009 which is considered to be effective. This Act has been developed in accordance with international arbitral regimes, encourages the use of arbitration as an agreed method of resolving commercial and other disputes and redefines and clarifies the limits of judicial review. An appeals process is provided in the 2008 Longline Management Plan in the event of a dispute over fishing licenses.</p> <p>While the mechanisms for dispute resolution at national and regional level are considered to be sufficiently transparent and effective for SG80 to be met, the mechanisms, including reviews of Commission decisions, under Articles 20, 31 and Annex II of the WCPF Convention have yet to be tested and proven effective. SG100 is therefore not met.</p>		

d	Guidepost	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	Y	Y	N
	Justification	<p>The Marine Resources Act 2005 provides for the maintenance of traditional forms of sustainable fisheries management; protection of the interests of artisanal fishers, subsistence fishers and local island communities, including ensuring their participation in the management of fisheries and of aquaculture; and broad participation by Cook Islanders in activities related to the sustainable use of marine resources</p> <p>The 2005 Fisheries Act allows for local authorities to take measures for the conservation, management and development of any fishery of local interest within its area of authority in accordance with the principles and provisions of the Act. Further, the Secretary of MMA is required to consult with a local authority on any matter of fisheries conservation, management or development which may affect the local authority or environment, and the local authority is required to consult with the Secretary on issues of mutual importance, which could include any impacts of the albacore longline fishery on artisanal/subsistence fisheries.</p> <p>The WCPFC Convention provides for recognition of the interests of small scale and artisanal fishers within the overall framework for sustainability in the WCPFC Convention. The Convention further requires that the needs of SIDs, territories and possessions and coastal communities dependent on stocks including those taken in the fishery be recognised in the allocation of catch or effort (Art 10 (3)). To date, the Commission has not allocated fishing rights but has sought and received external advice on allocation mechanisms and options. Further, Article 30 of the Convention provides for recognition of the interests of small scale and artisanal fishers within the overall management framework in the WCPFC Convention. The Convention explicitly recognizes the rights of artisanal and subsistence fishers and the dependence of coastal States and States fishing on the high seas on the stocks concerned.</p> <p>The Cook Islands Offshore Fisheries Policy 2013 includes a specific development action to ensure the interactions between offshore fisheries, artisanal and sports fishing are minimised through demarcated exclusion areas, and, where appropriate, market controls. There is, however, no mandated legal basis where rights are fully codified within the fishery management system and/or its policies and procedures. While SG80 is considered to be met, SG100 is not met.</p>		
References	<p>UNCLOS (Part V), UNFSA, WCPFC Convention, FFA Convention Cook Islands Arbitration Act 2009 Cook Islands Offshore Fisheries Policy 2013 Marine Resources Act 2005 Marine Resources (Longline Fishery) Regulations 2008 (incorporates the 2008 Longline Fishery Plan) Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPF Convention)</p>			
OVERALL PERFORMANCE INDICATOR SCORE:				85
CONDITION NUMBER (if relevant):				N/A

Evaluation table 23 - PI 3.1.2

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties.		
		The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue		SG 60	SG 80	SG 100
a	Guided post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
	Met?	Y	Y	N
	Justification	<p>Organisations and individuals directly involved in the management process and their roles are identified in the 2005 Marine Resources Act. Other interested parties, including eNGOs, commercial entities, charter and recreational fishers have been identified as demonstrated by engagement with MMR on a range of management-related issues. There are regular discussions with bilateral fishing partners licensed to fish in the Cook Islands EEZ. The level of communication suggests that roles and responsibilities are generally understood. Attendance at WCPFC meetings (including SC and TCC) and through regional cooperation at FFC and the Southern Committee has expanded understanding of the functions, roles and responsibilities of national jurisdictions and WCPF Commission and the components of the management structure. SG60 is met.</p> <p>The WCPF Convention provides information on the functions, roles and responsibilities of member states and the committees formed under Commission control (SC and TCC). The Commission and its committees have well defined operating procedures and terms of reference, and the roles and responsibilities of members and non-members are well defined in the Convention, in the Rules of Procedure and in relevant CMMs. The role and function of MMR and local authorities are clearly described in the Marine Resources Act 2005. The roles and responsibilities of the Minister and Secretary are also explicitly defined, particularly with respect to licensing. The functions, roles and responsibilities of most stakeholder groups at the national level are considered to be well understood but not explicitly defined, particularly in the case of NGOs. SG80 is met.</p> <p>At the international level the roles and responsibilities of CCMs and the Commission Secretariat are explicitly defined within the Convention and, through the effective administration and outputs of the various committees and other consultative arrangements administered by the Commission, there is clear evidence that roles and responsibilities are understood. However, at national level, while being explicitly defined and understood for most areas of responsibility and interaction, there is no explicit definition of the roles and responsibilities of CI Government with respect to consultation, including the sectors/stakeholders with whom consultation should occur, and means whereby it would happen. SG100 is not met.</p>		

b	Guidepost	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.
	Met?	Y	N	N
	Justification	<p>The MMR provides a range of opportunities for affected parties to have input into the management system, including through public notices in the press and consultation with stakeholders, which have been mostly driven the stakeholders themselves. There is evidence that the Department is willing to engage on issues of concern to stakeholders including bilateral partners and domestic stakeholders.</p> <p>At the international level, the Commission has a comprehensive process for obtaining relevant fisheries, including compliance, information from CCMs, This information is regularly sought from CCMs via Part 1 and 2 reporting (to the Commission) processes. SG60 is met.</p> <p>At the international level, the Commission is active in assisting and facilitating the regular and timely provision of fisheries information. These data are accepted and analysed by the Commission Secretariat or Science Provider. The Commission actively uses information from the fishery and its member states to inform fisheries management discussions and the formulation of management measures, as demonstrated by reports and outcomes of WCPFC meetings.</p> <p>At national level, while the Department does consult with stakeholders on a range of issues, including through the process of public notices in the local press, there is no evidence of consultation processes that regularly seek and accept relevant information. Feedback from stakeholders suggests that current consultation processes are not of a standard expected. There is no evidence to suggest or explanations given as to whether the information gathered from interested parties within the Cook Islands is used or not. The 2008 Management Plan requires that the Secretary shall organise consultations with key stakeholders at least once a year to discuss matters related to the management and regulation of fishing, including licensing, fisheries development initiatives and the social and economic impacts of large pelagic fishing. These consultations have not been convened on a regular basis. The 2008 act requires that a consultative Licensing Committee be convened if the number of applications at any point exceeds the licence number , to limit and provide transparent advice to the Minister and the Secretary on the granting of licences. It was reported to the team that this did not occur when the vessel limit was exceeded. SG80 is therefore not met.</p>		

c	Guidepost		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?		Y	N
	Justification	<p>The Commission Secretariat facilitates effective engagement by stakeholders. Attendance at Commission and related meetings are comprehensive and logistic and financial support is provided to CCMs to ensure attendance and meaningful involvement and interaction in the cooperative management of the albacore fishery. Additional services are provided through the FFA/FFC and associated committees.</p> <p>There is an implicit opportunity for all affected parties to be involved in consultation through submissions to the MMR on various issues. However there is no evidence of meaningful facilitation by MMR or other bodies to achieve effective engagement of interested and affected parties.</p> <p>SG80 is met, but not SG100.</p>		
References	<p>WCPFC, SC and TCC meeting records, WCPFC Rules of Procedure, WCPFC website http://www.wcpfc.int/ Marine Resources Act 2005</p>			
OVERALL PERFORMANCE INDICATOR SCORE:				75
CONDITION NUMBER (if relevant):				6

Evaluation table 24 - PI 3.1.3

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach		
Scoring Issue		SG 60	SG 80	SG 100
a	Guided post	Long-term objectives to guide decision-making, consistent with the MSC Principles and Criteria and the precautionary approach, are implicit within management policy	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy.
	Met?	Y	Y	P
	Justification	As the fishery falls under dual control, the scoring of this PI is based on the wider organisation, i.e. the WCPF Commission, since this is the management level where the key decisions are taken which affect the stock as a whole (P1), as well as stocks of bycatch species and the wider ecosystem (P2). Long-term objectives for the Commission are found in the WCPF Convention text. Under Article 2 the Commission has the objective to 'ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stocks' within the Convention area, consistent with UNCLOS and UNSFA. Article 5 provides principles and measures for achieving this conservation and management objective. Article 10(c) provides the explicit long term objective of 'maintaining or restoring populations'... ' above levels at which their reproduction may become seriously threatened'. Article 5 (c) explicitly requires CCMs to apply the precautionary approach and Article 6 outlines the means by which this will be given effect, including through the application of the guidelines set out in Annex II of UNSFA. These guidelines provide additional objectives to guide decision-making, including the use of target reference points to meet management objectives and the adoption of fisheries management strategies to ensure that target reference points are not exceeded on average. Evidence that these objectives are guiding, or are beginning to guide decision-making is provided in various reports of the Commission. Commission reports indicate that explicit action is being undertaken to develop and implement management arrangements to support achievement of objectives. While long term objectives have yet to be explicitly defined in terms of target reference points, the Commission Management Objectives Workshop (MOW) process is working on this issue, as is the FFA Southern Committee and Te Vaka Moana group. The team considered that SG100 was only partially met and a score of 90 has been awarded.		
References		Agreement of the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and highly Migratory Fish Stocks Convention on the Conservation and Management of Highly Migratory Fish Stocks in Western and Central Pacific Ocean Western and Central Pacific Fisheries Commission website http://www.wcpfc.int Summary reports of the 10th Meeting of the WCPFC and 9th Meetings of the WCPFC Scientific and Technical and Compliance Committees		
OVERALL PERFORMANCE INDICATOR SCORE:				90
CONDITION NUMBER (if relevant):				N/A

Evaluation table 25 - PI 3.1.4

PI 3.1.4		The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidpost	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and explicitly considers incentives in a regular review of management policy or procedures to ensure they do not contribute to unsustainable fishing practices.
	Met?	Y	N	N
	Justification	<p>At the national level, a system of annual licences for the majority of the fleet within a four-year framework agreement provides an incentive for vessels to fish within the rules, or risk non-renewal. The regional Register of Fishing Vessels, inclusion on which is necessary to fish in the waters of FFA states, provides an incentive for good behaviour given that registration may be withdrawn or suspended if a vessel is involved in a serious violation of the fisheries laws of any FFA member. The system whereby licences to fish in Cook Islands waters are renewed annually, under a multi-year umbrella agreement provides an additional incentive to comply with regulations or risk losing access.</p> <p>CMM 2010-06 establishes a list of presumed IUU vessels relating to the Convention area, This list provides an incentive to comply with the CMMs adopted by the WCPFC or risk a listing.</p> <p>Cook Islands has demonstrated in the past that it will terminate fishing agreements where management arrangements are circumvented. This was the case with vessels issued with experimental/exploratory licenses that failed to operate under license conditions requiring them to not target albacore and as a consequence were not re-licensed. By not renewing licenses (or withdrawing licenses) for vessels which do not comply with fisheries regulations, vessels are encouraged to be compliant in order to have access arrangements renewed. The limits on catch and effort in the Cook Islands EEZ provide some certainty to fishing companies operating in the EEZ and an encouragement to licensed vessels to campaign for effective controls to protect the value of their access to the fishery.</p> <p>The management system therefore provides for some incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2. SG60 is thus met.</p> <p>However, while the status of the southern albacore stock under the last SPC stock assessment (in 2012) was 'not overfished' and 'overfishing is not occurring', effort in the fishery has increased south of 20 degree south in the last 10 years despite CMM 2005-02 and its replacement CMM 2010-05. The expansion of effort in the albacore fishery has been driven in part by the provision of subsidies by the People's Republic of China . PRC has stated its intention to increase its fleet targeting albacore to 400 vessels (noting i) that this is possible while still continuing to respect CMM 2010-05, as long as additional effort is constrained to north of 20oS and ii) the assessment team has no information as to whether these as yet unbuilt vessels will be constructed using, or otherwise benefit from, subsidies). The last available SPC data indicates there are 286 Chinese longline vessels in the Convention area, but it is unclear how many of these are targeting albacore. A paper presented by China at the August 2014 SC confirms significant growth in the Chinese longline fleet, with an increase from 219 vessels in 2009 to 379 in 2013.</p>		

		<p>A recent FFA paper (Ilakini, 2013) identifies a wide range of subsidies, the most significant of which are payments to offset fuel costs and access fees (to PICs' EEZs, including Cook Islands). The Client also acknowledged that Chinese vessels, including client vessels, were in receipt of Chinese Government Subsidies. As effort in the regional fishery has continued to rise, catch rates have fallen in some areas. The increase in effort was last acknowledged at SC 9 where it was emphasised that increasing catch and effort on South Pacific albacore has occurred from 2009 to 2012, and that the current CMM 2010-05 appears not to be effective in constraining effort in the subtropics (south of 20°S). The exemption provision for SIDs within CMM 2010-05 provides no incentive for SIDs to comply with the spirit of the CMM, although this issue has been recognised in attempts to develop a new CMM that will restrict fishing for southern albacore within zones through an allocation process. While there is no TRP in place for albacore, many fleets have tied up and are now unprofitable, indicating that there are severe economic conditions in the fishery. This issue is primarily an economic problem for albacore with which this PI is not concerned and is dealt with under PI 1.2.1, albacore harvest strategy.</p> <p>There is some concern that without an effective control on effort and with the expansionist plans and subsidies of PRC in place, P1 and P2 outcomes may be adversely impacted. In the case of bigeye, it is possible that the limits specified in CMM 2013-01 Appendix F will be met, in which case the subsidies to the PRC fleet may be considered as incentives for unsustainable fishing at the flag state level.</p> <p>SG80 is thus not met.</p>
References	<p>Fisheries Subsidies and incentives provided by the People's Republic of China (PRC) to its Distant Water Fishing (DWF) Industry. Ilakini. J , Fisheries Development Division, FFA 2013 CMMs 2005-02, 2010-05 and 2003-01 Summary reports of the 10th Meeting of the WCPFC and 9th Meetings of the WCPFC Scientific and Technical and Compliance Committees Oceanic Fisheries Programme, SPC. Western and Central Pacific Fisheries Commission Tuna Fisheries Yearbook 2012</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		60
CONDITION NUMBER (if relevant):		7

Evaluation table 26 - PI 3.2.1

PI 3.2.1		The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC’s Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidpost	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are implicit within the fishery’s management system	Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are explicit within the fishery’s management system.	Well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are explicit within the fishery’s management system.
	Met?	Y	Y	P
	Justification	<p>There are clear objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach. The principle objective of the Marine Resources 2005 Act is to <i>provide for the sustainable use of the living marine resources for the benefit of the people of the Cook Islands</i>. Part 1(7) of the 2008 Longline Fishery Plan provides more detailed long-term objectives for the fishery. While this PI deals with the fishery-policy context, there is evidence that the overall objectives of the WCPF Convention (Art. 2) <i>.... to ensure, through effective management the long-term conservation and sustainable use of highly migratory fish stocks in the WCPFO, in accordance with UNCLOS and the Fish Stocks Agreement</i> are implicit in national legislation enacted to ensure Cook Islands obligations under international and regional law are effectively discharged (Art, 3(4) Marine Resources Act 2005). SG60 is therefore met.</p> <p>The key long term objectives for the fishery are explicitly described in Part (7) of the 2008 Longline Fishery Plan and include both biological and economic objectives. These include: longer term sustainable use for the benefit of the people of Cook Islands; mitigating impacts on non-target species; to develop and maintain economic viability; to develop a domestic fleet and onshore processing; to meet international obligations; and to protect traditional and small scale commercial inshore fishers. The 2013 Offshore Fisheries Policy provides additional objectives including sustainable resource management through sound biological principles. The NPOA for sharks defines the objective in implementing the plan as “seeking and promoting a rational approach, based on scientific evidence and application of the precautionary principle, to the conservation and management of shark resources”. The subsequent declaration of the Shark Sanctuary has further strengthened this objective.</p> <p>Cook Islands has explicitly adopted the measures in place for the conservation and management measures agreed at the WCPF Commission for key target stocks (albacore, bigeye and yellowfin tuna) , as well as resolutions relating to the conservation of non-target species, including sharks, seabirds and turtles. SG80 is thus met.</p> <p>The absence of operational objectives at the Commission has tended to result in a focus on avoiding LRPs rather than developing harvest strategies that would provide guidance on decision making related to the achievement of long term objectives related to TRPs .</p> <p>At the regional level, Cooks Islands reports against a number of indicators as part of the WCPF Commission obligations through Part 2 Reporting.</p> <p>The 2012 Large Pelagic Longline Fishery Regulations provides some well-defined and measureable short-term indicators against which to measure achievement of short and long term objectives. They include: caps on effort (initially 50 vessels, with the provision that if the total catch in the fishery exceeds 8,000 metric tonnes in any four quarter period further management of effort may occur following review, including reducing the number of vessels and time/area closures; a ban on transshipment, shark conservation and management measures (strengthened though the establishment of the Shark Sanctuary). However there is no long-term target catch or catch rate level as represented by a TAC or an MEY-based target reference</p>		

	point. SG100 is therefore partially met.
References	2012 Large Pelagic Longline Fishery Regulations Marine Resources (Longline Fishery) Regulations 2008 (incorporates the 2008 Longline Fishery Plan) Marine Resources Act 2005 Cook Islands Offshore Fisheries Policy 2013 WCPF Convention WCPFC website http://www.wcpfc.int/ National Plan of Action for the Conservation and Management of Sharks in the Cook Islands, 2012.
OVERALL PERFORMANCE INDICATOR SCORE:	90
CONDITION NUMBER (if relevant):	N/A

Evaluation table 27 - PI 3.2.2

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidpost	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	Y	Y	
	Justification	There are clear requirements on decision under the 2005 Act. Decision-making processes within the MMR are described in the 2008 Longline plan and 2012 regulations, which place certain obligations on the Secretary or his delegate in relation to taking decisions on fisheries management measures including the licensing of vessels and vessel caps. WCPFC decision-making processes are open, seek to apply the precautionary approach and best available information and are well documented. Consensus is the general rule for decision-making by Commission Members during their annual meetings. If consensus cannot be reached, voting, grounds for appealing decisions, conciliation and review are all part of the established decision-making process, as described in Article 20 of the Convention. The degree to which the decision making processes at the Commission result in measures that achieve fishery specific objectives could be questioned in respect of the control of fishing effort in the fishery (see discussion under P1 and 3.1.4 above). SG80 is considered as met.		
b	Guidpost	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Y	N	N
	Justification	Serious issues in the fishery are generally identified by SPC stock assessment and other reports at the regional level, and addressed through decisions taken under national fisheries legislation. The vessel cap and catch monitoring provide evidence that the issue of bigeye overfishing is being addressed and that Cook Islands is displaying 'a responsible level of development of their fisheries for South Pacific Albacore' as required by CMM 2010-05, para 2. For non-target species, the issue of shark mortality has resulted in the establishment of the Shark Sanctuary and the banning of wire traces. SG60 is met. The team however was advised by the MMR that in 2012 the vessel cap was exceeded under the authority of the Secretary, without the establishment of the Licensing Committee prescribed under the 2008 Plan and Regulations. Commission decision-making processes are based heavily on Scientific Committee reports on the status of target and non-target species and respond to serious issues, such as the overfishing, and suspected overfished, status of bigeye. However, the primary measure to control catch and effort in the albacore fishery within the WCPF Convention area (CMM 2010-05) 'appears to be not effective in constraining effort' (SC9 Record, para 172). As such, SG80 is not met.		

c	Guided post		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Y	
	Justification	<p>Article 4 (a) i) of the 2005 Act requires that decisions are based on the best scientific advice available in seeking MSY (as qualified by relevant environmental and economic factors) and b) that the precautionary approach should be applied to the management of the fishery. There is evidence that decision-making processes utilise best available information (e.g. in setting the vessel cap) as a trigger point for a review based on best available information).</p> <p>The WCPF Convention (Art. 6) also requires the application of the precautionary approach and the use of a Scientific Committee to ensure that the Commission obtains the best scientific information available for its consideration and decision-making.</p> <p>This scoring issue is met.</p>		
d	Guided post	Some information on fishery performance and management action is generally available on request to stakeholders.	Information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	Y	N	N
	Justification	<p>Quarterly and annual MMR reports provide national stakeholders with information on licensing and fleet structure, catch and effort, catch rates and other key fishery performance information. Information on fishery performance is publicly available through SPC data and Part 1 reports, the latter providing detailed reporting on catch, fleet size and other issues relating to the fishery. MMR produce annual and quarterly reports. Commission, SC and TCC papers and reports on the web provide a high level of public access and transparency, showing how scientific information is used to inform management actions, which are then monitored for effectiveness and discussed at the Commission. SG60 is thus met.</p> <p>Evidence is, however, available to show that the MMR is responsive to requests from information from stakeholders on decisions, but not always to the satisfaction of the latter. The team was made aware by stakeholders in the Cook Islands that there is, at times, a lack of transparency with respect to management decisions, including vessel licensing. It is not always clear to all stakeholders that decisions were arrived at based on available evidence and due process, particularly in relation to vessel licensing. On this basis, the team felt that SG80 was not met.</p>		

e	Guided post	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	Y	Y	N
	Justification	<p>No evidence is available to suggest that the MMR is disrespectful to, or defiant of Cook Islands law, or indeed, legally binding agreements reached at the Commission as they apply to the UoC. To the contrary, Cook Islands has shown considerable responsibility in upholding laws or regulations in respect of ensuring the sustainability of the fishery, including enacting agreements reached at the Commission into national legislation. SG 60 is thus met.</p> <p>While there have been no judicial decisions arising from legal challenges associated with the fishery, the management system in Cook Islands has the legal and other frameworks that would enable the MMR to comply with any such decisions in a timely fashion. SG 80 is thus met.</p> <p>The management system acts proactively to avoid legal disputes at the regional level by the prompt incorporation of CMMs into national legislation and the implementation of measures to support such legislation. There is some evidence at the national level that the management system could be more proactive in avoiding legal disputes by providing greater transparency through additional collective, participative and publically accountable involvement in the management of the fishery. Not all of SG 100 is met.</p>		
References	<p>CMM 2010-05 Marine Resources Act 2005 Marine Resources (Longline Fishery) Regulations 2008 (incorporates the 2008 Longline Fishery Plan) 2012 Large Pelagic Longline Fishery Regulations WCPF Convention MMR Annual and Quarterly Tuna Longline Fishery Reports</p>			
OVERALL PERFORMANCE INDICATOR SCORE:				75
CONDITION NUMBER (if relevant):				8

Evaluation table 28 - PI 3.2.3

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	Y	Y	Y
	Justification	<p>A comprehensive MCS system is in place using a modern fisheries patrol vessel for at sea inspections, VMS, port inspections, observers and logbook and other reporting requirements.</p> <p>The FFA has developed a regional monitoring, control and surveillance strategy which includes regional cooperation to control fishing in the region. The strategy was endorsed by Forum Fisheries Committee Ministers in July 2010.</p> <p>Levels of observer coverage in the fishery (~10%) exceed the regional benchmark and MMR and Cook Islands Police carry out regular boarding and inspection and unloading activities.</p> <p>The Cook Islands national fisheries MCS system is linked to regional (FFA and WCPFC) MCS systems including the harmonisation of Terms and Conditions of Access, a regional VMS system and the Regional Register of Foreign Fishing Vessels and a range of regional MCS cooperation programmes, including the Niue Treaty and the Agreed Minute of Cooperation in MCS between the US and FFA member states.</p> <p>Cook Islands have MOU arrangements with the US National Marine Fisheries Service (NFMS) and US National Oceanic and Atmospheric Administration (NOAA) covering compliance cooperation in Pago Pago, American Samoa. MMR has recently established the Cook Islands Fisheries Field Office (CIFFO) in Pago Pago, which will be permanently staffed to enable an expanded programme of port inspections and debriefing of observers. Long-term plans are to have four staff based in the office. Currently around 11% of the LT and other vessels fishing in Cooks Islands waters and landing in Pago Pago are inspected. To date, no significant breaches by LT vessels of fisheries regulations have been observed.</p> <p>SG100 is met.</p>		

b	Guidepost	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	Met?	Y	Y	N
	Justification	<p>There is evidence of sanctions being applied for breaches of regulations, and no evidence was provided to suggest these sanctions are being applied inconsistently. SG 80 is met.</p> <p>A range of sanctions to deal with non-compliance exist, and there is evidence that they are being applied (e.g. Shark Sanctuary regulations, see port inspection reports). The team however noted that there was no possibility of administrative penalties – the only route was legal. This makes them more complex, expensive and politically difficult to apply in every case, impacting on their ability to provide effective deterrence.</p>		
c	Guidepost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	Y	Y	N
	Justification	<p>Logbook data has been supplied according to license requirements and the LT fleet has a good track record of compliance with no serious breaches of regulations reported since the establishment of the company. VMS and observer reports add additional confirmation of general compliance with the management system. SG60 is met.</p> <p>A review of port inspection reports demonstrated a change in the behaviour of the fishery in response to enforcement of legislation (brought in in 2013) in regard to the shark sanctuary. Sharks were no longer landed, and compliance appeared to be good, with few reports of non-compliance. SG80 is met.</p> <p>The current level of observer coverage and at sea/port inspections provides a reasonable level of confidence that operators are complying with the management system. There is a relatively low level of port inspections in American Samoa where the majority of albacore landings from the fishery are landed. This will, however, change in the near future (during 2014) when MMR opens an office in Pago – the assessment team has not yet had the opportunity to review these activities, however. Likewise, the level of observer coverage (~105%) does not provide 'a high degree of confidence'. SG100 is not met.</p>		
d	Guidepost		There is no evidence of systematic non-compliance.	
	Met?		Y	
	Justification	The MMR has verbally confirmed to the team that there is no evidence of systematic non-compliance in the fishery. This scoring issue is met.		
References		<p>FFA Regional Register of Foreign Fishing Vessels (in good standing) (https://www.ffa.int/node/42/)</p> <p>Cooks Islands observer reports</p> <p>WCPFC-TCC9, 2013, Technical and Compliance committee Sixth Regular Session - Summary Report.</p>		

	<p>Various CMMs including:</p> <p>CMM 2006-08 (Boarding and Inspection Procedures)</p> <p>CMM 2007/01 (Regional Observer Programme)</p> <p>CMM 2009-09 (Vessels without Nationality)</p> <p>CMM 2010-06 (IUU Vessel List)</p> <p>CMM 2011-02 (Commission VMS)</p> <p>CMM 2012-05 (Charter Notification Scheme)</p>
OVERALL PERFORMANCE INDICATOR SCORE:	85
CONDITION NUMBER (if relevant):	N/A

Evaluation table 29 - PI 3.2.4

PI 3.2.4		The fishery has a research plan that addresses the information needs of management		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
	Met?	Y	Y	N
	Justification	<p>[Cooks Islands does not undertake research directly related to the tuna fishery. It does ensure the timely provision of catch, effort and related data to SPC, which is responsible for incorporating this information into the regional stock assessments. The SPC stock assessment and other research outcomes are fed back to i) the Cook Islands in a format to inform national fisheries management planning and ii) the WCFF Commission via the Scientific Committee. Research is driven primarily by the need to maintain target stock, and review the effects of fishing on non-target and dependent species (NTADs) and the marine ecosystem, consistent with P1 and P2. SG60 is met.</p> <p>The WCPFC Strategic Research Plan 2012-2016 addresses four overall research and data collection priorities: monitoring of fishing activities through the collection, compilation and validation of data from the fishery; monitoring and assessment of target stocks; monitoring and assessment of NTADS and of the pelagic ecosystems of the WCPO; and evaluation of existing Conservation and Management Measures (CMMs) and of potential management options. This plan, combined with SPC, FFA and national plans associated with research and monitoring prove a strategic approach to ensuring reliable and timely information is available to inform management decisions.</p> <p>A WCPFC Shark Research Plan (SRP) is now in place. Research under the plan will be led by the Oceanic Fisheries Programme of the Secretariat of the Pacific Community, and will contain assessment, research coordination and fishery statistics improvement components. The overall aim of the plan is to evaluate the status of blue, mako, oceanic whitetip, silky and thresher sharks in the western and central Pacific Ocean (WCPO) and to establish better datasets to support future assessments.</p> <p>SG80 is met; however, given there is no comprehensive research plan across P3, SG100 is not met.</p>		

b	Guided post	Research results are available to interested parties.	Research results are disseminated to all interested parties in a timely_fashion.	Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.
	Met?	Y	Y	Y
	Justification	The WCPFC and SPC Plans and results are available to all interested parties in a timely fashion, acknowledging the lag between obtaining logbook data from fleets, in particular DWFN longline fleets, and entry of the data. SG60 and 80 are met. The Working Paper approach in the SC allows preliminary results to get distributed to interested parties more quickly than the full peer-review publication process. The research plan and results are widely and publicly available and are disseminated to all interested parties in a timely fashion. SG 100 is therefore met.		
References	WCPFC Strategic Research Plan 2012-2016 SC working and information papers			
OVERALL PERFORMANCE INDICATOR SCORE:				90
CONDITION NUMBER (if relevant):				N/A

Evaluation table 30 - PI 3.2.5

PI 3.2.5		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives		
		There is effective and timely review of the fishery-specific management system		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The fishery has in place mechanisms to evaluate some parts of the management system.	The fishery has in place mechanisms to evaluate key parts of the management system	The fishery has in place mechanisms to evaluate all parts of the management system.
	Met?	Y	Y	N
	Justification	<p>In 2013 Cook Islands commissioned FFA to undertake a governance review of MMR. The results of that review are currently confidential to the Ministry.</p> <p>An annual report is provided to the Commission by the Secretariat on compliance of members with the reporting provisions of the Commission. Progress with implementation of CMMs is monitored through the reporting provisions within the CMMs themselves or the Annual Reports by members to the Commission. Commission meetings provide an overall review of processes and outcomes.</p> <p>Stock assessments conducted by the SPC are subject to peer review by other members of the Scientific Committee and occasional external review. SG 80 is met. At this stage, however, there is no regular evaluation of the system as a whole. SG100 is thus not met.</p>		
b	Guidepost	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
	Met?	Y	Y	N
	Justification	<p>WCPFC does not have a regular programme of external review. However, in 2008 the Commission agreed that an independent performance review be undertaken which was completed in 2011. A schedule of responses and actions were developed in response the recommendations of the review were considered by WCPFC9 in 2012. A recent Independent Review of the Commission's Transitional Science Structure and Functions suggested periodic external review of the stock assessments. This has been adopted by the WCPFC. SG80 is therefore met. At this stage, however, there is no regular external review. SG100 is not met.</p>		
References		<p>WCPFC8-2011/12 Review of the performance of the WCPFC. MRAG, 2008 WCPFC-NC6/WP-05 (2010) Issues arising from the Independent Review of the Commission's Transitional Science Structure and Functions. WCPFC, SC and TCC working and information papers and associated records.</p>		
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant):				N/A

Conditions

The three Principles scored an average score of 80 (Principle 1), 83 (Principle 2) and 81 (Principle 3). No PI scored less than 60. The assessment team concluded provisionally that the fishery should be certified, subject to eight conditions, three on Principle 1, two on Principle 2 and three on Principle 3. These are given below, together with the corresponding milestones and client action plan

Note that in accordance with the MSC Certification Requirements v1.3 (Annex CI), there are specific requirements in relation to harmonisation between overlapping fisheries, including regarding harmonisation of conditions and condition milestones and timelines. Where possible, the conditions of relevant PIs have been harmonised with the assessments listed in Section 4.1; these relate in particular to the conditions under P1. To ensure that the client can realistically achieve the given milestones, the allocated timelines are more generous than they would have been with full harmonisation. This approach takes into account the work already undertaken by the client to date, including the establishment of the WCPO Tuna MSC Principle 1 Alignment Group in 2014.

Table 32. Condition 1

Performance Indicator	PI 1.1.2 - Reference points
Score	75
Rationale	For full rationale see Evaluation table 2 - PI 1.1.2
Condition	The management system should formally adopt a target reference point for the South Pacific albacore stock which is consistent with maintaining the stock at B_{MSY} or some other measure with similar intent or outcome. This target reference point should be used for management purposes
Milestones	By the third annual surveillance audit a target reference point for regional management of the South Pacific albacore stock should be formally adopted by the WCPFC.
Client action plan	See Appendix 6
Consultation on condition	The client will consult and coordinate with other members of the WCPO Tuna MSC Principle 1 Alignment Group, environmental NGOs involved at FFA, PNA and WCPFC, the Cook Islands Ministry of Marine Resources, SPC, and other delegations to FFA, PNA and WCPFC.

Table 33. Condition 2

Performance Indicator	PI 1.2.1 - Harvest Strategy
Score	70
Rationale	For full rationale see Evaluation table 3 - PI 1.2.1
Condition	<p>The fishery should put in place a regional harvest strategy, incorporating limit and target reference points (management objectives), a harvest control rule and management actions, such that the strategy is responsive to the status of the stock and the elements of the strategy work together to maintain the stock at or around the target level.</p> <p>The key missing elements of the harvest strategy at present are 1. a target reference point formally adopted by the regional management system, and 2. a well-defined harvest control rule with associated management actions. These</p>

	issues are also addressed specifically in conditions 1 and 3.
Milestones	By the fourth annual surveillance audit the client should provide evidence that the key missing elements of the harvest strategy are put in place.
Client action plan	See Appendix 6
Consultation on condition	The client will consult and coordinate with other members of the WCPO Tuna MSC Principle 1 Alignment Group, environmental NGOs involved at FFA, PNA and WCPFC, the Cook Islands Ministry of Marine Resources, SPC, and other delegations to FFA, PNA and WCPFC.

Table 34. Condition 3

Performance Indicator	PI 1.2.2 - Harvest control rules and tools
Score	60
Rationale	For full rationale see Evaluation table 3 - PI 1.2.1
Condition	A well-defined regional-level harvest control rule should be put in place, with associated management actions (in the form of a CMM or another form as appropriate) which together act effectively to reduce exploitation rates as the limit reference point is approached. The selection of the harvest control rule should take into account the main uncertainties regarding the status of the stock or the impact of the fishery (or other uncertainties if considered important).
Milestones	By the third annual surveillance audit, the client should provide evidence that the harvest control rule and associated management actions are put in place.
Client action plan	See Appendix 6
Consultation on condition	The client will consult and coordinate with other members of the WCPO Tuna MSC Principle 1 Alignment Group, environmental NGOs involved at FFA, PNA and WCPFC, the Cook Islands Ministry of Marine Resources, SPC, and other delegations to FFA, PNA and WCPFC.

Table 35. Condition 4

Performance Indicator	PI 2.3.1 - ETP species outcome and PI 2.3.3 - ETP species information and monitoring
Score PI 2.3.1	75
Score PI 2.3.3	75
Rationale	For full rationale see Evaluation table 13 - PI 2.3.1 and Evaluation table 15 - PI 2.3.3
Condition	The occurrence and outcome of all catches of ETP species (sharks, sea turtles, seabirds and cetaceans) by LTFV vessels should be systematically and accurately reported on so that fishery-related mortality on ETP species can be quantitatively determined and the effectiveness of the management strategies can be determined. Where a need has been identified, the collected data should enable further development of management strategies to ensure that the fishery does not hinder recovery of ETP species.
Milestones	By the second annual audit it should be demonstrated that an appropriate reporting system is in place and is being used by all LTFV crew.
Client action plan	See Appendix 6
Consultation on condition	Consult with staff of SPC, MMR, and longline fishers to develop the ETP

	training workshop materials.
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Table 36. Condition 5

Performance Indicator	PI 2.3.2 - ETP species management
Score	75
Rationale	For full rationale see Evaluation table 13 - PI 2.3.1
Condition	The client will provide evidence that all Cook Islands regulations on fishery interactions with sea turtles are consistently respected and adhered to by LTFV crew so that it can be demonstrated that the fishery does not pose a risk of serious harm to sea turtles, mortality of sea turtles is minimized and the fishery does not hinder recovery of vulnerable sea turtle populations.
Milestones	By the third annual audit, the client should demonstrate that all Cook Islands regulations on fishery interactions with sea turtles are consistently respected and adhered to by LTFV crew.
Client action plan	See Appendix 6
Consultation on condition	By June 2016, logbook records of interactions with ETP species are consistent with observer records (demonstrated that an appropriate reporting system is in place and is being used by all LTFV crew).

Table 37. Condition 6

Performance Indicator	PI 3.1.2 - Consultation, roles and responsibilities
Score	75
Rationale	For full rationale see Evaluation table 23 - PI 3.1.2
Condition	The client must provide evidence that processes at national level are put in place to i) regularly engage with key stakeholders to seek and accept relevant information, and ii) demonstrate that the information obtained from such engagement has been duly considered.
Milestones	The processes should be in place by the third annual audit
Client action plan	See Appendix 6
Consultation on condition	NGOs with an interest in the Cook Islands longline fishery, MMR.

Table 38. Condition 7

Performance Indicator	PI 3.1.4 - Incentives for sustainability
Score	60
Rationale	For full rationale see Evaluation table 25 - PI 3.1.4
Condition	The client should demonstrate that the subsidies identified by FFA and acknowledged by the client do not lead to perverse incentives that are inconsistent with achieving the outcomes expressed by MSC principles 1 and 2; Or Implement a harvest strategy that includes strengthened harvest control rules that are more responsive to increasing effort in the albacore fishery, such that the impact of subsidies is restricted to lowering the operating costs of subsidized fleets, rather than acting as an incentive to increase effort.
Milestones	This condition should be met by the third annual audit
Client action plan	See Appendix 6
Consultation on condition	The client will consult and coordinate with other members of the WCPO Tuna MSC Principle 1 Alignment Group, environmental NGOs involved at FFA, PNA and WCPFC, the Cook Islands Ministry of Marine Resources, SPC, and other delegations to FFA, PNA and WCPFC.

Table 39. Condition 8

Performance Indicator	PI 3.2.2 - Decision-making processes
Score	75
Rationale	For full rationale see Evaluation table 27 - PI 3.2.2
Condition	By working with the relevant Cook Islands management agencies, the client should demonstrate i) that decision-making processes at national level respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions and ii) that information on fishery performance and management action at national level is available to stakeholders on request, and that explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging

	from research, monitoring, evaluation and review activity.
Milestones	By the third annual surveillance audit it should be demonstrated that Cook Islands decision-making processes are transparent, timely and adaptive and that information is available to stakeholders on request.
Client action plan	See Appendix 6
Consultation on condition	NGOs with an interest in the Cook Islands longline fishery, MMR.

Appendix 2. Peer Review Reports

Peer Review 1

Overall Opinion

<i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i>	Yes/No Yes	Conformity Assessment Body Response
<p><u>Justification:</u> The report is very well done and I suggested only minor changes to the original scoring. Most of my comments dealt with some small changes to the justifications.</p>		<u>Thank you</u>

<i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</i>	Yes/No Yes – with some comments	Conformity Assessment Body Response
<p><u>Justification:</u> The conditions raised are generally appropriate, but the comments I made on 3 conditions in my performance indicator review below should be taken into consideration.</p>		<u>See detailed responses below</u>

Do you think the client action plan is sufficient to close the conditions raised?	Yes/No Yes – providing the comments below are considered	Conformity Assessment Body Response
<p><u>Justification:</u></p> <p><u>For Condition 2</u>, the required outcomes in the client action plan are:</p> <p>Outcome 1. In 2016, FFA SC-SPTBF formally adopts a harvest strategy for sub-regional management of south Pacific albacore.</p> <p>Outcome 2. By December 2016 at WCPFC 14, there is evidence that the harvest strategy for south Pacific albacore is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points is in place.</p> <p>Maybe I am missing something, but according to the outcomes above, the harvest strategy is only adopted by a sub-group of FFA countries. Without the WCPFC adopting a harvest strategy (especially a harvest control rule) the large amount of fishing by non-FFA countries in international waters would not be subject to control.</p> <p><u>For condition 4:</u></p> <ul style="list-style-type: none"> • Better wording is required: “By August 2014, develop a ‘train-the-trainer’ ETP workshop to build the capacity for Cook Islands government and catch sector company dockside staff to train longline fisheries (CAPTAINS ??) participating in the Cook Islands longline albacore fishery to....” • I suggest that a time-frame be attached to Outcome 4 <p>For Condition 6: Action 1 states: “...that MMR convene at least one stakeholder consultation per year to provide a venue to discuss and collect information on the domestic management framework for the Cook Islands longline albacore tuna fishery...”. In the past the problem could have been that the MMR did not consider the general public a “key stakeholder”, and therefore the flow of information and transparency to the general public has been limited and a cause of some suspicion (see comment from Te Ipukarea Society in the discussion of performance indicator 3.2.3). It is suggested that the condition specifies that stakeholder consultation includes the general public.</p>		<p><u>Condition 2: The client action plan has been revised to make it clear that a harvest strategy is required at the regional level (WCPFC). A strategy from FFA (sub-regional) is a stepping stone on the way to this outcome. The timeline has also been pushed back one year to ensure that this is feasible.</u></p> <p><u>Condition 4: Wording has been changed as suggested, and a deadline has been added for Outcome 4.</u></p> <p><u>Condition 6: Wording of the action plan has been revised to make it clear that stakeholders consultations will be open to all interested parties.</u></p>

For Condition 7, Action 1 states:

“The client will request existing or otherwise new publically available written materials from the Cook Islands government that explain the basis for establishing the cap established for the limited entry fishery, and precautionary albacore annual catch level, to document that the decision for establishing these limits was not based on government subsidies to the catch sector vessels participating in the fishery.”

I find this action a bit irrelevant. The Chinese government could be subsidizing the fleet and increasing effort (e.g. through effort creep) without the Cook Islands government having any knowledge.

[This action has been deleted](#)

For reports using the Risk-Based Framework please follow [the link](#).

For reports assessing enhanced fisheries please follow [the link](#).

General Comments on the Assessment Report (optional)

In general I feel that the assessment report is excellent. I have made numerous comments, but those mainly deal with minor issues that do not affect the general thrust of the report.

I have notice a few factual mistakes and minor omissions in the assessment report, and I have noted those in a separate document.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.1	Yes	Yes	N/A	<p>The assessment of this indicator in the peer review report makes considerable use of the of the 2012 (most recent) albacore assessment by SPC (Hoyle, S., Hampton, J, and Davies, N. 2012). That assessment has considerable credibility – it was scrutinized by the fishery scientists present at the 2012 meeting of the WCPFC Scientific Committee (SC) The report of that meetings states:</p> <ul style="list-style-type: none"> • “Overall, SC endorsed the assessment results as the best available science for the basis of management.” • “There is no indication that current levels of catch are causing recruitment overfishing, particularly given the age selectivity of the fisheries.” 	<p>The CAB does not see any disagreement between the reviewer and the assessment. The extra details may strengthen the argument, but do not increase the score which is already at the maximum of 100.</p> <p>The rationale has been amended as suggested (details of the review of the stock assessment have been added to the rationale for 1.2.4).</p>

				<p>It should also be mentioned that the results of the 2012 stock assessment with respect to recruitment are very similar to that of the 2009 and 2011 assessments.</p> <p>As pointed out in the assessment of this indicator, a target reference point has not been formally adopted for management purposes. This should not detract from the scoring assigned as the stock status is examined from many other types of reference points, especially BMSY.</p>	
1.1.2	Yes	Yes	Yes	<p>A scoring of 75 is justified because there are appropriate target/limit reference points (as well described in the assessment report), but those are for stock assessment, rather than management purposes. The adoption by WCPFC of a target reference point for management purposes is an appropriate condition that would raise the scoring to 80, but the likelihood of that occurring in the near future (given the WCPFC track record on similar issues) is far from certain.</p>	The CAB finds no disagreement with the reviewer
1.1.3	N/A	N/A	N/A	<p>This indicator deals with the rebuilding of a depleted stock – which is not applicable to south Pacific albacore.</p>	
1.2.1	Yes	No	Yes	<p>“There is a robust and precautionary harvest strategy in place” Consider:</p> <ul style="list-style-type: none"> • The main regional harvest control strategy in place for the stock features (a) a harvest control rule (CMM-2010-05) based on numbers of vessels, rather than catch or effort, and (b) is not applicable to the area north of 20° south. • An FFA policy brief [FFA (2014). Hard Times in the Albacore Longline Fishery. Forum Fisheries Agency, Honiara] indicates that the Chinese fleet have gotten around the CMM by building more efficient vessels. • Catches of south Pacific albacore have expanded considerably since the early 2000s (the baseline period for the CMM): from 32,356 mt in 2000 to 68,415 mt in 2013. 	<p>The CAB recognizes that this is a judgement call. The interpretation that “...<i>evidence exists that [the harvest strategy] is achieving its objectives</i>” is based on the observation that management actions have been taken by the WCPFC internationally and Cook Islands domestically and the stock status is in good shape. While the actions are clearly not fully effective, it is probably reasonable to expect that the situation would have been worse without these actions, and there appears to be a will to take further action. The CAB felt that rejecting the SG80 criterion would imply the counter assertion, “...<i>no evidence exists that [the harvest strategy] is achieving its objectives</i>”, which did not seem valid.</p>

			<ul style="list-style-type: none"> • The Cook Islands harvest control strategy of limiting the number of licences to 50 is quite unlikely to have a substantial impact on the over-all regional level of fishing on the stock. • The peer report states “China reports that it has complied with CMM-2010-05 in full”. Such a non-verified statement for a harvest control strategy that is based on vessel numbers (i.e. easy to circumvent) hardly supports the contention of an effective harvest control strategy. • The peer report states: “Monitoring of the implementation of the harvest strategy (notably CMM-2010-05) is carried out via self-assessment by CCMs, included in their Part 2 reports submitted to WCPFC annually”. The FFA policy brief on the subject (FFA 2014) casts doubt on the veracity of the reporting, especially the Chinese albacore longliners operation in international waters: “At the moment it is even difficult to identify which boats are actually targeting albacore and which are targeting bigeye and/or yellowfin tuna, particularly high seas boats”. • The peer review report correctly states that the 2013 Scientific Committee meeting concluded that the current CMM 2010-05 appears not to be effective in constraining effort south of 20°S. And it is not applicable for effort north of 20° S. <p>In view of the above, the following guidepost does not appear to have been met: “The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.”</p> <p>The performance indicator score of 70 appears too high. A score of 60 is suggested.</p> <p>Condition 2 (if fully implemented) should raise the performance to the SG80 level.</p>	<p>The PR identifies several valid reasons why the scoring could have been more pessimistic. Rather than trying to argue the semantics of interpretation (which are complicated by the fact that the harvest strategy and its objectives are not well defined), we emphasize that all the relevant points raised by the PR should be addressed with the meeting of condition 2 (which is also rightly noted by the PR).</p>
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1.2.2	Yes	Yes	Yes	<p>I agree with the scoring, but I have two problems with the text. For this performance indicator (and a few others) reference is made to the Tokelau Agreement and action on bigeye:</p> <ul style="list-style-type: none"> • The text of the Tokelau Agreement has not yet been agreed 	<p>The (draft) Tokelau Agreement was only available after the scoring and had no bearing on the scoring. It is mentioned in the rationale mainly for completeness. We agree that it is way too soon to evaluate how successful it</p>
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				<p>upon and there is no guarantee that the FFA countries will ratify the final text. Previous similar attempts have fallen apart. Another aspect is that currently no decision has been made whether the Agreement should be binding or not. It is therefore inappropriate to assume the Agreement will be both implemented and will be effective.</p> <ul style="list-style-type: none"> The analogies to bigeye controls seem inappropriate: (1) those controls are hardly exemplary, and (2) assuming WCPFC will do for albacore what it did for bigeye is a big leap for many reasons, including the fact that the stakeholders are quite different (bigeye also involves purse seine interests). <p>Condition 3 should improve the fishery's performance. Such a CCM is now being considered for the December 2014 WCPFC meeting. The wording of Condition 3 could be improved. Currently, the condition is "The fishery must put in place a well-defined regional-level harvest control rule.....". Harvest control rules are put in place by WCPFC or individual countries, not by fisheries.</p>	<p>will be – but it should perhaps be acknowledged as process in the right direction.</p> <p>The team accepts that the situation for albacore and bigeye is not the same, but it does seem appropriate to evaluate how the Commission has previously acted in circumstances where the stock status is less good – and given that these circumstances have not arisen for albacore up till now, it is the only example available.</p> <p>The wording of Condition 3 has been changed as suggested.</p>
1.2.3	Yes	Yes	N/A	<p>I agree with the scoring, but I feel that the in peer review report's discussion of gaps, an important gap is missing: observer coverage.</p> <p>Observer coverage of the Cook Island flagged vessels in 2013 was about 6% (Cook Islands report at 2014 SC), coverage of other fleets targeting the stock in international waters (which produces about 60% of the south Pacific catch) is likely to be close to zero (per.comm., K.Staisch, Observer Coordinator, WCPFC). As stated in the peer review report, "the catch, effort and CPUE data set is the key indicator for stock assessment", but given the unverified nature of much of that data (especially that from international waters), this represents a significant gap. FFA (2014) makes the point that the some south Pacific albacore longliners fishing in international waters keep no fishing logs at all (determined through high seas boarding and inspection).</p>	<p>The rationale has been amended to cover this issue. The score was not changed (since the review agreed with it).</p>

1.2.4	Yes	Yes	N/A	<p>I agree with the scoring and the justification discussion.</p> <p>One point should be made about the discussion: The peer review report states: “The model is able to estimate a variety of reference points <u>which are or</u> might be used as limit and target reference points for management.”. It is my understanding that there are currently no limit/target reference points for south Pacific albacore for management purposes, so the “which are or” should be removed.</p>	<p>“are” applies in the case of the limit reference point, which is defined and agreed by WCPFC</p>
2.1.1	No – some stock assessment information available on the bait species (<i>S.longiceps</i>)	Yes	N/A	<p>I agree with the scoring and the justification discussion, with one minor exception: some stock assessment information is available on the bait species (<i>S.longiceps</i>): Prathibha Rohit and Uma S. Bhat (2003). Sardine fishery with notes on the biology and stock assessment of oil sardine off Mangalore-Malpe. J. mar. biol. Ass. India, 2003, 45 (1) : 61 – 73, which stated: “The study revealed that oil sardine is presently underexploited”.</p> <p>One issue may require clarification. CMM 2013-01 states: “The Commission will amend, or replace the objectives with target reference points after their adoption.</p> <ul style="list-style-type: none"> • Bigeye: the fishing mortality rate for bigeye tuna will be reduced to a level no greater than F_{msy}, i.e. $F/F_{msy} \leq 1$. This objective shall be achieved through step by step approach through 2017 in accordance with this Measure. • Yellowfin: 4: the fishing mortality rate is not greater than F_{msy}, i.e. $F/F_{msy} \leq 1$.” <p>The above implies that currently only objectives, rather than reference points have been formally adopted. This seems to be quite different than the statement in the peer review report: “Bigeye: only one limit reference point has been formally adopted for this species, set at 20% of the average annual total biomass over a recent period in the absence of fishing ($SB_{current}$, $F=0$)..... Yellowfin: as for bigeye, only one limit reference point has been formally adopted for this species: $Blim = 0.2 SB_{current}$, $F=0$.”</p> <p>It seems appropriate that there be some text reconciling the CMM</p>	<p>Agreed, reference to Rohit and Baht (2003) has been made in the scoring section and main report.</p> <p>Clarification regarding reference points has been added to the scoring section.</p>

				with the above text. If it is a question of stock assessment reference points vs management reference points, this should be clearly noted.	
2.1.2	Yes	Yes	N/A	<p>I agree with the scoring and the justification discussion.</p> <p>One issue requires some attention:</p> <ul style="list-style-type: none"> The peer review report states: “Pilling et al. (2013), however, did carry out a review of the implementation and effectiveness of key management measures for tropical tuna (as outlined in CMM 2008-01 and subsequent CMMs), using the most current data and stock assessments available. The study concluded that although tropical purse seine effort had not decreased, bigeye catches did decrease strongly during FAD closure periods and there was an overall decline in bigeye longline catch in comparison to the 2001 – 2004 average. While the above is certainly true, it implies a somewhat rosier picture than other parts of the Pilling et al. report. In other parts of the report it is suggested that CMM 2008-01 would eliminate overfishing of bigeye by only by 2021. To eliminate 100% of bigeye overfishing by 2018 it was estimated that a much longer annual FAD closure period is required by CMM 2008-01. 	The assessment team discussed this issue extensively both during and after scoring, particularly since a new stock assessment came out in draft form just as the PCDR was being finalised, which suggests that the situation for bigeye is worse than previously thought (stock biomass estimated to be below limit reference point). The team concluded, however, that given that this stock assessment is not yet available in its final form, it would not be appropriate to make changes to the scoring at this stage. Note that should the fishery receive certification, the stock status of bigeye will be considered carefully at the first annual surveillance audit in relation to the new stock assessment. It is also worth noting that the catch of bigeye by the fishery is very small compared to target fisheries, and that purse seining has been identified as the main source of effort on bigeye (although the new stock assessment draft does not that longline effort should also be tackled).
2.1.3	No	Yes	N/A	<p>I agree with the scoring, but for completeness some additional attention is required.</p> <p>In Section 3.4.1.4 of the main text of the peer review report, bait is discussed.</p> <ul style="list-style-type: none"> In Evaluation Table 9, there is a statement: “For <i>S. longiceps</i>, the amount of bait used in the fishery annually is known”. Table 17 gives a table of bait usage. There is no information on how the amount of bait used was estimated (i.e. from hooks set, cartons loaded on vessel, or by other means). Also in Table 17 the origin of the bait is given as Oman and China. According to the FAO species fact sheet for this species (fao.org/fishery/species/2086/en) the species is not found in China. The peer review report has a statement “As for <i>S. longiceps</i>, 	Clarification has been added to the bait section. The estimates of bait usage provided by the client relate to the JoC only, i.e. just the Cook Islands fishery.

				<p>the available information has permitted CMFRI so far to determine whether the species is likely to be within biologically based limits.” A more accurate/relevant statement would be: “Where <i>S. longiceps</i> has been studied (mainly in India), the available information shows no signs of over-exploitation.</p> <p>[If the removals are from the larger fishery, and not just in the Cooks] There is also an issue dealing with this and other indicators: observer coverage. There is the statement in the peer review report: “observer data based on 5% coverage of the longline fleet”. As mentioned above, observer coverage on albacore longliners on the international waters of the south Pacific is likely to be close to zero.</p>	
2.2.1	Yes	No	N/A	<p>There is the statement: “Although rather generic, this measure [Resolution 2005-03] is expected to result in the fishery not causing bycatch species to be outside biologically based limits. SG60 is therefore met”.</p> <p>The WCPFC adopts “resolutions” which are non-binding statements and “conservation and management measures” (CMMs) which are binding. It should be noted that Resolution 2005-03 is not a measure and therefore not binding. Considering the poor track record of many WCPFC member countries even on binding measures, expecting this resolution to result in the fishery not causing bycatch species to be outside biologically based limits appears to be a case of wishful thinking. I therefor suggest the overall performance indicator score be lowered to 75.</p>	<p>The scoring issue c requires <u>measures</u> or <u>practices</u> to be in place which are <u>expected</u> to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.</p> <p>There is no requirement for these measures or practices to be binding. Although it may indeed be wishful thinking, the resolution encourages CCMs to limit capture of non-target species and to release bycatch to the water unharmed. There is therefore an implicit expectation to keep bycatch species within biologically based limits or to not hinder their recovery. The team considered that this was sufficient for SG60 to be met (note that there is no SG80 for this scoring issue).</p>
2.2.2	Yes	Yes	N/A	I agree with the scoring and the associated discussion.	
2.2.3	Yes	Yes	N/A	I agree with the scoring and the associated discussion.	

2.3.1	Yes	Yes	Yes, but see note	<p>I agree with the scoring, but the supporting information (specifically the table and associated conclusions) needs to be improved.</p> <ul style="list-style-type: none"> • The title of the table should be something like “Information on annual discards of shark species” • The heading for column 2 should be some like “number of individuals observed (at 9.8% observer coverage)” • The heading for column 3 should be something like “Estimate of the number of individuals captured by extrapolating observed trips to all trips” • The heading of column 4 should be something like “most recent estimate of individuals captured at the stock level” • The conclusion from the table should be something like: “From the above table it is apparent that the number of sharks caught by the UoC is a very small portion of all those taken at the stock level. It is therefore unlikely to have a stock-level effect”. <p>Note for Condition: The condition states: “The occurrence and outcome of all interactions between LTFV vessels and any ETP species (sharks, seaturtles, seabirds and cetaceans) should be systematically and accurately reported.....”. The term “interactions” should be defined (If not already done in some MSC document). There is some uncertainty whether the term means any effect between the fishing operation and an ETP animal (e.g. simple depredation of bait without any harm to the ETP animal, or discarded bait which attracts birds) or only when when an ETP animal is harmed.</p>	<p>Table and wording has been amended.</p> <p>The term ‘interactions’ has been replaced by ‘catches’ to avoid confusion. Incidents of depredation are not included in this term.</p>
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2.3.2	Uncertain (see note 1)	Yes	Uncertain (see note 2)	<p>I agree with the scoring but some of the justification needs to be modified:</p> <ul style="list-style-type: none"> • “The review (if conducted) would produce a more precautionary CMM”. This sounds like a review automatically results in a CMM, which is a far cry from how the WCPFC system actually works. • Filippi et al. (2010) is extensively quoted but is not given in the list of references – so some of the attributed statements/concepts cannot be readily checked. <p>Note 1 on the relevant information: “A site visit carried out by Momo Kochen” is given as justification for a poor score on turtles. It is uncertain whether this person went on a longline trip, interviewed observers or crew, or obtained the information from some other source. Depending on the source, it may not be substantial enough for a poor score.</p> <p>Note 2 on the condition: The condition states: “The client should demonstrate that all Cook Islands regulations on fishery interactions with sea turtles are consistently respected and adhered to by LTFV crew so that the fishery does not pose a risk of serious harm to sea turtles, mortality of sea turtles is minimized and the fishery does not hinder recovery of vulnerable sea turtle populations”. This is rather vague; it should be tightened up and made more precise on how it should be demonstrated (e.g. by observers, by oath of the captain, nod from Momo Kochen, etc.) and how far into the subject the client must go (does it require a treatise on what is required for a recovery of a sea turtle population?).</p>	<p>Filippi et al. (2010) reference has been added. The wording of the rationale under scoring issue a has been amended.</p> <p>The site visit took place aboard LTFV vessels (included in the UoC) in Pago Pago - one of its aims was to verify compliance with the relevant CMMs. Clarification has been added to the text.</p> <p>The CAB is limited in how conditions can be worded. These suggestions would be too prescriptive; however the wording of the condition has been amended slightly.</p>
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2.3.3	No	Yes	No	<p>I agree with the scoring, but I see a problem in approaching the issues from only the LTFV's impacts.</p> <p>One of guideposts is: "Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species". Because the area covered by the LTFV fishery covers only a small portion of the range of the stock of most of the concerned ETP species, and many other longline fleets operate in that range, it seems that an important type of information is the catch of those ETP species by the LTFV fleet relative to that of the other fleets. In other words, it seems that the discussion is too narrow and focuses on LTFV, when impacts/recovery must be taken in context with what is occurring in other fleets in the range.</p> <p>In terms of the effectiveness of the condition, to determine features like the effectiveness of a management strategy for the recovery of an ETP species, it seems that (similar to that mentioned above) information on ETP catches by other fleets in the species range is required.</p>	<p>I see your point; however, this PI only requires us to look at the fishery's impacts on the ETP species, i.e. the UoC (I believe this issue is being addressed in the new MSC fisheries standard which has more scope for cumulative impacts to be considered). Please note that this SG was not met for this assessment.</p> <p>The team felt that the wording of the condition is sufficient to bring the fishery up to SG80 level for this PI - no changes have been made to cover other fleets (this would not be possible).</p>
2.4.1	Yes	Yes	N/A	I agree with the scoring and the discussion.	
2.4.2	Yes	Yes	N/A	I agree with the scoring and the discussion.	
2.4.3	No	No	N/A	The peer review report states: "LTFV currently does not monitor the amount of fishing gear lost". I find it hard to believe that LTFV vessels do not keep track of all substantial gear losses and report that to the company. This should be checked with LTFV, and (if true) a higher score should be given.	This was checked with the client group during the assessment and has been accurately presented in the report. We do not agree with an increase in the score.
2.5.1	Yes	Yes	N/A	I agree with the scoring and the discussion.	

2.5.2	Yes	Yes	N/A	<p>I agree with the scoring and most of the discussion. The following, however, needs some attention:</p> <ul style="list-style-type: none"> • Allain et al. (2011) is mentioned in the discussion but is not given in the list of references. • There are statements such as “the EAFM approach for the Cook Islands is ongoing”. Given the Cook Islands’ (and the region’s) past experience with EAFM and tuna management plans, do not expect anything marvellous on EAFM in the Cooks in the near future. 	<p>Allain et al. (2011) has been added to the references.</p> <p>The fact that EAFM has not yet resulted in anything concrete in the Cook Islands has already been taken into account in the scoring.</p>
2.5.3	Yes	Yes	N/A	<p>I agree with the scoring and most of the discussion. The following, however, needs some attention:</p> <ul style="list-style-type: none"> • It is unclear what “facilitated through Project 62” means. • Lehodey et al. (2013) and Fitzsimmons (2011) not in the list of references 	<p>Clarification has been added. Both references have also been added.</p>
3.1.1	Yes	Yes	N/A	<p>The peer review report has a very thorough justification which I believe more than adequately justifies the scoring.</p> <p>There is one small point: the peer review report contains the statement: “Cook Islands has signed/ ratified UNCLOS, the UN Fish Stocks Agreement, and FAO Code of Conduct,.....”. The Cook islands did not sign/ratify the FAO Code, but rather was present at the 1995 FAO Conference, during which the Code was unanimously adopted.</p>	<p>Text has been amended</p>

3.1.2	Yes	No	Yes	<p>The peer review report has a very thorough discussion of this performance indicator.</p> <p>The peer report contains the statement: “there is no explicit definition of the roles and responsibilities of CI Government with respect to consultation, including the sectors/stakeholders with whom consultation should occur, and means whereby it would happen”. In support of this contention, I have had recent contact with the NGO community in the Cook Islands, which appear to be dissatisfied with the level of information on offshore fishing that they are able to obtain from the CI Government.</p> <p>In view of the above, a score of 75 appears too generous for an indicator of whether “The management system has effective consultation processes”. A score of 70 is suggested.</p> <p>I agree wholeheartedly with Condition 6.</p>	<p>It was precisely the views of the NGOs in the Cook Islands that motivated this score (SIb not met at the 80 level). SIa does not relate to consultation processes and is demonstrably met at the 80 level.</p> <p>SIc SG80 is as follows: <i>The consultation process provides opportunity for all interested and affected parties to be involved.</i> It was our view that, despite that fact that consultation processes are unclear (hence the comment quoted left and the score of 60 for SIb), interested parties were demonstrably involved – certainly we found that they had no trouble in putting their views across, whether it was to the assessment team, to MMR directly or to the public (e.g. in the Cook Island Times).</p> <p>In addition, MMR does respond to queries raised by NGOs and other stakeholders and has made recent improvements (although much remains to be done – hence the condition).</p>
3.1.3	No	Yes	N/A	<p>The justification for the indicator starts with: “As the fishery falls under dual control, the scoring of this PI is based on the wider organisation....”. Although it is true that the WCPFC level exerts most influence, I feel there should be at least some discussion of the national management policy (as portrayed in the Longline Fisheries Management Plan, fisheries legislation, and other fishery documents) as to whether it has long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria. Such a discussion (and any criticism) could have a positive effect on future national policies – as it is not often that Pacific Island governments receive constructive criticism on fisheries matters from outside agencies.</p>	<p>This question is extensively covered under 3.2.1 (fishery-specific objectives).</p>
3.1.4	No	Yes		<p>Additional information:</p> <ul style="list-style-type: none"> The paper presented by China to the August 2014 meeting of the WCPFC Scientific Committee states “There are two types of tuna longline vessels, ice fresh tuna longline (IFLL), including 	<p>This information still does not make it clear how targeted effort on albacore has increased. However, irrespective of this, there is an increase in effort by the Chinese fleet by both classes of vessel that target albacore at least part of</p>

				<p>those targeting albacore, and deep frozen tuna longline (DFLL). The number of IFLL and DFLL vessel was 120 and 99 respectively in 2009, 155 and 89 respectively in 2010, 182 and 93 respectively in 2011, 202 and 84 respectively in 2012, 272 and 107 respectively in 2013”.</p> <p>The justification in the peer review report contains the statement: “The client should demonstrate that the subsidies identified by FFA and acknowledged by the client...”. The acknowledgement by the client (if correct) should be inserted into the justification text, as it reinforces the contention that there are indeed subsidies (some Chinese albacore longline operators deny this).</p>	<p>their operations. Text revised to reflect this new information.</p> <p>Text revised to add this clarification.</p>
3.2.1	Yes	Yes	N/A	I agree with the scoring and the discussion.	
3.2.2	Partially	Yes	Yes	<p>There is the statement in the justification: “The team however was advised that in 2012 the vessel cap was exceeded under the authority of the Secretary, without the establishment of the Licensing Committee prescribed under the 2008 Plan and Regulations.” As this appears to be largely responsible for the low score, I feel it is important that this be verified (was it just one individual’s contention?), including input from the Cook Islands MMR.</p> <p>If the above is verified then Condition 8 would be appropriate.</p>	This information came from the MMR directly and has been clarified in the text.
3.2.3	No	No	N/A	<p>There are two statements in the justification on observer coverage:</p> <ul style="list-style-type: none"> • “Levels of observer coverage in the fishery (~10%) exceed the regional benchmark” • “the level of observer coverage (~15%) does not provide 'a high degree of confidence'.” <p>These statements should be made consistent.</p>	<p>The level of observer coverage is approx. 10% - this has been rectified.</p> <p>Note that the guidepost quoted is at the SG80 level, so if not met, it would lead to a score of <80, not 80. One out of three SIs met the 100 level – this does not include the</p>

				<p>A guidepost states: Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence". NGOs have complained about this issue: "There has been at least one incident where regulations have been breached, and MMR has chosen not to issue any penalty. Some other breaches of regulations have resulted in fines at minimum levels, and others with no disclosure to the public on the amount fined, showing a lack of transparency by the regulatory authority" (per.comm., K.Passfield, Te Ipukarea Society).</p> <p>Considering the above, a scoring of 85 appears too generous. I suggest a score of 80.</p>	<p>SIs that consider application of sanctions, which only meet the 80 level. The assessment team notes:</p> <ul style="list-style-type: none"> • It is not unusual for the management agency to use discretion in relation to sanctions (e.g. letting vessels off with a warning for a first offence or where regulations are new). • Lack of transparency is dealt with under Condition 6.
3.2.4	Yes	Yes	N/A	I agree with the scoring and the justification	
3.2.5	Yes	Yes	N/A	I agree with the scoring and the justification	

Any Other Comments

Comments	Conformity Assessment Body Response
<p>I have notice a few factual mistakes and minor omissions in the assessment report, and I have noted those in a separate document.</p>	<p>Many thanks - all have been incorporated into the report.</p>

For reports using the Risk-Based Framework: N/A

Performance Indicator	Does the report clearly explain how the process used to determine risk using the RBF led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response:
1.1.1				
2.1.1				
2.2.1				
2.4.1				
2.5.1				

Peer Review 2

Overall Opinion

<i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i>	Yes	Conformity Assessment Body Response
<i>Justification:</i> Detailed information is provided in the certification report to justify the scores (with some exceptions) allocated by the assessment team.		<i>PI 1.1.2: The CAB openly recognizes that lack of an explicit target reference point is a problem that needs addressing. The interpretation of the ameliorating circumstances is consistent</i>

<p>Exceptions: PI 1.1.2 Since only an explicit limit biomass reference point (20%SB_{current},F=0) is formally agreed by WCPFC the SG80 is only partially met and thus an overall score of 65 may be more appropriate.</p> <p>PI 3.2.1 Without an explicit target reference point for this fishery I find the score of 90 to be overly generous. A score of 80 seems more appropriate.</p>	<p><i>with the case precedence standards of the harmonization process. See more detailed response below.</i></p> <p><i>PI 3.2.1: This PI refers to the fishery-specific context, which we have to take to mean the Cook Islands – the rationale therefore considers objectives at this level, although it does also mention some Commission-level objectives, for completeness. Note that the MSC Guidance (GCB4.7) states: This PI deals only with the fishery-specific policy context, such as within national or provincial/state or joint authority policy or custom specifically applied to the fishery under assessment.</i></p>
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<i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</i>	Yes	Conformity Assessment Body Response
<p><u>Justification:</u> The text specifying the conditions in most cases directly addresses the requirement to improve the fishery's performance to the SG80 level.</p> <p>I found that the timeline given in Condition 3 (PI 1.2.2) that the harvest control rule and associated management action is put in place by the second annual surveillance audit to be overly optimistic.</p> <p>The statement in Condition 4 (PI 2.3.1 and 2.3.3) "should be systematically and accurately reported.." is inadequate to improve the fishery's performance to the SG80 level.</p>		<p>Condition 3 should be met by the third annual surveillance audit. The client in their action plan are proposing that it should be met at the December 2016 meeting of WCPFC, which would be around the time of the 2nd annual audit, but if this is not achieved, the fishery would have a grace period of an additional year.</p> <p>Correct – actions and outcomes have been added to ensure that if required, management measures will be put in place such that the fishery meets the 80</p>

Condition 5 would be stronger if it stated that “the client must provide evidence” rather than “the client should demonstrate”.		level for PI 2.3.1. Changed as suggested.
<i>Do you think the client action plan is sufficient to close the conditions raised?</i>	Yes	Conformity Response Assessment Body
<i>Justification:</i> The client action plan if achieved provides a path to closing the conditions. However, careful consideration needs to be given to the timeline. I found, for example, the timeline for Condition 3 to be overly optimistic (see above).		<i><u>The timeline has been reviewed with the client.</u></i>

If included:

For reports using the Risk-Based Framework please follow [the link](#).

For reports assessing enhanced fisheries please follow [the link](#).

General Comments on the Assessment Report (optional)

The MSC Peer Review Report is very well-written and very detailed. The report shows that the authors have a great deal of experience with tuna fisheries. There are a few places where I disagreed with the report but this would not change the conclusion reached by the assessment team.

Performance Indicator Review

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

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
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1.1.1	Yes	Yes	NA	<p>The team has correctly applied the terms likely, highly likely and high degree of certainty as per CB2.2.1.1, CB2.2.1.2 and CB2.2.1.3 to score this PI.</p> <p>Sla: Based on the information provided in the 2012 stock assessment (Hoyle et al 2012), the assessment team concluded correctly that there is a high degree of certainty ($P \geq 95\%$) that the stock is above the point where recruitment would be impaired.</p> <p>Sib: The team evaluated the stock status against MSY-based reference points using a Kobe plot, and concluded correctly that there is a high degree of certainty that the stock has been above the Bmsy reference level since since assessments began. The conclusion is strengthened by the results of the structured uncertainty analysis.</p>	No response required
1.1.2	Yes	No	Yes	<p>An overall score of 65 is more appropriate for this PI.</p> <p>Sla: The SPC stock assessment provides advice to the WCPFC that includes estimates of implicit target reference points Bmsy and Fmsy. Based on these estimates limit reference points can also be estimated for this fishery, thus meeting the SG60 requirement. Since only an explicit limit biomass reference point ($20\%SB_{current,F=0}$) is formally agreed by WCPFC the SG80 is only partially met.</p> <p>Slb: I agree that the agreed $20\%SB_{current,F=0}$ limit reference point is set above the level that would pose a risk to reproductive capacity.</p> <p>Slc: The team concluded correctly that since there is no target reference point agreed by WCPFC the scoring issue at the SG80 level is not met.</p>	<p>The CAB openly recognizes that lack of an explicit target reference point is a problem that merits a condition. The subjective interpretation of the ameliorating circumstances is consistent with the case precedence of the harmonization process.</p> <p>It appears (post-scoring) that the Commission's approach is likely to be to take a target reference point $40-60\%B_{current,F=0}$ (at least, this would be consistent with its current approach to the other main tuna stocks). The team considered that the various options for target reference points (including this one) are appropriate for the stock and can be measured. The issue of their formal use in management is considered under Slc, as well as under 1.2.2. The rationale has been somewhat amended to take into account new information.</p>
<p>Document: Peer Reviewer Template Date of issue: 19 January, 2011 File: TAB_D_031_peer_reviewer_template_v1.doc</p>					

3.2.2	Yes	Yes	No	The condition also need to adress the issue of controlling effort in the WCPFC Convention Area since CMM 2010-05 'appears to be not effective in constraining effort'.	<p>3.2.2 refers to the fishery itself rather than the stock as a whole, and therefore, again, the scoring, rationale and condition concentrate on the Cook Islands management system. In addition, it is about decision-making processes, rather than the outcome of these processes (the decisions). The focus of this condition is the (apparently) slightly arbitrary nature of decision-making in the Cook Islands, on occasion.</p> <p>(Guidance GCB4.8: <i>In this context, the relevant performance-related issue is if the decision-making processes actually produce measures and strategies within the fishery-specific management system, not an evaluation of the quality of those measures and strategies which is covered elsewhere in the tree structure under P1 and P2. The assessment issue is about the decision-making processes themselves.</i>)</p> <p>The CAB further notes that the issue of concern in this comment is encompassed by condition 2: "The fishery should put in place a regional harvest strategy, incorporating limit and target reference points (management objectives), a harvest control rule and management actions, such that the strategy is responsive to the status of the stock and the elements of the strategy work together to maintain the stock at or around the target level."</p> <p>Implement has been added to the condition wording.</p>
3.2.3	Yes	Yes	NA	The information provided supports the score of 85 given for this PI.	
3.2.4	Yes	Yes	NA	The information provided supports the score of 80 given for this PI.	
3.2.5	Document Peer Reviewer Template Date of issue: 19 January, 2011 File: TAB_D_031_peer_reviewer_template_v1.doc	Yes	NA	The information provided supports the score of 80 given for this PI.	

Any Other Comments

Comments	Conformity Assessment Body Response
<p>Harmonization with other southern albacore tuna fisheries is mentioned in section 4 of the report. Table 25 compares scores given to this fishery to other similar fisheries and provides comments on differences in scores. However, MSC Guidelines suggest there should be harmonization of the timelines of the condition with other overlapping fisheries. This is particularly important for the Conditions 1, 2 and 3 which are regional in nature. I could not find any reference to harmonizing timelines of conditions with other southern albacore fisheries.</p> <p>While the status of the southern albacore stock according to the 2012 assessment is not overfished and overfishing is probably not occurring, fishing effort has increased. This increased effort has led to catches increasing by 40% between 2005 and 2012 despite the adoption of CMMs in 2005 (CMM 2005-02) and 2010 (2010-05) designed to limit entry. There is some concern that without effective effort control in place P1 and P2 outcome may be adversely impacted.</p>	<p>Specific reference to harmonization of timelines with the other fisheries was made on page 200. To avoid confusion this paragraph has now also been added to the harmonization section.</p> <p>MSC no longer require timelines in client action plans to be explicitly harmonised, and in this case it would have been impossible, given that several fisheries with similar conditions were certified some year ago. They do, however, require other fisheries' timelines to be considered, and we have done this.</p> <p>The CAB completely agreed with you, and these issues are explicitly dealt with under Conditions 1-3. Note, however, the MSC does not take account of the economic efficiency of fisheries, except to the extent that it impacts on their biological sustainability (cf scoring and condition for PI 3.1.4).</p>

For reports using the Risk-Based Framework:

Performance Indicator	Does the report clearly explain how the process used to determine risk using the RBF led to the stated	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response:

	outcome? Yes/No			
1.1.1				
2.1.1				
2.2.1				
2.4.1				
2.5.1				

For reports assessing enhanced fisheries:

<i>Does the report clearly evaluate any additional impacts that might arise from enhancement activities?</i>	Yes/No	Conformity Assessment Body Response:
<u>Justification:</u>		

Appendix 3. Stakeholder submissions

Prior to publication of the PCDR, one formal stakeholder comment was submitted by the FTBOA, as shown below. A number of comments were also received via email and these have been summarised in section 4.4.

In the matter of assessment and comment on:

“The Cook Islands EEZ South Pacific albacore longline fishery will henceforth be known as the Liancheng Overseas Fishery (Shenzhen) Company (SZLC), Huanam Southern Fishing (Shenzhen) Company (HNSFC), and the China Fishing Agency (CFA) Cook Islands EEZ south Pacific albacore longline fishery.”

The Fiji Tuna Boat Owners Association (FTBOA) raises objection to MSC certification of the above group on the basis that the vessels employed are heavily State subsidised . The vessels employed are not of the flag of the Cook Islands or the EEZ in which the accreditation is sort.

We are the opinion that the South Pacific Albacore Fishery *per se* should be managed to Maximum Economic Yield (MEY) if there is to be sustainable long term management of the fishery. Vessels that are State subsidised to the extent of this Group work to financial parameters that are not available to vessels of the host flag (Cook Islands) or that of neighbouring states. This in turn creates a position whereby the regional stock is fished down to a level below the economic return of unsubsidised (PIC and other) fleets. The true unsubsidised economic viability of the catching sector provides the ultimate resource management tool which, in this case, is disregarded.

We do not consider that this position should be condoned , or encouraged, by Marine Stewardship Council accreditation.

May we further question the title of the assessment *“The Cook Islands EEZ South Pacific albacore longline fishery will henceforth be known as the -----”*?. The title infers a presumption that is surely neither correct nor appropriate.

It would be appreciated if the above views are taken into consideration and recorded in the assessment process.

Yours faithfully,



Radhika Kumar,
Interim Secretary FTBOA.

1. The report shall include:
 - a. All written submissions made by stakeholders during consultation opportunities listed in CR 27.15.3.1
 - b. All written and a detailed summary of verbal submissions received during site visits regarding issues of concern material to the outcome of the assessment (*Reference CR 27.15.3.2*)
 - c. Explicit responses from the team to stakeholder submissions included in line with above requirements (*Reference CR 27.15.3.3*)

(REQUIRED FOR FR AND PCR)

Document: Peer Reviewer Template

Date of issue: 19 January, 2011

File: TAB_D_031_peer_reviewer_template_v1.doc

2. The report shall include all written submissions made by stakeholders about the public comment draft report in full, together with the explicit responses of the team to points raised in comments on the public comment draft report that identify:
 - a. Specifically what (if any) changes to scoring, rationales, or conditions have been made.
 - b. A substantiated justification for not making changes where stakeholders suggest changes but the team makes no change.

(Reference: CR 27.15.4)

Appendix 4. Surveillance Frequency

(REQUIRED FOR THE PCR ONLY)

1. The report shall include a rationale for determining the surveillance score.
2. The report shall include a completed fishery surveillance plan table using the results from assessments described in CR 27.22.1

Table A4: Fishery Surveillance Plan

Score from CR Table C3	Surveillance Category	Year 1	Year 2	Year 3	Year 4
[e.g. 2 or more]	[e.g. Normal Surveillance]	[e.g. On-site surveillance audit]	[e.g. On-site surveillance audit]	[e.g. On-site surveillance audit]	[e.g. On-site surveillance audit & re-certification site visit]

Appendix 5. Client Agreement

(REQUIRED FOR PCR)

The report shall include confirmation from the CAB that the Client has accepted the PCR. This may be a statement from the CAB, or a signature or statement from the client.

(Reference: CR: 27.19.2)

Appendix 5.1 Objections Process

(REQUIRED FOR THE PCR IN ASSESSMENTS WHERE AN OBJECTION WAS RAISED
AND ACCEPTED BY AN INDEPENDENT ADJUDICATOR)

The report shall include all written decisions arising from an objection.

(Reference: CR 27.19.1)

Appendix 6. Client Action Plan

Client Action Plan

For the SZLC, HNSFC & CFA Cook Islands EEZ south Pacific albacore longline fishery

Please see Appendix 8 for a letter of support to the Client Action Plan from the Cook Islands Ministry of Marine Resources.

July 2014

Condition 1: The management system should formally adopt a target reference point for the South Pacific albacore stock which is consistent with maintaining the stock at B_{MSY} or some other measure with similar intent or outcome. This target reference point should be used for management purposes.

Relevant PI: 1.1.2. Limit and target reference points are appropriate for the stock.

Score: 75

Rationale: There is no explicit target reference point agreed by WCPFC for use in management.

Client Actions:

Action 1. During 2014 and 2015, encourage the FFA Southern Committee, Sub-Committee on South Pacific Tuna and Billfish Fisheries (SC-SPTBF), through client submission of a position statement to the Cook Islands delegation, to adopt an explicit target reference point for south Pacific albacore to be used in management of sub-regional pelagic longline fisheries.

Action 2. During 2014, 2015 and 2016, encourage WCPFC, through client submission of a position statement to the Cook Islands delegation to the Commission, to adopt an explicit target reference point for south Pacific albacore to be used in management of regional pelagic longline fisheries.

Action 3: From 2014 onwards, participate in meetings and joint activities of the WCPO Tuna MSC Principle 1 Alignment Group to pursue adoption of a sub-regional and WCPFC target reference point for south Pacific albacore. The Group is comprised of client groups of fisheries certified and under assessment against the Marine Stewardship Council (MSC) standard and of participants of Fishery Improvement Projects (FIPs) for fisheries for albacore, bigeye and yellowfin tunas in the Convention Area of the Western and Central Pacific Fisheries Commission (WCPFC), and other stakeholders. The Group participants work together to coordinate and align policy activities of relevant MSC client groups and participants of FIPs related to sub-regional and regional management of fisheries for albacore, bigeye and yellowfin tunas in the Convention Area of the WCPFC. (see https://sites.google.com/site/seafoodcompaniestunamanagement/home/wcpo_tuna-p1_alignment).

Outcomes & Schedule:

Outcome 1. In 2016, FFA SC-SPTBF formally adopts a target reference point for sub-regional management of south Pacific albacore.

Outcome 2. By December 2016 at WCPFC 14, WCPFC formally adopts a target reference point for regional management of south Pacific albacore.

Document: Peer Reviewer Template

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Consultation on condition: The client will consult and coordinate with other members of the WCPO Tuna MSC Principle 1 Alignment Group, environmental NGOs involved at FFA, PNA and WCPFC, the Cook Islands Ministry of Marine Resources, SPC, and other delegations to FFA, PNA and WCPFC

Condition 2: A regional harvest strategy should be put in place and implemented, incorporating limit and target reference points (management objectives), a harvest control rule and management actions, such that the strategy is responsive to the status of the stock and the elements of the strategy work together to maintain the stock at or around the target level.

The key missing elements of the harvest strategy at present are: (1) A target reference point formally adopted by the regional management system; and (2) A well-defined harvest control rule with associated management actions. These issues are also addressed specifically in conditions 1 and 3.

Relevant PI: 1.2.1. There is a robust and precautionary harvest strategy in place.

Score: 70

Rationale: At the WCPFC level, SG80 is not met, because the harvest strategy is not, or is insufficiently, responsive to the status of the stock. The assessment team members were not confident based on past form that, should albacore stock status be revealed at the next stock assessment to be approaching or below target levels, the WCPFC would be able to stabilise or decrease fishing mortality in a fully effective and timely way. SG80 is therefore not met in relation to the regional harvest strategy.

Fishing effort and the fishing mortality rate have both increased in recent years, but without exceeding an implied target reference point or an adopted limit reference point. Using the harvest strategy for WCPO bigeye as an indicator of how the harvest strategy for south Pacific albacore would fare if the albacore stock did dip below a TRP, given that the bigeye harvest strategy has been insufficiently responsive to the change in status of the stock, it is likely that the albacore harvest strategy would likewise not be adequate, in that if the albacore stock were to approach or go below a TRP, WCPFC would not likely be able to stabilise or decrease fishing mortality in a fully effective and timely way. However, since there is no evidence that the stock status is in jeopardy in the short-term, the harvest strategy is therefore achieving the fundamental management objectives. The domestic harvest strategy includes a limited entry fishery, limiting licenses to 50, and a precautionary catch limit of 8000 tonnes of albacore in the EEZ.

Client Actions:

Action 1. During 2014 and 2015, encourage FFA SC-SPTBF, through client submission of a position statement to the Cook Islands delegation, to define a preferred option for the sub-regional system to monitor, conduct stock assessments, and define a harvest control rule and management actions (collectively referred to as a harvest strategy) for south Pacific albacore to ensure that if a TRP were to be exceeded, that the sub-regional management authorities would respond to the change in status of the stock to bring the stock back to within the TRP in a fully effective and timely way.

Action 2. During 2014, 2015 and 2016, encourage WCPFC, through client submission of a position statement to the Cook Islands delegation to the Commission, to adopt a harvest strategy for south Pacific albacore that is consistent with any FFA sub-regional harvest strategy, and that ensures that if a TRP were to be exceeded, that WCPFC would respond to the change in status of the stock to bring the stock back to within the TRP in a fully effective and timely way.

Action 3. From 2014 onwards, participate in meetings and joint activities of the WCPO Tuna MSC Principle 1 Alignment Group to pursue adoption of a sub-regional and WCPFC robust and precautionary harvest strategy for south Pacific albacore.

Outcomes & Schedule:

Outcome 1. In 2016, FFA SC-SPTBF formally adopts a harvest strategy for sub-regional management of south Pacific albacore.

Outcome 2. In 2017, WCPFC formally adopts a harvest strategy for regional management of south Pacific albacore.

Outcome 3. By December 2018 at WCPFC 15, there is evidence that the harvest strategy for south Pacific albacore is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points is in place.

Consultation on condition: The client will consult and coordinate with other members of the WCPO Tuna MSC Principle 1 Alignment Group, environmental NGOs involved at FFA, PNA and WCPFC, the Cook Islands Ministry of Marine Resources, SPC, and other delegations to FFA, PNA and WCPFC.

Condition 3: A well-defined regional-level harvest control rule should be put in place, with associated management actions (in the form of a CMM or another form as appropriate) which together act effectively to reduce exploitation rates as the limit reference point is approached. The selection of the harvest control rule should take into account the main uncertainties regarding the status of the stock or the impact of the fishery (or other uncertainties if considered important).

Relevant PI: 1.2.2. There are well-defined and effective harvest control rules in place.

Score: 60

Rationale: The harvest control rule (CMM 2010-05) does not include a well-defined pre-agreed response of reducing the exploitation rate if the south Pacific albacore stock approaches or falls below a target or limit reference point.

The HCR does not account for basic uncertainties. The HCR calls for constraining only non-SIDS' distant water and domestic developed countries' fishing effort by capping the number of vessels in the southern hemisphere subtropics, but this input control, even if it achieved full compliance, might still not effectively stabilize fishing mortality and catch rates because: (i) the non-SIDS vessels could increase effort, (ii) SIDS fleets are not constrained (however, the proposed Tokelau Arrangement would address this current gap), (iii) there are no constraints north of 20 deg. South, (iv) there are no constraints on fishing mortality of south Pacific albacore by vessels not targeting albacore.

The harvest control rule objective is to stabilize fishing effort, mortality and catch rates of south Pacific albacore in the area south of 20 degrees S. latitude. It appears that the HCR has not however effectively stabilized fishing effort in this area. There is no formal target reference point, the stock is above MSY-based biomass and fishing mortality reference points and far above the formal LRP, but given recent reductions in CPUE, it may be below levels to sustainably support optimal economic yields.

Client Actions:

Action 1: During 2014 and 2015, encourage FFA SC-SPTBF, through client submission of a position statement to the Cook Islands delegation, and continued participation in the

WCPO Tuna MSC Principle 1 Alignment Group, to adopt the proposed Tokelau Arrangement, and to take steps to ensure full compliance.

Action 2: During 2014, 2015 and 2016, encourage WCPFC, through client submission of a position statement to the Cook Islands delegation to the Commission, and continued participation in the WCPO Tuna MSC Principle 1 Alignment Group, to adopt a HCR for the stock that establishing catch limits by CCM, and explicit pre-agreed actions to be taken to reduce the exploitation rate if the stock approaches or falls below reference points.

Outcomes & Schedule:

Outcome 1. By the end of 2015, FFA SC-SPTBF adopts a well-defined and effective harvest control rule for sub-regional management of south Pacific albacore, establishing catch limits for the FFA member SIDS, and explicit pre-agreed actions to be taken to reduce the exploitation rate if the stock approaches or falls below reference points.

Outcome 2. By December 2016 at WCPFC 14, WCPFC adopts a well-defined and effective harvest control rule for regional management of south Pacific albacore, that is consistent with any adopted FFA sub-regional measure, and at a regional level establishes catch limits by CCM, and explicit pre-agreed actions to be taken to reduce the exploitation rate if the stock approaches or falls below reference points.

Consultation on condition: The client will consult and coordinate with other members of the WCPO Tuna MSC Principle 1 Alignment Group, environmental NGOs involved at FFA, PNA and WCPFC, the Cook Islands Ministry of Marine Resources, SPC, and other delegations to FFA, PNA and WCPFC.

Condition 4: The occurrence and outcome of all catches of ETP species (sharks, sea turtles, seabirds and cetaceans) by LTFV vessels should be systematically and accurately reported on so that fishery-related mortality on ETP species can be quantitatively determined and the effectiveness of the management strategies can be determined. Where a need has been identified, the collected data should enable further development of management strategies to ensure that the fishery does not hinder recovery of ETP species.

Relevant Pls:

2.3.1. The fishery meets national and international requirements for the protection of ETP species. The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species

2.3.3. Relevant information is collected to support the management of fishery impacts on ETP species, including:

- Information for the development of the management strategy;
- Information to assess the effectiveness of the management strategy; and
- Information to determine the outcome status of ETP species.

Score 2.3.1: 75

Rationale: Low certainty of fishery-wide estimates of catch rates and levels of ETP species, and dearth of information on the conservation status of affected populations/stocks/species, results in high uncertainty in the effects of the fishery on ETP species.

Score 2.3.3: 75

Rationale: Logbook data recording of ETP catch events were inconsistent and lower than observer records.

Client Actions:

Action 1: By August 2014, develop a 'train-the-trainer' ETP workshop to build the capacity for Cook Islands government and catch sector company dockside staff to train longline captains in the Cook Islands longline albacore fishery to: (i) understand Cook Islands government longline rules, (ii) improve species identification, (iii) understand proper methods for completing SPC logbook forms, (iv) understand handling and release practices for seabirds, sea turtles, cetaceans and elasmobranchs to optimize the probability of post-release survival.

Action 2: By the end of 2015, all captains of vessels in the client group attend a minimum of one ETP training workshop per year.

Action 3: If data suggest an issue with ETP interactions (such that PI 2.3.1 is not being met at the 80 level) then the fishery will develop and implement further management actions to address the issue(s) identified.

Outcomes & Schedule:

Outcome 1: Materials for the ETP workshop, bilingual English/Chinese, are completed by June 2015. Materials include: a powerpoint presentation to lead the training workshop, summary of Cook Islands longline rules, handling/release methods guides for each of the four groups (turtles, cetaceans, seabirds, elasmobranchs), species identification guide.

Outcome 2: By the end of 2016, records confirm that all captains of vessels in the client group that were active in the fishery during 2015 attended at least one workshop during 2015.

Outcome 3: By June 2016, logbook records of interactions with ETP species are consistent with observer records (demonstrated that an appropriate reporting system is in place and is being used by all LTFV crew).

Outcome 4: By June 2016, Observer records of handling and release practices for ETP species demonstrate longline fisher compliance with relevant binding measures.

Outcome 5: By December 2016, data on interactions with ETP species have been analysed and any issues in terms of outcomes for ETP species have been flagged.

Outcome 6: By June 2017, if necessary, new management measures are agreed and in place to deal with any outstanding issues for ETP species, such that the 80 level is met for PI 2.3.1 for all relevant ETP species.

Consultation on condition: Consult with staff of SPC, MMR, and longline fishers to develop the ETP training workshop materials.

Condition 5: The client will provide evidence that all Cook Islands regulations on fishery interactions with sea turtles are consistently respected and adhered to by LTFV crew so that it can be demonstrated that the fishery does not pose a risk of serious harm to sea turtles, mortality of sea turtles is minimized and the fishery does not hinder recovery of vulnerable sea turtle populations.

Relevant PI: 2.3.2. The fishery has in place precautionary management strategies designed to:

- Meet national and international requirements;
- Ensure the fishery does not pose a risk of serious harm to ETP species;

- Ensure the fishery does not hinder recovery of ETP species; and
- Minimise mortality of ETP species.

Score: 75

Rationale: Evaluation table 13 - PI 2.3.1

Client Actions:

Action 1. By the end of 2016, via a dockside inventory of longline vessel gear designs, estimate the depth of hooks in a basket (between 2 floats) when gear is soaking, and if some of the hooks are soaking shallower than 50m, identify options to get all hooks below 50m (a best practice gear design to avoid and minimize catch of sea turtles and some elasmobranch species).

Action 2: Improvement in identification of ETP species to the species level (including for sea turtles) and recording on SPC logbook forms by captains and crew of vessels in the client group will be pursued via the training workshop described under condition 4.

Action 3: Captains of vessels in the client group will be required to annually attend a ETP training workshop, described under Condition 4, in part to improve compliance with required sea turtle handling and release methods.

Outcomes & Schedule:

Outcome 1: By the third annual audit, client demonstrates that all Cook Islands regulations on fishery interactions with sea turtles are consistently complied with, including through the implementation of the subsequent Outcomes under this condition.

Outcome 2: By June 2017, all vessels in the client group are employing gear designs that are predicted to result in the terminal tackle soaking below 50m depth.

Outcome 3: (Same as Outcome under Condition 4) By June 2016, logbook records of interactions with ETP species are consistent with observer records (demonstrated that an appropriate reporting system is in place and is being used by all LTFV crew).

Consultation on condition: Consult with staff of SPC, MMR, and longline fishers.

Condition 6: The client must provide evidence that processes at national level are put in place to i) regularly engage with key stakeholders to seek and accept relevant information, and ii) demonstrate that the information obtained from such engagement has been duly considered.

Relevant PI: 3.1.2. The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties

Score: 75

Rationale: There is a lack of evidence of a Cook Islands government consultation processes that regularly seeks and considers relevant information to guide the pelagic longline albacore fishery's domestic management system. The Cook Islands 2008 Management Plan requires that the Secretary shall organise consultations with key stakeholders at least once a year to discuss matters related to the management and regulation of fishing, including licensing, fisheries development initiatives and the social and economic impacts of large pelagic fishing. These consultations have not been convened on a regular basis. The 2008 act requires that a consultative Licensing Committee be convened if the number of applications at any point exceeds the licence

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number, to limit and provide transparent advice to the Minister and the Secretary on the granting of licences. It was reported to the team that this did not occur when the vessel limit was exceeded.

Client Actions:

Action 1: By June 2015, the client will request in a letter to MMR that MMR convene at least one stakeholder consultation per year to provide a venue to discuss and collect information on the domestic management framework for the Cook Islands longline albacore tuna fishery, and to request that, if the number of applications for longline licenses exceeds the limit, that a consultative Licensing Committee be convened. The client will emphasize that the national consultation process should provide opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement, and that the management system demonstrate how information received during the stakeholder consultations was considered, and how it was used or not used, and why.

Outcomes & Schedule:

Outcome 1: The domestic consultative processes is in place by the third annual audit.

Consultation on condition: NGOs with an interest in the Cook Islands longline fishery, MMR.

Condition 7: The client should demonstrate that the subsidies identified by FFA and acknowledged by the client do not lead to perverse incentives that are inconsistent with achieving the outcomes expressed by MSC principles 1 and 2;

Or

Implement a harvest strategy that includes strengthened harvest control rules that are more responsive to increasing effort in the albacore fishery, such that the impact of subsidies is restricted to lowering the operating costs of subsidized fleets, rather than acting as an incentive to increase effort.

Relevant PI: 3.1.4. The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing

Score: 60

Rationale: It is possible that China government subsidies to China flagged longline albacore vessels that fish in the WCPFC convention area may be incentivizing unsustainable fishing capacity levels.

Client Actions:

Action 1: In implementing defined actions to meet conditions of certification related to MSC principles 1 and 2, and meeting relevant Outcomes for these actions, the client will contribute to achieving effective sub-regional and regional management systems for the south Pacific albacore regional fishery, including the adoption of a formal target reference point that maintains the stock at a level consistent with B_{MSY} or similar precautionary management target, a harvest strategy responsive to the state of the stock and designed to achieve the management objectives, and HCR and tools consistent with the harvest strategy that reduce fishing mortality as the BRPs are approached and which account for uncertainty. By securing this effective stock management system this will ensure that the impact of government subsidies is not able to result in unsustainable levels of fishing under WCPFC.

Outcomes & Schedule:

Outcome 1: By December 2018 at WCPFC 15, robust sub-regional and regional management systems are in place. For details see Condition 2.

Consultation on condition: The client will consult and coordinate with other members of the WCPO Tuna MSC Principle 1 Alignment Group, environmental NGOs involved at FFA, PNA and WCPFC, the Cook Islands Ministry of Marine Resources, SPC, and other delegations to FFA, PNA and WCPFC.

Condition 8: By working with the relevant Cook Islands management agencies, the client should demonstrate i) that decision-making processes at national level respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions and ii) that information on fishery performance and management action at national level is available to stakeholders on request, and that explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.

Relevant PI: 3.2.2. The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.

Score: 75

Rationale: The national decision-making process has not consistently been transparent, timely and adaptive in responding to serious issues identified in relevant research, monitoring, evaluation and consultation. E.g., in 2012 the vessel cap was exceeded under the authority of the Secretary, without the establishment of the Licensing Committee prescribed under the 2008 Plan and Regulations.

Client Actions:

Action 1: By June 2015, the client will urge the Cook Islands Government, via including in the letter to MMR to be written and sent per the activity under condition 6, requesting that the national decision-making processes for management of the Cook Islands longline albacore fishery respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.

Outcomes & Schedule:

Outcome 1: The domestic consultative processes is in place by the third annual audit. Stakeholders consultations will be open to all interested parties.

Consultation on condition: NGOs with an interest in the Cook Islands longline fishery, MMR.

Appendix 7. Stakeholders

Organization	Contacts
SPC	<p>Advisor tuna fisheries (science) and fisheries monitoring Oceanic Fisheries Programme Manager Contact: JohnpH@spc.int</p> <p>Fisheries Scientist (FFA Support) Graham Pilling, grahamp@spc.int</p> <p>Fisheries Scientist (Bioeconomic) Aaron Berger, aaronb@spc.int</p>
FFA	<p>Alice McDonald, Fisheries Adviser Alice.Mcdonald@ffa.int</p> <p>Hugh Walton Hugh.Walton@ffa.int</p> <p>Wez Norris wez.norris@ffa.int</p>
WWF	<p>WWF South Pacific Programme Office (NGO) Mr. Seremaia Tuqiri, Offshore Fisheries Policy Officer +679 3315533 stugiri@wwfpacific.org.fj</p> <p>Mr. Alfred 'Bubba' Cook, Western Central Pacific Tuna Programme Officer +679 3315533 acook@wwfpacific.org.fj</p> <p>WWF Smart Fishing Initiative (Global Fisheries Programme) Daniel Suddaby, Tuna Manager +44(0) 207 221 5395 Daniel.suddaby@wwf.panda.org</p> <p>WWF Smart Fishing Initiative (Global Fisheries Programme) Peter Trott, Policy Manager – Fisheries Markets ptrott@wwf.org.au</p>
Cook Islands Ministry of Marine Resources (MMR)	<p>Ben Ponia (Head of Fisheries) B.Ponia@mmr.gov.ck</p> <p>Andrew Jones (MCS) A.Jones@mmr.gov.ck</p> <p>Georgia Langdon (catch data) G.Langdon@mmr.gov.ck</p>
Cook Islands Government	<p>Joshua Mitchell (Foreign Affairs Department) joshm@oyster.net.ck</p>

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Pacific Islands Conservation Initiative Trust (PICIT)	Stephen Lyon PO Box 1019 Titikaveka Rarotonga Cook Islands stephen@picionline.org
Te Vaka Moana (TVM)	- South Pacific Fisheries Cooperation Dave Marx, TVM Manager & Coordinator davemarx@tevakamoana.org
Western Central Pacific Fisheries Commission (WCPFC)	Glen Hurry, Executive Director Glenn.Hurry@wcpfc.int Martin Tsamenyi, Legal Advisor Martin.Tsamenyi@wcpfc.int
Birdlife International	BirdLife Pacific Regional Office don@birdlifepacific.org.fj Karen Baird - Kermadec and Global Seabird Programme Advocate (Birdlife International) K.Baird@forestandbird.org.nz
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Pew Environment Group	Amanda Nickson anickson@pewtrusts.org Adam Baske abaske@pewtrusts.org
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Fiji Fish	Russell Dunham, Chief Executive Officer

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Ltd (fishing company)	doherty@oyster.net.ck
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Appendix 8. Letter of support from MMR



__ August 2014

Via email: Chrissie.Sieben@macalister-elliott.com; j.gascoigne@orange.fr

Assessment Team – Cook Islands EEZ S. Pacific albacore

Attn: Chrissie Sieben and Dr. Jo Gascoigne

MacAlister Elliott and Partners Ltd.

56 High Street

Lymington

Hampshire

SO41 9AH UK

Dear Ms. Sieben and Dr. Gascoigne,

The Cook Islands Ministry of Marine Resources fully supports efforts by Luen Thai Fishing Venture (LTFV), Liancheng Overseas Fishery (Shenzhen) Co. Ltd (SZLC); China Southern Fishery Shenzhen Co. Ltd; and China Fishing Agency Ltd., collectively the client group, to pursue certification of their vessels participating in the south Pacific albacore longline fishery in the Cook Islands Exclusive Economic Zone against the Marine Stewardship Council standard. We are committed to assist the client group, if the fishery passes the MSC assessment, in successfully implementing their conditions of certification. The Ministry of Marine Resources is therefore committed to implementing activities described in the draft Client Action Plan that require action by our agency.

With regards,

Ben Ponia

Cook Islands Ministry of Marine Resources
P.O Box 85, Moss Rd, Avarua District, Cook Islands
+682 28 721