

Solomon Islands Skipjack and Yellowfin Tuna Purse Seine Anchored FAD, Purse Seine Unassociated, and Pole and Line Fishery

Harmonization Report

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2. Glossary

CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EEZ	Exclusive Economic Zone
ETP	Endangered, Threatened or Protected species
FAO	Food and Agriculture Organization of the United Nations
FCM	Fisheries Certification Methodology
IFQ	Individual Fishing Quota
ITQ	Individual Transferable Quota
Kg	Kilogram
Lb.	Pound, equivalent to roughly 2.2 kg
LOA	Length Over-All
M	Million (lbs.)
MSC	Marine Stewardship Council
MSE	Management Strategy Evaluation
nm	nautical mile
OFL	Over-Fishing Level
PI	Performance Indicator
SCS	SCS Global Services
SI	Scoring Issue
SSB	Spawning Stock Biomass
t and mt	metric ton
TAC	Total Allowable Catch
WWF	World Wildlife Fund

3. Executive Summary

Table 1. Unit of Certification(s) and Unit of Assessment(s)

Stock/Species (FCP V2.1 7.5.2.a)	Method of Capture (FCP V2.1 7.5.2.b)	Fishing fleet (FCP V2.1 7.5.2.c)
Western and Central Pacific Ocean Skipjack Tuna	Gear 1 - Purse seine sets associated with anchored fish aggregating devices (FADs) Gear 2 - Purse seine sets unassociated with fish aggregating devices Gear 3 - Pole and line	The Main Group Archipelago (MGA) and Exclusive Economic Zone (EEZ) of the Solomon Islands. Vessels included /eligible to use the certificate are restricted to those that are operating on behalf of Tri Marine International Pte. Ltd., on behalf of National Fisheries Developments, Ltd. (NFD).
Western and Central Pacific Ocean Yellowfin Tuna		

Fishery Operations Overview

This report presents the Marine Stewardship Council (MSC) assessment of the Solomon Islands Skipjack (*Katsuwonus pelamis*) and Yellowfin Tuna (*Thunnus albacares*) caught Purse Seine Anchored FAD, Purse Seine Unassociated, and Pole and Line fishery. Within the report, the Unit of Assessment will be referred to more simply as the Solomon Islands Purse-seine and Pole and Line fishery. The UoA and UoC includes vessels owned/chartered by Tri Marine International Pte. Ltd.'s, National Fisheries Development Ltd (NFD). The initial assessment was conducted by MRAG using MSC Certification Requirements (CR) v1.3. The fishery was certified on July 12, 2016.

Assessment Overview

The team selected to undertake the assessment included two team members that collectively meet the requirements for MSC assessment teams. These were Dr. Robert J. Trumble and Max Stocker

The certificate was issued on the 12th of July, 2016.

The fishery has been subject to three surveillance audits since the original certificate was issued during which time no Principle 1 conditions were closed. This harmonization report is an Annex to the third (2019) surveillance audit report in compliance with instructions issued by the MSC in February 2019 for Principle 1 v2.0 assessment upgrade process. This upgrade was conducted by Principle 1 expert, Sandy Morison, during the 3rd year surveillance audit. Surveillance audit meetings were conducted via remote calls to relevant people between June 11 and June 18, 2019. Both audit team members, Mr. Morison, and Mr. Meere participated in each call.

Summary of Findings

This report provides updated background information and the harmonized rationales and scores for each of the Performance Indicators (PIs) under Principle 1 (Stock status and Harvest strategy) of the MSC Standard. No PIs failed to reach the minimum Scoring Guidepost (SG) of 60, and the average scores for Principles 1 was above 80. The team originally issued scoring two issue-level conditions for each Unit of Certification for two different PIs that did not meet SG80 level. A Client Action Plan, detailed in Appendix 1.2., was produced to meet these original conditions.

In Principle 1 two of the PIs (1.2.1 and 1.2.2) received scores under SG80, these are related to the harvest strategy and the harvest control rule.

In this report we provide the harmonized rationales for all Principle 1 PIs.

4. Report Details

4.1 Authorship and peer review details

Audit Team

The original audit team was comprised of Dr. Robert J. Trumble and Dr. Max Stocker.

The audit team for the P1 harmonization and 3rd year surveillance audit consisted of:

Mr Alexander Morison, Lead auditor and Principle 1 and Principle 2 Expert

Mr. Frank Meere, Principle 3 Expert

The qualifications for the original audit team and the P1 upgrade team were:

Dr. Robert J. Trumble – MRAG – Team Lead

Dr. Robert J. Trumble (Assessment Team Leader) joined MRAG Americas in 2000 as a senior research scientist and became Vice President in 2005. He has wide-ranging experience in marine fish science and management, fishery habitat protection, and oceanography. Dr. Trumble serves as Certification Manager for MRAG. He has overseen all MRAG pre-assessments and full assessments. He has received MSC training on numerous occasions, including the Risk-based Framework, and has led an RBF on three occasions.

Previously, he served as Senior Biologist of the International Pacific Halibut Commission in Seattle, Washington, in various research and management positions at the Washington Department of Fisheries, and with the US Naval Oceanographic Office. Dr. Trumble has extensive experience working with government agencies, commercial and recreational fisheries groups, Indian tribes, and national and international advisory groups. He received appointments to the Scientific and Statistical Committees of the South Atlantic Fishery Management Council and the Pacific Fishery Management Council, the Groundfish Management Team of the North Pacific Fishery Management Council, the affiliate faculty of Fisheries at the University of Washington, and the Advisory Committee of the Washington Sea Grant Program. Dr. Trumble received a Ph.D. in Fisheries from the College of Fisheries, University of Washington.

Dr. Max Stocker - Stocker & Associates Consultants

Dr. Max Stocker is a scientist with over 30 years of extensive experience in fisheries science. He is currently the 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). He served as co-chair of the Stock Assessment Working Group of the Scientific Committee of the WCPFC and chaired the ISC Albacore

Working Group. 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.

Alexander (Sandy) Morison– Morison Aquatic Sciences – Principle 1 Expert and Team Lead

Mr. Morison is a consultant specializing in fisheries and aquatic sciences. He has over 30 years' experience in fishery science and assessment at state, national and international levels and has held senior research positions for state and national organizations in Australia. He is currently chair of the Ecologically Related Species Working Group of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) and has been engaged in the Kobe process for harmonization of measures across the tuna RFMOs.

Mr. Morison has considerable experience with issues of tuna and other pelagic species through various positions in addition to his current role with CCSBT. He was Australia's representative on the Science Working Group during the establishment of the South Pacific Regional Fisheries Management Organisation and was the inaugural chair of the Jack Mackerel Working Group during that time. He has also chaired Australia's East Coast Tuna and Billfish Resource Assessment Group.

Mr. Morison has participated as part of a team undertaking MSC pre-assessments for several fisheries and is also trained as a lead auditor for MSC assessments.

1. Heard Island and MacDonalld Islands Mackerel Icefish: Reassessments and surveillance audits (Principle 1).
2. Heard Island and MacDonalld Islands Patagonian toothfish: First assessment, reassessment and surveillance audits (Principle 1).
3. Lakes and Coorong Fishery (South Australia): Reassessments and surveillance audits (Principle 1).
4. Macquarie Island Patagonian toothfish fishery: First assessment, reassessment and surveillance audits (Principle 1).
5. Kyoto Danish Seine Fishery: Reassessment (Principle 1).
6. Western Rock Lobster Fishery: Surveillance audits and reassessment. (Principle 1)
7. PNA Western and Central Pacific unassociated purse seine fishery (skipjack tuna): Surveillance audits (Principle 1).
8. PNA Western and Central Pacific unassociated purse seine fishery (yellowfin tuna): Expedited assessment (Principle 1).

9. Northeastern Tropical Pacific purse seine yellowfin & skipjack tuna: first assessment (Principle 2).
10. Tri Marine Western and Central Pacific skipjack and yellowfin tuna: first assessment (Team leader, Principle 1 and Principle 2).
11. Peel-Harvey Inlet, blue swimmer crab and sea mullet fisheries (Principle 1).
12. Western Australia deep-sea crab fishery (Principle 1).
13. Australian pearl oyster fishery (Principle 1).
14. Pre-assessments of three other fisheries (confidential).

Mr. Morison was the facilitator for an assessment of the ecological risks from Queensland's East Coast Trawl Fishery that looked at the full range of ecological components. He was senior author of the report that synthesized background information and the results of an expert workshop and was a co-author of the summary and technical reports that described the results of the project. He was subsequently engaged to assist with an assessment of this fishery's vulnerability to climate change.

Sandy is also contracted by the Australian Fisheries Management Authority to chair the South East Fisheries Resource Assessment Group and the Shark Fisheries Resource Assessment Group, is the Scientific Representative on the South East Fishery Management Advisory Committee and is a member of the South East Scalefish and Shark Fishery Resource Assessment Group. He has also been the scientific representative on other Resource Assessment Groups. Sandy has experience with the assessment of invertebrate, chondrichthyan and teleost fisheries including commercial and recreational fisheries in freshwater, estuarine and marine habitats and fisheries operating in tropical, temperate and polar environments.

He has particular expertise with fish age and growth and has been involved in the development and implementation of harvest strategies for several fisheries. He has over 20 publications in peer-reviewed scientific journals (8 as senior author), 8 book chapters, and over 100 project reports, technical reports, client reports and papers in workshop and conference proceedings.

For more details visit: www.morisonagsci.com.au

Mr. Morison meets the team leader requirements laid out in FCRV2.0 Annex PC, Table PC1.

Peer Reviewers

There were no peer reviewers for this report as this fishery qualified for a reduced harmonization process (MSC variation response, Appendix A).

4.2 Version details

Table 2. Fisheries program documents versions

Document	Version number
MSC Fisheries Certification Process	Version 2.1
MSC Fisheries Standard	Version 2.01
MSC General Certification Requirements	Version 2.3
MSC Reporting Template	Version 1.1

5. Unit(s) of Assessment and Certification and results overview

5.1 Unit(s) of Assessment (UoA) and Unit(s) of Certification

5.1.1 Unit(s) of Assessment & Unit(s) of Certification

Table 3. Unit(s) of Assessment (UoA)

UoA	Description
Species	Skipjack Tuna (<i>Katsuwonus pelamis</i>)
Stock	Western and Central Pacific
Geographical area	The Main Group Archipelago (MGA) and Exclusive Economic Zone (EEZ) of the Solomon Islands
Harvest method / gear	Purse seine: Free school sets, unassociated with fish aggregating devices (FADs; WCPFC definition – See Box below) ¹ Purse seine sets associated with anchored fish aggregating devices (FADs) Pole and line
Client group	Tri Marine International Pte. Ltd., on behalf of National Fisheries Developments, Ltd. (NFD). Only NFD vessels will be eligible.
Other eligible fishers	NA
UoA	Description
Species	Yellowfin Tuna (<i>Thunnus albacares</i>)
Stock	Western and Central Pacific
Geographical area	The Main Group Archipelago (MGA) and Exclusive Economic Zone (EEZ) of the Solomon Islands

¹The assessment team evaluated all unassociated sets as determined in the SPC observer database, which are classified as either unassociated or feeding on bait fish **at the beginning of the set**. The Unit of Certification, and product eligible to carry label, is determined by a more restrictive definition of “unassociated” given in detail in the box below, whereby sets are determined to be unassociated, based on the verified absence of aggregating devices, **at the end of the set**.

Harvest method / gear	Purse seine: Free school sets, unassociated with fish aggregating devices (FADs; WCPFC definition – See Box below) ² Purse seine sets associated with anchored fish aggregating devices (FADs) Pole and line
Client group	Tri Marine International Pte. Ltd., on behalf of National Fisheries Developments, Ltd. (NFD). Only NFD vessels will be eligible.
Other eligible fishers	NA

Six Units of Certification have been identified as follows:

1. Pole and line fishery, yellowfin target stock, NFD vessels
2. Pole and line fishery, skipjack target stock, NFD vessels
3. Purse Seine fishery, yellowfin target stock, NFD vessels, unassociated sets
4. Purse seine fishery, skipjack target stock, NFD vessels, unassociated sets
5. Purse Seine fishery, yellowfin target stock, NFD vessels, anchored FAD sets
6. Purse seine fishery, skipjack target stock, NFD vessels, anchored FAD sets

Note: Although the purse seine fishery also sets on drifting FADs and logs, these will not be assessed.

This fishery has been found to meet scope requirements (FCP v2.1 7.4) for MSC fishery assessments as it

- Does not operate under a controversial unilateral exemption to an international agreement, use destructive fishing practices, does not target amphibians, birds, reptiles or mammals and is not overwhelmed by dispute. (FCP 7.4.2.1, 7.4.2.2, 7.4.3, 7.4.5)
- The fishery does not engage in shark finning, has mechanisms for resolving disputes (FCP 7.4.5.1), and has not previously failed assessment or had a certificate withdrawn.
- Is not an enhanced fishery, is not based on an introduced species, and does not represent an inseparable or practically inseparable species (FCP 7.5.1, 7.5.2, 7.5.8-13)
- Does not overlap with another MSC certified or applicant fishery (7.5.14),
- And does not include an entity successfully prosecuted for violating forced labor laws (7.4.4)
- The Unit of Assessment, the Unit of Certification, and eligible fishers have been clearly defined, traceability risks characterized, and the client has provided a clear indication of their position relative to certificate sharing (7.5.1-7.7.7).

Definition of a FAD

The definition of a FAD to be used for this Certification follows that used by the WCPFC which has been developed as part of CMMs specifying FAD closure periods. CMM 2008-01 states that *“For the purposes of these measures, the term Fish Aggregation Device (FAD) means any man-made device, or natural floating object, whether anchored or not, that is capable of aggregating fish.”*

This was expanded upon in CMM 2009-02 in defining the Rules for FAD Closures:

“The definition of a FAD in footnote 1 to CMM 2008-01 shall be interpreted as including:

‘any object or group of objects, of any size, that has or has not been deployed, that is living or non-living, including but not limited to buoys, floats, netting, webbing, plastics, bamboo, logs and whale sharks floating on or near the surface of the water that fish may associate with’

3. *During the FAD closure period specified in CMM 2008-01, no purse seine vessel shall conduct any part of a set within one nautical mile of a FAD. That is, at no time may the vessel or any of its fishing gear or tenders be located within one nautical mile of a FAD while a set is being conducted.*
4. *The operator of a vessel shall not allow the vessel to be used to aggregate fish, or to move aggregated fish including using underwater lights and chumming.*
5. *A FAD and/or associated electronic equipment shall not be retrieved by a vessel during the period of a FAD closure unless:*
 - a. *the FAD and/or associated electronic equipment are retrieved and kept on board the vessel until landed or until the end of the closure; and*
 - b. *the vessel does not conduct any set either for a period of seven (7) days after retrieval or within a fifty (50) mile radius of the point of retrieval of any FAD.*
6. *In addition to paragraph 6, vessels shall not be used to operate in cooperation with each other in order to catch aggregated fish. No vessel shall conduct any set during the prohibition period within one nautical mile of a point where a FAD has been retrieved by another vessel within twenty four (24) hours immediately preceding the set.*

Codes to implement the above definition and to be used by observers to classify set types are listed in the WCPFC Regional Observer Program Minimum Standard Data Fields document (www.wcpfc.int/system/files/Table-ROP-data-fields-instructions.pdf). For *“Purse seine free school association (tuna)”* these may be either *“unassociated”* or *“feeding on bait fish”*. Purse seine associated school associations (i.e. FAD sets) include sets on *“Drifting log, debris, dead animal; drifting raft; anchored raft; live whales/marine mammals; live whale shark; other floating object”*.

Set types are recorded by observers at the time a set commences but, on hauling, a whale shark or other object may be found to have been associated with the school. This occurs apparently because *“the whale shark may be not visible at the time of setting and so the set is recorded as another set type (e.g. unassociated, feeding on baitfish)”*. Subsequently, the observer discovers the animal in the net during the brailing process, and records it as an interaction” (WCPFC8 - 2011-IP-01 (rev. 1)).

For the purposes of this assessment, such functionally associated hauls, discovered at the end of the set, are defined *post hoc* to be associated and therefore may not be within the Unit of Certification, or carry the MSC ecolabel, regardless of the set type initially recorded by an observer.

5.2 Assessment results overview

5.2.1 Determination, formal conclusion and agreement

The fishery attained a score of 80 or more against each of the MSC Principles and did not score less than 60 against any Indicators. The assessment team has concluded that the Solomon Islands Skipjack and Yellowfin Tuna fisheries (as defined in this report) should therefore be certified according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries.

Following this Recommendation of the assessment team, and review by stakeholders and peer-reviewers, a determination is hereby made by the MRAG Americas Certification Decision Making Process to certify the Solomon Islands Pole and Line, Free School, and Anchored FAD Fisheries for Skipjack and yellowfin Tuna according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries.

The P1 harmonization upgrade was conducted concurrently with the surveillance audit. Per the variation request process (Appendix B), the Harmonization report is included as an appendix to the 3rd year surveillance audit.

5.2.2 Principle level scores

5.2.3 Summary of conditions

Table 4. Summary of conditions as of the third year surveillance audit

Condition number	Condition	Performance Indicator (PI)	Status	PI original score	PI revised score
1	By the first re-assessment surveillance audit (2022), demonstrate that the harvest strategy for Skipjack Tuna 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	1.2.1 Skipjack	On target	70	Not revised
2	SI a) By the first re-assessment surveillance audit (2022), demonstrate that well defined HCRs are in place for Skipjack Tuna that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY. SI b) By the first re-assessment surveillance audit (2022), provide evidence that the selection of the harvest control rules for Skipjack Tuna are robust to the main uncertainties. SI c) By the first re-assessment surveillance audit (2022), provide evidence that indicates that the	1.2.2 Skipjack	On target	60	Not revised

	tools in use for Skipjack Tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules.				
3	By the first re-assessment surveillance audit (2022), demonstrate that the harvest strategy for Yellowfin Tuna 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	1.2.1 Yellowfin	On target	70	Not revised
4	SI a) By the first re-assessment surveillance audit (2022), demonstrate that well defined HCRs are in place for Yellowfin Tuna that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY. SI b) By the first re-assessment surveillance audit (2022), provide evidence that the selection of the harvest control rules for Yellowfin Tuna are robust to the main uncertainties. SI c) By the first re-assessment surveillance audit (2022), provide evidence that indicates that the tools in use for Yellowfin Tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	1.2.2 Yellowfin	On target	60	Not revised
5	By the third surveillance, the fishery client shall demonstrate that documented explanations provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity are made available on request to interested stakeholders.	3.2.2 Decision making	Closed at 1 st surveillance	75	80
6	By the second surveillance audit of the reassessment, provide evidence that the management system includes consultation processes that regularly seek and accept relevant information from a range of sources, including local knowledge. Additionally, the national management system demonstrates consideration of the information obtained.	PI 3.1.2 Management system	New Condition	95	75
7	SI b) By the second surveillance audit of the reassessment, provide evidence that decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a	PI 3.2.2 Decision making	New Condition	75 80*	75

	<p>transparent, timely and adaptive manner and take account of the wider implications of decisions.</p> <p>SI d) By the second surveillance audit of the reassessment, provide evidence that Information on the fishery's 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.</p>				
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7. Scoring

7.1 Summary of Performance Indicator level scores

Table 5. Summary of Performance Indicator Scores and Associated Weights Used to Calculate Principle Scores for UoA 1 Skipjack Tuna (SKJ) and UoA 2 Yellowfin Tuna (YFT).

Principle	Component	Wt	Performance Indicator (PI)		Wt	SKJ	YFT
One	Outcome	0.333	1.1.1	Stock status	1.0	100	90
			1.1.2	Stock rebuilding	0.0	N/A	N/A
	Management	0.667	1.2.1	Harvest strategy	0.25	70	70
			1.2.2	Harvest control rules & tools	0.25	60	60
			1.2.3	Information & monitoring	0.25	90	90
			1.2.4	Assessment of stock status	0.25	95	95

Table 6. Principle level scores

Principle	UoA 1 Skipjack	UoA 2 Yellowfin
Principle 1 – Target species	85.83	82.50

7.1.1 Principle 1 background

Skipjack Tuna (*Katsuwonus pelamis*)

Distribution: Skipjack are found mainly in the tropical areas of the Atlantic, Indian and Pacific Oceans. Their geographic limits are 55-60° N and 45-50° S, with the greatest abundance seen in equatorial waters, being roughly limited to a 20°C surface isotherm (Hoyle et al., 2011). In the western Pacific, warm, pole ward-flowing currents near northern Japan and southern Australia seasonally extend their distribution to 40°N and 40°S (Rice et al. 2014).

Skipjack in the Western and Central Pacific Ocean are considered to comprise one stock for assessment and management purposes. A substantial amount of information on skipjack movement is available from tagging programs, which have documented some large-scale movement within the Pacific (Figure 1). In general, skipjack movement is highly variable (Sibert et al., 1999) but is thought to be influenced by large-scale oceanographic variability (Lehodey et al. 1997). Skipjack Tuna are also classified as a ‘highly migratory species’ and are listed as such in Annex I of UNCLOS. Analyses of the tagging data have, however, indicated that the median lifetime displacement of skipjack ranges from 420 to 470 nautical miles (Sibert and Hampton 2003). Other studies (Hoyle et al. 2011, Lehody et al. 2011) also indicate that mixing rates appear to be fairly restricted, particularly between the equatorial and sub-tropical/temperate North Pacific.

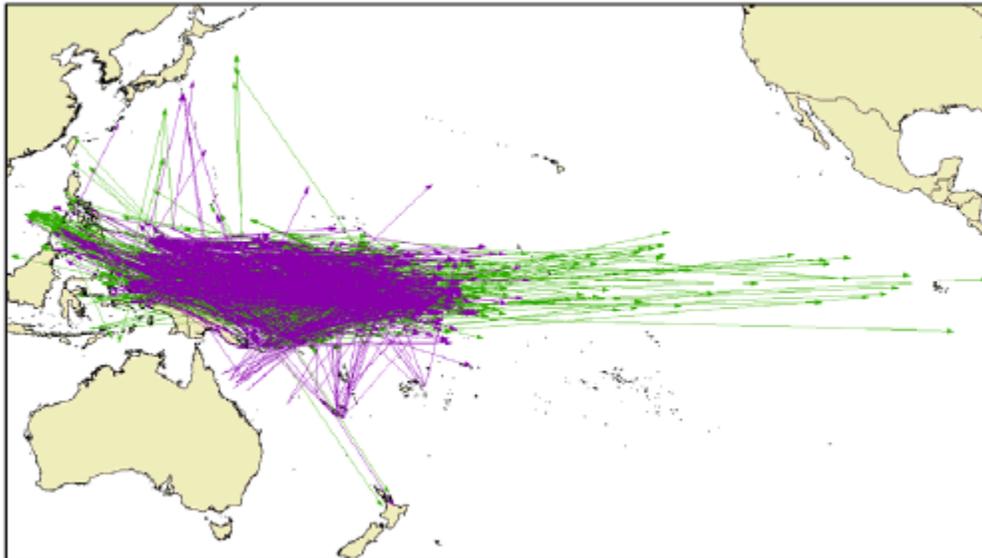


Figure 1. Released and recaptured skipjack from the Regional Tuna Tagging Program (purple arrows) and Pacific Tuna Tagging Program (green arrow) tagging programs. Only recaptures >1,000 nautical miles shown (from Rice et al. 2014).

Biology: Skipjack are the smallest of the major commercial tuna species, generally not exceeding 20 kg. They form both free schools and schools associated with FADs or other floating objects. Monthly observer sampling of the catch indicates that, when fished as surface schooling adults, they are typically caught at

30 – 70 cm and 2-5 kg in size (Williams and Terawasi 2015). Depth distribution ranges from the surface to about 260 m during the day, but is limited to near surface waters at night.

Skipjack Tuna feed on fishes, crustaceans, cephalopods and mollusks; cannibalism is common. They are preyed upon by large pelagic fishes and sharks. Skipjack Tuna are not a Low Trophic Level species. Their trophic level is reported in Fishabase.org has been estimated at 4.4 (± 0.5 se).

Skipjack Tuna reach maturity at about 40 cm fork length (FL) and within their first year. They spawn in batches throughout the year in equatorial waters, and from spring to early fall in subtropical waters, with the spawning season becoming shorter as distance from the equator increases. Fecundity increases with size but is highly variable, the number of eggs per season in females of 41 to 87 cm fork length ranging between 80 000 and 2 million. For the Skipjack Tuna stock assessment, maturity and fecundity at size were not included in the maturity parameter, so in this assessment the term ‘spawning biomass’ refers to the biomass of adult fish (age >3 years), rather than spawning potential as in other tuna stock assessments (Rice et al. 2014).

Skipjack growth is rapid compared to yellowfin and bigeye tuna. In the Pacific, approximate age estimates from counting daily rings on otoliths suggest that growth may vary between areas. At 150, 200, 300 and 400 days, fork lengths (FLs) of 30, 33, 40, and 46 cm were estimated for fish sampled mostly in the north Pacific (Tanabe et al. 2003), but growth estimates were faster (42, 47, 55, and 60 cm) for fish sampled close to the equator (Leroy 2000). Growth has been found to vary spatially in the eastern Pacific (Maunder 2001) and in the Atlantic (Gaertner et al., 2008), based on analyses of tagging data.

Estimates of natural mortality rate have been obtained using a size-structured tag attrition model (Hampton 2000), which indicated that natural mortality was substantially larger for small skipjack (21-30 cm FL, $M=0.8$ mo⁻¹) compared to larger skipjack (51–70 cm FL, $M=0.12-0.15$ mo⁻¹). The longest period at liberty for a tagged skipjack was 4.5 years. Skipjack Tuna reach sexual maturity at about 40 cm FL.

Stock assessments and stock status:

Stock assessments for Skipjack Tuna have been conducted regularly since 2000. Furthermore, an independent review of the 2011 bigeye tuna assessment (Ianelli et al., 2012) had several recommendations for improvement that apply equally to the skipjack assessment, and these have been incorporated into the current assessment wherever possible. The assessment model uses MULTIFAN-CL and is based mainly on catch and effort data for various fleets, size data and tagging data.

The main conclusions of the 2014 stock assessment (Rice et al., 2014) were as follows:

- A fluctuating but consistently high level of recruitment since the early 1970s has supported a robust fishery in all regions. The analysis suggests that the regional declines in spawning potential, in all regions except region 1, are being driven primarily by the fishing impacts. Although the ratio of exploited to unexploited spawning potential is estimated to have declined,

with some fluctuations, throughout the model period, the average total biomass of the last five years is estimated to be above the average total biomass of the first five years of the model.

- Latest catches slightly exceed MSY ($C_{\text{latest}}/MSY = 1.08$).
- Fishing mortality for adult and juvenile Skipjack Tuna is estimated to have increased continuously since the beginning of industrial tuna fishing, but fishing mortality still remains below the level that would result in the MSY ($F_{\text{current}}/F_{MSY} = 0.62$).
- Recent levels of spawning potential are well above the level that will support the MSY.
- The estimated 2011 level of spawning potential represents approximately 52% of the unfished level, and is well above the limit reference point (LRP) of 20%SBF=0 agreed by WCPFC.
- Recent levels of spawning potential are in the middle of the range of candidate biomass related target reference points (TRPs) currently under consideration for Skipjack Tuna, i.e., 40-60% SBF=0.
- Stock status conclusions were most sensitive to alternative assumptions regarding steepness and growth. However, the main conclusions of the assessment are robust to the range of uncertainty that was explored.

Results are also summarized in Figure 2, Figure 3, Figure 5, Figure 4, Figure 5 and Figure 6.

The stock assessment has also considered the potential impact of some fleets changing their reporting practices mentioned above such that some searching days are reported as non-fishing transit days. “This practice essentially represents effort creep and we have not yet specifically corrected recent data to ensure consistency of reporting. Therefore the impact of this is not known, but it will be minimized by the practice of estimating frequent time-based changes in catchability.” (Rice et al, 2014). The issue was not identified as a major source of uncertainty for the assessment.

The assessment is undertaken by the Oceanic Fisheries Program (OFP) of the Secretariat for the Pacific Community (SPC) as the scientific advisory body for the WCPFC. It uses MULTIFAN-CL which is an integrated statistical modelling framework that with a large degree of flexibility as to which model components are fixed or estimated (including biological parameters, fishery characteristics and variances).

Draft results of assessments are submitted to the meeting of the Scientific Committee (SC) for discussion and review by members, after which it is revised and a final report presented to the WCPFC plenary, usually held in December.

The assessment reports contain descriptions of structural assumptions, model parameterization and priors. These have been progressively developed over the years and the latest report generally only contains details of changes to these assumptions which may be more fully described in earlier versions. For the latest assessment (Rice et al. 2014), there were six main differences in the input data and structural assumptions compared to the reference case from the previous, 2011 assessment:

- i. Updated catch, size and tagging data to the end of 2012.
- ii. Expanded the number of regions from 3 to 5.

- iii. An additional 5 fisheries added to accommodate the 5 region structure, bringing the number to 23 from 18.
- iv. Updated CPUE indices derived from operational catch and effort data from Japanese pole-and-line fisheries.
- v. Set-based weighting of purse-seine length frequency samples to enhance representativeness of these data.
- vi. Exclusion of the four terminal spatially-aggregated recruitment deviates from the parameter estimation process.

The impacts of each of these changes were examined in a stepwise development towards a new reference case model.

In addition to the reference case, a wide range of other model formulations were examined. The key uncertainties identified concerned the assumed steepness of the stock-recruitment relationship, the growth curve, the weighting of length samples and the tag mixing period. A grid of 36 combinations of the following factors: the steepness of the SRR (0.65, 0.80, or 0.95), and the growth model (2010 estimate, growth re-estimated or fixed growth curve externally estimated), and sample size weighting (20, 50), mixing period (1, 2 quarters). A separate model was run for each of the combinations in the grid.

A retrospective analysis has also been undertaken for the assessment, which involves rerunning the model after consecutively removing successive years of data to estimate model bias. The results of the retrospective analyses were the basis of a modification to the reference case whereby recruitment deviates for the last four quarters were not estimated and a better reference point developed for spawning potential depletion (the most recent year of the assessment).

For Skipjack Tuna an alternative model formulation was also explored using age- and season-specific movement rates based on the ecosystem model SEAPODYM (Lehodey et al, 2001) to test the plausibility of using ecosystem model output in the place of internal estimation. The use of the SEAPODYM movement parameters greatly degraded the likelihood and so this model was not included in the uncertainty grid described above.

As noted above, draft stock assessments are reviewed by the SC, which includes scientists from member countries. These are external to SPC, the agency undertaking the assessments, but are part of the internal WCPFC processes and we do not consider that this review constitutes an external review as intended by MSC requirements.

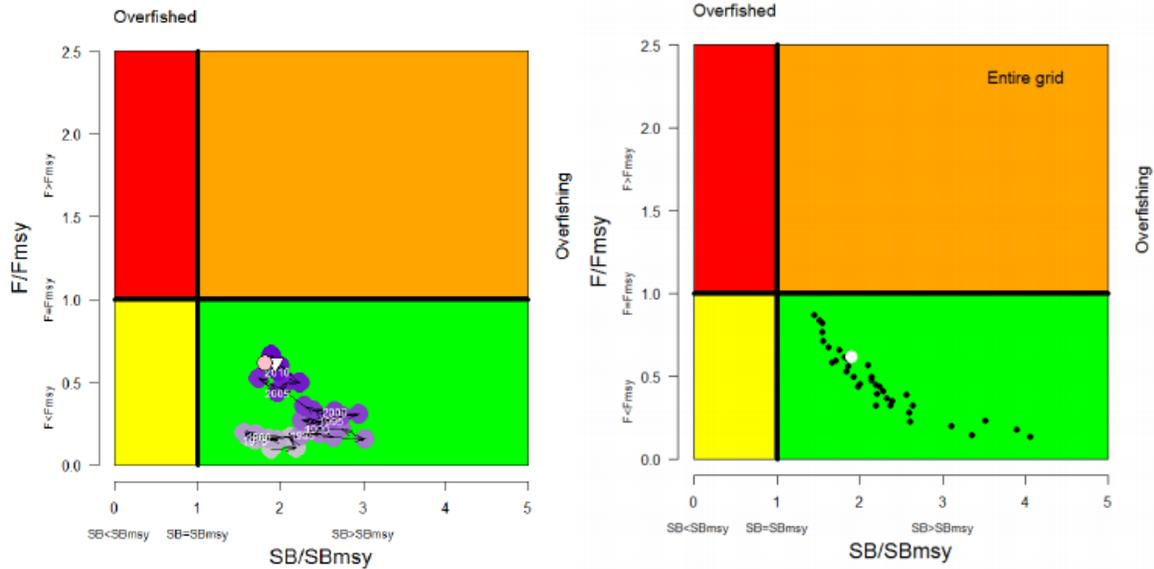


Figure 2. Left: Temporal trend in annual stock status of Skipjack Tuna, relative to SB_{MSY} (x-axis) and F_{MSY} (y-axis) reference points, for the period 1972-2011 from the reference case. The colour of the points is graduated from mauve to dark purple through time and the points are labelled at 5-year intervals. The white triangle (obscured behind pink circle) represents the average for the current (2008-2011) period and the pink circle the latest period (2011). Right: Summary of the latest stock status (2011) for the reference case (white dot) and the entire grid of sensitivities that were explored (from Rice et al. 2014).

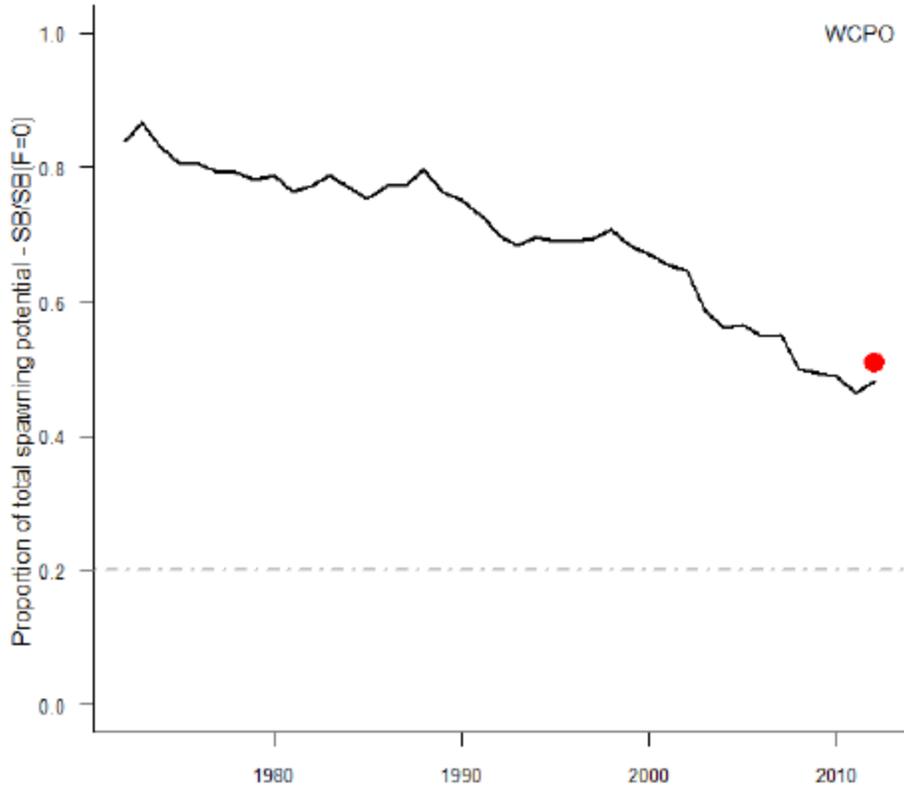


Figure 3. Ratio of exploited to unexploited spawning potential of Skipjack Tuna for the WCPO for the reference case. The current WCPFC limit reference point of $20\%SB_{F=0}$ is provided for reference as the grey dashed line and the red circle represents the level of spawning potential depletion based on the agreed method of calculating $SB_{F=0}$ over the last ten years of the model (excluding the last year) (from Rice et al. 2014).

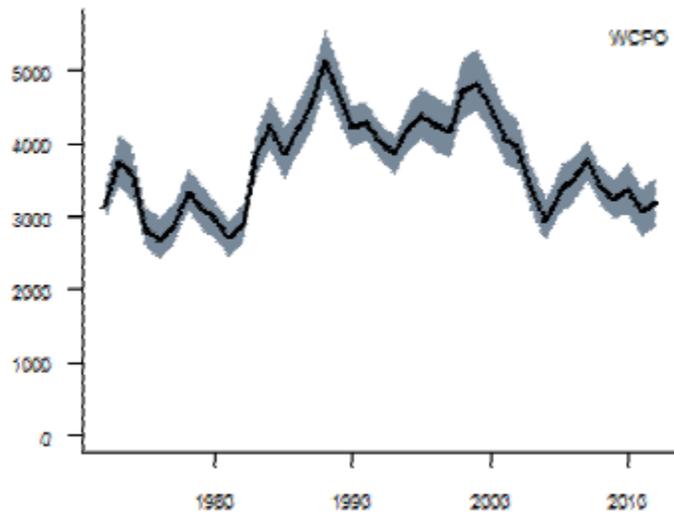


Figure 4. Estimated annual average spawning potential for the WCPO for the reference case. The shaded areas indicate the approximate 95% confidence intervals (from Rice et al. 2014).

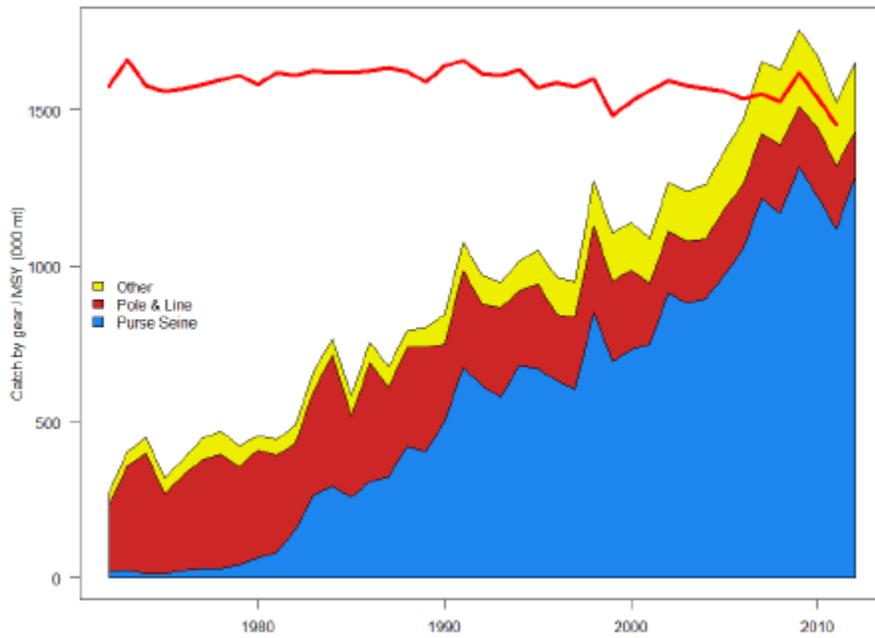


Figure 5. Skipjack Tuna: History of the annual estimates of MSY (red line) compared with annual catch split into three sectors for the reference case (from Rice et al. 2014).

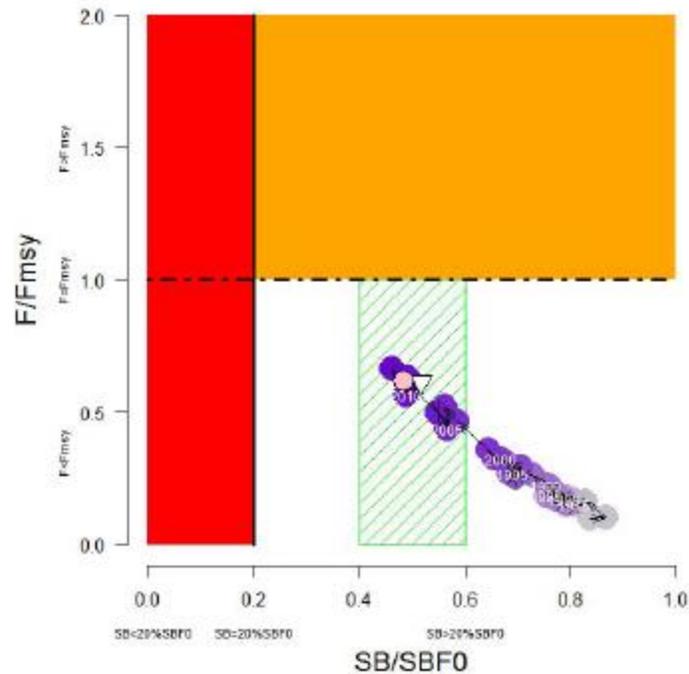


Figure 6. Skipjack Tuna: An alternative representation of stock status of Skipjack Tuna as a potential step towards displaying stock status with target and limit reference points. The red zone represents spawning potential levels lower than the agreed limit reference point which is marked with the solid black line. The orange region is for fishing mortality greater than FMSY ($F=FMSY$ is marked with the black dashed line). The lightly shaded green rectangle covering 0.4-0.6 $SBF=0$ is the 'space' that WCPFC has asked for consideration of a TRP for skipjack. The white triangle represents the average for the current period (2008-2011) and the pink circle the latest period (2011) (from Rice et al. 2014).

History of fishing and management:

The spatial distribution of catches in the WCPO over the past ten years is provided in Figure 7, and a regional breakdown by major gear category by year is provided in Figure 8. It is noteworthy that archipelagic waters, which include the Solomon Islands Main Group Archipelago, are not within the Convention Area, in line with UNCLOS declaring archipelagic waters to be under sovereign state control. However, WCPFC members with archipelagic waters (i.e., Solomon Islands, PNG) are required to implement compatible measures or, if measures are adopted in areas under national jurisdiction, they must not undermine the effectiveness of measures adopted by the Commission under its Convention in respect to the same stocks (WCPFC, 2000, Article 8 (3)).

Catches in the northern region are highly seasonal, as are the domestic pole-and-line fisheries operating in the regions 2 and 3 (see Figure 17 for location of regions). A number of significant trends in the fisheries have occurred over the model period, specifically:

- The development of the Japanese offshore purse seine fishery in region 1 since the mid-1990s;
- The virtual cessation of the domestic pole-and-line fisheries in Papua New Guinea and Fiji and the recent low catches from the Solomon Islands fishery;

- The general decline in the Japanese distant-water pole-and-line fisheries in the equatorial regions, particularly region 3;
- The development of the equatorial purse-seine fisheries from the mid-1970s and the widespread use of FADs since the mid-1990s, allowing an expansion of the purse-seine fishery in region 3;
- Large changes in the purse seine fleet composition and increasing size and efficiency of the fleet.
- The steady increase in catch for the domestic fisheries of Indonesia and the Philippines.

Skipjack Tuna were not included in the earlier tuna specific Conservation and Management Measures (CMMs) passed by the WCPFC because there were no concerns about the status of the species. They were first included in CMM 2012-01 and have been included in the later iterations of this CMM – CMM 2013-01 and 2014-01. CMM 2014-01 deals with skipjack, yellowfin and bigeye tuna and includes the following requirements for purse seine effort control:

Exclusive Economic Zones

20. Coastal States within the Convention Area that are Parties to the Nauru Agreement (PNA) shall restrict the level of purse seine effort in their EEZs to 2010 levels through the PNA Vessel Days Scheme (VDS).

21. CCMs shall support the ongoing development and strengthening of the PNA VDS including implementation and compliance with the requirements of the VDS as appropriate.

22. Other coastal States within the Convention Area with effort in their EEZs exceeding 1,500 days annually over the period 2006-2010 shall limit effort in their EEZs to 2001-2004 average or 2010 levels.

23. Other coastal States within the Convention Area other than those referred to in paragraph 20 and paragraph 22 shall establish effort limits, or equivalent catch limits for purse seine fisheries within their EEZs that reflect the geographical distributions of skipjack, yellowfin, and bigeye tunas, and are consistent with the objectives for those species. Those coastal States that have already notified limits to the Commission shall restrict purse seine effort and/or catch within their EEZs in accordance with those limits.

High Seas purse seine effort limits

25. For 2015, non-SIDS CCMs shall restrict the level of purse seine effort on high seas to the limits indicated in Attachment D.7 The Commission shall review these limits at its meeting in 2015 and agree on high seas purse seine effort limits to apply after 2015.

26. Notwithstanding any agreement that may be reached at its annual meetings in 2014, 2015 and 2016 on high seas purse seine effort limits the total effort level for non-SIDS CCMs shall not exceed the total level of effort in Attachment D.

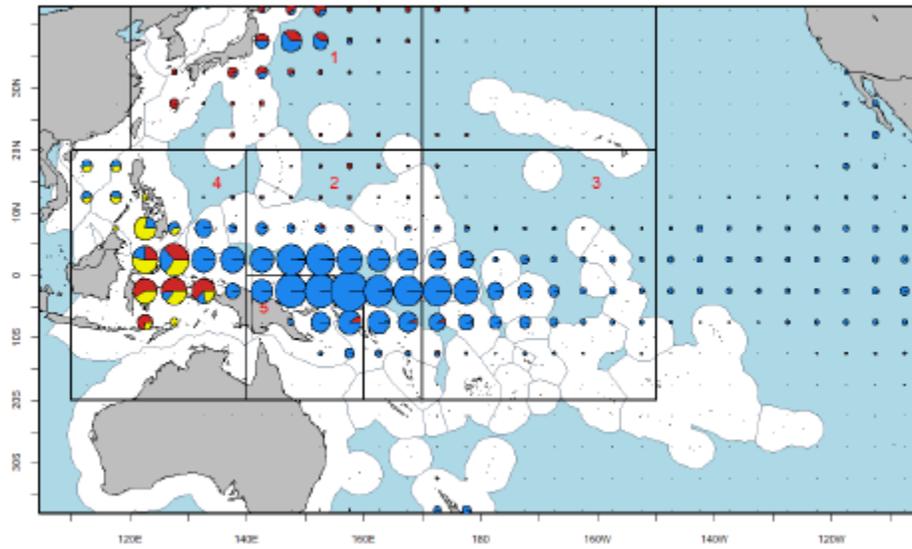


Figure 7. Catch distribution (2003-2012) of Skipjack Tuna by 5 degree squares of latitude and longitude and fishing method: longline (green), purse-seine (blue), pole-and-line (red), and other (yellow). Overlaid are the subregions for the assessment model. Note there is in fact no break at 170 E in Region 1 (from Rice et al. 2014).

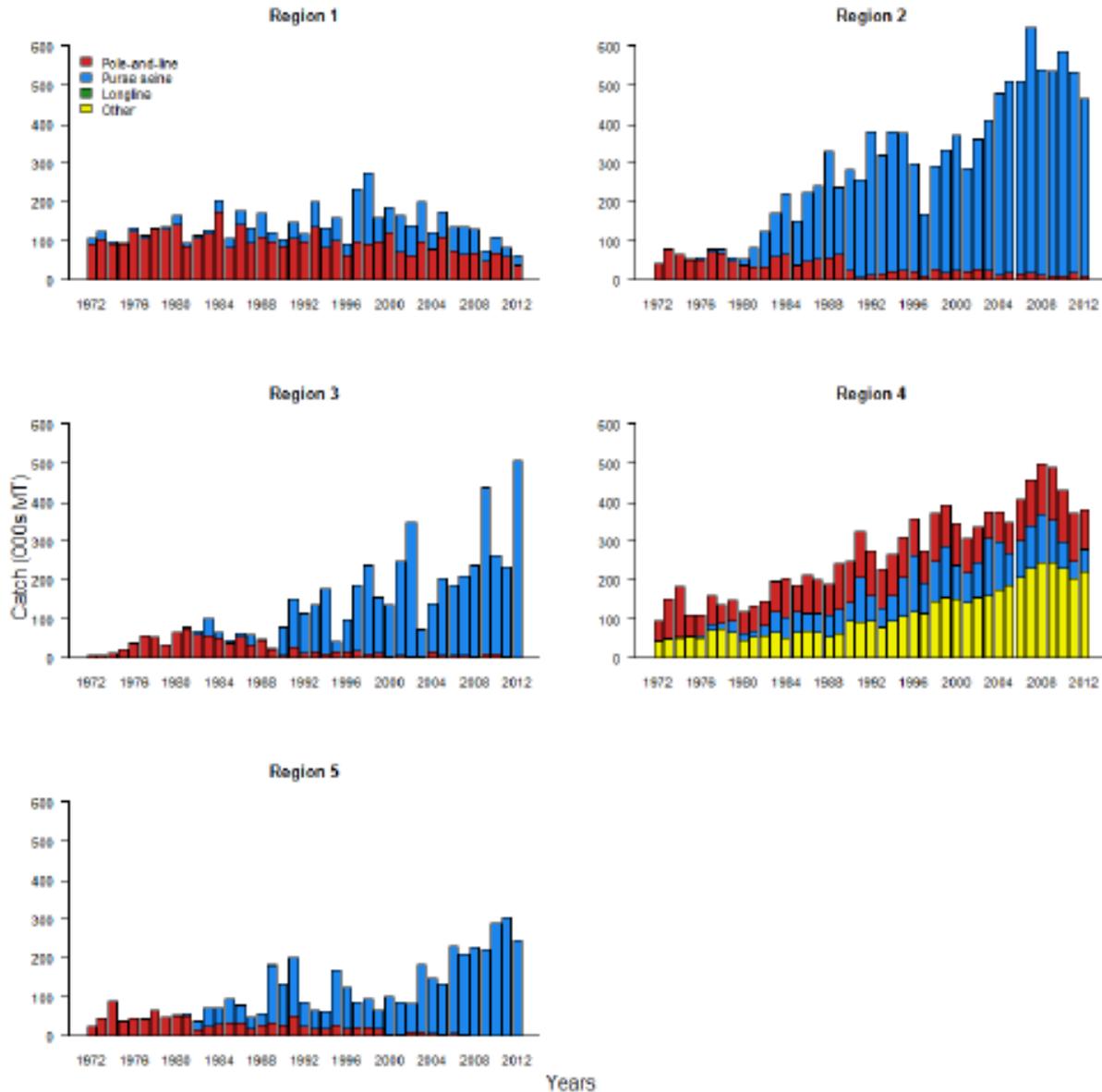


Figure 8. Total annual catch (1000s mt) of Skipjack Tuna by fishing method and assessment subregion from the 2014 assessment’s reference case model (from Rice et al. 2014). Regions are the same as shown in Figure 7.

Yellowfin Tuna (*Thunnus albacares*)

Distribution: Yellowfin Tuna are found worldwide in tropical and subtropical seas. The thermal boundaries of occurrence are roughly 18° and 31°C.

Although the distribution of Yellowfin Tuna in the Pacific is nearly continuous, lack of evidence for long-ranging east-west or north-south migrations of adults suggests that there may not be much exchange between the Yellowfin Tuna from the eastern and the central Pacific, nor between those from the

western and the central Pacific. This suggests the existence of subpopulations. There is a large amount of tagging data (1989-2012) which indicates extensive latitudinal movements among the equatorial regions but also a level of longitudinal movements to and from the sub-tropical latitudes (Figure 9). For the purpose of WCPFC yellowfin stock assessments, the stock within the domain of the model area (essentially the WCPO, west of 210°E, Figure 10) has been considered as a discrete stock unit (Davies et al. 2014).

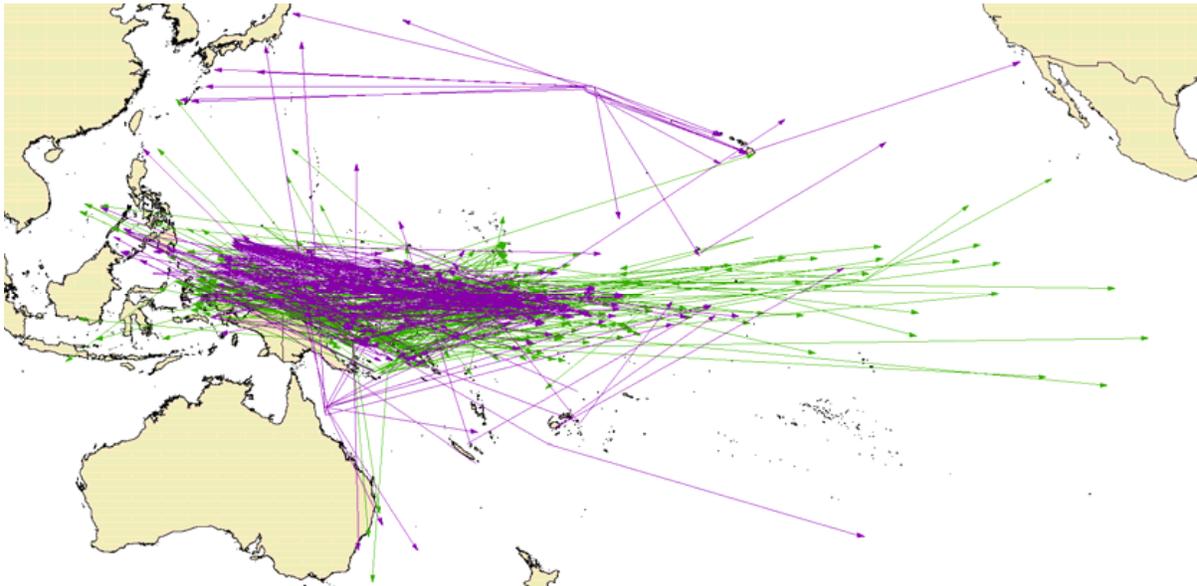


Figure 9. Long-distance (>1,000 nmi) displacements of tagged yellowfin in the Pacific Ocean from data available to SPC. The green arrows are data from the Pacific Tuna Tagging Programme (2008-current). The purple arrows are from earlier SPC tagging in the western Pacific (Regional Tuna Tagging Project, 1989-1992), the IATTC in the eastern Pacific and the University of Hawaii in the North Pacific around Hawaii (from Davies et al. 2014).

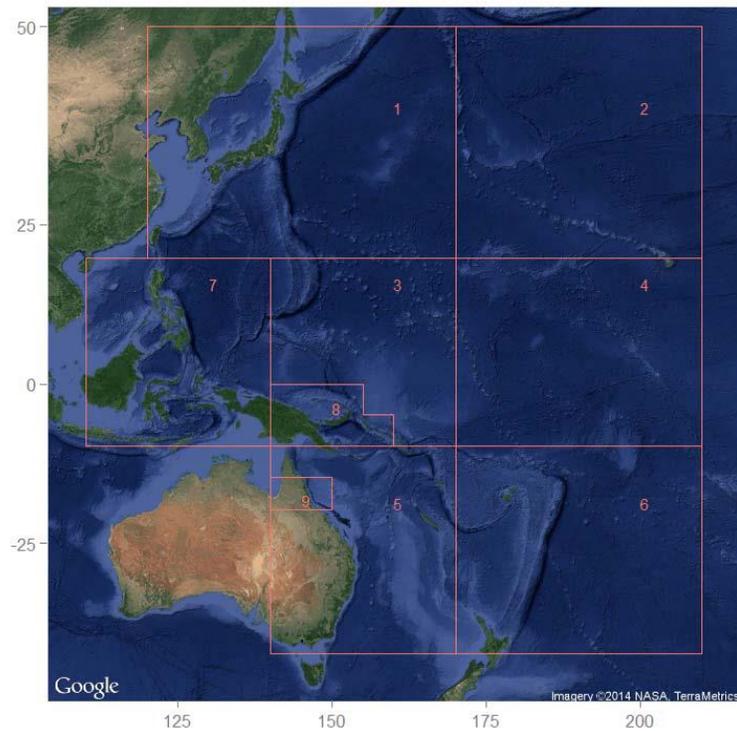


Figure 10. Yellowfin Tuna: Regional structure of the reference case model (from Davies et al. 2014).

Biology:

Yellowfin Tuna start to mature at 5 years of age but when information on sex ratios, maturity at age, fecundity, and spawning fraction are included, the reproductive output is found to peak between 10 and 15 years of age (Figure 11). Spawning occurs throughout the year in the core areas of distribution, but peaks are always observed in the northern and southern summer months respectively. Individuals may spawn every few days over the spawning period. Larval distribution in equatorial waters is transoceanic the year round but there are seasonal changes in larval density in subtropical waters.

Growth in length for Yellowfin Tuna is estimated to continue throughout their life (Figure 12). The estimated mean length of the final age-class is 153.4 cm but maximum fork length is over 200 cm.

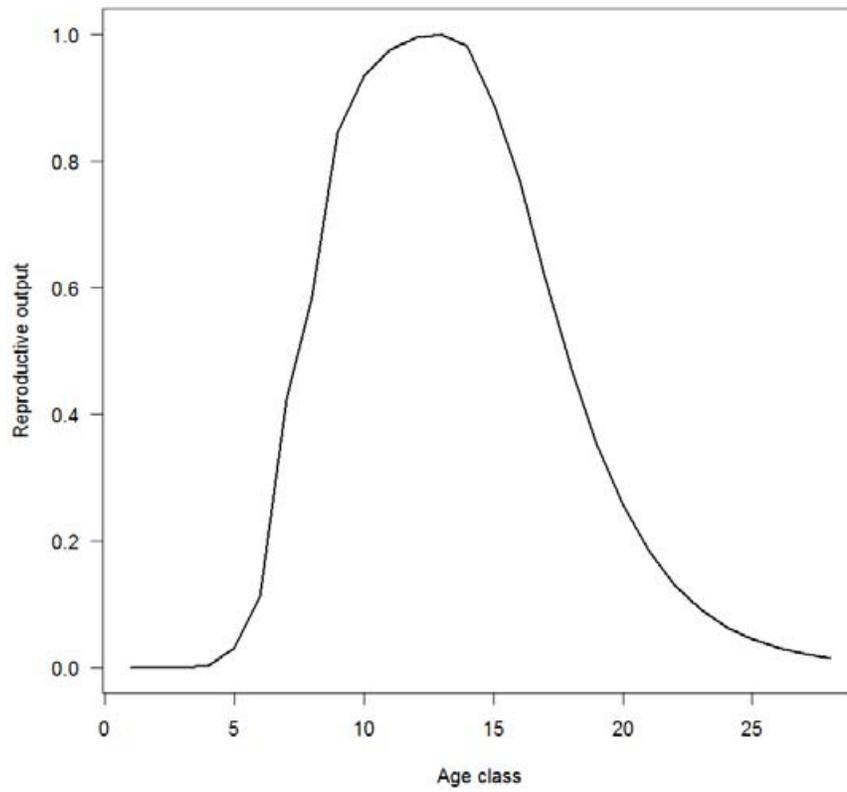


Figure 11. Yellowfin Tuna: Index of spawning potential incorporating information on sex ratios, maturity at age, fecundity, and spawning fraction (from Davies et al. 2014).

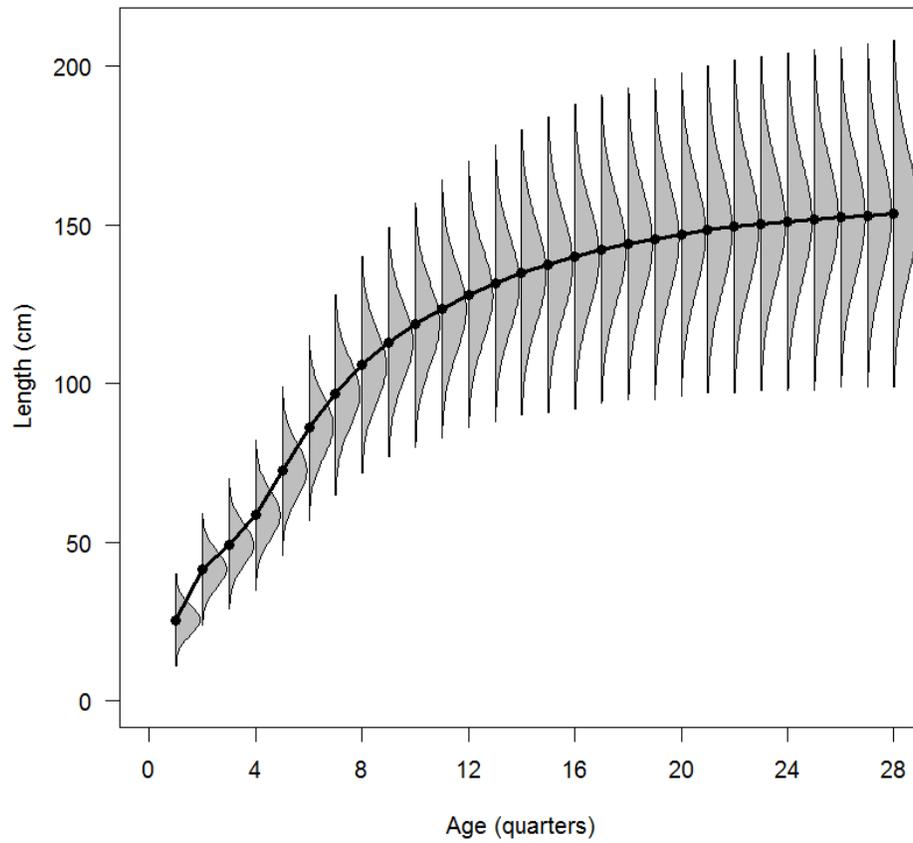


Figure 12. Yellowfin Tuna: Estimated growth for the reference case. The black line represents the estimated mean length (FL, cm) at age and the grey area represents the estimated distribution of length at age (from Davies et al. 2014).

Yellowfin Tuna feed on other fish, crustaceans and squid. Their trophic level has been estimated at 4.4 ± 0.4 se.

Natural mortality is estimated to vary with age and by sex. The generally increasing proportion of males in the catch with increasing size is assumed to be due to an increase in the natural mortality of females, associated with sexual maturity and the onset of reproduction. The assessment model used fixed externally-estimated values for natural mortality-at-age but also examined the sensitivity to estimating this during the model fitting process.

Stock assessments and stock status:

Stock assessments for Yellowfin Tuna have been conducted regularly and almost annually since 1999. Furthermore, an independent review of the 2011 bigeye tuna assessment (Ianelli et al., 2012) had several recommendations for improvement that apply equally to the yellowfin assessment, and these have been incorporated into the current assessment wherever possible. The assessment model uses MULTIFAN-CL and is based mainly on catch and effort data for various fleets, size data and tagging data.

The main conclusions of the 2014 stock assessment (Davies et al. 2014) were as follows:

1. The new regional structure appeared to work well for yellowfin, and in combination with other modelling and data improvements, provided a more informative assessment than in the past.
2. Spatially-aggregated recruitment was estimated to decline in the early part of the assessment, but there was no persistent trend post-1965.
3. There appeared to be confounding between the estimates of regional recruitment distribution and movement such that certain regions had very low recruitments. While adding complexity to the recruitment process of age 1 fish, this did not add to the uncertainty over the range of runs considered in this assessment.
4. Latest catches marginally exceeded the MSY ($C_{\text{latest}}/MSY = 1.04$).
5. Recent levels of fishing mortality were most likely below the level that will support the MSY ($F_{\text{current}}/F_{MSY} = 0.76$).
6. Recent levels of spawning potential were most likely above (based on 2008-11 average and based on 2012) the level which will support the MSY ($SB_{\text{current}}/SB_{MSY} = 1.37$, $SB_{\text{latest}}/SB_{MSY} = 1.29$).
7. Recent levels of spawning potential were most likely above (based on 2008-11 average and based on 2012) the limit reference point of 20%SBF=0 agreed by WCPFC.
8. Recent levels of spawning potential were most likely higher (by 1%, based on 2008-11 average) and lower than (by 2% based on 2012) the candidate biomass-related target reference points (TRPs) currently under consideration for Skipjack Tuna, i.e., 40-60%SBF=0.
9. Stock status conclusions were most sensitive to alternative assumptions regarding the modelling of tagging data, assumed steepness and natural mortality. However, the main conclusions of the assessment were robust to the range of uncertainty that was explored.

Results are also summarized in Figure 14, Figure 15, Figure 16, Figure 17, Figure 18 and Figure 19. There has been a substantial decline in the estimate of MSY since 1970s (Figure 17). Prior to this time, the WCPO yellowfin fishery was almost exclusively conducted using longlines, with a low exploitation of small yellowfin but the increased development of fisheries that catch younger yellowfin has reduced MSY levels (Davies et al. 2014).

The stock assessment has also considered the potential impact of some fleets changing their reporting practices mentioned above such that some searching days are reported as non-fishing transit days. “This practice essentially represents effort creep and we have not yet specifically corrected recent data to ensure consistency of reporting. Therefore, the impact of this is not known, but it will be minimized by the practice of estimating frequent time-based changes in catchability” (Davies et al. 2014). The issue was not identified as a major source of uncertainty for the assessment.

The assessment for yellowfin follows a similar process to that for skipjack described above: it is undertaken by SPC’s OFP, uses MULTIFAN-CL, draft results of assessments are submitted to the SC for discussion and review, and a final report presented to the WCPFC plenary. For yellowfin there was also a pre-assessment workshop that reviewed the main input data sets and provided recommendations regarding the range of assessment model options and sensitivities to be included within the stock assessment.

The assessment reports contain descriptions of structural assumptions, model parameterization and priors. These have been progressively developed over the years and the latest report generally only contains details of changes to these assumptions which may be more fully described in earlier versions. For the latest assessment (Davies et al. 2014), aside from updating the input data (catch, effort, size frequencies, and standardised CPUE derived from aggregate and operational data), there were five main differences in the input data and structural assumptions of the current (2014) assessment compared to the 2011 assessment

- i. Spatial structure was expanded from six to nine regions.
- ii. Fishery structure has been expanded from 25 to 33 fisheries; and features the first inclusion of some Japanese and Vietnamese coastal fishery catches and consequent revisions to the definition of WCPO fisheries.
- iii. Incorporation of CPUE indices derived from either Japanese logsheet data, or all operational data from all fleets (combined flags) available to SPC.
- iv. A revised protocol for deriving the length- and weight size compositions for the principal longline fisheries.
- v. The correction of the purse-seine length frequency data collected by observers to account for sampling bias and the inclusion of Pago Pago port sampling data, with all data weighted in respect of the set catch weight

The impacts of each of these changes were examined in a stepwise development towards a new reference case model.

In addition to the reference case a wide range of other model formulations were examined. The key uncertainties were identified and the effect of this uncertainty was explored through a grid of 48 combinations of model options:

- Tag mixing period: 2 different levels
- Steepness: Ref. Case (0.8), $h_{0.65}$ (0.65), $h_{0.95}$ (0.95)
- CPUE: 2 different series
- Size data weighting: 2 options
- Natural mortality: fixed values or estimated.

A separate model was run for each of the combinations in the grid.

A retrospective analysis has also been undertaken for the yellowfin assessment, which involves rerunning the model after consecutively removing successive years of data to estimate model bias. The results of the retrospective analyses were the basis of a modification to the reference case whereby recruitment deviates for the last four periods were not estimated.

As noted above, draft stock assessments are reviewed by the SC, which includes scientists from member countries. These are external to SPC, the agency undertaking the assessments, but are a part of the internal WCPFC processes and we do not consider that this review constitutes an external review as intended by MSC requirements.

The assessment team has also become aware of two reviews of the previous Yellowfin Tuna assessment (Haddon 2010 and Maguire 2010) which were commissioned by the USA through the Center for

Independent Experts (CIE). A response to these reviews was provided by SPC to SC7 (SPC-OFP 2011) but there was no reference to the findings of this review or the response in the latest stock assessment (Davies et al. 2014). There is, however, extensive consideration of the results of the review of the bigeye tuna assessment (Iannelli et al. 2012). The SPC response also notes that the review was not initiated by SPC or WCPFC and was conducted without the knowledge of SPC or any direct contact with SPC by either CIE or the reviewers.

History of fishing and management:

Total annual catches by major gear categories for the WCPO are shown in Figure 20 and a regional breakdown is provided in Figure 21. The spatial distribution of catches over the past ten years is provided in Figure 22. The catch identified as “other” is dominated by the domestic fisheries of the Philippines and Indonesia, principally catching smaller fish using a variety of small-scale gear types (e.g. pole-and-line, ringnet, gillnet, handline and seine net) but also including small to medium sized purse seines (Davies et al. 2014). The annual yellowfin tuna catch in the WCPO increased from 100,000 mt in the 1960s to about 550,000 mt in recent years (Figure 19). In 2008, a record catch of 650,000 mt was reported. The catch reported for 2012 was 612,797 mt; purse-seine catch was 61% of the total catch in 2012, while the longline fleet caught 16-20% of the annual catch in recent years. The remainder of the catch is dominated by the domestic fleets of the Philippines and Indonesia catching smaller fish with a variety of small scale gear (Davies *et al.*, 2014). Latest catches marginally exceed MSY (WCPFC, 2014a). Of this total catch, the Solomon Islands accounts for 15,000 to 20,000 mt of yellowfin annually (MRMR 2015), with the NFD fleet accounting for 10,000 to 15,000 m (Table 7).

Table 7: Total Tuna Catch - Solomon Islands Waters (Mt): 2011-2014 (Source: SPC Catch & Effort Database, 1 June 2015)

Gear Type & Flag	2011					2012					2013					2014				
	SKJ	YFN	BET	ALB	TOTAL	SKJ	YFN	BET	ALB	TOTAL	SKJ	YFN	BET	ALB	TOTAL	SKJ	YFN	BET	ALB	TOTAL
PS - SI Flag	16,686	7,900	933	0	25,520	17,115	8,854	531	0	26,500	15,608	8,381	763	0	24,752	20,908	19,117	646	0	40,670
PS - Foreign/Charter	104,703	21,474	4,135	0	130,312	36,421	8,097	1,485	0	46,003	62,962	17,537	2,737	0	83,237	40,063	25,222	1,571	0	66,855
PL - SI Flag	722	149	0	0	871	1,877	258	0	0	2,135	1,389	277	0	1,666	535	114	0	0	0	649
LL - Foreign/Charter	115	5,904	1,950	10,426	18,394	43	9,353	1,714	11,668	22,777	96	4,873	1,120	11,452	17,542	362	15,738	4,769	24,617	45,486
TOTAL	122,226	35,428	7,018	10,426	175,097	55,456	26,562	3,729	11,668	97,415	80,056	31,068	4,621	11,452	127,197	61,867	60,190	6,986	24,617	153,660

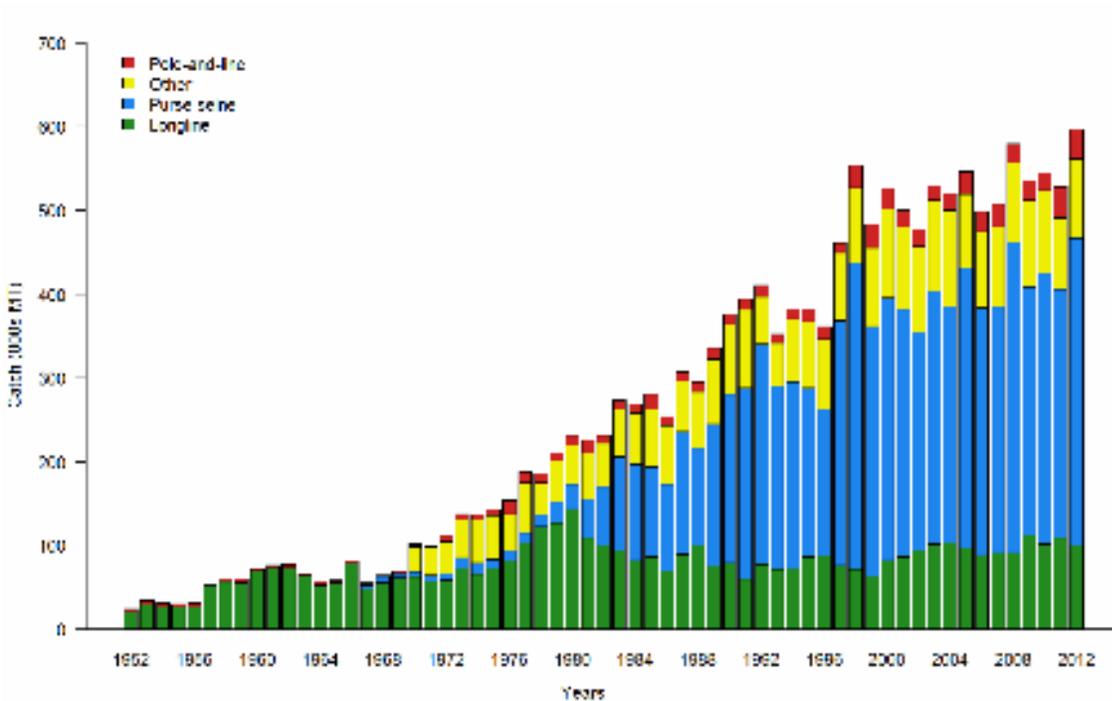


Figure 13: Total annual catch (1000s mt) by fishing gear from the reference case model (Davies et al., 2014).

Notes under Skipjack Tuna above about trends in the fisheries are also relevant to Yellowfin Tuna.

Yellowfin have been subject to the provisions of CMMs since CMM 2005-01 was passed which included the requirement that “CCMs shall take necessary measures to ensure that purse seine effort levels do not exceed either 2004 levels, or the average of 2001 to 2004 levels, in waters under their national jurisdiction, beginning in 2006.” The most recent measure is CMM 2014-01 and the purse seine effort control measures it contains are provided above under Skipjack Tuna.

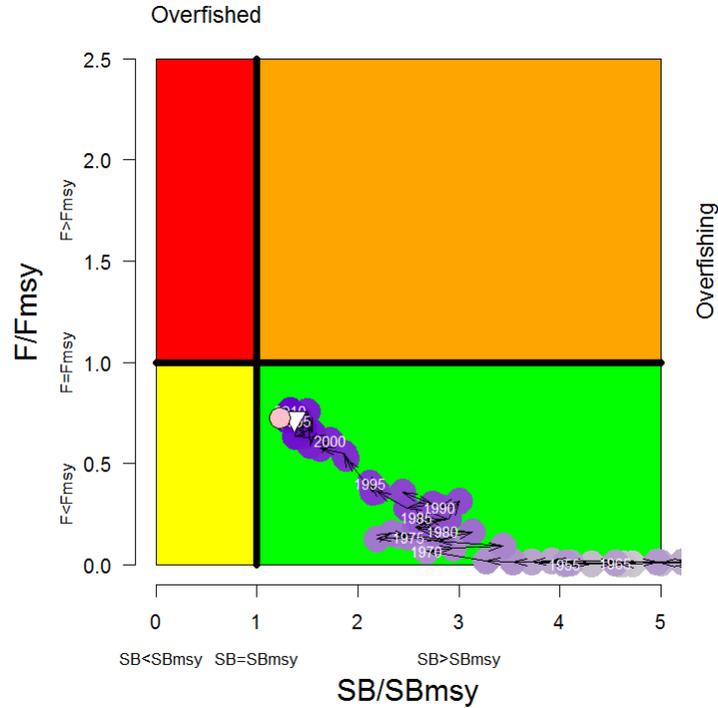


Figure 14. Yellowfin Tuna: Temporal trend in annual stock status, relative to SB_{MSY} (x-axis) and F_{MSY} (y-axis) reference points, for the period 1952–2011 from the reference case. The colour of the points is graduated from mauve to dark purple through time and the points are labelled at 5-year intervals. The white triangle represents the average for the current period and the pink circle the latest period (from Davies et al. 2014).

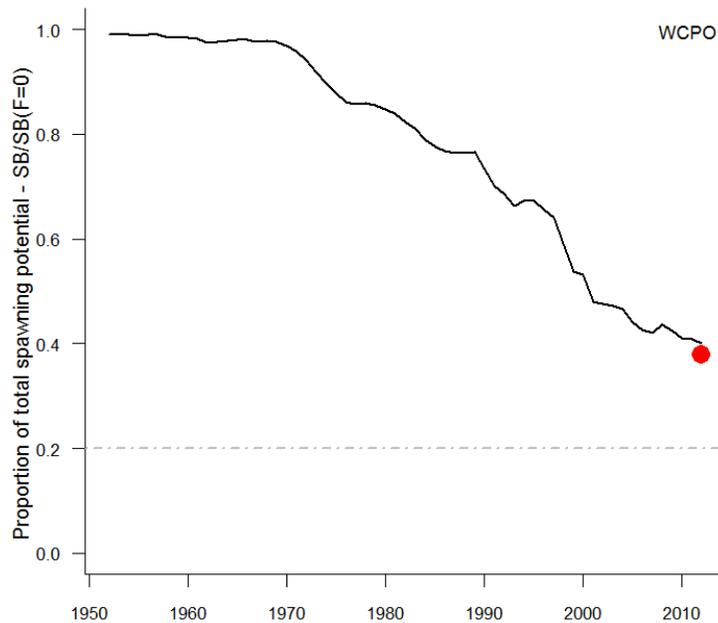


Figure 15. Yellowfin Tuna: Ratio of exploited to unexploited spawning potential, $SB/SB_{F=0}$, for the WCPO for the reference case. The current WCPFC limit reference point of $20\%SB_{F=0}$ is provided for reference as the grey

dashed line and the red circle represents the level of spawning potential depletion based on the agreed method of calculating $SB_{F=0}$ over the last ten years of the model (excluding the last year) (from Davies et al. 2014).

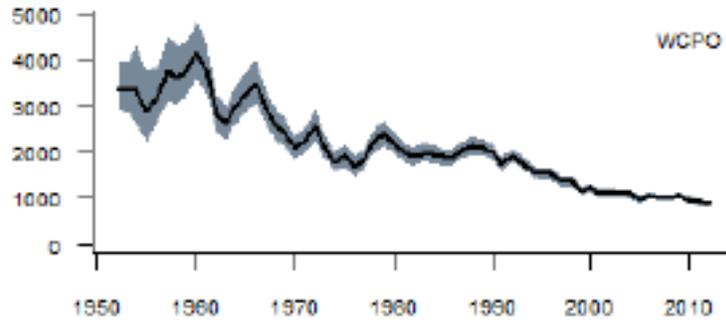


Figure 16. Estimated annual average spawning potential for the WCPO for the reference case. The shaded areas indicate the approximate 95% confidence intervals (From Davies et al. 2014).

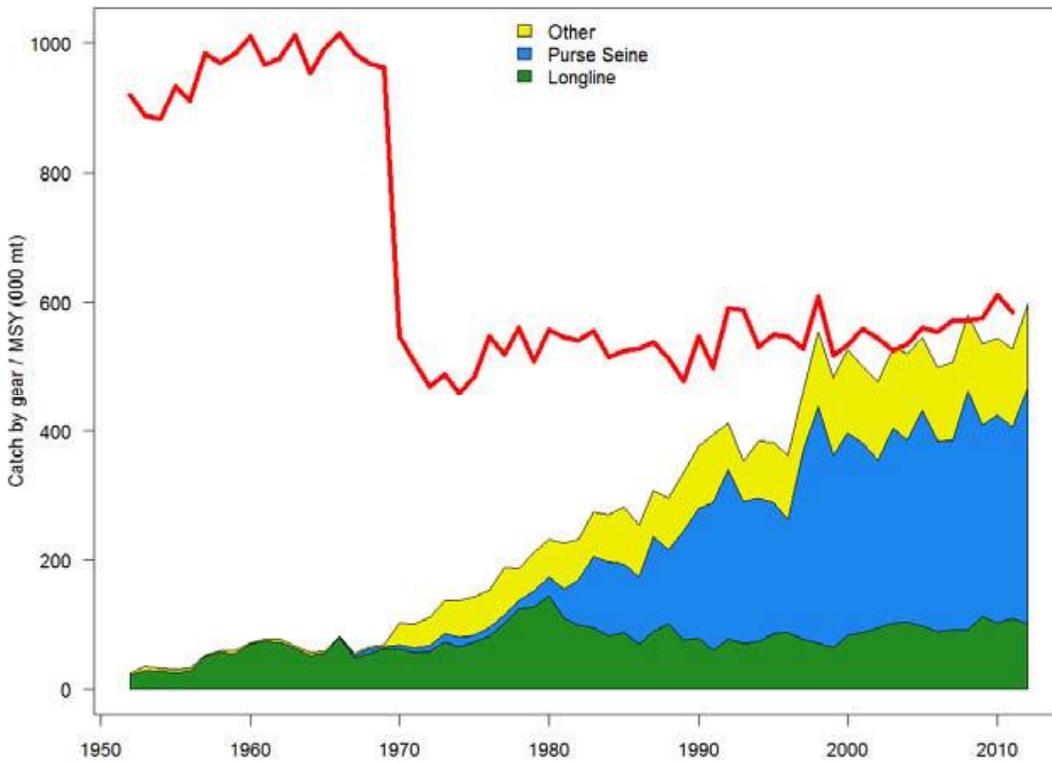


Figure 17. Yellowfin Tuna: History of the annual estimates of MSY (red line) compared with annual catch split into three sectors for the 2014 assessments' reference case (Davies et al.2014).

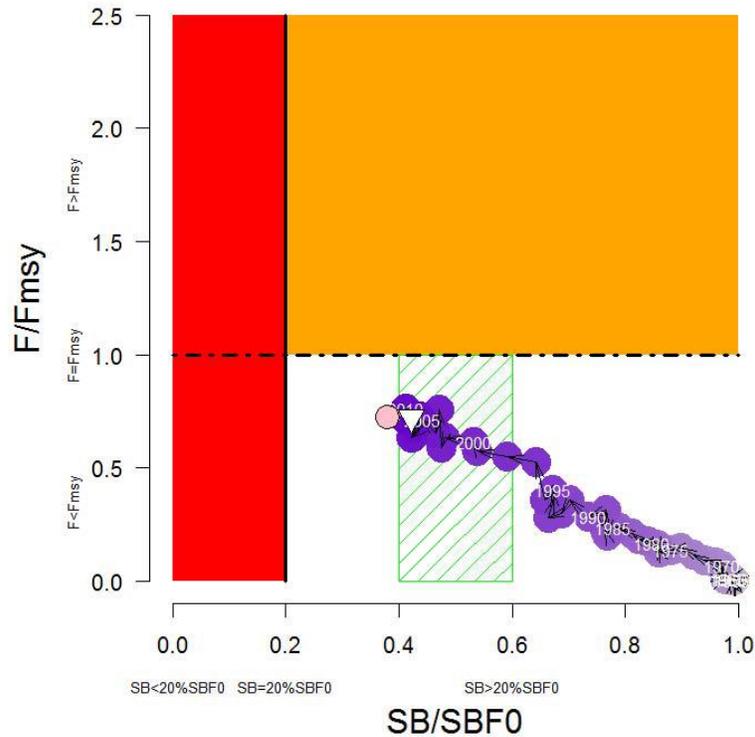


Figure 18. Yellowfin Tuna: Alternative portrayal of stock status with target and limit reference points. The red zone represents spawning potential levels lower than the agreed limit reference point which is marked with the solid black line. The orange region is for fishing mortality greater than FMSY ($F=F_{MSY}$ is marked with the black dashed line). The lightly shaded green rectangle covering 0.4- 0.6 SBF_0 is the 'space' that WCPFC has asked for consideration of a TRP for skipjack (from Davies et al. 2014).

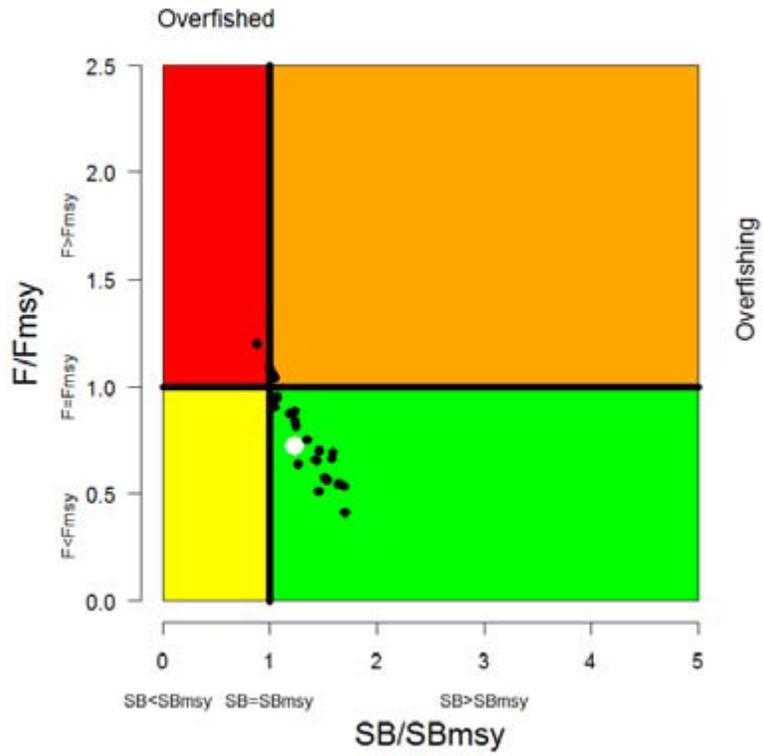


Figure 19. Yellowfin Tuna: Plot of versus for the 48 model runs undertaken for the structural uncertainty analysis in black, and the reference case model by the large white circle (from Davies et al. 2014).

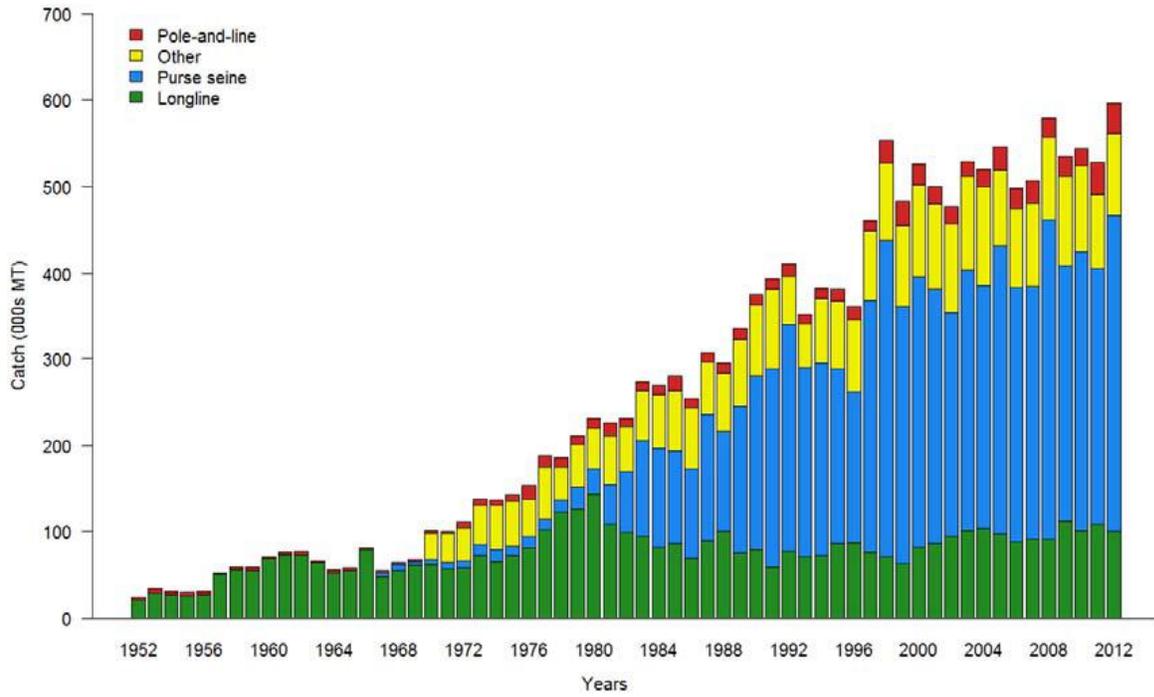


Figure 20. Total annual catch (1000s mt) of Yellowfin Tuna by fishing gear as used in the 2014 stock assessment’s reference case model (from Davies et al. 2014).

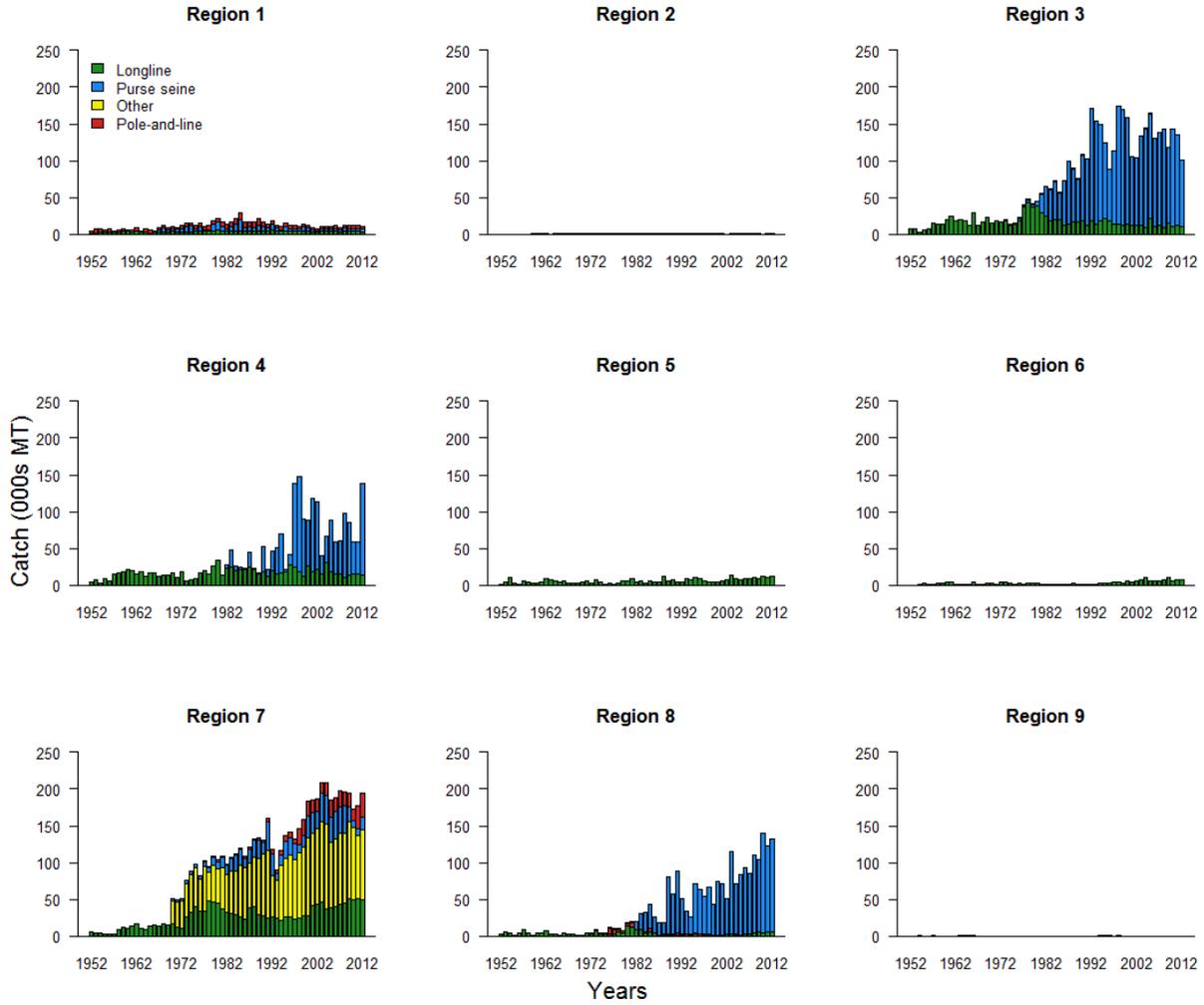


Figure 21. Total annual catch (1000s mt) of Yellowfin Tuna by fishing method and assessment region from the 2014 assessment's reference case model (from Davies et al. 2014).

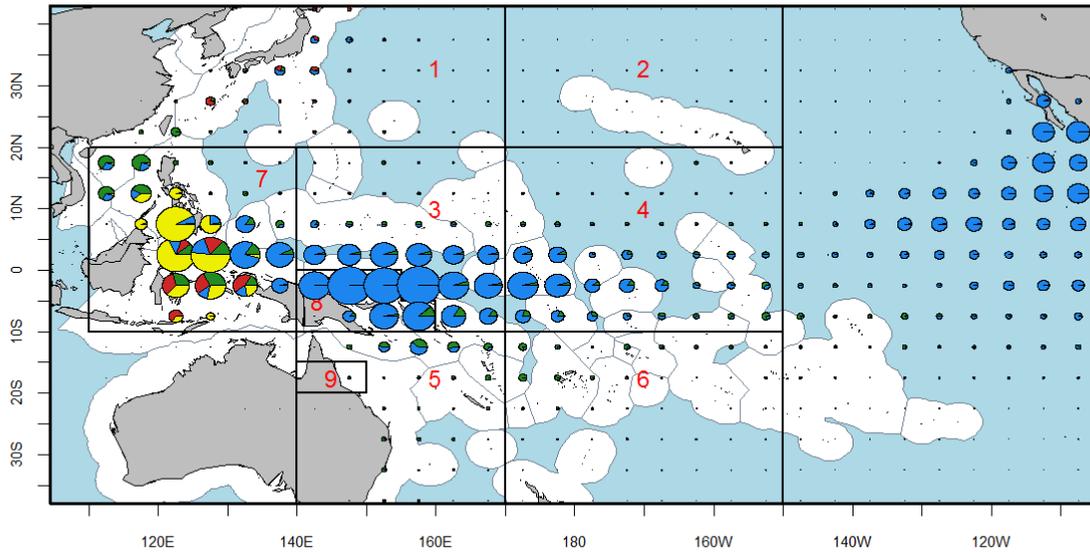


Figure 22. Catch distribution (1990-2010) for Yellowfin Tuna by 5 degree squares of latitude and longitude and fishing method: longline (green), purse-seine (blue), pole-and-line (red), and other (yellow). Overlaid are the regions for the 2014 assessment model (from Davies et al. 2014).

7.2 Principle 1 Performance Indicator scores and rationales

Evaluation Table for PI 1.1.1 Skipjack Tuna – Stock status

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	Stock status relative to recruitment impairment		
Guidepost	It is likely that the stock is above the point where recruitment would be impaired (PRI).	It is highly likely that the stock is above the PRI.	There is a high degree of certainty that the stock is above the PRI.
Met?	Y	Y	Y
Justification	<p>The reference case from the 2019 stock assessment (Vincent et al. 2019) estimated that the stock is currently moderately exploited, and the level of fishing mortality is sustainable. The trajectory of the median spawning biomass depletion indicates a long-term trend, and has been under the interim TRP ($50\%SB_{F=0}$) since 2009 (for 10 years) and was well above the limit reference point, $20\%SB_{F=0}$.</p> <p>The analysis of model structural uncertainty in the assessment (Vincent et al., 2019), using a crosswise grid of alternative model formulations, produced results which were spread relatively closely around the target reference point and well away from the limit reference point, and no models met, or even approached the thresholds of formal definitions of "overfishing" or "overfished."</p> <p>Previous modelling had indicated that a biomass of this level for Skipjack Tuna had a greater than 95% likelihood of being above the limit reference point of 20% of unfished levels (SPC-OFP 2014). A stock above this limit reference point is considered above the point where recruitment would be impaired. The 2019 stock assessment includes additional data and a range of model improvements such as a change to the maturity schedule used in this assessment, with length-at-maturity now larger than in the previous assessment, which has resulted in a reduction in the estimate of potential spawning biomass, relative to the 2016 assessment.</p> <p>Vincent et al. (2019) noted that the median level of spawning potential depletion from the uncertainty grid was $SB_{recent}/SB_{F=0} = 0.44$ with a probable range of 0.37 to 0.53 (80% probability interval). There were no individual models where $SB_{recent}/SB_{F=0} < 0.2$, which indicated that the probability that recent spawning biomass was below the LRP was zero.</p> <p>Additionally, the grid median $F_{recent}/FMSY$ was 0.45, with a range of 0.34 to 0.60 (80% probability interval) and that no values of $F_{recent}/FMSY$ in the grid exceed 1. Therefore, SC15 noted that there was a zero probability that the recent fishing mortality exceeds FMSY.</p> <p>There is, therefore, a high degree of certainty that the stock is above the point where recruitment would be impaired, which meets the requirements of scoring issue a at the SG 60, SG 80 and SG 100 levels.</p>		
b	Stock status in relation to achievement of MSY		

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
	Guidepost		The stock is at or fluctuating around a level consistent with MSY.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?		Y	Y
	Justification	<p>The 2019 assessment (Vincent et al., 2019) provides estimates of recent and current spawning biomass (SB) relative to unfished levels ($SB_{F=0}$) and that which would support MSY (SB_{MSY}), for the selected stock assessment models, sensitivities and the structural uncertainty analysis. These include estimates for the 'recent' biomass (SB_{recent}) which is the average over the period 2015-2018 and 'latest' (SB_{latest}) which is for 2018. The target reference point (TRP) for Skipjack Tuna was set at an initial level of 50% $SB_{F=0}$ in CMM 2015-06.</p> <p>The 2019 assessment estimated $SB_{recent}/SB_{F=0} = 0.44$ with an 80% probability interval of 0.37 to 0.53 and $SB_{latest}/SB_{F=0} = 0.41$ with an 80% probability interval of 0.36 to 0.49 for the reference case, and ranged between 0.32 and 0.48 across the one off sensitivity models explored</p> <p>These results indicate that the stock is at or close to the target reference point of 50% $SB_{F=0}$.</p> <p>The 2019 assessment also estimated $SB_{latest}/SB_{MSY} = 2.47$ with an 80% probability interval of 1.78 to 3.36 and $SB_{recent}/SB_{MSY} = 2.62$ with an 80% probability interval of 1.89 to 3.61 for the reference case, and ranged between 1.60 and 3.11 across the one off sensitivity models explored.</p> <p>These results indicate that there is approximate a 5% chance of the stock being below B_{MSY} over the period 2015-2018.</p> <p>These results indicate that there is a high degree of certainty that it has been above a level consistent with MSY over recent years.</p> <p>This meets the requirements of scoring issue b at the SG 80 and SG 100 levels.</p>		
References		Pilling et al. 2014a; Rice et al. 2014; SPC-OFP 2014; Vincent et al., 2019		
Stock Status relative to Reference Points				
	Type of reference point	Value of reference point	Current stock status relative to reference point	
Reference point used in scoring stock relative to PRI (SIa)	Level of spawning biomass in the absence of fishing ($SB_{F=0}$) LRP: 20% $SB_{F=0}$	$SB_{F=0} = 6,220,675$ t $0.2 \times SB_{F=0} = 1,244,135$ t	$SB_{latest}/SB_{F=0} = 0.41 > LRP$ $SB_{recent}/SB_{F=0} = 0.44 > LRP$	
Reference point used in scoring stock relative to MSY (SIb)	Level of spawning biomass in the absence of fishing ($SB_{F=0}$) TRP: 50% $SB_{F=0}$	$SB_{F=0} = 6,220,675$ t $0.5 \times SB_{F=0} = 3,110,338$ t $SB_{MSY} = 1,100,947$ t	$SB_{latest}/SB_{F=0} = 0.41 < TRP$ $SB_{recent}/SB_{F=0} = 0.44 < TRP$ $SB_{latest}/SB_{MSY} = 2.44$	

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
	Level of spawning biomass relative to MSY (SB_{MSY})		$SB_{recent}/SB_{MSY} = 2.62$
OVERALL PERFORMANCE INDICATOR SCORE:			100
CONDITION NUMBER (if relevant): Click here to enter text.			

Evaluation Table for PI 1.1.2 Skipjack Tuna – Stock rebuilding

PI 1.1.2	Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue	SG 60	SG 80	SG 100
a	Rebuilding timeframes		
Guidpost	A rebuilding timeframe is specified for the stock that is the shorter of 20 years or 2 times its generation time . For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the stock.
Met?	Not scored		Not scored
Justification	Not scored- Stock does not require rebuilding		
b	Rebuilding evaluation		
Guidpost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is evidence that the rebuilding strategies are rebuilding stocks, or it is likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.	There is strong evidence that the rebuilding strategies are rebuilding stocks, or it is highly likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.
Met?	Not scored	Not scored	Not scored
Justification	Not scored- Stock does not require rebuilding		
References			
OVERALL PERFORMANCE INDICATOR SCORE:			Not scored
CONDITION NUMBER (if relevant):			

Evaluation Table for PI 1.2.1 Skipjack Tuna – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guided post	The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	Y	N	Not scored
	Justification	<p>The harvest strategy for WCPO skipjack has several contributing components, with WCPFC, PNA and national and archipelagic waters management actions being supported by a robust stock assessment and extensive monitoring frameworks. There are, however, no formal harvest control rules.</p> <p>The conservation and management measures applied to Skipjack Tuna and the elements they contain are assessed as being expected to achieve stock management objectives meeting the requirements of the SG 60 level.</p> <p>The skipjack stock is well above levels that would raise concerns about potential impairment of recruitment, so measures to reduce the catch have not been required to date. Nevertheless, the absence of agreed harvest control rules within WCPFC or PNA for any other tuna species, and the record of failing to reduce fishing mortality on bigeye tuna so that they have now become overfished (see PI 2.1.1), reduces the level of confidence that the harvest strategy would be responsive to the state of the stock or that the elements will work together when required to do so to achieve the management objectives.</p> <p>The original PNA skipjack assessment (Banks et al. 2011) scored that fishery as meeting the SG 80 level on the basis that “the Commission responded to the change in the results of the skipjack assessment and the more cautionary tone of the scientific advice in 2010 by deciding to address the management of skipjack explicitly in the preparation of a CMM to replace CMM 2008-01 beyond 2011.” At the time of that assessment the specific measures to be contained in the CMM had not been agreed or adopted. CMM 2012-01 (and subsequent tuna CMMs) do contain measures to restrict purse seine fishing effort but there is no explicit linkage to stock status of any species.</p> <p>These concerns prevent the conclusion that the elements of the strategy are working together to achieve stock management objectives.</p> <p>This conclusion is consistent with the results of extensive harmonisation discussions among CABs as described in detail in Section 4.1.</p> <p>Furthermore, we have considered a submission from the PNAO concerning PI 1.2.1 for skipjack as outlined in SCS (2017). This submission contained an account of the processes followed by WCPFC and PNA in making adjustments to management arrangements for Skipjack Tuna. This submission has also been considered by other CABs as part of harmonisation discussions on this issue. We, and the other CABs, remained of the view that the deficiencies in the harvest strategy for Skipjack Tuna identified in the initial assessment still remain, particularly while there was no harvest control rule. Specifically, core concerns in the scoring of skipjack under PI 1.2.1 relative to PNA have been identified as:</p> <p>There is a lack of a clear link between the PAE and scientific advice on stock status</p>		

PI 1.2.1	There is a robust and precautionary harvest strategy in place		
	<p>There is no clear linkage between potential catch and allocated effort It is not possible to transparently understand how the VDS/PAE will deal with effort creep and concomitant increase in Q. Because Principle 1 is evaluated stock-wide, If PNA unilaterally develops their own HCR, it will become necessary for a formal commitment from PNA to reduce effort to compensate for removals by non-PNA fishery participants in the WCPO, if necessary, to assure that overall PNA removals remain compliant with any HCR and the overall PNA HS.</p> <p>Skipjack Tuna is therefore considered to meet the SG 60 level of this scoring issue but not the SG 80 or SG 100 levels.</p>		
b	Harvest strategy evaluation		
Guidepost	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	Not scored
Justification	<p>The most recent stock assessment (Vincent et al., 2019) indicates that fishing mortality for Skipjack Tuna has always been below the F_{MSY} level and that the stock has not declined below the default target of B_{MSY}. This constitutes good evidence that the harvest strategy is meeting its objectives.</p> <p>The harvest strategy has not been fully evaluated. Therefore, Skipjack Tuna is considered to meet the requirements of both the SG 60 and SG 80 of this scoring issue.</p>		
c	Harvest strategy monitoring		
Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
Met?	Y		
Justification	<p>Monitoring in place for the purse seine fishery for Skipjack Tuna include mandatory logbooks with records of catch and effort for each fishing operation, a VMS, 100% observer coverage of fishing operations including detailed recording of catch composition, tagging data, biological studies and port inspections. These support a sophisticated stock assessment process that provides robust estimates of stock status that is sufficient to determine whether the harvest strategy is working. This meets the SG 60 requirements.</p>		
d	Harvest strategy review		
Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
Met?			Not scored
Justification	Not scored as not all SG 80 requirements are met.		
e	Shark finning		

PI 1.2.1	There is a robust and precautionary harvest strategy in place		
Guidepost	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	Sharks are not a target species of this fishery. This PI is therefore not relevant. Shark finning is addressed, however, under PI 2.1.2		
f	Review of alternative measures		
Guidepost	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a biannual review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
Met?	Not relevant	Not relevant	Not relevant
Justification	CMM 2015-01 (and its predecessors) requires that "To create a disincentive to the capture of small fish and to encourage the development of technologies and fishing strategies designed to avoid the capture of small tunas and other fish, CCMs shall require their purse seine vessels fishing in EEZs and on the high seas within the area bounded by 20°N and 20°S to retain on board and then land or transship at port all bigeye, skipjack, Yellowfin Tuna." Exceptions to this requirement are possible where the fish are unfit for human consumption for reasons other than size or when serious malfunction of equipment occurs. Reporting of discards is done via vessel logbooks and Observer Programs (100% observer coverage). Compliance with CMM 2015-01 (and its predecessors) is verified by observers, with any violations (such as illegal discards) being reported to the WCPFC via the Observer authority. Reported discards for the UoA represented 1.3% of the total catch for 2014 and 2015. Discarded catches of skipjack across the whole fleet are also estimated to be minor and are ignored in the stock assessment (Vincent et al., 2019). The rules in place indicate that this scoring issue is not relevant to the UoA.		
References	McKechnie et al. 2016; Vincent et al., 2019		
OVERALL PERFORMANCE INDICATOR SCORE:			Score
CONDITION NUMBER: 1 By the first re-assessment surveillance audit (2022), demonstrate that the harvest strategy for Skipjack Tuna 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.			70

Evaluation Table for PI 1.2.2 Skipjack Tuna – Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guidepost	Generally understood HCRs are in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.
	Met?	Y	N	Not scored
	Justification	<p>A generally understood HCR is taken here to mean one that is not well defined, as otherwise there is no distinction between requirements at the SG60 and SG80 levels. This PI is also assessed taking account the guidance for scoring ‘available’ HCRs at SG60 containing in SA2.5.2, SA2.5.3 and SA2.5.5.</p> <p>The first option for scoring ‘available’ HCRs is intended to cover the situation where even generally understood HCRs are not yet clearly in place for a fishery. For WCPFC fisheries, including Skipjack Tuna, there are measures for controlling fishing effort through closures, limits on fishing capacity and, for vessels involved, through limits on fishing days under the VDS. There are expectations about responses and examples of how actions have been implemented for species such as bigeye tuna, but there is no clear linkage or explicit process that links changes in stock status to emergent associated management actions. Therefore we do not consider that there are even generally understood HCRs <i>that are also “in place”</i>; the options for ‘available’ HCRs are therefore evaluated below.</p> <p>The second question to address, is whether there are HCRs that meet the requirements for being considered as ‘available’.</p> <p>The guidance in SA2.5.2a indicates that teams shall accept ‘available’ HCRs in cases where, “...Stock biomass has not previously been reduced below the MSY level or has been maintained at that level for a recent period of time that is at least longer than 2 generation times of the species, and is not predicted to be reduced below BMSY within the next 5 years”.</p> <p>As noted at PI 1.1.1 scoring issue (b), the 2016 assessment provides probabilistic estimates of parameters of interest, and has been extensively explored using a crosswise grid of sensitivity tests (McKechnie et al, 2016). The stock assessment estimates spawning biomass for Skipjack Tuna, SB, to be at 48% of unfished levels ($SB_{F=0}$) and 2.56 times SB_{MSY}. The stock is estimated to have never been reduced to SB_{MSY} and has hence been above SB_{MSY} in all years.</p> <p>According to WCPFC (2014a), paragraph 48, “Future status under <i>status quo</i> projections (assuming 2012 conditions) was robust to assumptions on future recruitment. Under either assumption, spawning biomass remained relatively constant and it is exceptionally unlikely (0%) for the stock to become overfished ($SB_{2032} < 0.2SB_{F=0}$) or for the spawning biomass to fall below SB_{MSY}, and it is exceptionally unlikely (<1%) for the stock to become subject to overfishing ($F > F_{MSY}$).”</p> <p>An estimate of the generation time of Skipjack Tuna using the MSC definition (Box GSA4 in CR v2.0) is not available but SPC have produced an estimate of 2 years by a different</p>		

PI 1.2.2	There are well defined and effective harvest control rules (HCRs) in place		
	<p>method (Berger et al. 2013) and by any method of estimation 2 generation times will be much less than the 20 years used in the projections mentioned above. The CR v2.0 SA2.5.2a condition is therefore met and HCRs are therefore considered to be 'available'.</p> <p>The third question to address is whether these available HCRs meet the requirement for reducing the exploitation rate as the LRP is approached. The guidance in SA2.5.3 requires that "Teams shall recognise 'available' HCRs as 'expected to reduce the exploitation rate as the point of recruitment impairment is approached' only in cases where, HCRs are effectively used in some other UoAs, that are under the control of the same management body and of a similar size and scale as the UoA; or An agreement or framework in place that requires the management body (<i>in this case WCPFC</i>) to adopt HCRs before the stock declines below B_{msy}".</p> <p>There are CMMs that are in place for a range of tuna species within the WCPFC (including skipjack) that contain a range of management measures that are designed to constrain fishing mortality to acceptable levels. Nevertheless, none are more highly developed than the measures currently in place for Skipjack Tuna and therefore they do not offer an example of effectiveness in reducing exploitation as the PRI is approached. Option a. is therefore not considered to be met.</p> <p>Option b. examines plans for the introduction of an effective HCR. WCPFC Conservation and Management Measure CMM 2014-06 (WCPFC, 2014) sets out definitions of harvest strategies to be developed and implemented. The definitions include target and limit reference points and decision rules or ("harvest control rules"), with a clear intention that harvest control rules, tested using simulation approaches, will be part of the implemented harvest strategies. The Commission agreed to adopt a work plan at its 2015 annual meeting, which was revised in 2016, with application to skipjack, bigeye, yellowfin, Pacific bluefin, and South and North Pacific albacore tunas. In fact, work towards establishing reference points and harvest control rules was progressed through the Management Objectives Workshop (MOW) process.</p> <p>We note that there is no specific requirement in CMM 2014-06 linking implementation of the HCRs to stock projections. Nevertheless, given that Skipjack Tuna are projected to remain well above B_{MSY} for many years and that the process CMM 2014-06 describes has already been initiated – considered in place - we have considered that the requirements of Option b. SA2.5.3b are met. The requirements of the SG60 level are therefore considered to be met.</p> <p>In summary, generally understood HCRs are not in place. Skipjack is a stock that has not previously been reduced below MSY, which has always been maintained well above the TRP and has an improbably low likelihood of becoming overfished or to experience overfishing. Therefore, this stock meets the requirements to be considered against "availability" requirements. In the WCPF, HCRs are not effectively used in any other WCPFC-managed UoAs. However, there is a framework that is in place, expected to develop further that will require the WCPFC to take action on HCRs before there is any detectable, projected risk that skipjack stock status could decline below B_{MSY}.</p>		
b	HCRs robustness to uncertainty		
	Guidepost		<p>The HCRs are likely to be robust to the main uncertainties.</p> <p>The HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties.</p>

PI 1.2.2	There are well defined and effective harvest control rules (HCRs) in place		
Met?		N	Not scored
Justification	The 'available' harvest control rules are not sufficiently articulated to allow an evaluation of the extent to which they are robust to the main uncertainties. When well-defined HCRs are developed, they can be evaluated as to whether this is the case. The SG80 requirements are not considered to be met.		
c	HCRs evaluation		
Guidpost	There is some evidence that tools used or available to implement HCRs 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 HCRs.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the HCRs.
Met?	Y	N	Not scored
Justification	<p>As noted under scoring issue "a" above, following SA2.5.3b, we have recognised 'available' HCRs as 'expected to reduce the exploitation rate as the point of recruitment impairment is approached'.</p> <p>SA2.5.5b, which requires that teams shall include in their rationale a description of the formal agreement or legal framework that the management body has defined, and the indicators and trigger levels that will require the development of HCRs.</p> <p>The agreement is contained in CMM 2014-06 whose objective is "To agree that the Commission shall develop and implement a harvest strategy approach for each of the key fisheries or stocks under the purview of the Commission according to the process set out in this conservation and management measure."</p> <p>This CMM contains general principles (including a description of a harvest strategy) and principles and elements of the proposed harvest strategies (which are consistent with the MSC definitions). The definitions include target and limit reference points and decision rules (or "harvest control rules"), with a clear intention that harvest control rules, tested using simulation approaches, will be part of the implemented harvest strategies. The specified timelines are that:</p> <p><i>"The Commission shall agree a workplan and indicative timeframes to adopt or refine harvest strategies for skipjack, bigeye, yellowfin, South Pacific albacore, Pacific bluefin and northern albacore tuna by no later than the twelfth meeting of the Commission in 2015. This workplan will be subject to review in 2017."</i></p> <p>Work towards establishing reference points and harvest control rules was initiated before this CMM was passed through the Management Objectives Workshop process and requires no additional trigger for their development.</p> <p>The requirements of SA2.5.5b are therefore considered to be met.</p> <p>Furthermore, SA2.5.6 requires that, in scoring issue (c) for "evidence" teams shall include consideration of the current levels of exploitation in the UoA, such as measured by the fishing mortality rate or harvest rate, where available.</p> <p>The most recent stock assessment for Skipjack Tuna (Vincent et al., 2019) and the earlier <i>status quo</i> projections (Pilling et al. 2014a) provide some evidence that the tools in use (the VDS and WCPFC effort limits) are effective in controlling exploitation of Skipjack Tuna and achieving the exploitation levels that are required. As noted above, these indicate that fishing mortality for Skipjack Tuna has always been below the F_{MSY} level, that the stock has not declined below B_{MSY} and that it is exceptionally unlikely (<1%) that fishing mortality will increase above the F_{MSY} level by 2032. The current levels of exploitation are therefore acceptable and the requirements of SA2.5.6 are met.</p> <p>This meets the requirements of the SG60 level.</p>		

PI 1.2.2	There are well defined and effective harvest control rules (HCRs) in place
	The HCRs are only regarded as being 'available' in scoring issue (a) and not 'in place', so we have considered that it is not possible to score more than 60 for issue (c) since the SG80 refers to the tools 'in use' in the fishery and not the tools 'in use or available' . In any case, not all available evidence indicates that current exploitation is adequately contained by the existing main tools (VDS and WCPFC effort limits) as catches of skipjack are still increasing and, although fishing mortality remains below the F_{MSY} level, it has increased continuously since the beginning of industrial tuna fishing. So the effectiveness of the CMM 2014-01 for restricting fishing mortality to previous levels is not well demonstrated. The requirements of the SG80 level are therefore not clearly met.
References	Berger et al. 2015, McKechnie et al. 2016, Pilling et al. 2014a, WCPFC (2014a), WCPFC 2014 (CMM for HCRs)
OVERALL PERFORMANCE INDICATOR SCORE:	
<p>CONDITION NUMBER (if relevant):</p> <p>Condition 2</p> <p>SI a) By the first re-assessment surveillance audit (2022), demonstrate that well defined HCRs are in place for Skipjack Tuna that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY.</p> <p>SI b) By the first re-assessment surveillance audit (2022), provide evidence that the selection of the harvest control rules for Skipjack Tuna are robust to the main uncertainties.</p> <p>SI c) By the first re-assessment surveillance audit (2022), provide evidence that indicates that the tools in use for Skipjack Tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules.</p>	60

Evaluation Table for PI 1.2.3 Skipjack Tuna – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guidepost	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, UoA 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	Y
	Justification	The monitoring system that is in place for the fishery collects a comprehensive range of information on related to the fishery: this includes mandatory logbooks with records for each fishing operation, a VMS, 100% observer coverage of fishing operations providing a detailed record of catch composition, and port inspections. Information is also available on stock structure (from tagging and other work), and all other key aspects of the species' biology. Data on environmental conditions is collected and is known to be important for understanding shifts in the distribution of the stock and the fishery. This information has been used to produce complex models of the ecological system (SEAPODYM) that are beyond what is needed for implementation of the harvest strategy. This is considered to meet the requirements of the SG 60, SG 80 and SG 100 levels.		
b	Monitoring			
	Guidepost	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA 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	Stock abundance and removals are monitored at a level of accuracy and coverage that is sufficient to support the harvest control measures in place. There is not, however, a high degree of certainty about all the information required. Delays in the finalization of data from the most recent year prevented the most recent data being used in the assessment and, particularly for a short lived species such as Skipjack Tuna, this could lead to a mismatch between estimates of stock status from the assessment, management actions, and the actual stock status on the water (Rice et al. 2014).		

PI 1.2.3	Relevant information is collected to support the harvest strategy		
	<p>Furthermore, the Japanese pole-and-line fishery, which provides the standardised CPUE indices in regions 1, 2, and 3, represents less than 10% of the total catch of Skipjack Tuna and even less in the main equatorial zone, but remains the only fishery that can provide long-term information on relative biomass levels (McKechnie et al. 2016). These authors also report that there is a limited understanding of the factors driving the patterns observed in these data which are the basis for the key index that drives estimated abundance trends. Nevertheless, the accuracy and coverage of the estimates of removal and abundance have been shown to be sufficient to support an assessment and harvest strategy.</p> <p>Operational level data are also not provided by some WCPFC members (although some who do not provide it to WCPFC make their country's data available for assessment purposes).</p> <p>The issues raised above mean that we do not consider there to be a high degree of certainty about stock abundance or the robustness of the assessment to this uncertainty.</p> <p>This meets the requirements for the SG 60 and SG 80 levels but not the SG 100 level.</p>		
c	Comprehensiveness of information		
	Guidepost		There is good information on all other fishery removals from the stock.
	Met?		Y
	Justification	<p>Other fishery removals from the stock include catches by other WCPFC members including removals with fishing gears other than purse seine. Catches by members are required to be reported to the WCPFC. Article 5 of the Convention requires CCMs to “collect and share, in a timely manner, complete and accurate data concerning fishing activities on, inter alia, vessel position, catch of target and non-target species and fishing effort, as well as information from national and international research programmes.”</p> <p>This scoring issue was the subject of particular attention in the PNA Skipjack Tuna assessment (Banks et al. 2011) and in particular whether there was good information on the level of fishery removals from some countries.</p> <p>The conclusion was that “despite a number of deficiencies in compilation and analysis from the Indonesia and Philippines, this reaches SG 80”.</p> <p>Since that assessment there has been additional work to improve the level of data available (noted in the Surveillance Reports for the PNA Skipjack Tuna: Lewis and Scott 2012, Scott and Stokes 2013) and we conclude that the requirements of the SG 80 level are also met for this fishery.</p>	
References	Banks et al. 2011; Lewis and Scott 2012; Vincent et al. 2019; Scott and Stokes 2013		
OVERALL PERFORMANCE INDICATOR SCORE:			90
CONDITION NUMBER (if relevant): Click here to enter text.			NA

Evaluation Table for PI 1.2.4 Skipjack Tuna – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		Y	Y
	Justification	The most recent assessment applied to Skipjack Tuna (Vincent et al., 2019), like other recent assessments, is an integrated, model-based assessment that is undertaken by an experienced and internationally recognised stock assessment program at the SPC. It takes into account major features relevant to the biology and the nature of the fishery. It therefore meets the requirements of the SG 80 and SG 100 levels of this scoring issue.		
b	Assessment approach			
	Guidepost	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	Y	Y	
	Justification	The assessment reports provide a wide range of estimates of stock status relative to indicators of interest to management including both the target and limit reference points that have been agreed for Skipjack Tuna. This therefore meets the requirements of the SG 60 and SG 80 levels.		
c	Uncertainty in the assessment			
	Guidepost	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 assessment of Skipjack Tuna has provided explicit commentary on the major sources of uncertainty, has assessed the sensitivity of the assessment to these uncertainties, and has evaluated current and future stock status relative to these in a probabilistic way. This meets the requirements of the SG 60, SG 80 and SG 100 levels of this scoring issue		
d	Evaluation of assessment			
	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			Y
	Justification	There is an ongoing program of review of assessment assumptions and approaches by the staff in the SPC-OFP. Alternative hypotheses are continually being explored (within funding and time constraints) and assessments are updated and modified as required.		

PI 1.2.4	There is an adequate assessment of the stock status		
	<p>Model structure has been updated to reflect the availability of new data or new interpretations of existing data and a suite of sensitivity analyses have been undertaken to explore the impact of options such as changing assumptions for fixed parameters or different treatments of the data. Furthermore, retrospective analyses have been undertaken to explore any systematic biases in the model and the results used to adjust the reference case.</p> <p>The assessment for Skipjack Tuna has been shown to be robust and therefore meets the requirements of this scoring issue.</p> <p>We note that there has been no simulation testing of the model, but such testing is not necessary to meet the requirements.</p>		
e	Peer review of assessment		
	Guidepost	The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?	Y	N
	Justification	<p>Internal reviews are undertaken by SPC and there has been an external review of the assessment of Bigeye tuna (Ianelli et al. 2012) which provided recommendations that were also applicable to other similar assessments such as for Skipjack Tuna. Many of those recommendations have been addressed with the latest skipjack assessment.</p> <p>There have also been external reviews commissioned of different aspects of the data analyses that feed into the skipjack and other tuna assessments.</p> <p>There is also a level of external review provided by submission to the scientific committee of the WCPFC, at which experienced scientific staff from several countries attend, but we consider this to be internal to WCPFC processes.</p> <p>Therefore, there has been no external review of the Skipjack Tuna stock assessment and we consider that this scoring issue is met at the SG 80 level but not at the SG 100 level</p>	
	References	Ianelli et al. 2014, Vincent et al. 2019	
OVERALL PERFORMANCE INDICATOR SCORE:			95
CONDITION NUMBER (if relevant): Click here to enter text.			NA

Evaluation Table for PI 1.1.1 Yellowfin Tuna Stock – Stock status

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	Stock status relative to recruitment impairment		
Guidepost	It is likely that the stock is above the point where recruitment would be impaired (PRI).	It is highly likely that the stock is above the PRI.	There is a high degree of certainty that the stock is above the PRI.
Met?	Y	Y	Y
Justification	<p>The diagnostic case from the 2017 stock assessment (Tremblayer-Boyer et al. 2017) estimated that the spawning biomass was at 40% of unfished levels in 2015 and was well above the WCPFC limit reference point, $20\%SB_{F=0.5}$. Recruitment was also estimated to have been stable since the mid-1960s.</p> <p>In the analysis of model structural uncertainty in the assessment (Tremblayer-Boyer et al. 2017), using a crosswise grid of 72 alternative model formulations, only two runs (<5%) fell below the limit reference point.</p> <p>Previous modelling had also indicated that a biomass of this level for Yellowfin Tuna had a greater than 95% likelihood of being above the limit reference point of 20% of unfished levels (SPC-OFP 2014). A stock above this limit reference point is considered to be above the point where recruitment would be impaired.</p> <p>Furthermore, Pilling et al. (2014) used stochastic projections under status quo conditions to estimate that it was exceptionally unlikely (<1%) that the yellowfin stock would fall below the limit reference point level or that fishing mortality would increase above the F_{MSY} level by 2032, and dependent upon the future recruitment assumption, it was exceptionally unlikely (<1%; long-term recruitment deviate assumption) or very unlikely (<10%; recent recruitment assumption) to fall below B_{MSY}.</p> <p>There is, therefore, a high degree of certainty that the stock is above the point where recruitment would be impaired, which meets the requirements of scoring issue a at the SG 60, SG 80 and SG 100 levels.</p>		
b	Stock status in relation to achievement of MSY		
Guidepost		The stock is at or fluctuating around a level consistent with MSY.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
Met?		Y	N
Justification	<p>There is no explicit target reference point for Yellowfin Tuna but there is considered to be an implicit target of B_{MSY} (supported by CMM 2016-01).</p> <p>The grid medians for both SB_{recent}/SB_{MSY} and SB_{latest}/SB_{MSY} in the most recent assessment were 1.42 (Tremblayer-Boyer et al. 2017) which is well above this (default) target reference point and, given the estimated stock trajectory, would have done so over the whole period modelled.</p> <p>This meets the requirements of scoring issue b at the SG 80 level.</p> <p>Following SA2.2.1.3 a high degree of certainty means greater than or equal to the 95th percentile of a distribution. This assessment (unlike the previous one) does not provide 95% confidence intervals for the ratios SB_{recent}/SB_{MSY} and SB_{latest}/SB_{MSY} but across</p>		

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
	<p>the grid of uncertainties only two runs (<5%) fell below the chance of the stock being below BMSY over recent years. This finding might suggest that that Yellowfin Tuna now meets the requirements of scoring issue b at the SG 100 level.</p> <p>Nevertheless, previous assessment scores for Yellowfin Tuna, based on the 2014 stock assessment (Rice et al. 2014), were that the SG 100 level was not met because the lower 95% confidence intervals for B/BMSY was less than 1 and the upper 95% confidence interval for F/FMSY was greater than 1. The 2017 assessment was slightly more optimistic but as the stock has recently been estimated to have been below that threshold the SG 100 requirement that stock be above MSY over recent years is still not met.</p>		
References	Pilling et al. 2014, Rice et al. 2014, Tremblayer-Boyer et al. 2017		
Stock Status relative to Reference Points			
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	Level of spawning biomass in the absence of fishing ($SB_{F=0}$) LRP: 20% $SB_{F=0}$	$SB_{F=0} = 2,592,702$ t $0.2X SB_{F=0} = 518,540$ t	$SB_{latest}/SB_{F=0} = 0.46 > LRP$ $SB_{recent}/SB_{F=0} = 0.42 > LRP$
Reference point used in scoring stock relative to MSY (SIb)	Level of spawning biomass relative to MSY (SB_{MSY})	$SB_{MSY} = 750,100$ t	$SB_{latest}/SB_{MSY} = 1.58$ $SB_{recent}/SB_{MSY} = 1.46$
OVERALL PERFORMANCE INDICATOR SCORE:			Score
CONDITION NUMBER (if relevant):			90

Evaluation Table for PI 1.1.2 Yellowfin Tuna – Stock rebuilding

PI 1.1.2	Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue	SG 60	SG 80	SG 100
a	Rebuilding timeframes		
Guidepost	A rebuilding timeframe is specified for the stock that is the shorter of 20 years or 2 times its generation time . For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the stock.
Met?	Not scored		Not scored
Justification	Not scored- Stock does not require rebuilding.		
b	Rebuilding evaluation		
Guidepost	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is evidence that the rebuilding strategies are rebuilding stocks, or it is likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.	There is strong evidence that the rebuilding strategies are rebuilding stocks, or it is highly likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.
Met?	Not scored	Not scored	Not scored
Justification	Not scored- Stock does not require rebuilding.		
References	[List any references here]		
OVERALL PERFORMANCE INDICATOR SCORE:			Score
CONDITION NUMBER (if relevant): Click here to enter text.			N/A

Evaluation Table for PI 1.2.1 Yellowfin Tuna – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guidepost	The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG 80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG 80.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG 80.
	Met?	Y	N	Not scored
	Justification	<p>Agreed harmonized score: 60</p> <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 – MSCI Vocabulary v1.1).</p> <p>The harvest strategy for WCPO yellowfin has several contributing components, with WCPFC, PNA and national and archipelagic waters management actions being supported by a robust stock assessment and extensive monitoring frameworks. There are, however, no formal harvest control rules. This conclusion is consistent with the results of extensive harmonisation discussions among CABs as described in detail in Section 4.1.</p> <p>The range of measures applied to the sectors that fish for Yellowfin Tuna are expected to achieve stock management objectives meeting the requirements of the SG 60 level.</p> <p>Nevertheless, the general stock decline for yellowfin (albeit with a recent increase in stock size), the absence of agreed harvest control rules within WCPFC or PNA for any other tuna species, and the record of the Commission failing to reduce fishing mortality on bigeye tuna when it was thought to have been subject to overfishing, reduces the level of confidence that the harvest strategy would be responsive to the state of the stock or that the elements will work together when required to do so to achieve the management objectives.</p> <p>It is also not clear that coherent management actions are applied throughout the range of the stock, particularly in Indonesia and the Philippines.</p> <p>Overall this prevents the conclusion that the strategy is designed to achieve stock management objectives.</p> <p>Yellowfin Tuna is therefore considered to meet the SG 60 level of this scoring issue but not the SG 80 or SG 100 levels.</p>		
b	Harvest strategy evaluation			
	Guidepost	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

PI 1.2.1	There is a robust and precautionary harvest strategy in place		
			to maintain stocks at target levels.
Met?	Y	Y	Not scored
Justification	<p>Yellowfin Tuna have been estimated to be above default target levels and the status quo stock projections undertaken indicate that “it was exceptionally unlikely (<1%) that the yellowfin stock would fall below the limit reference point level or that fishing mortality would increase above the F_{MSY} level by 2032” (Pilling et al. 2014a).</p> <p>Furthermore, the most recent stock assessment (Tremblayer-Boyer et al. 2017) indicates that fishing mortality for Yellowfin Tuna has always been below the F_{MSY} level and that the stock has not declined below the default target of B_{MSY}. This constitutes good evidence that the harvest strategy is meeting its objectives.</p> <p>Therefore, Yellowfin Tuna is considered to meet both the SG 60 and SG 80 levels of this scoring issue</p>		
c	Harvest strategy monitoring		
Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
Met?	Y		
Justification	<p>Monitoring in place for the longline fishery for Yellowfin Tuna include mandatory logbooks with records of catch and effort for each fishing operation, a VMS, tagging data, biological studies and port inspections. There is, however, only very limited observer coverage of fishing operations so there are relatively few data on the discarded component of the catch, but few yellowfin would be expected to be discarded. The data that are collected do support a sophisticated stock assessment process that provides robust estimates of stock status that is sufficient to determine whether the harvest strategy is working. This meets the SG 60 requirements.</p>		
d	Harvest strategy review		
Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
Met?			Not scored
Justification	Not scored as not all SG 80 requirements are met.		
e	Shark finning		
Guidepost	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	Sharks are not a target species (or even a main retained species) of this fishery. This PI is therefore not relevant.		
f	Review of alternative measures		
Guidepost	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they	There is a biannual review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the

PI 1.2.1	There is a robust and precautionary harvest strategy in place			
			are implemented as appropriate.	target stock, and they are implemented, as appropriate.
Met?	Not relevant	Not relevant	Not relevant	Not relevant
Justification	<p>CMM 2015-01 (and its predecessors) requires that “To create a disincentive to the capture of small fish and to encourage the development of technologies and fishing strategies designed to avoid the capture of small tunas and other fish, CCMs shall require their purse seine vessels fishing in EEZs and on the high seas within the area bounded by 20°N and 20°S to retain on board and then land or transship at port all bigeye, skipjack, Yellowfin Tuna.” Exceptions to this requirement are possible where the fish are unfit for human consumption for reasons other than size or when serious malfunction of equipment occurs. Reporting of discards is done via vessel logbooks and Observer Programs. Compliance with CMM 2015-01 (and its predecessors) is verified by observers with any violations (such as illegal discards) being reported to the WCPFC via the Observer authority. Reported discards for the UoA represented 0.9% of the total catch for 2014 and 2015. Discarded catches of yellowfin across the whole fleet are also estimated to be minor and are ignored in the stock assessment (Tremblayer-Boyer et al. 2017). The rules in place indicate that this scoring issue is not relevant to the UoA.</p>			
References	Pilling et al. 2014, Tremblayer-Boyer et al. 2017			
OVERALL PERFORMANCE INDICATOR SCORE:				Score
<p>CONDITION NUMBER: 3</p> <p>By the first re-assessment surveillance audit (2022), demonstrate that the harvest strategy for Yellowfin Tuna 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.</p>				70

Evaluation Table for PI 1.2.2 Yellowfin Tuna – Harvest control rules and tools

PI 1.2.2	There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue	SG 60	SG 80	SG 100
a	HCRs design and application		
Guided post	Generally understood HCRs are in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.
Met?	Y	N	Not scored
Justification	<p>A generally understood HCR is taken here to mean one that is not well defined, as otherwise there is no distinction between requirements at the SG 60 and SG 80 levels. This PI is also assessed taking account the guidance for scoring ‘available’ HCRs at SG 60 containing in SA2.5.2, SA2.5.3 and SA2.5.5.</p> <p>The first option for scoring ‘available’ HCRs is intended to cover the situation where even generally understood HCRs are not yet clearly in place for a fishery. For WCPFC fisheries, including Yellowfin Tuna, there are measures for controlling fishing effort through closures, limits on fishing capacity and, for vessels involved, through limits on fishing days under the VDS. There are expectations about responses and examples of how actions have been implemented for species such as bigeye tuna, but there is no clear linkage or explicit process that links changes in stock status to emergent associated management actions. Therefore we do not consider that there are even generally understood HCRs <i>that are also “in place”</i>; and the options for ‘available’ HCRs are evaluated below.</p> <p>The second question to address, is whether there are HCRs that meet the requirements for being considered as ‘available’.</p> <p>The guidance in SA2.5.2a indicates that teams shall accept ‘available’ HCRs in cases where, “...Stock biomass has not previously been reduced below the MSY level or has been maintained at that level for a recent period of time that is at least longer than 2 generation times of the species, and is not predicted to be reduced below B_{MSY} within the next 5 years”.</p> <p>As noted at PI 1.1.1 scoring issue (b), the 2017 assessment provides probabilistic estimates of parameters of interest, and has been extensively explored using a crosswise grid of sensitivity tests (Tremblayer-Boyer et al. 2017). The stock assessment estimates spawning biomass for Yellowfin Tuna, SB, to be at 46% of unfished levels ($SB_{F=0}$) and 1.58 times SB_{MSY}. The stock is estimated to have never been reduced to SB_{MSY} and has hence been above SB_{MSY} in all years.</p> <p>According to WCPFC (2014a), paragraph 37, “Future status under <i>status quo</i> projections (assuming 2012 conditions) depends upon assumptions on future recruitment. When spawner-recruitment relationship conditions are assumed, spawning biomass is predicted to increase and the stock is exceptionally unlikely (0%) to become overfished ($SB_{2032} < 0.2SB_{F=0}$) or to fall below SB_{MSY}, nor to become subject to overfishing ($F > F_{MSY}$). If recent (2002-2011) actual recruitments are assumed, spawning biomass will remain relatively constant, and the stock is exceptionally unlikely (0%) to become overfished or to</p>		

PI 1.2.2	There are well defined and effective harvest control rules (HCRs) in place
	<p>become subject to overfishing, and it was very unlikely (2%) that the spawning biomass would fall below SB_{MSY}.”</p> <p>An estimate of the generation time of Yellowfin Tuna using the MSC definition (Box GSA4 in CR v2.0) is not available but SPC have produced an estimate of 5 years by a different method (Berger et al. 2013) and by any method of estimation 2 generation times will be much less than the 20 years used in the projections mentioned above.</p> <p>The CR v2.0 SA2.5.2a condition is therefore met and HCRs are therefore considered to be ‘available’.</p> <p>The third question to address is whether these available HCRs meet the requirement for reducing the exploitation rate as the LRP is approached. The guidance in SA2.5.3 requires that “Teams shall recognise ‘available’ HCRs as ‘expected to reduce the exploitation rate as the point of recruitment impairment is approached’ only in cases where, HCRs are effectively used in some other UoAs, that are under the control of the same management body and of a similar size and scale as the UoA; or An agreement or framework in place that requires the management body (<i>in this case WCPFC</i>) to adopt HCRs before the stock declines below B_{msy}”.</p> <p>There are CMMs that are in place for a range of tuna species within the WCPFC (including yellowfin) that contain a range of management measures that are designed to constrain fishing mortality to acceptable levels. Nevertheless, none are considered to be more highly developed than the measures currently in place for Yellowfin Tuna and therefore they do not offer an example of effectiveness in reducing exploitation as the PRI is approached. Option a. is therefore not considered to be met.</p> <p>Option b. examines plans for the introduction of an effective HCR. WCPFC Conservation and Management Measure CMM 2014-06 (WCPFC, 2014) sets out definitions of harvest strategies to be developed and implemented. The definitions include target and limit reference points and decision rules or (“harvest control rules”), with a clear intention that harvest control rules, tested using simulation approaches, will be part of the implemented harvest strategies. The Commission agreed to adopt a work plan at its 2015 annual meeting, which was revised in 2016 and 2017, with application to skipjack, bigeye, yellowfin, Pacific bluefin, and South and North Pacific albacore tunas. In fact, work towards establishing reference points and harvest control rules was progressed through the Management Objectives Workshop (MOW) process.</p> <p>We note that there is no specific requirement in CMM 2014-06 linking implementation of the HCRs to stock projections. Nevertheless, given that Yellowfin Tuna are projected to remain well above B_{MSY} for many years and that the process CMM 2014-06 describes has already been initiated – considered in place - we have considered that the requirements of Option b. SA2.5.3b are met. The requirements of the SG 60 level are therefore considered to be met.</p> <p>In summary, generally understood HCRs are not in place. Yellowfin is a stock that has not previously been reduced below MSY, which has always been maintained well above the TRP and has an improbably low likelihood of becoming overfished or to experience overfishing. Therefore this stock meets the requirements to be considered against "availability" requirements. In the WCPF, HCRs are not yet effectively used in any other WCPFC-managed UoAs. However, there is a framework that is in place, expected to develop further that will require the WCPFC to take action on HCRs before there is any detectable, projected risk that yellowfin stock status could decline below B_{MSY}.</p>
b	HCRs robustness to uncertainty

PI 1.2.2	There are well defined and effective harvest control rules (HCRs) in place		
Guidepost		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties.
Met?		N	Not scored
Justification	Agreed harmonized score: SG 80 is not met. The 'available' harvest control rules are not sufficiently articulated to allow an evaluation of the extent to which they are robust to the main uncertainties. When well-defined HCRs are developed they can be evaluated as to whether this is the case. The SG80 requirements are not considered to be met.		
c	HCRs evaluation		
Guidepost	There is some evidence that tools used or available to implement HCRs 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 HCRs.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the HCRs.
Met?	Y	N	Not scored
Justification	As noted under scoring issue a above, following SA2.5.3b, we have recognised 'available' HCRs as 'expected to reduce the exploitation rate as the point of recruitment impairment is approached'. SA2.5.5b, which requires that teams shall include in their rationale a description of the formal agreement or legal framework that the management body has defined, and the indicators and trigger levels that will require the development of HCRs. The agreement is contained in CMM 2014-06 whose objective is "To agree that the Commission shall develop and implement a harvest strategy approach for each of the key fisheries or stocks under the purview of the Commission according to the process set out in this conservation and management measure." This CMM contains general principles (including a description of a harvest strategy) and principles and elements of the proposed harvest strategies (which are consistent with the MSC definitions). The definitions include target and limit reference points and decision rules (or "harvest control rules"), with a clear intention that harvest control rules, tested using simulation approaches, will be part of the implemented harvest strategies. The specified timelines are that: <i>"The Commission shall agree a workplan and indicative timeframes to adopt or refine harvest strategies for skipjack, bigeye, yellowfin, South Pacific albacore, Pacific bluefin and northern albacore tuna by no later than the twelfth meeting of the Commission in 2015. This workplan will be subject to review in 2017."</i> Work towards establishing reference points and harvest control rules was initiated before this CMM was passed through the Management Objectives Workshop process and requires no additional trigger for their development. The requirements of SA2.5.5b are therefore considered to be met. Furthermore, SA2.5.6 requires that, in scoring issue (c) for "evidence" teams shall include consideration of the current levels of exploitation in the UoA, such as measured by the fishing mortality rate or harvest rate, where available.		

PI 1.2.2	There are well defined and effective harvest control rules (HCRs) in place
	<p>The most recent stock assessment for Yellowfin Tuna (Tremblayer-Boyer et al. 2017) and the earlier <i>status quo</i> projections (Pilling et al. 2014a) provide some evidence that the tools in use (the VDS and WCPFC effort limits) are effective in controlling exploitation of Yellowfin Tuna and achieving the exploitation levels that are required. As noted above, these indicate that fishing mortality for Yellowfin Tuna has always been below the F_{MSY} level, that the stock has not declined below B_{MSY} and that it is exceptionally unlikely (<1%) that fishing mortality will increase above the F_{MSY} level by 2032. The current levels of exploitation are therefore acceptable and the requirements of SA2.5.6 are met. This meets the requirements of the SG 60 level.</p> <p>The HCRs are only regarded as being ‘available’ in scoring issue (a) and not ‘in place’, so we have considered that it is not possible to score more than 60 for issue (c) since the SG 80 refers to the tools ‘in use’ in the fishery and not the tools ‘in use or available’. In any case, not all available evidence indicates that current exploitation is adequately contained by the existing main tools (VDS and WCPFC effort limits) as catches of yellowfin (although slightly lower in 2015) are still generally increasing and, although fishing mortality remains below the F_{MSY} level, it has increased continuously since the beginning of industrial tuna fishing. So the effectiveness of the CMM 2014-01 for restricting fishing mortality to previous levels is not well demonstrated.</p> <p>The requirements of the SG 80 level are therefore not clearly met.</p>
References	Berger et al. 2015, Tremblayer-Boyer et al. 2017, Pilling et al. 2014a, WCPFC (2014a), WCPFC 2014 (CMM for HCRs)
OVERALL PERFORMANCE INDICATOR SCORE:	
<p>CONDITION NUMBER: 4</p> <p>SI a) By the first re-assessment surveillance audit (2022), demonstrate that well defined HCRs are in place for Yellowfin Tuna that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY.</p> <p>SI b) By the first re-assessment surveillance audit (2022), provide evidence that the selection of the harvest control rules for Yellowfin Tuna are robust to the main uncertainties.</p> <p>SI c) By the first re-assessment surveillance audit (2022), provide evidence that indicates that the tools in use for Yellowfin Tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules.</p>	<p>Score</p> <p>60</p>

Evaluation Table for PI 1.2.3 Yellowfin – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guided 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, UoA 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>Stock structure - the WCPO yellowfin fishery is assessed and managed as a single stock. However, suggestive evidence for population structure is emerging for the tropical tunas (e.g. Kolody et al., 2013).</p> <p>Williams (2013) identified data gaps (for all key species, rather than yellowfin in particular) as follows:</p> <ul style="list-style-type: none"> • Vietnamese domestic fleet: no annual catch data provided (but this now appears to be provided – see Davies et al. 2014); • Philippines and Indonesian fleets: catch data not broken down by gear type; operation (logsheet) data not provided; • Chinese Taipei 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 detail's spatial models such as SEAPOPDM. <p>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. 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 SG 80 is met, but SG 100 is not met.</p>		

PI 1.2.3	Relevant information is collected to support the harvest strategy			
b	Monitoring			
	Guidepost	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA 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>Stock abundance and removals are monitored at a level of accuracy and coverage that is sufficient to support the harvest control measures in place. There is not, however, a high degree of certainty about all the information required. Operational level data are not provided by some WCPFC members (although some who do not provide it to WCPFC make their country's data available for assessment purposes).</p> <p>The issues raised above mean that we do not consider there to be a high degree of certainty about stock abundance or the robustness of the assessment to this uncertainty.</p> <p>This meets the requirements for the SG 60 and SG 80 levels but not the SG 100 level.</p>		
c	Comprehensiveness of information			
	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		Y	
Justification	<p>This scoring issue was the subject of particular attention in the original Skipjack Tuna assessment (Banks et al. 2011) and in particular whether there was good information on the level of fishery removals from some countries. The conclusion was that “despite a number of deficiencies in compilation and analysis from the Indonesia and Philippines, this reaches SG 80”.</p> <p>Since that assessment there has been additional work to improve the level of data available (noted in the Surveillance Reports for Skipjack Tuna) and we conclude that the requirements of the SG 80 level are also met for Yellowfin Tuna.</p>			
References	Banks et al. 2011, Tremblayer-Boyer et al. 2017			
OVERALL PERFORMANCE INDICATOR SCORE:				80
CONDITION NUMBER (if relevant): Condition				N/A

Evaluation Table for PI 1.2.4 Yellowfin Tuna – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		Y	Y
	Justification	The most recent assessment applied to Yellowfin Tuna (Tremblayer-Boyer et al. 2017), like other recent assessments, is an integrated, model-based assessment that is undertaken by an experienced and internationally recognised stock assessment program at the SPC. It takes into account major features relevant to the biology and the nature of the fishery. It therefore meets the requirements of the SG 80 and SG 100 levels of this scoring issue		
b	Assessment approach			
	Guidepost	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	Y	Y	
	Justification	The assessment reports provide a wide range of estimates of stock status relative to indicators of interest to management including both the target and limit reference points that have been agreed for Yellowfin Tuna. This therefore meets the requirements of the SG 60 and SG 80 levels		
c	Uncertainty in the assessment			
	Guidepost	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 assessment of Yellowfin Tuna has provided explicit commentary on the major sources of uncertainty, has assessed the sensitivity of the assessment to these uncertainties, and has evaluated current and future stock status relative to these in a probabilistic way. This meets the requirements of the SG 60, SG 80 and SG 100 levels of this scoring issue		
d	Evaluation of assessment			
	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			Y

PI 1.2.4	There is an adequate assessment of the stock status		
Justification	<p>There is an ongoing program of review of assessment assumptions and approaches by the staff in the SPC-OFP. Alternative hypotheses are continually being explored (within funding and time constraints) and assessments are updated and modified as required. Model structure has been updated to reflect the availability of new data or new interpretations of existing data and a suite of sensitivity analyses have been undertaken to explore the impact of options such as changing assumptions for fixed parameters or different treatments of the data. Furthermore, retrospective analyses have been undertaken to explore any systematic biases in the model and the results used to adjust the reference case.</p> <p>The assessment for Yellowfin Tuna has been shown to be robust and therefore meets the requirements of this scoring issue.</p> <p>We note that there has been no simulation testing of the model, but such testing is not necessary to meet the requirements.</p>		
E	Peer review of assessment		
Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
Met?		Y	N
Justification	<p>Internal reviews are undertaken by SPC and there has been an external review of the assessment of Bigeye tuna (Ianelli et al. 2012) which provided recommendations that were also applicable to other similar assessments such as for Yellowfin Tuna. Many of those recommendations have been addressed with the latest yellowfin assessment. There have also been external reviews commissioned of different aspects of the data analyses that feed into the assessments.</p> <p>This is also a level of review provided by submission to the scientific committee of the WCPFC, at which experienced scientific staff from several countries attend, but we consider this to be internal to WCPFC processes.</p> <p>We note, as discussed in the background, there have been two earlier reviews of the previous Yellowfin Tuna assessment (Haddon 2010 and Maguire 2010) which were commissioned by the USA through the Center for Independent Experts (CIE). A response to these reviews was provided by SPC to SC7 (SPC-OFP 2011) but there was no reference to the findings of this review or the response in the subsequent stock assessment (Davies et al. 2014). Given the manner of its initiation (it was not commissioned by the WCPFC or SPC) and the lack of a clear response in the subsequent assessment we are inclined to take a conservative approach in not considering scoring the last scoring issue to have been met at the SG 100 level. An effective external review should lead to an acknowledgment of deficiencies identified and evidence of a response in the subsequent assessment. Therefore, we consider that this scoring issue is met at the SG 80 level but not at the SG 100 level.</p>		
References	Davies et al. 2014, Haddon 2010, Ianelli et al. 2012, Maguire 2010, SPC-OFP 2011, Tremblayer-Boyer et al. 2017		
OVERALL PERFORMANCE INDICATOR SCORE:			95
CONDITION NUMBER (if relevant): Condition			N/A

8. Appendices

8.1 Assessment information

The assessment information for the Principle 1 v2.0 assessment upgrade for this fishery is presented here. The reader is directed back to the PCR of the fishery for information on the initial site visit.³

All meetings were by a remote interview with participants listed in Table 8. Table 9 shows the schedule of these meetings and the category of participants in each. Information was also obtained by an email exchange with Secretariat to the Pacific Community (SPC) representatives.

Table 8. List of clients and stakeholders contacted during the surveillance audit.

Name	Role	Affiliation
Alexander (Sandy) Morison	Lead Auditor (P1, P2)	SCS
Frank Meere	Auditor (P3)	SCS
Amanda Hamilton	Client representative	TMI
Angelina Tan Wei Li	Client representative	TMI
Frank Wickham	Fishing company	NFD
Cynthia Wickham	Fishing company	NFD
Eddie Honiwala	Stakeholder	Solomon Islands, MFMR
Charles Tobasala	Stakeholder	Solomon Islands, MFMR
Selina Lipa	Stakeholder	Solomon Islands, MFMR
Pamela Maru	Stakeholder	FFA
Tim Adams	Stakeholder	FFA
Hugh Walton	Stakeholder	FFA
Graham Pilling	Stakeholder	SPC (by email)
Peter Williams	Stakeholder	SPC (by email)

Table 9. Audit Overview: Key meetings and participants

	Date	Location	Topic	Attendees
1	Monday 10 June	Teleconference	SI-PS-PL. Opening meeting with a client. Meeting with TMI, NFD representatives	SCS, Client, TMI, NFD
2	Tuesday 11 June	Teleconference	SI-PS-PL. Stakeholder consultation	SCS, Client, FFA
3	Tuesday 11 June	Teleconference	SI-PS-PL. Management consultation	SCS, Client, MFMR
4	Tuesday 11 June	Teleconference	Stakeholder consultation.	SCS, PNA representatives
5	Wed 12 June (Tuesday 11 June US time)	Teleconference	SI-PS-PL & TMI-WCP-PS. Closing meetings	SCS, Client, TMI

³ <https://fisheries.msc.org/en/fisheries/tri-marine-western-and-central-pacific-skipjack-and-yellowfin-tuna/@@view>

8.1.1 Stakeholder Participation

SCS identified relevant stakeholders for this fishery through professional networks of SCS and the audit team and know-how of the organizations working in the area. A list of over 300 individuals from approximately 100 different organizations was compiled including representatives from the government, private sector and non-profit sectors working at regional and national levels. The main form of communication to stakeholders has been via email to personal or organizational email addresses. Stakeholders on the list received an email with the surveillance announcement, the MSC stakeholder template to provide input and an invitation to participate at the onsite.

One written stakeholder submission was received and the harmonized responses are included in Section 6.4. The stakeholder submission and SCS's response is included as an Appendix in the surveillance audit report.

An announcement of the surveillance audit remote meeting was published to the MSC website on May 10th, 2019. Stakeholders were informed of the announcements through the MSC website and through email. An audit plan was provided to the client, management, scientists, and interested stakeholders by SCS before the meeting.

No stakeholders requested a private meeting with the team.

During surveillance meetings, the assessment team had discussions with representatives from the management agency (MFMR), the client group and stakeholders as shown above.

8.1.2 Evaluation techniques

One of the most significant, and difficult, aspects of the MSC certification process is ensuring that the assessment team acquires a complete and thorough grounding in all aspects of the fishery under evaluation. In even the smallest fishery, this is no easy task as the assessment team typically needs information that is fully supported by documentation in all areas of the fishery from the status of stocks, to ecosystem impacts, through management processes and procedures.

Under the MSC program, it is the responsibility of the applying organizations or individuals to provide the information required proving the fishery or fisheries comply with the MSC standards. It is also the responsibility of the applicants to ensure that the assessment team has access to any and all scientists, managers, and fishers that the assessment team identifies as necessary to interview in its effort to properly understand the functions associated with the management of the fishery. Last, it is the responsibility of the assessment team to make contact with stakeholders that are known to be interested, or actively engaged in issues associated with fisheries in the same geographic location.

In addition to information provided by the client and information gained during the site visit, the assessment team gathered information using a range of methods. The website of the WCPFC (www.wcpfc.int) was a key source of documentation about the target species, other retained species, CMMs and other management arrangements. The PNA website (www.pnatuna.com) was also used to source information relevant to fishing in PNA waters. Direct approaches were made to the SPC for data on the fishery including data from logbooks and observers. The pre-assessment report (a draft copy of which was provided to the assessment team) was used as background.

Stakeholders were informed primarily via announcements posted on the MSC website, and via direct email outreach. None were identified.

Scoring was completed by consensus through team meetings and exchanging rationales by email and draft score and report sharing. The decision rule for MSC certification is as follows:

1. No PIs score below 60 (cannot receive certification)
2. The aggregate score for each Principle, rounded to the nearest whole number, is 80 or above
3. 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 Principle Level Scores).

The scoring elements considered under each of the Principles are outlined in Table 4.3. None were considered data deficient and requiring the use of the RBF for the assessment.

Table 10. Scoring elements considered in assessing the fishery.

Component	Scoring elements	Main/not main	Data-deficient or not
Target species	Skipjack tuna	N/A	Not data deficient
	Yellowfin tuna	N/A	Not data deficient
Retained species	Bigeeye tuna	Main	Not data deficient
Bycatch species	Silky shark	Not main	Not data deficient
ETP species	Sharks and rays (10 species)	N/A	Not data deficient

	Cetaceans (9 species)	N/A	Not data deficient
	Turtles (6 species)	N/A	Not data deficient
	Seabirds (various)	N/A	Not data deficient
Habitats	Pelagic habitats	N/A	Not data deficient

Scoring and Report Development Process

Onsite Visit: Scoring was initiated during the 3rd year surveillance held in June 2019.

Scoring Methodology

The assessment team followed guidelines in MSC FCP v2.1 Section 7.10 “Scoring the fishery”. Scoring in the MSC system occurs via an Analytical Hierarchy Process and uses decision rules and weighted averages to produce Principle Level scores. There are 28 Performance Indicators (PIs), each with one or more Scoring Issues (SIs). Each of the scoring issues are considered at the 60, 80, and 100 scoring guidepost levels. The decision rule described in Table 10 determines the Performance Indicator score, which must always be in an increment of 5. If there are multiple ‘elements’⁴ under consideration (e.g. multiple main primary species), each element is scored individually for each relevant PI, then a single PI score is generated using the same set of decision rules described in Table 10.

Table 11. Decision Rule for Calculating Performance Indicator Scores based on Scoring Issues, and for Calculating Performance Indicator Scores in Cases of Multiple Scoring Elements. (Adapted from MSC FCPV2.1 Table 4)

Score	Combination of individual SIs at the PI level, and/or combining multiple element PI scores into a single PI score.
<60	Any scoring element/SI within a PI which fails to reach SG60 shall not be assigned a score as this is a pre-condition to certification.
60	All elements (as scored at the PI level) or SIs meet SG60 and only SG60.
65	All elements/SIs meet SG60; a few achieve higher performance, at or exceeding SG80, but most do not meet SG80.
70	All elements/SIs meet SG60; half* achieve higher performance, at or exceeding SG80, but some do not meet SG80 and require intervention action to make sure they get there.
75	All elements/SIs meet SG60; most achieve higher performance, at or exceeding SG80; only a few fail to achieve SG80 and require intervention action.
80	All elements/SIs meet SG80, and only SG80.
85	All elements/SIs meet SG80; a few achieve higher performance, but most do not meet SG100.
90	All elements/SIs meet SG80; half achieve higher performance at SG100, but some do not.

⁴ MSC FCRV2.0 7.10.7: In Principle 1 or 2, the team shall score PIs comprised of differing scoring elements (species or habitats) that comprise part of a component affected by the UoA.

95	All elements/SIs meet SG80; most achieve higher performance at SG100, and only a few fail to achieve SG100.
100	All elements/SIs meet SG100.

**MSC FCPV2.1 uses the word 'some' instead of half. SCS considers 'half' a clearer description of the methodology utilized.*

8.2 Peer Review reports

This fishery was eligible for a reduced P1 upgrade (Appendix A) from the variation request submitted to the MSC for all tuna fisheries. Fisheries assessed under a reduced upgrade are not subject to peer review.

8.3 Stakeholder input

No stakeholder written comments were received prior to the closing of the 30 day consultation period. No stakeholders requested a private meeting with the team. However, one stakeholder submission was received by SCS concerning another MSC assessment. It was also relevant to this fishery as it pertains to yellowfin and skipjack and was the subject of cross-CAB harmonisation discussions (described in 4.2 Harmonization Considerations) so the submission has also been considered as part of this surveillance audit/P1 Upgrade. The stakeholder submission and SCS's response is included as an Appendix in the Year 3 Surveillance audit report.

8.4 Conditions

The condition timelines for Principle 1 for Skipjack and Yellowfin below specify improved performance of the fishery to at least SG80 outside the time period of the term of the initial certification period. This qualifies as an ‘exceptional circumstance’ per FCP v2.1 (7.18.1.5) as the condition timelines were required, under the P1 v2.0 Upgrade Process, to be harmonized across all tuna fisheries targeting the same stock. Milestones have been set such that SG80 will be met by the first surveillance audit to take place in 2022 under the second certificate of the fishery (should it be successfully renewed). Progress against the milestone in the first surveillance audit will be judged against the outcomes of the Commission meeting held in December of 2021.

Condition 1 PI 1.2.1 Skipjack

Table 12. Condition 1 Skipjack ⁵	
Performance Indicator	PI 1.2.1a (Skipjack). There is a robust and precautionary harvest strategy in place
Score	PI score: 70
Rationale	See rationale for PI 1.2.1a (Skipjack): Evaluation Table for PI 1.2.1 Skipjack tuna – Harvest strategy
Condition	By the first re-assessment surveillance audit (2022), demonstrate that the harvest strategy for Skipjack Tuna 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
Milestones	<p>The milestones reflect the updated Proposed Revisions to Harvest Strategy Work plan (WCPFC14-2017-DP27_rev2):⁶</p> <p>1. 4th Surveillance (2020): SC provide advice on performance of candidate harvest control rules; TCC consider the implications of candidate harvest control rules; Commission consider advice on progress towards harvest control rules. Score 70.</p> <p>2. 1st Surveillance audit of re-assessment (2022): Harvest Strategy for Skipjack in place. Score 80.⁷</p> <p><u>Original milestones</u></p> <p>At the end of the second and third years, the client shall provide evidence that achieving the condition will occur by the end of the fourth year.</p>

⁵ The Principle 1 milestones and timelines for this fishery are harmonized with other MSC tuna fisheries in the WCPO. The milestones have been set one year after the WCPFC workplan so that the assessment team can review the outcomes of the Commission meetings held in December each year in the following year’s audit.

⁶ The language on milestones has been changed from that of the PCR to align with other SCS tuna assessments. The intent has not changed.

⁷ We have not included the milestone in year 2021 because the fishery will be undergoing re-assessment during 2021, so progress against the condition will not be able to be assessed. Instead, the wording of the final milestone (i.e. Year 2022) reflects the expected output of the WCPFC workplan for that stock in year 2021 as detailed in the 2017 WCPFC workplan.

	At the end of the fourth year, the client shall provide evidence that 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.	
Client action plan	Responsible Party/ies: 4th Surveillance (2020): SC provide advice on performance of candidate harvest control rules; TCC consider the implications of candidate harvest control rules; Commission consider advice on progress towards harvest control rules. Score 70.	
	Activities:	Tri Marine/NFD will actively support work towards the development and adoption of a harvest strategy for WCPO skipjack that includes management action responses to changes in skipjack stock status and harvest control rules aimed at maintaining the WCPO skipjack stock at or near target reference points.
	Expected outcome:	Commission consider advice on progress towards harvest control rules
	Expected score:	70
	2. 1st Surveillance of re-assessment (2022): Harvest Strategy for Skipjack in place. Score 80.	
	Activities:	A harvest strategy for WCPO skipjack will be adopted that includes management action responses to changes in skipjack stock status and harvest control rules aimed at maintaining the WCPO skipjack stock at or near target reference points
	Expected outcome:	A formal harvest strategy for skipjack is adopted which is responsive to the state of the stock and achieves management objectives reflected in the target and limit reference points.
	Expected score:	80
Consultation on condition	The client will consult with MFMR, other members within the Solomon Islands, US and American Samoa delegations to WCPFC, other WCPFC delegations, including FFA/PNA members, SPC, ISSF and environmental NGOs.	

Condition 2 PI 1.2.2 Skipjack

Table 13. Condition 2 Skipjack ⁸	
Performance Indicator	PI 1.2.2 (Skipjack). Harvest control rules and tools
Score	PI score: 60
Rationale	See rationale for PI 1.2.2 (Skipjack): Evaluation Table for PI 1.2.2 Skipjack tuna – Harvest control rules and tools
Condition	<p>SI a) By the first re-assessment surveillance audit (2022), demonstrate that well defined HCRs are in place for Skipjack Tuna that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY.</p> <p>SI b) By the first re-assessment surveillance audit (2022), provide evidence that the selection of the harvest control rules for Skipjack Tuna are robust to the main uncertainties.</p> <p>SI c) By the first re-assessment surveillance audit (2022), provide evidence that indicates that the tools in use for Skipjack Tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules.</p>
Milestones	<p>The milestones reflect the updated Proposed Revisions to Harvest Strategy Work plan (WCPFC14-2017-DP27_rev2):</p> <p>1. 4th Surveillance (2020): SC provide advice on performance of candidate harvest control rules; TCC consider the implications of candidate harvest control rules; Commission consider advice on progress towards harvest control rules. Score 60.</p> <p>2. 1st Surveillance of re-assessment (2022): Harvest Strategy for Skipjack in place. Score 80.</p> <p><u>Old milestones</u></p> <p>At the end of the first year, the client shall provide a plan that will achieve the condition by end of the fourth year.</p> <p>At the end of the second and third years, the client shall provide evidence that achieving the condition will occur by the end of the fourth year.</p> <p>At the end of the fourth year, the client shall provide evidence that well defined harvest control rules are in effect that consider main uncertainties and use appropriate and effective tools.</p>

⁸ The Principle 1 milestones and timelines for this fishery are harmonized with other MSC tuna fisheries in the WCPO. The milestones have been set one year after the WCPFC workplan so that the assessment team can review the outcomes of the Commission meetings held in December each year in the following year's audit.

Client action plan	Responsible Party/ies: 4th Surveillance (2020): SC provide advice on performance of candidate harvest control rules; TCC consider the implications of candidate harvest control rules; Commission consider advice on progress towards harvest control rules. Score 60.	
	Activities:	<ul style="list-style-type: none"> • Tri Marine/NFD will actively support work towards the development and adoption of a harvest strategy for WCPO skipjack that includes management action responses to changes in skipjack stock status and harvest control rules aimed at maintaining the WCPO skipjack stock at or near target reference points. • Tri Marine/NFD will advocate that PNA establish more explicit linkages between total allowable effort (TAE) of the VDS and the harvest strategy (effort limited to that which maintains the stock at target reference point), including reductions in PAE as the limit reference point is neared.
	Expected outcome:	Commission agreement on TRP for yellowfin
	Expected score:	60
	2. 1st Surveillance audit re-assessment (2022): Harvest Strategy for Skipjack in place. Score 80.	
	Activities:	<ul style="list-style-type: none"> ▪ Tri Marine/NFD will demonstrate that the WCPFC has well defined and effective harvest control rules taking into account the main uncertainties are in place for skipjack that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.
	Expected outcome:	A formal harvest strategy for skipjack is adopted which is responsive to the state of the stock and achieves management objectives reflected in the target and limit reference points.
	Expected score:	80
Consultation on condition	The client will consult with MFMR, other members within the Solomon Islands, US and American Samoa delegations to WCPFC, other WCPFC delegations, including FFA/PNA members, SPC, ISSF and environmental NGOs.	

Condition 3 PI 1.2.1 Yellowfin

Table 14. Condition 1 Yellowfin tuna ⁹	
Performance Indicator	PI 1.2.1 (Scoring issue a) Harvest strategy design
Score	PI score: 70
Rationale	<p>See rationale for PI 1.2.1a: Evaluation Table for PI 1.2.1 Yellowfin tuna – Harvest strategy</p> <p>The general stock decline for yellowfin (albeit with a recent increase in stock size), the absence of agreed harvest control rules within WCPFC or PNA for any other tuna species, and the record of the Commission failing to reduce fishing mortality on bigeye tuna when it was thought to have been subject to overfishing, reduces the level of confidence that the harvest strategy would be responsive to the state of the stock or that the elements will work together when required to do so to achieve the management objectives.</p> <p>It is also not clear that coherent management actions are applied throughout the range of the stock, particularly in Indonesia and the Philippines.</p> <p>Overall this prevents the conclusion that the strategy is designed to achieve stock management objectives.</p> <p>Yellowfin tuna is therefore considered to meet the SG 60 level of this scoring issue but not the SG 80 or SG 100 levels.</p>
Condition	By the first re-assessment surveillance audit (2022), demonstrate that the harvest strategy for Yellowfin Tuna 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
Milestones	<p>The milestones reflect the updated Proposed Revisions to Harvest Strategy Work plan (WCPFC14-2017-DP27_rev2):</p> <p>1. 4th Surveillance (2020): SC provide advice on potential Target Reference Points for yellowfin; Commission agree on a TRP for yellowfin. SC to provide advice on performance of candidate HCRs; Commission to consider advice on progress towards HCR. Score 70.</p> <p>2. 1st Surveillance of re-assessment (2022): SC to provide advice on performance of candidate HCRs; TCC consider the implications of candidate HCRs; Commission consider advice on progress toward HCRs; Adopt a HCR. Score 80.</p> <p><u>Original milestones</u></p> <p>At the end of the first year, the client shall provide a plan that will achieve the condition by end of the fourth year.</p> <p>At the end of the second and third years, the client shall provide evidence that achieving the condition will occur by the end of the fourth year.</p>

⁹ The Principle 1 milestones and timelines for this fishery are harmonized with other MSC tuna fisheries in the WCPO. The milestones have been set one year after the WCPFC workplan so that the assessment team can review the outcomes of the Commission meetings held in December each year in the following year's audit.

	At the end of the fourth year, the client shall provide evidence that 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.	
Client action plan	Responsible Party/ies:	
	1. 4th Surveillance (2020): SC provide advice on potential Target Reference Points for yellowfin; Commission agree a TRP for yellowfin. SC to provide advice on performance of candidate HCRs; Commission to consider advice on progress towards HCR. Score 70.	
	Activities:	Tri Marine/NFD will actively support work towards the development and adoption of a harvest strategy for WCPO yellowfin that includes management action responses to changes in yellowfin stock status and harvest control rules aimed at maintaining the WCPO yellowfin stock at or near target reference points.
	Expected outcome:	Commission agreement on TRP for yellowfin
	Expected score:	70
	2. 1st Surveillance of re-assessment (2022): SC to provide advice on performance of candidate HCRs; TCC consider the implications of candidate HCRs; Commission consider advice on progress toward HCRs; Adopt a HCR. Score 80.	
	Activities:	A harvest strategy for WCPO yellowfin will be adopted that includes management action responses to changes in yellowfin stock status and harvest control rules aimed at maintaining the WCPO yellowfin stock at or near target reference points. Tri Marine/NFD's support and advocacy will largely be through active participation in WCPFC meetings as part of the Solomon Islands, US and American Samoa delegations. Such participation will include communicating specific desired policies to support meeting this condition. MFMR will also advocate and support these conditions being met through active participation in PNA, FFA and WCPFC initiatives/proposals regarding harvest strategies.
	Expected outcome:	A formal harvest strategy for yellowfin is adopted which is responsive to the state of the stock and achieves management objectives reflected in the target and limit reference points.
Expected score:	80	
Consultation on condition	The client will consult with MFMR, other members within the Solomon Islands, US, and American Samoa delegations to WCPFC, other WCPFC delegations, including FFA/PNA members, SPC, ISSF and environmental NGOs.	

Condition 4 PI 1.2.2 Yellowfin

Table 15. Condition 2. Yellowfin tuna	
Performance Indicator	PI 1.2.2 Harvest control rules and tools
Score	PI score 60
Rationale	See rationale for PI 1.2.2 a,b,c: Evaluation Table for PI 1.2.2 yellowfin tuna – Harvest control rules and tools
Condition	<p>SI a) By the first re-assessment surveillance audit (2022), demonstrate that well defined HCRs are in place for Yellowfin Tuna that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY.</p> <p>SI b) By the first re-assessment surveillance audit (2022), provide evidence that the selection of the harvest control rules for Yellowfin Tuna are robust to the main uncertainties.</p> <p>SI c) By the first re-assessment surveillance audit (2022), provide evidence that indicates that the tools in use for Yellowfin Tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules.</p>
Milestones	<p>As for Condition 3:</p> <p>The milestones reflect the updated Proposed Revisions to Harvest Strategy Work plan (WCPFC14-2017-DP27_rev2):</p> <p>1. 4th Surveillance (2020): SC provide advice on potential Target Reference Points for yellowfin; Commission agree a TRP for yellowfin. SC to provide advice on performance of candidate HCRs; Commission to consider advice on progress towards HCR. Score 60.</p> <p>2. 1st Surveillance of re-assessment (2022): SC to provide advice on performance of candidate HCRs; TCC consider the implications of candidate HCRs; Commission consider advice on progress toward HCRs; Adopt a HCR. Score 80.</p> <p><u>Original milestones</u></p> <p>At the end of the first year, the client shall provide a plan that will achieve the condition by end of the fourth year.</p> <p>At the end of the second and third years, the client shall provide evidence that achieving the condition will occur by the end of the fourth year.</p> <p>At the end of the fourth year, the client shall provide evidence that well defined harvest control rules are in effect that consider main uncertainties and use appropriate and effective tools.</p>
Client action plan	<p>Responsible Party/ies:</p> <p>1. 4th Surveillance (2020): SC provide advice on potential Target Reference Points for yellowfin; Commission agree a TRP for yellowfin. SC to provide advice on performance of candidate HCRs; Commission to consider advice on progress towards HCR. Score 70.</p>

	Activities:	Tri Marine/NFD will actively support work towards the development and adoption of a harvest strategy for WCPO yellowfin that includes management action responses to changes in yellowfin stock status and harvest control rules aimed at maintaining the WCPO yellowfin stock at or near target reference points. Tri Marine/NFD will advocate that adoption of additional WCPFC management measures for yellowfin.
	Expected outcome:	Commission agreement on a TRP for yellowfin
	Expected score:	60
	2. 1st Surveillance of re-assessment (2022): SC to provide advice on performance of candidate HCRs; TCC consider the implications of candidate HCRs; Commission consider advice on progress toward HCRs; Adopt a HCR. Score 80.	
	Activities:	Tri Marine/NFD will demonstrate that well defined and effective harvest control rules taking into account the main uncertainties are in place for yellowfin that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.
	Expected outcome:	A formal harvest strategy for yellowfin is adopted which is responsive to the state of the stock and achieves management objectives reflected in the target and limit reference points.
	Expected score:	80
Consultation on condition	The client will consult with MFMR, other members within the Solomon Islands, US and American Samoa delegations to WCPFC, other WCPFC delegations, including FFA/PNA members, SPC, ISSF and environmental NGOs.	

8.5 Client Action Plan

For Client Action Plan please see Section 8.4.

8.6 Surveillance

Given the readily available information concerning the fisheries and the small number of easily tracked conditions, MRAG Americas has determined that the fisheries qualify for level 4 surveillance as described in CR v2.0 Section 7.23. Unless changed in subsequent notices, surveillance will occur off-site for surveillance audits 1 and 3, and on-site for surveillance audits 2 and 4.

8.7 Harmonised fishery assessments

Principle 1 scores for the above fishery have been subject to harmonization and there are no differences among the fisheries for Principle 1.

Table 16. Fisheries in the MSC System Considered for P1 Harmonization. All fisheries listed here were subject to the P1 upgrade harmonization process that required an alignment of scores and condition timelines across all tuna fisheries in the WCPFC.

	Fishery	Status	Principles for Harmonization	Conformity Assessment Body
1	American Samoa EEZ albacore and yellowfin longline	Certified	Principle 1	CU Pesca
2	Fiji albacore and yellowfin tuna longline	Certified	Principle 1	Acoura/LR
3	French Polynesia albacore and yellowfin longline	Certified	Principle 1	CU Pesca
4	MIFV RMI EEZ Longline Yellowfin and Bigeye Tuna	Certified	Principle 1	CU Pesca
5	Pan Pacific yellowfin, bigeye and albacore longline fishery	Under Assessment	Principle 1	CU Pesca
6	PNA Western and Central Pacific skipjack and yellowfin tuna	Certified	Principle 1	Acoura/LR
7	PNG Fishing Industry Association's purse seine Skipjack & Yellowfin Tuna Fishery	Under Assessment	Principle 1	SCS
8	PT Citraraja Ampat, Sorong pole and line skipjack and yellowfin tuna	Certified	Principle 1	DNV GL
9	Kiribati albacore, bigeye and yellowfin tuna longline fishery	Under Assessment	Principle 1	CU Pesca
11	Solomon Islands Longline Tuna Fishery	Under Assessment	Principle 1	SCS
12	Solomon Islands skipjack and yellowfin tuna	Certified	Principle 1	SCS
13	SZLC, CSFC & FZLC Cook Islands EEZ South Pacific albacore & yellowfin longline	Under Assessment	Principle 1	CU Pesca
14	Tri Marine Western and Central Pacific skipjack and yellowfin tuna	Certified	Principle 1	CU Pesca
15	Tropical Pacific yellowfin and skipjack tuna free-school purse seine fishery	Certified	Principle 1	SCS
16	Walker Seafood Australia albacore, yellowfin tuna and swordfish	Certified	Principle 1	CU Pesca
17	WPSTA Western and Central Pacific skipjack and yellowfin free school purse seine	Certified	Principle 1	CU Pesca
18	Ishihara Marine Products albacore and skipjack pole and line fishery	Certified	Principle 1	CU Pesca
19	Japanese skipjack and albacore pole and line	Certified	Principle 1	Lloyds Register (Acoura)
20	New Zealand Talley's skipjack	Certified	Principle 1	Lloyds Register (Acoura)

Appendix A

List of relevant tuna fisheries and associated actions February 2019

Fishery name	Stock	P1 upgrade required?	P1 upgrade type	CAB proposal condition deadline	Part of variation request?	Action required
North West Atlantic Canada Harpoon swordfish	AO-SWO-N	Yes	Full	n/a	Yes	P1 rescored against v2.0 at first opportunity (no alignment of condition timelines required)
North West Atlantic Canada Longline swordfish	AO-SWO-N	Yes	Full	n/a	Yes	P1 rescored against v2.0 at first opportunity (no alignment of condition timelines required)
US North Atlantic swordfish, yellowfin and albacore	AO-SWO-N	Yes	Full	n/a	Yes	P1 rescored against v2.0 at first opportunity (no alignment of condition timelines required)
US North Atlantic swordfish, yellowfin and albacore	AO-YFT	Yes	Full*	2022	Yes	P1 rescored against v2.0 at first opportunity (no alignment of condition timelines required)
Northeastern Tropical Pacific Purse Seine SKJ and YFT	EPO-SKJ	Yes	Full*	n/a	Yes	P1 rescored against v2.0 at first opportunity (no alignment of condition timelines required)
French Polynesia albacore and yellowfin longline fishery	EPO-YFT	No	n/a	n/a	Yes	No P1 upgrade or alignment of condition timelines required
Echebastar Indian Ocean Purse Seine Skipjack Tuna	IO-SKJ	No	n/a	n/a	Yes	No P1 upgrade or alignment of condition timelines required
Maldives Pole and Line Tuna Skipjack	IO-SKJ	No	n/a	n/a	Yes	No P1 upgrade or alignment of condition timelines required
AAFA and WFOA North Pacific albacore tuna	PO-ALB-N	No	n/a	2023	Yes	Condition timelines to be aligned with relevant proposed deadline at next surveillance audit
American Samoa EEZ Albacore and Yellowfin Longline Fishery	PO-ALB-S	No	n/a	2021	Yes	Condition timelines to be aligned with relevant proposed deadline at next surveillance audit
Fiji albacore and yellowfin longline	PO-ALB-S	No	n/a	2021	Yes	Condition timelines to be aligned with relevant proposed deadline at next surveillance audit
French Polynesia albacore and yellowfin longline fishery	PO-ALB-S	No	n/a	2021	Yes	Condition timelines to be aligned with relevant proposed deadline at next surveillance audit
New Zealand Albacore Troll Fishery	PO-ALB-S	No	n/a	2021	Yes	No P1 upgrade or alignment of condition timelines required

Fishery name	Stock	P1 upgrade required?	P1 upgrade type	CAB proposal condition deadline	Part of variation request?	Action required
New Zealand Talley's skipjack	WPO-SKJ	No	n/a	2021	Yes	No P1 upgrade or alignment of condition timelines required
PNA skipjack and yellowfin tuna	WPO-SKJ	No	n/a	2021	Yes	Condition timelines to be aligned with relevant proposed deadline at next surveillance audit
WPSTA purse seine free school yellowfin and skipjack	WPO-SKJ	No	n/a	2021	Yes	Condition timelines to be aligned with relevant proposed deadline at next surveillance audit
American Samoa EEZ Albacore and Yellowfin Longline Fishery	WPO-YFT	No	n/a	2021	Yes	Condition timelines to be aligned with relevant proposed deadline at next surveillance audit
Fiji albacore and yellowfin longline	WPO-YFT	No	n/a	2021	Yes	Condition timelines to be aligned with relevant proposed deadline at next surveillance audit
French Polynesia albacore and yellowfin longline fishery	WPO-YFT	No	n/a	2021	Yes	Condition timelines to be aligned with relevant proposed deadline at next surveillance audit
PNA skipjack and yellowfin tuna	WPO-YFT	No	n/a	2021	Yes	Condition timelines to be aligned with relevant proposed deadline at next surveillance audit
WPSTA purse seine free school yellowfin and skipjack	WPO-YFT	No	n/a	2021	Yes	Condition timelines to be aligned with relevant proposed deadline at next surveillance audit
North Atlantic albacore artisanal fishery	AO-ALB-N	Yes	Reduced	n/a	Yes	P1 rescored against v2.0 at first opportunity (no alignment of condition timelines required)
US North Atlantic swordfish, yellowfin and albacore	AO-ALB-N	Yes	Reduced	n/a	Yes	P1 rescored against v2.0 at first opportunity (no alignment of condition timelines required)
Northeastern Tropical Pacific Purse Seine SKJ and YFT	EPO-YFT	Yes	Reduced	n/a	Yes	P1 rescored against v2.0 at first opportunity (no alignment of condition timelines required)
CHMSF British Columbia albacore tuna North Pacific	PO-ALB-N	Yes	Reduced	2023	Yes	P1 rescored against v2.0 at first opportunity AND condition timelines to be aligned with relevant proposed deadline
Japanese skipjack and albacore pole and line	PO-ALB-N	Yes	Reduced	2023	Yes	P1 rescored against v2.0 at first opportunity AND condition timelines to be aligned with relevant proposed deadline
SZLC, CSFC & FZLC Cook Islands EEZ South Pacific albacore & yellowfin longline	PO-ALB-S	Yes	Reduced	2021	Yes	P1 rescored against v2.0 at first opportunity AND condition timelines to be aligned with relevant proposed deadline
Walker Seafood Australian albacore, yellowfin tuna, and swordfish longline	PO-ALB-S	Yes	Reduced	2021	Yes	P1 rescored against v2.0 at first opportunity AND condition timelines to be aligned with relevant proposed deadline
Japanese skipjack and albacore pole and line	WPO-SKJ	Yes	Reduced	2021	Yes	P1 rescored against v2.0 at first opportunity AND condition timelines to be aligned with relevant proposed deadline
Solomon Islands skipjack and yellowfin tuna	WPO-SKJ	Yes	Reduced	2021	Yes	P1 rescored against v2.0 at first opportunity AND condition timelines to be aligned with relevant proposed deadline

Fishery name	Stock	P1 upgrade required?	P1 upgrade type	CAB proposal condition deadline	Part of variation request?	Action required
TriMarine Western and Central Pacific Skipjack and Yellowfin Tuna	WPO-SKJ	Yes	Reduced	2021	Yes	P1 rescored against v2.0 at first opportunity AND condition timelines to be aligned with relevant proposed deadline
Solomon Islands skipjack and yellowfin tuna	WPO-YFT	Yes	Reduced	2021	Yes	P1 rescored against v2.0 at first opportunity AND condition timelines to be aligned with relevant proposed deadline
SZLC, CSFC & FZLC Cook Islands EEZ South Pacific albacore & yellowfin longline	WPO-YFT	Yes	Reduced	2021	Yes	P1 rescored against v2.0 at first opportunity AND condition timelines to be aligned with relevant proposed deadline
TriMarine Western and Central Pacific Skipjack and Yellowfin Tuna	WPO-YFT	Yes	Reduced	2021	Yes	P1 rescored against v2.0 at first opportunity AND condition timelines to be aligned with relevant proposed deadline
Walker Seafood Australian albacore, yellowfin tuna, and swordfish longline	WPO-YFT	Yes	Reduced	2021	Yes	P1 rescored against v2.0 at first opportunity AND condition timelines to be aligned with relevant proposed deadline
ACTEMSA-LEAL SANTOS pole and line West Atlantic skipjack fishery	AO-SKJ-W	n/a	n/a	2022	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1
Sant Yago TF Unassociated purse seine Atlantic yellowfin tuna fishery	AO-YFT	n/a	n/a	2022	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1
Pan Pacific yellowfin, bigeye and albacore longline fishery	EPO-BET	n/a	n/a	n/a	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1
Panama tropical Pacific yellowfin and skipjack purse seine tuna fishery	EPO-SKJ	n/a	n/a	n/a	No	Condition timelines to be harmonised with overlapping fishery (no RFMO workplan exists), either as part of assessment or at 1st SA following FCP 2.1
Pan Pacific yellowfin, bigeye and albacore longline fishery	EPO-YFT	n/a	n/a	n/a	No	No conditions expected therefore no action
Panama tropical Pacific yellowfin and skipjack purse seine tuna fishery	EPO-YFT	n/a	n/a	n/a	No	No conditions expected therefore no action
Ishihara Marine Products albacore and skipjack pole and line fishery	PO-ALB-N	n/a	n/a	2023	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1
Pan Pacific yellowfin, bigeye and albacore longline fishery	PO-ALB-N	n/a	n/a	2023	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1
AAFA and WFOA South Pacific albacore tuna	PO-ALB-S	n/a	n/a	2021	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1
Pan Pacific yellowfin, bigeye and albacore longline fishery	PO-ALB-S	n/a	n/a	2021	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1
Pan Pacific yellowfin, bigeye and albacore longline fishery	WPO-BET	n/a	n/a	2021**	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1
SZLC CSFC & FZLC FSM EEZ Longline Yellowfin and Bigeye Tuna	WPO-BET	n/a	n/a	2021**	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1

Fishery name	Stock	P1 upgrade required?	P1 upgrade type	CAB proposal condition deadline	Part of variation request?	Action required
Ishihara Marine Products albacore and skipjack pole and line fishery	WPO-SKJ	n/a	n/a	2021	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1
PT Citraraja Ampat, Sorong pole and line Skipjack and Yellowfin Tuna	WPO-SKJ	n/a	n/a	2021	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1
Tropical Pacific yellowfin and skipjack free-school purse seine fishery	WPO-SKJ	n/a	n/a	2021	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1
Pan Pacific yellowfin, bigeye and albacore longline fishery	WPO-YFT	n/a	n/a	2021	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1
PT Citraraja Ampat, Sorong pole and line Skipjack and Yellowfin Tuna	WPO-YFT	n/a	n/a	2021	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1
SZLC CSFC & FZLC FSM EEZ Longline Yellowfin and Bigeye Tuna	WPO-YFT	n/a	n/a	2021	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1
Tropical Pacific yellowfin and skipjack free-school purse seine fishery	WPO-YFT	n/a	n/a	2021	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1
Solomon Islands longline albacore and yellowfin tuna fishery	WPO-YFT	n/a	n/a	2021	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1
Solomon Islands longline albacore and yellowfin tuna fishery	PO-ALB-S	n/a	n/a	2021	No	Condition timelines to be aligned with relevant proposed deadline, within assessment if possible or at 1st SA following FCP 2.1

* Reduced upgrade permitted if an assessment against v2.0 has been completed for another UoA on the same stock

** No date for WPO-BET included in CAB's proposal. This date is added following the logic of the variation request and in line with other WCPFC stock workplans

Appendix B

Principle 1 v2.0 assessment upgrade process February 2019

8.8 Introduction

This document provides the process requirements CABs shall follow to upgrade Principle 1 assessments of tuna fisheries currently certified against v1.3 of the MSC Fisheries Standard.

This process is only applicable to the combined tuna fishery variation request, submitted 11 December 2018.

This process is adapted from FCP v2.1 7.27 and Annex PE - scope extensions. It is noted that the MSC has no expectation that CABs – if they choose to apply this process before the FCP v2.1 becomes effective - are obliged to adopt the FCP v2.1 more generally before such time that it is required to do so.

The MSC expects that Principle 1 assessment upgrades will be conducted at the next surveillance audit. These process requirements do not change the need for CABs to conform to surveillance audit requirements as per FCP v2.1 7.28.

1. Scope

- 1.1. The requirements of this annex shall apply only to Principle 1 assessment upgrade of tuna fisheries currently certified against v1.3 of the MSC Fisheries Standard (as per Appendix A of the MSC's variation response).

2. Assessment team

- 2.1. The team shall comprise of a team leader and a minimum of 1 additional team member, that meet the qualifications and competency requirements relevant to Principle 1, specifically that the team leader shall meet Table PC1; team members meet table PC2; and combined they meet sections 1 (Fish stock assessment), 2 (Fish stock biology / ecology) and 5 (Current knowledge of the country, language and local fishery context) of table PC3.

3. Announcement

- 3.1. The CAB shall use the 'MSC Surveillance Announcement Template', which shall be uploaded to the MSC database for publication on the MSC website, to notify stakeholders and the MSC of the CAB's intent to undertake a Principle 1 v2.0 assessment upgrade at the next surveillance audit.
- 3.2. The CAB shall include the following information in the announcement:
 - a. Reference to the variation request
 - b. Details of the on-site or off-site assessment (depending on the surveillance level of the fishery as per FCP 7.28), including the date and, where relevant, the location of the site visit.
 - c. Details of what will be assessed/reviewed during the audit
 - d. Details of reporting timelines with respect to audit timing and expected report publication
 - e. Details of the opportunities and input methods for stakeholders to participate during the on-site or off-site assessment.
 - i. The details should make clear that the assessment team is available to meet with stakeholders in person or remotely.

- f. Summaries of CVs of the team and team leader, including an explanation of how they meet the competency criteria in the GCR and Annex PC , as well as confirmation that the team has no conflicts of interest in relation to the fishery under assessment.

- 3.3. The CAB shall upload the Announcement to the MSC database for publication on the MSC website at least 30 days before the Principle 1 v2.0 assessment upgrade on site or offsite audit is carried out.

4. Assessment

- 4.1. The CAB shall conduct the Principle 1 v2.0 assessment upgrade at the next Surveillance Audit.
- 4.2. The CAB shall use one of the following assessment types:
 - a. On-site. The assessment involves face-to-face engagement with the client, conducting stakeholder interviews and a review of management and science in the fishery.
 - b. Off-site. The assessment involves engagement with the client, conducting stakeholder interviews and a review management and science in the fishery and is undertaken by the assessment team from a remote location.
- 4.3. The CAB shall determine whether the Principle 1 v2.0 assessment upgrade is conducted on-site or off-site depending on the existing surveillance level assigned to the fishery and the ability of the CAB to remotely verify information.
 - 4.3.1. Where an off-site assessment is conducted, the CAB shall provide a rationale in the announcement of how clause 4.3 is met.
- 4.4. The team shall:
 - a. Conduct interviews to make sure that the team is aware of any concerns or information that stakeholders may have.
 - b. Allow private interviews with the team for stakeholders who request one.
 - c. Use any information provided in private in conformity with confidentiality requirements, see FCP v2.1 Section 4.3.
- 4.5. The CAB shall evaluate the assessment components using all requirements in MSC Fisheries Standard Annex SA2 following the process as described in FCP Section 7.17 and Section 7.18.
- 4.6. The CAB shall complete the Principle 1 v2.0 upgrade assessment in compliance with timelines as set out in FCP 7.20.1 and 7.22.1.

5. Reporting

- 5.1. If the stock has been assessed against FCR v2.0 Annex SA, the CAB shall follow 5.1.1 – 5.1.4.
 - 5.1.1. The CAB shall produce a single report using the ‘MSC Reporting Template’ and follow procedures outlined in FCP Sections 7.19.1, 7.19.2, 7.19.6 to 7.19.10, 7.24.3 and 7.24.4 (exclusive of references to the Peer Review Draft Report and the Peer Review College).
 - 5.1.2. Reporting shall include:
 - a. Sections 1 to 5 of the ‘MSC Reporting Template’, limited to Principle 1
 - b. Section 7.1 (limited to Principle 1) and Section 7.2 of the ‘MSC Reporting Template’
 - c. Section 8 of the ‘MSC Reporting Template’

- 5.1.3. Where appropriate, the CAB shall populate sections of the 'MSC Reporting Template' from the existing Public Certification Report.
- 5.1.4. The report, completed in accordance with 5.1.2, will be published as an Annex to the Surveillance Audit.
 - 5.1.4.1. If the Principle 1 v2.0 upgrade assessment is conducted outside of a Surveillance Audit, the CAB shall upload the report to the MSC database for publication on the MSC website.
- 5.2. If the stock has not been assessed against FCR v2.0 Annex SA, the CAB shall follow 5.2.1 – 5.2.5
 - 5.2.1. The CAB shall produce the following reports using the 'MSC Reporting Template' and follow procedures outlined in FCP Sections 7.19 to 7.23 and 7.24.1 to 7.24.4:
 - a. Client and Peer Review Draft Report.
 - b. Public Comment Draft Report.
 - c. Final Draft Report.
 - d. Public Certification Report.
 - 5.2.2. Reporting shall include:
 - a. Sections 1 to 5 of the 'MSC Reporting Template', limited to Principle 1
 - b. Section 7.1 (limited to Principle 1) and Section 7.2 of the 'MSC Reporting Template'
 - c. Section 8 of the 'MSC Reporting Template'
 - 5.2.3. Where appropriate, the CAB shall populate sections of the 'MSC Reporting Template' from the existing Public Certification Report.
 - 5.2.4. The minimum number of peer reviewers for Principle 1 v2.0 assessment upgrade shall be 1.
 - 5.2.5. All other requirements for peer review outlined in FCP Sections 7.14, 7.19.3-7.19.5 and 7.20.9 shall apply.

6. Certification

- 6.1. The CAB shall make a determination regarding the Principle 1 assessment upgrade outcome and notify stakeholders in the Final Draft Report.
- 6.2. If it determined that the scores from the Principle 1 assessment upgrade meet the requirements for certification, the CAB shall update the Fishery Certificate Statement and fishery certificate(s) in accordance to FCP v2.1 Section 7.24.6.3 and 7.25.3.
- 6.3. If the determination is that the fishery has not met the requirements for certification, the CAB shall report this in the Final Draft Report and Public Certification Report and shall make no changes to the existing certificate, which shall remain valid.
- 6.4. If the Principle 1 assessment upgrade results in continued certification, the CAB shall conduct a full Principle 1 assessment at re-assessment.

Table 17: Principle 1 v2.0 assessment upgrade – indicative timelines

Principle 1 assessment upgrade announcement	30 days
On-site or off-site visit (i.e. surveillance audit)	
Client & Peer Review	60 days
Public Comment Draft Report	30 days
Final Draft Report	15 days
Public Certification Report	
Total	135 days (4.5 months)

