Tri Marine Western and Central Pacific skipjack and yellowfin fishery

MSC Fishery Assessment Report

Public Comment Draft Report (PCDR)

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2 Glossary

CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMM	WCPFC Commission Members, Cooperating non-Members, and participating Territories WCPFC Conservation and Management Measure
EEZ	Exclusive Economic Zone
ELAPS	Effort Limit Area for Purse Seine
ETP	Endangered, Threatened or Protected species
FAD	Fishing Aggregating Devices
FAO	Food and Agriculture Organization of the United Nations
FCM	Fisheries Certification Methodology
FSM	Federated States of Micronesia
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
NMFS	NOAA National Marine Fisheries Service, United States
NORMA	National Oceanic Research and Management Authority, Federated States of Micronesia
MFMR	Ministry of Fisheries & Marine Resources, Solomon Islands
MMR	Ministry of Marine Resources, Cook Islands
MPI	Ministry of Primary Industries, New Zealand
OFL	Over-Fishing Level
OFDC	Overseas Fisheries Development Council of Republic of China
OFP	Oceanic Fisheries Program
PI	Performance Indicator
PNA	Parties to the Nauru Agreement
SEAPODYM	Spatial Ecosystem and Population Dynamics Model
SCS	SCS Global Services
SPC	Secretariat for the Pacific Community
SI	Scoring Issue
SSB	Spawning Stock Biomass
TFA	Taiwan Fisheries Agency
t and mt	metric ton
TAC	Total Allowable Catch
VDS	Vessel Day Scheme

VME	Vulnerable Marine Ecosystem
VMS	Vessel Monitoring System
VFD	Vanuatu Fisheries Department
WCPFC	Western and Central Pacific Fisheries Commission
WCPO	Wester and Central Pacific Ocean
WWF	World Wildlife Fund

3 Executive Summary

This report presents the Marine Stewardship Council (MSC) assessment of the Western and Central Pacific Yellowfin and Skipjack tuna caught by all vessels licensed to the USA, and select vessels licensed to Chinese Taipei, Solomon Islands, New Zealand, Cook Islands and the Federated States of Micronesia (FSM) using purse-seine gear (free school and associated sets) fishing within the WCPF Convention Area in the Effort Limit Area for Purse Seine (ELAPS), comprised of all areas of high seas and US exclusive economic zones (EEZs) between 20 degrees north and 20 degrees south in the Western and Central Pacific Fisheries Commission (WCPFC) Convention area, as well as EEZs of PNA member countries; and EEZs of Cook Islands, Tokelau, Fiji, Vanuatu, and Samoa in select management areas. The assessment was conducted, and the findings were prepared by SCS Global Services (SCS), an MSC-accredited, independent, third-party conformity assessment body, in accordance with the MSC Principles and Criteria for sustainable fishing. The assessment complies with the MSC Certification Requirements V2.2 (released March 25, 2020). The fishery was assessed against the Default Assessment Tree, version 2.01.

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

Stock/Species (FCP V2.2 7.5.2.a)	Method of Capture (FCP V2.2 7.5.2.b)	Fishing fleet (FCP V2.2 7.5.2.c)
Yellowfin and Skipjack tuna in the Western Central Pacific Ocean	Purse seine[1] all set types	Flag states include: USA, Federated States of Micronesia, Solomon Islands, New Zealand, Cook Islands, Vanuatu and Chinese Taipei. For the USA UoA, the UoA includes all US-flagged vessels licensed in the region/gear. The UoC is restricted to select vessels. For FSM, Chinese Taipei, Vanuatu, New Zealand, Cook Islands, and Solomon Islands, the UoA and UoC is restricted to select vessels. [2] The geographic scope is different for the US vessels than other flag states, because of access arrangements provided under the US Multilateral Treaty. Regions within US EEZs and 20 degrees north and 20 degrees south in the Western and Central Pacific Fisheries Commission (WCPFC) Convention area, as well as the EEZs of PNA member countries; and select management areas within the EEZs of the following non-PNA countries: Cook Islands, Tokelau, Fiji, Vanuatu, and Samoa are included. For all other flag states, the UoA's fishing areas include the highs seas between 20 degrees north and 20 degrees south in the WCPFC Convention area as well as the EEZ of PNA countries and Tokelau[3] and the EEZs of the following non-PNA countries only: Cook Islands and Vanuatu.

[1] All purse seine set types (free school, anchored FAD, drifting FAD) are assessed here. This adheres to FCP v2.2 UoA requirements, as '*the MSC no longer allows the UoA nor UoC to be defined by a subset of activities undertaken with the stock(s)/gear(s) combination*.' (FCP v2.2 G7.5)

[2] For a list of selected vessels in the UoA See Section 8.16 Vessel list

[3] Tokelau are non-PNA members but are signatory to the PNA Vessel Day Scheme and annual Total Allowable Efforts are set within Tokelau's EEZ.

Fishery Operations Overview

The Tri Marine Western and Central Pacific Skipjack and Yellowfin Tuna Fishery is a commercial fishing operation. All vessels operate within the WCPFC Convention area using purse seine (both free school and FAD sets) targeting Skipjack and Yellowfin tuna.

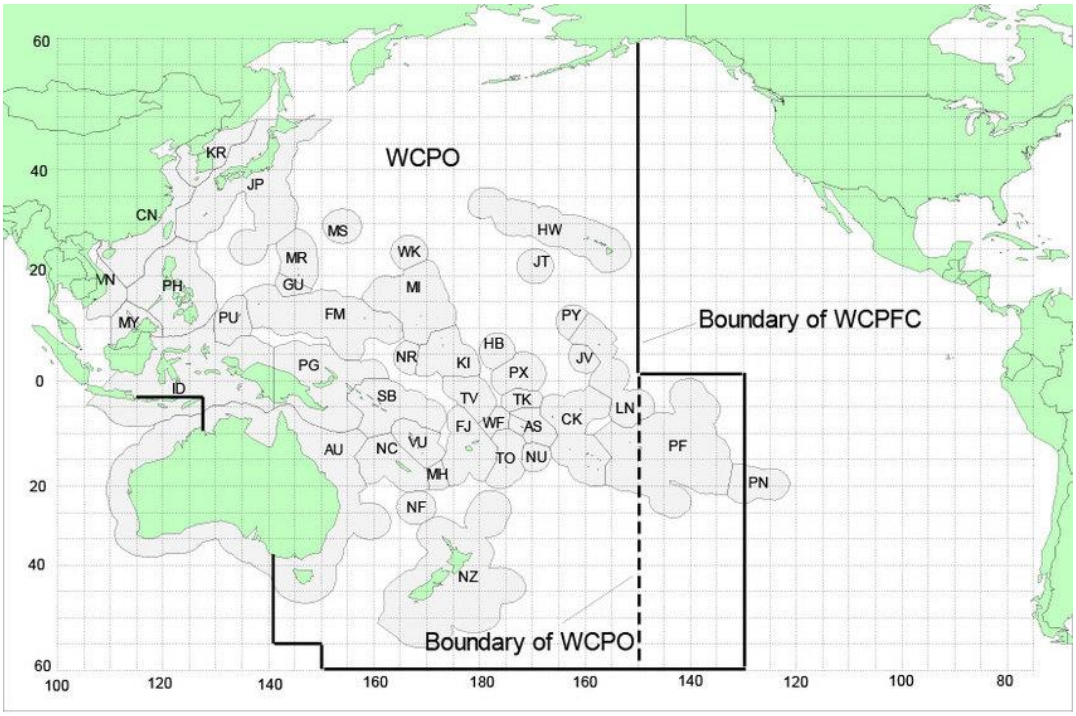


Figure 1. Map of the Western and Central Pacific Fisheries Convention Area with EEZ

Assessment Overview

The team selected to undertake the ACDR assessment includes two team members that collectively meet the requirements for MSC assessment teams. These are:

- Dr. Gerard DiNardo, Principle 1 & 2 Expert & Team Lead
- Mr. Andy Bodsworth, Principle 3 Expert

Summary of Findings

In this report, we provide detailed rationales for scores presented for each of the Performance Indicators (PIs) under Principle 1 (Stock status and Harvest strategy), Principle 2 (Ecosystem Impact) and Principle 3 (Governance, Policy and Management system) of the MSC Standard. No PIs failed to reach the minimum Scoring Guidepost (SG) of 60, and the average scores for the three Principles remained above SG80). At the ACDR stage, the team estimated draft scores under SG80 for the following PIs: Principle 1 (1.2.1 and

1.2.2 for both skipjack and yellowfin), Principle 2 (2.3.1, 2.3.2, 2.4.1, 2.4.2, and 2.4.3) and Principle 3 (3.1.2 for Solomon Islands, 3.2.2 for Solomon Islands and Vanuatu, and 3.2.3 for all flag states).

At the PCDR stage, the team has estimated that the following draft scores are under SG80:

- Principle 1: Two of the PIs (1.2.1 and 1.2.2) for both skipjack and yellowfin received scores under 80 for all UoAs. These conditions are rooted in a lack of clear harvest control rules linked to the status of the yellowfin and skipjack stocks. Scores under Principle 1 are harmonized with all overlapping MSC-certified fisheries targeting yellowfin and skipjack in WCPFC waters.

- Principle 2: Across all flag states, PIs 2.3.1, 2.3.2, 2.4.1, 2.4.2, and 2.4.3 do not reach the SG80 score. These are due to concerns with derelict Fishing Aggregating Devices (FADs) impact on habitats, and uncertainty regarding status of certain Endangered Threatened and Protected (ETP) species. Cook Islands and Vanuatu do not reach SG80 in 2.2.2 d.

- Principle 3: The Flag States of Solomon Islands, Vanuatu and Federated States of Micronesia all received a score of SG60 at 3.2.3 a Monitoring, Control, and Surveillance because of the need to demonstrate an effective MCS framework at the national level vis retention of ETP species, and a lack of robust systems to identify incidents of non-compliance from relevant observer data analysis. In addition, there is a variable interpretation of the need to implement WCPFC CMM 2018-01 Paragraph 19 in relation to 'lesser entangling' FAD design. Solomon Islands received draft scores below SG80 for 3.2.2b and 3.2.2d, and Vanuatu also received a score of SG60 on 3.2.2 b as the assessment team has not received evidence that decision-making processes at the country level respond to serious and other important issues.

4 Report Details

4.1 Authorship and peer review details

Audit Team

Dr. Gerard DiNardo—SCS Global Services—Principle 1 & 2 Expert

Dr. Gerard DiNardo has over 25 years of experience as a research fishery scientist and senior manager for NOAA Fisheries in the United States, as well as extensive knowledge, understanding, and involvement in fishery issues and processes of tuna-RFMOs and RFOs. Ensuring sustainable development and management of fisheries, including the identification of research and plans of action to support effective management decision making has been the focus throughout his career, and with a strong background and understanding of international fisheries and MSC. He holds an MSc from Long Island University, C.W. Post Center and a Ph.D from University of Maryland, where his dissertation topic was FISHMAP: An Expert System for Sampling Fish Populations.

Gerard was appointed as the Fisheries Resources Division Director of the Southwest Fisheries Science Center in San Diego, CA from 2015 to 2019. Previously, he held several positions at NMFS, including Supervisor of the Stock Assessment Program in the Fisheries Research and Monitoring Division at the Pacific Islands Fisheries Science Center. Dr. DiNardo was multiple publications related to the assessment of pelagic species, including tuna. He's held positions as Co-Chair of the Joint PICES/ISC Working Group on Ocean Conditions and the Distribution and Productivity of Highly Migratory Fish for the North Pacific Marine Science Organization, standing member of the NMFS National Stock Assessment Methods Steering Committee, science expert on the U.S.A. Delegation to the Western Central Pacific Fisheries Commission and Chair of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC).

General Team requirements

Dr. DiNardo's experience satisfies the MSC requirements for a Team Member as described in PC2 (FCP v2.2):

- ✓ With relevant degree (PhD from the University of Maryland) and over 5 years of research experience in a marine conservation biology and fisheries
- ✓ Has passed the MSC compulsory training modules for Team Members within the last 5 years. Completed the MSC FCPv2.2 online modules.
- ✓ Affirms he has no conflict of interest in conducting this assessment.

Principle 1 Tuna

- ✓ Dr. Dinardo meets the qualifications for fish stock assessment with: 3 years' or more experience of applying relevant stock assessment techniques being used by the fishery under assessment. Dr. Dinardo has Primary authorship of roughly 30 peer-reviewed stock assessments of a type used by the fishery under assessment. In addition, Dr. Dinardo has 26 years of experience with NOAA, National Marine Fisheries Service as a stock assessment scientist and later Program Leader for the Stock Assessment Program at the Pacific Island Fisheries Science Center and later the Southwest Fisheries Science Center as Director of the Fisheries Resource Division. In this capacity he was responsible for conducting stock assessments on highly migratory species (i.e., tuna), demersal fish species (snappers and groupers), and crustaceans (lobsters) in the Pacific Ocean, and overseeing the application of modelling platforms to advance stock assessment research.
- ✓ Dr. Dinardo meets the qualifications for 'Fish stock biology/ecology' with 3 years' or more experience working with the biology and population dynamics of the target or species with similar biology As evidenced by his research and publications on post release mortality and development of the HI longline observer program. Dr. DiNardo also Chaired the International Scientific Committee (2010-2017), an RFO tasked with completing stock assessments for the WCPFC on highly migratory stocks in the North Pacific Ocean.

Principle 2 Tuna

- ✓ Dr. Dinardo meets the qualifications for 'Fishing impacts on aquatic ecosystems' with 3 years' or more experience in research into, policy analysis for, or management of, the impact of fisheries on aquatic ecosystems including at least two of the following topics: i. Bycatch. ii. Endangered, threatened, or protected (ETP) species. iii. Habitats. iv. Ecosystem interactions. As evidenced by his development of the HI longline observer program to estimate bycatch rates for marine mammals, sea turtles and seabirds. Additionally, Dr. DiNardo participated in the development of a California Current Ecosystem management strategy evaluation (MSE), representing the first application of a MSE at the ecosystem level. He was also c-author of the annual NMFS bycatch report that assembled, and sometime estimated, regional bycatch estimates for fisheries in the Eastern Pacific Ocean. Dr. DiNardo also produced bycatch estimates (numbers and rates) associated with the High Seas Driftnet fishery.

Mr. Andy Bodsworth—Cobalt Marine Resource Management Pty Ltd—Principle 3 Expert

Mr. Andy Bodsworth has extensive fisheries management experience; principally with the Australian Fisheries Management Authority (AFMA) managing tropical, sub-tropical and temperate commercial fisheries across a wide range of gear types. More recently he has worked as Principal Consultant and CEO of sustainable fisheries consulting firm Cobalt Marine Resource Management Pty Ltd. Andy holds a

Graduate Certificate in Environmental Management from the University of Queensland, with a focus on fisheries policy, economics and management.

Since 1999, Andy has worked extensively with small and large fishing businesses, federal and state government agencies, environmental NGO's, and other stakeholders to develop, implement and review best practice fisheries management and marine conservation policies and strategies. He has managed purse seine and mid-water trawl fisheries for schooling small pelagic species, including skipjack tuna; and purse seine and pelagic longline fisheries for tropical and temperate tuna and billfish species subject to international management agreements and treaties. He has also worked extensively with Regional Fisheries Management Organisation's (RFMO's) in Australia's area of interest.

As program manager for Australia's larger northern fisheries, including traditional fisheries in Torres Strait managed under treaty with Papua New Guinea, he has worked closely with traditional inhabitant fishers over many years to enable sustainable fishing businesses in these remote areas.

Mr. Bodsworth's principal expertise lies in the evaluation of fisheries management performance against contemporary sustainability guidelines. He was the fisheries management representative on a multi-disciplinary team that developed Australia's initial Harvest Strategy Policy Framework and supporting operational guidelines. He also has extensive experience with development of fishery specific harvest strategies to improve economic, environmental and social performance for large and small commercial fisheries. He has a particular interest and expertise in ESD based risk assessment and using this to guide development of fishery improvement strategies.

Andy has managed several larger scale projects to formally evaluate ESD performance for higher value commercial fisheries, as well as high profile marine conservation and recovery strategies such as Australia's National Plan of Action for the Conservation and Management of Sharks (NPOA Sharks). He has worked extensively with Australian government fisheries and environment agencies, fishing industry peak bodies and businesses, and conservation NGO's such as WWF Australia over many years.

Peer Reviewers

Two peer reviewers provided feedback on the report. The peer review shortlist was posted for 10-days.

1.2 Version details

Table 2. Fisheries program documents versions

Document	Version number
MSC Fisheries Certification Process	**Version 2.2**
MSC Fisheries Standard	**Version 2.01**
MSC General Certification Requirements	**Version 2.3**
MSC Reporting Template	**Version 1.2**

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

The Unit of Assessment includes the Western and Central Pacific Yellowfin and Skipjack tuna caught by all vessels licensed by the United States (US), , and select vessels licensed to Solomon Islands (SI), Vanuatu (VU), New Zealand (NZ), Cook Islands (CI), Federated States of Micronesia (FSM), and Chinese Taipei (CT) using purse-seine gear (all set types). The geographic scope for each flag state is described below in Table 3. Only select vessels (identified in 8.16) are part of the UoC.

This fishery has been found to meet scope requirements (FCP v2.2 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 the dispute. (FCP 7.4.2.1, 7.4.2.2, 7.4.3, 7.4.5)
- 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 subject to additional review given “habitat modification” and potential enhancement has been determined as per G7.4.2.12 (FCP v 2.2)
- 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),
- 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).

This assessment includes a total of fourteen Units of Assessment (UoAs). The UoAs use the same gear but target two stocks (Principle 1), with purse-seine nets (all set types) (Principle 2) and are divided into seven UoA fleets according to flag states to which the fleet is licensed (Principle 3).

<u>Under Principle 1</u>, there are two sets of scoring tables: one for each target species/stock.

<u>Under Principle 2</u>, all purse seine set types (free school, anchored FAD, drifting FAD) are assessed here as a single UoA, which adheres to FCP v2.2 G7.5 requirements. In addition, catch composition was evaluated across each flag state separately in order to categorize species for MSC evaluation (Primary, Secondary, ETP, Main/Minor). However, as no significant difference in catch composition was detected between the flag states, catch data was pooled across all flag states for the same set type. Because skipjack and yellowfin are scored thoroughly under Principle 1, they are not scored a second time as primary species. A target species that is certified under Principle 1 and has obtained an overall score >80 for P1, will have

already be assessed under a higher standard of performance than those for main retained/primary under Principle 2, thus it is expected to obtain a score >80 for the relevant Principle Indicators under P2. If in a subsequent assessment one of the target P1 target species fails and is no longer considered as certified, it will then be scored under Principle 2. Flag states have been considered separately where needed in Principle 2.

Under Principle 3, scoring considers all applicable biological and/or jurisdictional levels that apply to the management system of the UoA. The potentially relevant jurisdictions include the WCPFC, PNA, and the seven licensing flag states of the fleet under assessment (USA, Chinese Taipei, Solomon Islands, New Zealand, Cook Islands, Vanuatu and FSM). Each flag state is scored separately. The applicable jurisdictions are determined on a PI, and SI, basis, because the relevant jurisdictions that affect performance relative to the respective scoring guideposts vary based on the aspect of the governance and fishery management system being assessed. For reader-friendliness and to minimize duplicative text in the report, a single set of evaluation tables are provided for all seven flag states. Differences in scores across the three sets of nation state scores (based on flag state performance and other relevant considerations) are noted. Although WCPFC performance is considered in each SI, it is not 'scored' as an element as per individual species or guilds in Principle 2, but instead is incorporated with the flag state score to generate an overall UoA score for each flag state (USA, Chinese Taipei, Solomon Islands, New Zealand, Cook Islands, Vanuatu and FSM).

The Unit of Assessment geographic scope is different for the USA flagged vessels than for all other flag states in the UoA**.** The fishing area for USA-flagged vessel includes the Effort Limit Area for Purse Seine (ELAPS), comprised of the US exclusive economic zones (EEZs) and the highs seas between 20 degrees north and 20 degrees south in the Western and Central Pacific Fisheries Commission (WCPFC) Convention area, as well as the EEZs of PNA member countries; and select management areas within the EEZs of the following non-PNA countries: Cook Islands, Tokelau, Fiji, Vanuatu, and Samoa. USA-flagged vessels operate under the US Multilateral Treaty.

For all other flag states (Chinese Taipei, Solomon Islands, New Zealand, Vanuatu, Cook Island and the Federated States of Micronesia), the UoA's fishing areas include the highs seas between 20 degrees north and 20 degrees south in the WCPFC Convention area as well as the EEZ of PNA countries and the EEZs of the following non-PNA countries only: Cook Islands and Vanuatu and Tokelau.

The scope of the assessment is limited to vessels that are part of the client group (for a list of the vessels See Appendix 8.17). There may be some vessels, however, that move out and in of the client group which will be considered as long as they share the same characteristics (fishing gear/operations, management system, and area of operation). The current assessment is based on the observer data of the vessels currently listed as part of the client group, which is considered representative of other vessels with the same characteristics that may join the client group. Taking a precautionary approach, when adding new vessels to the client group, following Annex PE, SCS will conduct a gap analysis, to confirm all the assessment tree components are the same for the existing fishery certificate and confirm that these vessels are within scope of the MSC Fisheries Standard, (i.e., verify that no vessels have been convicted of

shark finning violation or conviction for forced or child labour in the last two years). For more details as how this may apply to vessels flagged to SI see footnote in Table 3.

Table 3. Unit(s) of Assessment (UoA) and Unit(s) of Certification (UoC)

Units of Assessment: Defined as the species, gear, and fleet assessed (Total)	
UoA: Species & Stock	1) Western and Central Pacific Skipjack tuna (*Katsuwonus pelamis*) 2) Western and Central Pacific Yellowfin tuna *(Thunnus albacares*)
UoA: Gear Type	Purse seine, all set types
UoA: Scope	**All purse seine vessels** licensed to fish in the WCPF Convention area under the purview of: United States: National Marine Fisheries Service (NMFS) **Only select purse seine vessels** licensed to fish in the WCPF Convention area by the following nations and under the purview of: Federated States of Micronesia (FSM): National Oceanic Resources Management Authority (NORMA) Solomon Islands[4]: Ministry of Fisheries and Marine Resources (MFMR) Chinese Taipei: Taiwan Fisheries Agency (FA) New Zealand: Ministry of Primary Industries (MPI) Cook Islands: Ministry of Marine Resource (MMR) Vanuatu: Vanuatu Fisheries Department (VFD)
UoC: Scope	**Select purse seine vessels** licensed to fish in the WCPF Convention area under the purview of: United States: National Marine Fisheries Service (NMFS) **Only select purse seine vessels** licensed to fish in the WCPF Convention area by the following nations and under the purview of: Federated States of Micronesia (FSM): National Oceanic Resources Management Authority (NORMA) Chinese Taipei: Taiwan Fisheries Agency (FA) New Zealand: Ministry of Primary Industries (MPI) Cook Islands: Ministry of Marine Resource (MMR) Vanuatu: Vanuatu Fisheries Department (VFD)
Other Eligible Fishers	The UoA and UoC are the same size, there are no other eligible fishers.

[4]No vessels flagged to Solomon Islands were specifically included in the Unit of Certification, though Solomon Islands were examined under the Unit of Assessment more broadly. The team scored fishery impact outcomes, management, and information PI's specific to Solomon Islands flagged purse seine vessels under Principle 2. The team assumed the performance of those PI's for Solomon Islands is analogous to the fishery activities, information provided, and scores determined across the other flag states examined under Principle 2. Where there are conditions consistently applied across all flags, a condition was placed on the Solomon Islands. The team also collected evidence regarding Principle 3 as it relates to the Solomon Islands well and issued scores accordingly. Though the team assumes the Solomon Islands scores are analogous to the other flag states examined, should additional vessels flagged to the Solomon Islands be considered at a future date, the assessment team will conduct Gap Analyses including review of catch information and observer data as required to verify the scores for Solomon Islands.

Units of Assessment: Defined as the species, gear, and fleet assessed (Total)	
Further information: Geographic Area	**The Unit of Assessment geographic scope is different for the USA flagged vessels.** The fishing area for USA-flagged vessel includes the Effort Limit Area for Purse Seine (ELAPS), comprised of the US exclusive economic zones (EEZs) and the highs seas between 20 degrees north and 20 degrees south in the Western and Central Pacific Fisheries Commission (WCPFC) Convention area, as well as the EEZs of PNA member countries; and select management areas within the EEZs of the following non-PNA countries: Cook Islands, Tokelau, Fiji, Vanuatu, and Samoa . USA-flagged vessels operate under the US Multilateral Treaty. For all other flag states (Chinese Taipei, Solomon Islands[5], New Zealand, Vanuatu, Cook Island and the Federated States of Micronesia), the UoA's fishing areas include the highs seas between 20 degrees north and 20 degrees south in the WCPFC Convention area as well as the EEZ of PNA countries and the EEZs of the following non-PNA countries only: Cook Islands and Vanuatu
Further information: Management System	The key components of the regional and sub-regional governance arrangements and fishery management framework relevant to the UoA include: • The Western and Central Pacific Fisheries Commission (WCPFC); • The Parties to the Nauru Agreement (the PNA Agreement); • The Vessel Day Scheme (VDS) established under the Palau Arrangement; • The United States Multilateral Treaty (USMT) (also known as the South Pacific Tuna Treaty, SPTT) (USA fleet only); • FSM Agreement (FSMA) • The Pacific Islands Forum Fisheries Agency (FFA) (not a regulatory organisation but plays an important role in providing technical assistance to members).

[5]To clarify, no vessels flagged to Solomon Islands were specifically included for examination in this assessment but the Solomon Islands was examined as part of the Unit of Assessment as explained on the previous page.

5.1.2 Scope of Assessment in Relation to Enhanced Fisheries or Introduced Fisheries

This fishery involves fish aggregation devices (FADs) deployed which under G7.4.2.12 (FCP v 2.2) are considered a "habitat modification" and for subject to fishery enhancement considerations. Thus, the assessment team evaluated the use of FADs in the UoA against the MSC eligibility criteria in Table 1, and determined that FADs meet the requirements under Table 1 of the FCP:

> *Any modifications to the habitat of the stock are reversible and do not cause serious or irreversible harm to the natural ecosystem's structure and function.*

Following clause 7.7.1.2 d in the MSC FCP v2.2 , the CAB shall assess:

> *The impacts of habitat modification under the habitats and ecosystems components in Principle 2. The CAB shall consider environmental impacts including:*
>
> *i. Whether serious or irreversible harm may be caused to the natural ecosystem's structure and function, including the natural food chains of predator and/or prey species.*
>
> *ii. The types and extent of habitat modifications and the possibility of these causing serious or irreversible harm*

As per the recent ACDR published Eastern Pacific Yellowfin and Skipjack Tuna Purse Seine fishery (Andrews et al 2020), the team considered the following two issues in particular:

- Reversible modification of habitat: FADs are deployed in the epipelagic zone often in relatively deep waters, where there is no habitat impact, however, FADs may also transition into derelict and/or stranded gear that may entangle with benthic habitat when lost and/or not recovered. These potential indirect impacts of drifting FADs are considered reversible once FADs are removed. Additionally, the assessment team considered the possibility of drifting FADs causing serious or irreversible harm in PIs 2.4.x. Derelict FADS are considered abandoned fishing gear. The MSC intent regarding impacts from gear loss on habitat is described in Box GSA7 (MSC Standard v2.01), indicating that the impacts of gear loss on habitats are considered under the Habitats components, specifically at the SG100 level for PI 2.4.2, where fisheries are required to have a management strategy in place even for gears that do not regularly contact benthic habitats since gear loss could occur. Considering a broader interpretation of the MSC's intent (in line with clause 7.7.1.2) the assessment team took a more precautionary approach categorizing coral reefs that are impacted by abandoned fishing gear as VMEs.

The assessment team noted that the use of FADs are subject to management measures and controls at both national and WCPFC levels. Though measures are in place, evidence of habitat impacts on VMEs and other habitat types due to lost or derelict FADs require actions by the UoA to ensure actions are implemented... As a result, the assessment team issued conditions to ensure adequate progress for implementation of relevant management measures and controls within the UoA (see section 7.3.6 for background; 7.3.8 for scoring).

- Serious or irreversible harm to ecosystem structure and function is not caused by FAD modifications: the assessment team has reviewed relevant and credible resources and scientific publications on the subject of the "ecological trap" hypothesis. This hypothesis is centered on potential evidence of disproportionate aggregation and/or changes of behavior of certain species due to FADs. The assessment team carefully considered the evidence presented on fish residence times in particular and concluded there is no unequivocal evidence of irreversible harm to ecosystem structure and function (see Section 7.3.7 PI 2.5.1).

There is no evidence of species introduction in this fishery.

5.2 Assessment results overview

5.2.1 Determination, formal conclusion and agreement

The determination of the fishery is drafted at the final report and completed at the PCR.

5.2.2 Principle level scores

To be drafted at Client and Peer Review Draft Report stage.

Table 4. Principle level scores

Principle	Cook Islands (CI)		Solomon Islands (SI)		Vanuatu (VU)		United States (US)		New Zealand (NZ)		Federated States of Micronesia (FSM)		Chinese Taipei (CT)	
Principle 1 – Target species	YFT	SKJ	YFT	SKJ	YFT	SKJ	YFT	SKJ	YFT	SKJ	YFT	SKJ	YFT	SKJ
	80.8	85.8	80.8	85.8	80.8	85.8	80.8	85.8	80.8	85.8	80.8	85.8	80.8	85.8
Principle 2 – Ecosystem impacts	81.7		82.3		81.7		82.3		82.3		82.3		82.3	
Principle 3 – Management system	84.6		84.0		83.1		84.6		84.6		83.8		83.8	

5.2.3 Summary of conditions

Table 5. Summary of conditions

#	Condition	Performance Indicator (PI)	Deadline	Exceptional circumstances?	Carried over from previous certificate?	Related to previous condition?
1-1	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	2023 (Year 2 Surveillance)	No	Yes	NA
1-2	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 tools in use for Skipjack Tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	1.2.2 Skipjack	2023 (Year 2 Surveillance)	No	Yes	NA
1-3	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 Yellowfin	2023 (Year 2 Surveillance)	No	Yes	NA
1-4	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.	1.2.2 Yellowfin	2023 (Year 2 Surveillance)	No	Yes	NA

#	Condition	Performance Indicator (PI)	Deadline	Exceptional circumstances?	Carried over from previous certificate?	Related to previous condition?
	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.					
2-1	Cook Islands fleet - By the 4th annual surveillance audit, provide evidence that it is highly likely that shark finning is not taking place.	2.2.2 (d)	Year 4 Surv	No	No	NA
2-2	Vanuatu fleet - By the 4th annual surveillance audit, provide evidence that it is highly likely that shark finning is not taking place	2.2.2 (d)	Year 4 Surv	No	No	NA
2-3	By the fourth surveillance, provide evidence to demonstrate that direct effects of the UoA are highly likely to not hinder recovery of ETP species (False Killer whale, Sei Whale, Indo-Pacific Bottlenose Dolphin, Rough-toothed dolphin, mobulas and giant manta ray)	2.3.1 (b)	Year 4 Surv	No	No	NA
2-4	By the third surveillance provide evidence that: a. There is some evidence that the measures/strategy is being implemented successfully b. There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of (cetaceans, mobulas and manta rays species and they are implemented as appropriate	2.3.2(d) 2.3.2(e)	Year 3 Surv	No	No	NA
2-5	By the third surveillance - Provide evidence that some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of Giant Manta Ray and mobulas.	2.3.3 (b)	Year 3 Surv	No	No	NA
2-6	All Flags - By the fourth surveillance audit provide evidence that FAD sets by the UoA is highly unlikely to reduce the structure and function of the VME habitats to a point where there would be serious or irreversible harm.	2.4.1(b)	Year 4 Surv	No	No	NA
2-7	All Flags (including Solomon Islands) – By the fourth year surveillance audit, provide evidence that:	2.4.2(a) (b)	Year 4 Surv	No	No	NA

#	Condition	Performance Indicator (PI)	Deadline	Exceptional circumstances?	Carried over from previous certificate?	Related to previous condition?
	SIa there is a partial strategy in place for VMEs (coral reefs) that is expected to achieve the Habitat Outcome 80 level of performance or above. SI b There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.					
2-8	All Flags (including Solomon Islands) - By the third surveillance audit, provide evidence that the information available is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the timing and location of use of the fishing gear and, to the degree possible, the spatial extent of interaction.	2.4.3(b)	Year 3 Surv	No	No	NA
3-1	Vanuatu - By the second surveillance audit of the re-assessment, provide evidence that decision-making processes for Vanuatu's VFD, respond to serious and other important issues identified in relevant research, monitoring, evaluation, and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	3.2.2(b)	Year 2 Surv	No	No	NA
3-2	SI b) By the second surveillance audit of the re-assessment, provide evidence that decision-making processes for the Solomon Islands' MFMR respond to serious and other important issues identified in relevant research, monitoring, evaluation, and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions. SI d) For the Solomon Islands' MFMR, by the second surveillance audit of the re-assessment, 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.	3.2.2(b) 3.2.2(d)	Year 2 Surv	No	No	NA
3-3	Solomon Islands - By the third surveillance audit of the re-assessment, the fishery client shall provide evidence that the monitoring, control and surveillance system implemented in the fishery has demonstrated an ability to consistently identify any infringements, and enforce relevant management measures, strategies and/or	3.2.3(a)	Year 3 Surv	No	No	NA

#	Condition	Performance Indicator (PI)	Deadline	Exceptional circumstances?	Carried over from previous certificate?	Related to previous condition?
	rules at both a national level (e.g. Flag States TMDP, Vessel License Conditions), and at a regional level (e.g. WCPFC CMM's).					
3-4	Federated States of Micronesia- By the third surveillance audit of the re-assessment, the fishery client shall provide evidence that the monitoring, control and surveillance system implemented in the fishery has demonstrated an ability to consistently identify any infringements, and enforce relevant management measures, strategies and/or rules at both a national level (e.g. Flag States TMDP, Vessel License Conditions), and at a regional level (e.g. WCPFC CMM's).	3.2.3(a)	Year 3 Surv	No	No	NA
3-5	Vanuatu - By the third surveillance audit of the re-assessment, the fishery client shall provide evidence that the monitoring, control and surveillance system implemented in the fishery has demonstrated an ability to consistently identify any infringements, and enforce relevant management measures, strategies and/or rules at both a national level (e.g. Flag States TMDP, Vessel Licence Conditions), and at a regional level (e.g. WCPFC CMM's).	3.2.3(a)	Year 3 Surv	No	No	NA
3-6	All Flags - By the fourth surveillance audit, the fishery client shall provide evidence that the monitoring, control and surveillance system implemented in the fishery has demonstrated an ability to enforce relevant management measures, strategies and/or rules at both a national level (e.g. compliance with national TMDP, Vessel Licence Conditions), and at a regional level (e.g. demonstrate compliance with WCPFC CMM's such as 2018-01).	3.2.3(a)	Year 4 Surv	No	No	NA

5.2.4 Recommendations

Monitoring of ETP interactions associated with UoA vessels from Vanuatu and Cook Islands should be reviewed as part of the MSC annual surveillance meetings.

6. Traceability and eligibility

6.1 Eligibility date

The target eligibility date will be the date of publication of the certificate.

Based on the information provided by the client, SCS has determined that the fishery client currently has in place sufficient systems of tracking and tracking to ensure the separation of any certified product from the non-certified product.

Based on the information provided by the client, SCS has determined that systems allow the fishery client to trace back to the UoC any fish or fish products sold as MSC certified and that the fishery client maintains appropriate records to demonstrate the traceability back to their UoCs of certified fish or fish products.

6.2 Traceability within the fishery

Chain of custody begins at the point of landing (either to a processing plant or transshipment with carrier vessel) for purse seine vessels. Vessels are not required to have separate Chain of Custody certificates.

Since the fishery is assessed under FCP v2.2, all set types are included within the UoA and therefore segregation between set types is not required. Below we've listed the main stages of the supply chain within the fishery and the relevant tracking, tracing and segregation systems at each step:

1. There is 100% observer coverage of all purse-seine fishing activity undertaken in the WCPFC.
2. WCPFC mandates on data provision require that vessel logs are completed for every set, with specific minimum data requirements for the fishing operation. Daily Catch and Effort reports must be submitted daily by fishing masters. Information requirements include:
    a. Vessel identifiers: name of vessel and country of registration
    b. Trip information: Port or place of departure, date of departure, port or place of unloading, date of arrival in port, transshipment at sea activity
    c. School association (either FAD or freeschool)
    d. Set location
    e. Weight of fish caught by species
    f. Well number/location of retained catch
3. At the point of setting, the skipper records the set type (School association) in the logbook. The observer will also record the set type, lat. and long, and will record species once the catch is brought onboard the deck.
4. The catch will then be sorted by the crew and retained species will be placed in a pre-designated well.
5. Both the observer's report and captain's logbook record the well the catch was placed in. An observer must be present if fish is moved between wells while the fishing trip is underway.

6. No auctioning of tuna occurs, and fish are transferred directly from the vessel to the processing plant/carrier vessel. This point is considered to be the change of ownership.

Table 6. Traceability within the fishery

Factor	Description
Will the fishery use gears that are not part of the Unit of Certification (UoC)? If Yes, please describe: - If this may occur on the same trip, on the same vessels, or during the same season; - How any risks are mitigated.	No non-certified gear is used in the fishery. Vessels in the UoA employee uniquely purse seine gear, and this is stated in the license conditions the vessels operate under. There are several regulations and traceability systems in place to ensure there is no mixing between certified and non-certified product. Vessels comply with real time catch traceability systems, that begin from the point of capture to offload onshore. Traceability systems and relevant regulations include: ▪ 100% observer coverage (MSC Standards trained) ▪ Real time E-reporting ▪ Informal onboard electronic monitoring ▪ Vessel logbook/ Catch Documentation scheme ▪ VMS ▪ And dockside and port enforcement controls. WCPFC regulations require that both the observer and vessel logbook report information on school association. All set types are included in FCP v2.2. The observers record which wells the fish enter. Observers must be present any time fish is transferred between wells. These traceability platforms and processes currently meet and satisfy EU's market import requirements. The following records will be passed to the first receivers (Tri Marine): captains' statement, fishing logbook for all sets for the fishing trip, and well chart identifying the fish as MSC or non-MSC. Tri Marine reviews these documents and then issues an MSC qualification determination. The systems in place are considered appropriate to manage the risk of mixing between non-certified and certified fishing methods. Furthermore, all product coming off vessels will be certified.
Will vessels in the UoC also fish outside the UoC geographic area? If Yes, please describe: - If this may occur on the same trip; - How any risks are mitigated.	There is a potential for vessels in the UoC to fish outside the UoA geographic area and mixed trips do occur. As described here and the sections above, there are systems in place mitigating this potential risk. Fishing, transport, storage and transshipment stages in the fishery are covered under the

	regulatory framework, and 100% observer coverage on-board, port observers, and VMS traceability system. This can all be confirmed by the following records that will be passed to the first receivers: captains' statement, fishing logbook, and well chart. This information should be used by the first receiver and Chain of Custody auditors to verify MSC eligibility. **Risk of fishing in non-UoC geographic areas** The US-flagged UoC vessels operate in regions within US EEZs and 20 degrees north and 20 degrees south in the Western and Central Pacific Fisheries Commission (WCPFC) Convention area, as well as the EEZs of PNA member countries; and select management areas within the EEZs of the following non-PNA countries: Cook Islands, Tokelau, Fiji, Vanuatu, and Samoa are included. The US fleet also fishes in the Eastern Pacific Ocean under the purview of the IATTC. Fishing masters are required to complete official logbooks which records information about the fishing vessel's activities including *inter alia* set location, type of set, catch volumes by species and well numbers. Only fish captured in the region described above is MSC eligible. The fishing master's logbook and well chart enables identification of catch from MSC-eligible areas. If there is catch from non-UoA regions, it must either be stored in separate wells, or a double-separation net must be used to prevent mixing when stored within the same dry well. The fishing area for all non-US UoC vessels include the highs seas between 20 degrees north and 20 degrees south in the WCPFC Convention area as well as the EEZ of PNA countries and the EEZs of the following non-PNA countries only: Cook Islands, Tokelau and Vanuatu. The same information described above (i.e. fishing master logbook, captain's statement, and well chart) is required to be filled out by necessary for these vessels to ensure that catch came only from PNA, Vanuatu or Cook Islands EEZ's or the high seas in the WCPFC.
Do the fishery client members ever handle certified and non-certified products during any of the activities covered by the fishery certificate? This refers to both at-sea activities and on-land activities. - Transport - Storage - Processing - Landing - Auction If Yes, please describe how any risks are mitigated.	The vessels will handle both non-certified species and potentially non-certified skipjack and yellowfin from outside the UoA geographic area, caught during the same trip. Non-target species such as Bigeye may be caught and landed by the fishery. The processing plant/cold storage will sort the catch by species and separate them into bins. This process will be evaluated under the chain of custody certificate, as the fishery certificate only extends up to the point of landing. While there is a risk of non-certified fish mixing with certified fish when vessels fish both inside and outside the certified region, or on occasions outside the UoA, the traceability mechanisms such as

	well segregation or double netting, combined with 100% observer coverage, ensure mixing will not occur.
Does transshipment occur within the fishery? If Yes, please describe: - If transshipment takes place at-sea, in port, or both; - If the transshipment vessel may handle product from outside the UoC; - How any risks are mitigated.	Transhipment is not allowed at sea for purse-seine vessels (CMM 2009-06). Under CMM-2009-06, at-sea transhipment is permitted by non-purse seine vessels (e.g. longliners) under exceptional circumstances and must be monitored by observers and enforcement officers. Under WCPFC/CMM 2009-06, transhipment with purse seiners is only allowed to take place in port. Transhipment in port is subject to national jurisdiction; some ports require observer monitoring for transhipments (i.e. Majuro); others do not. WCPFC/CMM 2009-06 requires vessels to notify WCPFC and their flag-state authority prior to conducting transhipment and is only undertaken under the supervision of company representatives and for some port states, observers. Thus, risk of mixing during transhipment is minimal.
Are there any other risks of mixing or substitution between certified and non-certified fish? If Yes, please describe how any risks are mitigated.	None identified.

6.3 Eligibility to enter further chains of custody

The team has concluded and determined that the product originating from the UoC will be eligible to enter further certified chains of custody and be sold as MSC certified or carry the MSC ecolabel. The point of intended change of ownership of product is the first sale when the fishing vessel unloads catch into a carrier or to a land-based cold storage/processing facility. The team has determined that the point of first sale is also the point from which subsequent Chain of Custody is required. Lists of documents to be solicited by CoC auditor at point where CoC is required [i.e. : Invoices from the sale of whole round tuna from the fishing vessel owner to the trader, unloading report and outturn report and well charts, logbook] must be requested by the CoC auditor to ensure the product is coming from eligible vessels and from the geographic areas within the UoA/UoC.

Below is a list of parties/categories of parties whose product will be eligible to use the fishery certificate and sell product as MSC certified with the blue eco-label:

Catch may be either offloaded onto Tri Marine carriers or landed at various ports for transfer land-based cold storage/processing facility. There are no restrictions on eligible points of landing but subsequent (and separate) chain of custody certificates will be required.

SCS informs the UoC that if they sell or label non-eligible (nonconforming) product as MSC certified, they must (in accordance with FCP v2.2 7.9.4):

a. Notify any affected customers and SCS of the issue within 4 days of detection.
b. Immediately cease to sell any non-conforming products in stock as MSC certified until their certified status has been verified by SCS.
c. Cooperate with SCS to determine the cause of the issue and to implement any corrective actions required.

6.4 Eligibility of Inseparable or Practicably Inseparable (IPI) stock(s) to Enter Further Chains of Custody

No IPI species were identified in this fishery.

Tuna species, including skipjack, yellowfin and bigeye are stored in the same wells. While there is a concern of the risk that bigeye may not be distinguishable from yellowfin. The client explained that species sorting takes place once the product is offloaded and prior to any processing activity. The processing plants receiving fish from UoA vessels are already certified under MSC CoC as they source product from other MSC certified tuna fisheries, where this risk has already been identified, thus the sorting and subsequent segregation process is already in place. For this reason, bigeye is not considered an IPI species.

7 Scoring

7.1 Summary of Performance Indicator level scores

Table 7. Summary of Performance Indicator Scores and Associated Weights Used to Calculate Principle Scores.

						Yellowfin	Skipjack
Principle	Component	Weight	Performance Indicator (PI)		Weight	Score	Score
One	Outcome	0.3	1.1.1	Stock status	1.000	90	100
			1.1.2	Stock rebuilding	0.000		
	Management	0.7	1.2.1	Harvest strategy	0.250	70	70
			1.2.2	Harvest control rules & tools	0.250	60	60
			1.2.3	Information & monitoring	0.250	80	80
			1.2.4	Assessment of stock status	0.250	95	95

					CI	SI[6]	VU	US	NZ	FSM	CT
Two	Primary species	0.2	2.1.1	Outcome	100	100	100	100	100	100	100
			2.1.2	Management strategy	95	95	95	95	95	95	95
			2.1.3	Information/Monitoring	100	100	100	100	100	100	100
	Secondary species	0.2	2.2.1	Outcome	80	80	80	80	80	80	80
			2.2.2	Management strategy	75	85	75	85	85	85	85
			2.2.3	Information/Monitoring	95	95	95	95	95	95	95

[6]No vessels flagged to Solomon Islands were specifically included for examination in this assessment. Nevertheless, the team scored fishery impact outcomes, management, and information PI's specific to Solomon Islands flagged purse seine vessels under Principle 2. The team assumed the performance of those PI's for Solomon Islands is analogous to the fishery activities, information provided, and scores determined across the other flag states examined under Principle 2. Where there are conditions consistently applied across all flags, a condition was placed on the Solomon Islands. The team also collected evidence regarding Principle 3 as it relates to the Solomon Islands well and issued scores accordingly. Though the team assumes the Solomon Islands scores are analogous to the other flag states examined, should additional vessels flagged to the Solomon Islands be considered at a future date, the assessment team will conduct Gap Analyses including review of catch information and observer data as required to verify the scores for Solomon Islands.

					CI	SI[6]	VU	US	NZ	FSM	CT
	ETP species	0.2	2.3.1	Outcome	75	75	75	75	75	75	75
			2.3.2	Management strategy	75	75	75	75	75	75	75
			2.3.3	Information strategy	75	75	75	75	75	75	75
	Habitats	0.2	2.4.1	Outcome	70	70	70	70	70	70	70
			2.4.2	Management strategy	70	70	70	70	70	70	70
			2.4.3	Information	75	75	75	75	75	75	75
	Ecosystem	0.2	2.5.1	Outcome	80	80	80	80	80	80	80
			2.5.2	Management	80	80	80	80	80	80	80
			2.5.3	Information	80	80	80	80	80	80	80
Three	Governance and policy	0.5	3.1.1	Legal &/or customary framework	85	85	85	85	85	85	85
			3.1.2	Consultation, roles & responsibilities	85	85	80	85	85	80	80
			3.1.3	Long term objectives	90	90	90	90	90	90	90
	Fishery specific management system	0.5	3.2.1	Fishery specific objectives	95	95	95	95	95	95	95
			3.2.2	Decision making processes	80	75	75	80	80	80	80
			3.2.3	Compliance & enforcement	75	75	75	75	75	75	75
			3.2.4	Monitoring & manag. performance eval.	80	80	80	80	80	80	80

Table 8. Final Principle Scores

Principle	Cook Islands (CI)		Solomon Islands (SI)		Vanuatu (VU)		United States (US)		New Zealand (NZ)		Federated States of Micronesia (FSM)		Chinese Taipei (CT)	
	YFT	SKJ	YFT	SKJ	YFT	SKJ	YFT	SKJ	YFT	SKJ	YFT	SKJ	YFT	SKJ
Principle 1 – Target species	80.8	85.8	80.8	85.8	80.8	85.8	80.8	85.8	80.8	85.8	80.8	85.8	80.8	85.8
Principle 2 – Ecosystem impacts	81.7		82.3		81.7		82.3		82.3		82.3		82.3	
Principle 3 – Management system	84.6		84.0		83.1		84.6		84.6		83.8		83.8	

7.2 Principle 1

7.2.1 Principle 1 background: Skipjack tuna

7.2.1.1 Skipjack tuna - Life History Information

Taxonomic classification

Class: Actinopterigii
Order: Perciformes
Family: Scombridae
Genus: *Katsuwonus*
Species: *pelamis*

Biology

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 and has been estimated at 4.4 ($\pm$ 0.5 se).

Behaviour

Skipjack tuna form both free schools and schools associated with FADs or other floating objects. Depth distribution ranges from the surface to about 260 m during the day but is limited to near surface waters at night.

Growth and Natural Mortality

Skipjack are the smallest of the major commercial tuna species, generally not exceeding 20 kg. 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 (Berger et al. 2013)Skipjack growth is rapid compared to Yellowfin and bigeye tuna. In the Pacific, approximate age estimates suggest that growth varies 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), while growth estimates for fish sampled in close to the equator were faster, 42, 47, 55, and 60 cm (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.

Reproduction and Recruitment

Skipjack tuna reach maturity within their first year at about 40 cm FL. 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 FL ranges from 80 000 to 2 million. Skipjack tuna have a generation time of 2 years (Berger et al. 2013).

Distribution and Stock Structure

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, and are 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 2). 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.

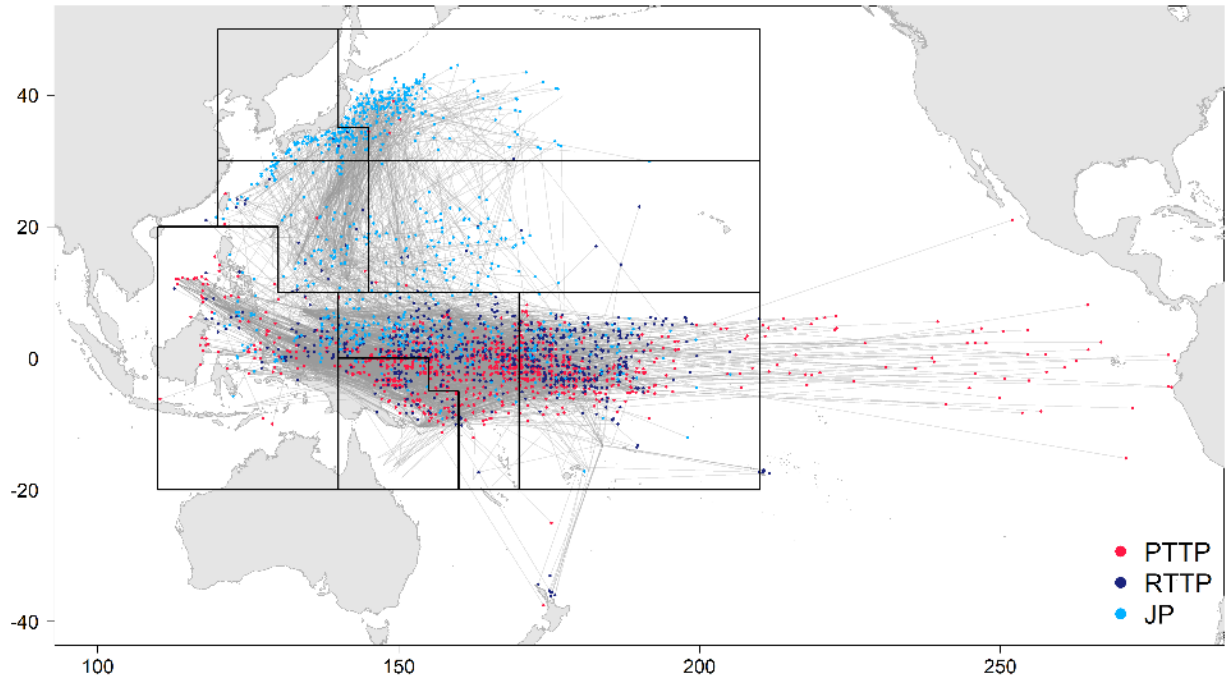


Figure 2. Plot of tag recaptures greater than 1,000 nautical miles from the point of release by the program of release for those tags that were released within the assessment region. PTTP is the Pacific Tuna Tagging Program, RTTP the Region Tuna Tagging Program, and JP the Japanese agging program. (from).

7.2.1.2 Skipjack - Status of stocks

Stock assessments for Skipjack Tuna are undertaken by the Oceanic Fisheries Program (OFP) of the Secretariat for the Pacific Community (SPC) as the scientific advisory body for the WCPFC. Draft results of assessments are submitted to the meeting of the WCPFC's 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, as well as stock status determination. Stock assessments for Skipjack Tuna have been conducted regularly since 2000,the most recent being in 2019 using the integrated statistical modeling framework MULTIFAN-CL with model input based mainly on catch and effort data for various fleets, size data and tagging data (Vincent et al. 2019). This assessment followed the previously agreed approach but also addressed several recommended improvements. In particular, the SC used an 8-region model to describe the stock status of Skipjack Tuna because it considered that it better captures the biology of Skipjack Tuna than the existing 5 region structure (Figure 2). Stock status was determined over an uncertainty grid of 54 models with assumed weightings as illustrated in Table 9.

The spatial structure used in the assessment model is shown in Figure 3. Time series of total annual catch (1000's mt) by fishing gear for all regions is shown in Figure 4. The overall spawning potential summed

across region for the diagnostic model is shown in Figure 5. The estimated annual average juvenile and adult fishing mortality for the diagnostic model is shown in Figure 6. The median and 80th percent quantile trajectories of fishing depletion for models in the weighted structural uncertainty grid is shown in Figure 7, where it can be seen that the median has been fluctuating in the vicinity of the target since 2009. The Majuro plot (Figure 8) shows the recent fishing mortality and spawning potential relative to the unfished spawning potential for all models in the structural uncertainty grid for (i) spawning potential in the recent time period (2015–2018), and (ii) spawning potential in the latest time period (2018). The Kobe plot (Figure 9) shows the recent fishing mortality and spawning potential relative to spawning potential at MSY for all models in the structural uncertainty grid for (i) spawning potential in the recent time period (2015–2018) and (ii) spawning potential in the latest time period (2018).

The SC noted that the median level of spawning potential depletion from the uncertainty grid was SBrecent/SBF=0 = 0.44 with a probable range of 0.37 to 0.53 (80% probability interval). There were no individual models where SBrecent/SBF=0 < 0.2, which indicated that the probability that recent spawning biomass was below the LRP was zero.

The SC also noted that the grid median Frecent/FMSY was 0.45, with a range of 0.34 to 0.60 (80% probability interval) and that no values of Frecent/FMSY in the grid exceed 1. Therefore, there was a zero probability that the recent fishing mortality exceeds FMSY.

The SC noted that the largest uncertainty in the structural uncertainty grid was due to the assumed tag mixing period. In addition, it acknowledged that further study is warranted to investigate the uncertainty surrounding the appropriate mixing period for the tagging data.

The SC acknowledged that the spatial extent of the Japanese pole-and-line fishery has decreased over the time period and that the future use of this standardized CPUE index within future stock assessments is uncertain.

Therefore, the SC acknowledged that further study of alternative indices of abundance is warranted, such as investigation of standardizing the purse seine fishery and evaluation of the feasibility of conducting fishery independent surveys.

Table 9. Skipjack tuna: Description of the updated structural sensitivity grid used to characterize uncertainty in the assessment (from WCPFC-SC 2019).

Axis	Value	Relative weight
Steepness	0.65	0.8
	0.80	1.0
	0.95	0.8
Growth	Low	1.0
	Diagnostic	1.0
	High	1.0
Length composition scalar	50	0.8
	100	1.0
	200	1.0
Tag mix	1	1.0
	2	1.0

Table 10. Skipjack tuna: Summary of reference points over the various models in the structural uncertainty grid. Fmult is the multiplier of recent (2014-2017) fishing mortality required to attain MSY, Frecent is the average fishing mortality of recent years (2014-2017), SBrecent is the average spawning potential of recent years (2015-2018) and SBlatest is the spawning potential in 2018 (from WCPFC-SC 2019).

	Mean	Median	Minimum	10th %ile	90th %ile	Maximum
C_{latest}	1,755,328	1,755,693	1,749,846	1,753,471	1,757,057	1,757,083
$Y_{Frecent}$	1,877,914	1,864,040	1,679,600	1,737,702	2,043,556	2,135,200
f_{mult}	2.282	2.258	1.472	1.757	2.957	3.705
F_{MSY}	0.223	0.222	0.180	0.189	0.264	0.270
MSY	2,296,566	2,294,024	1,953,600	1,995,987	2,767,083	2,825,600
F_{recent}/F_{MSY}	0.461	0.447	0.270	0.343	0.600	0.679
$SB_{F=0}$	6,220,675	6,299,363	5,247,095	5,580,942	6,913,431	7,349,557
SB_{MSY}	1,100,947	1,064,400	631,900	723,742	1,544,060	1,688,000
$SB_{MSY}/SB_{F=0}$	0.175	0.176	0.117	0.131	0.225	0.23
$SB_{latest}/SB_{F=0}$	0.414	0.415	0.325	0.36	0.487	0.525
SB_{latest}/SB_{MSY}	2.468	2.382	1.551	1.779	3.356	3.925
$SB_{recent}/SB_{F=0}$	0.440	0.440	0.336	0.372	0.530	0.551
SB_{recent}/SB_{MSY}	2.623	2.579	1.601	1.892	3.613	4.139

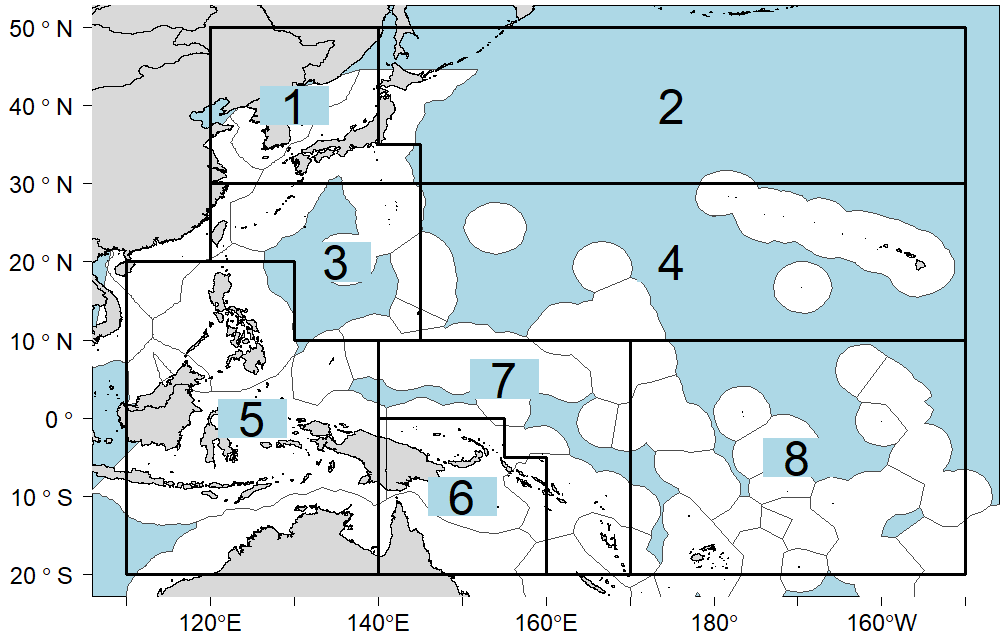


Figure 3. Skipjack tuna: Eight region spatial structure used in the 2019 stock assessment model (from WCPFC-SC 2019).

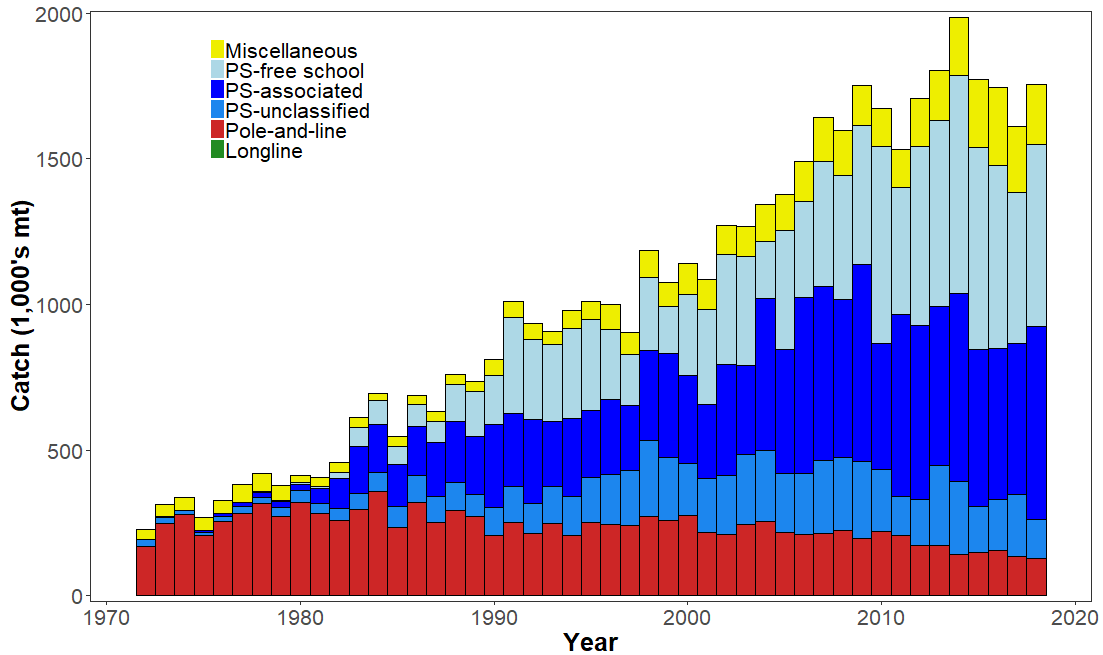


Figure 4. Skipjack tuna: Time series of total annual catch (1000's mt) by fishing gear over the full assessment period (from WCPFC-SC 2019).

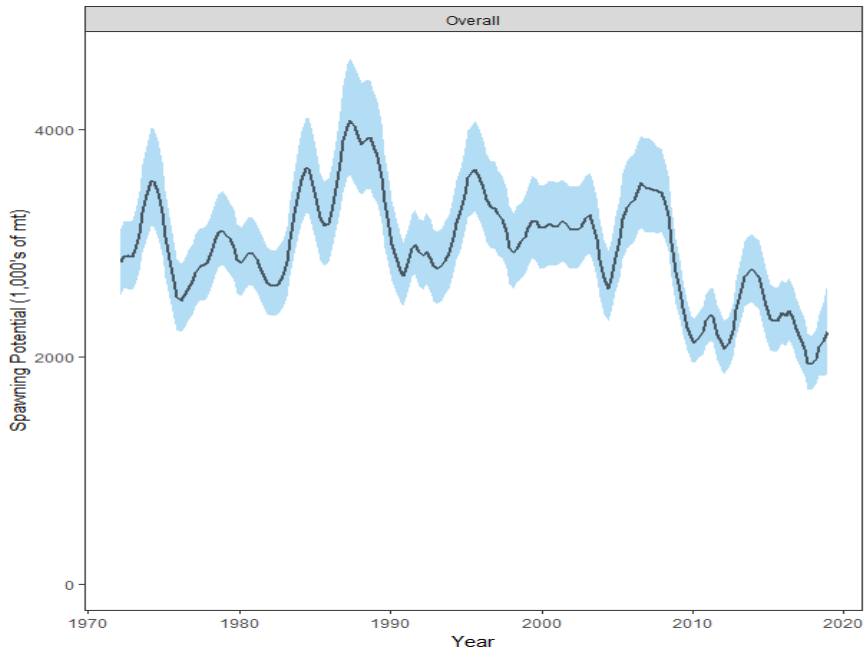


Figure 5. Skipjack tuna: Estimated temporal overall spawning potential summed across regions from the diagnostic model, where the shaded region is ± 2 standard deviations (i.e., 95% CI) (from WCPFC-SC 2019).

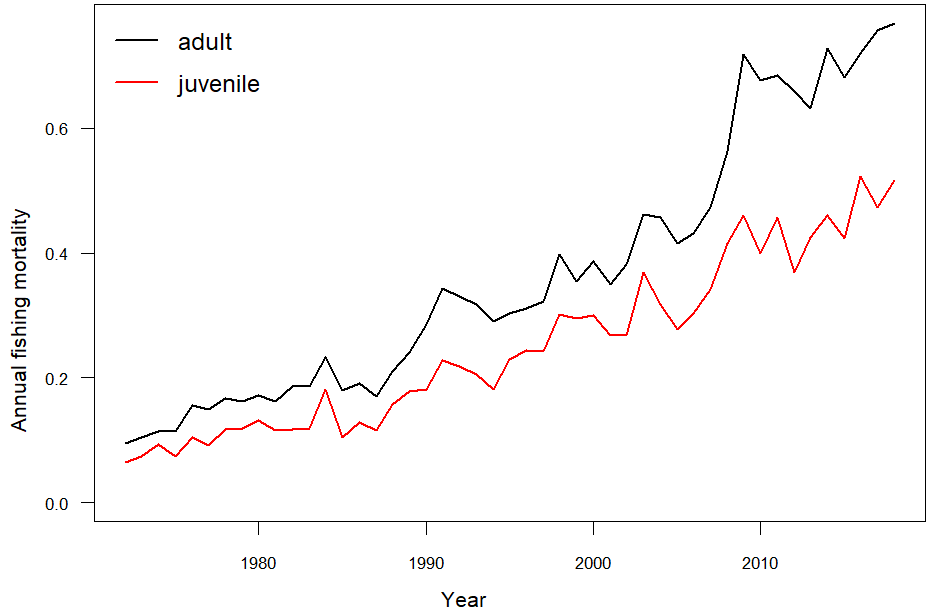


Figure 6. Skipjack tuna: Estimated annual average juvenile and adult fishing mortality for the diagnostic model (from WCPFC-SC 2019).

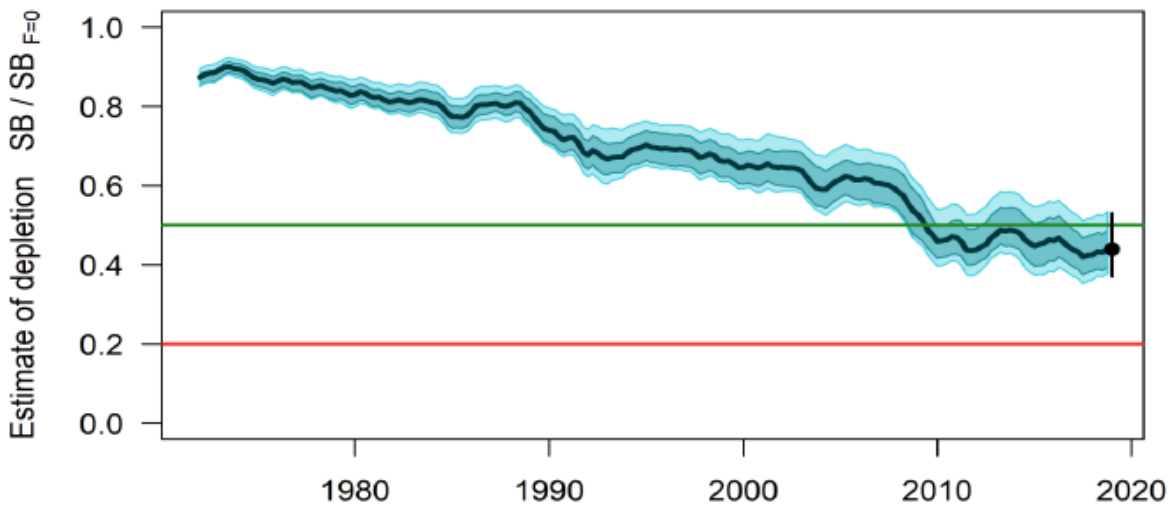


Figure 7. Skipjack tuna: Plot showing the trajectories of spawning potential depletion for the model runs included in the structural uncertainty grid weighted by the values given in Table SKJ-01. Red horizontal line indicates the agreed limit reference point, the green horizontal line indicates the interim target reference point (from WCPFC-SC 2019).

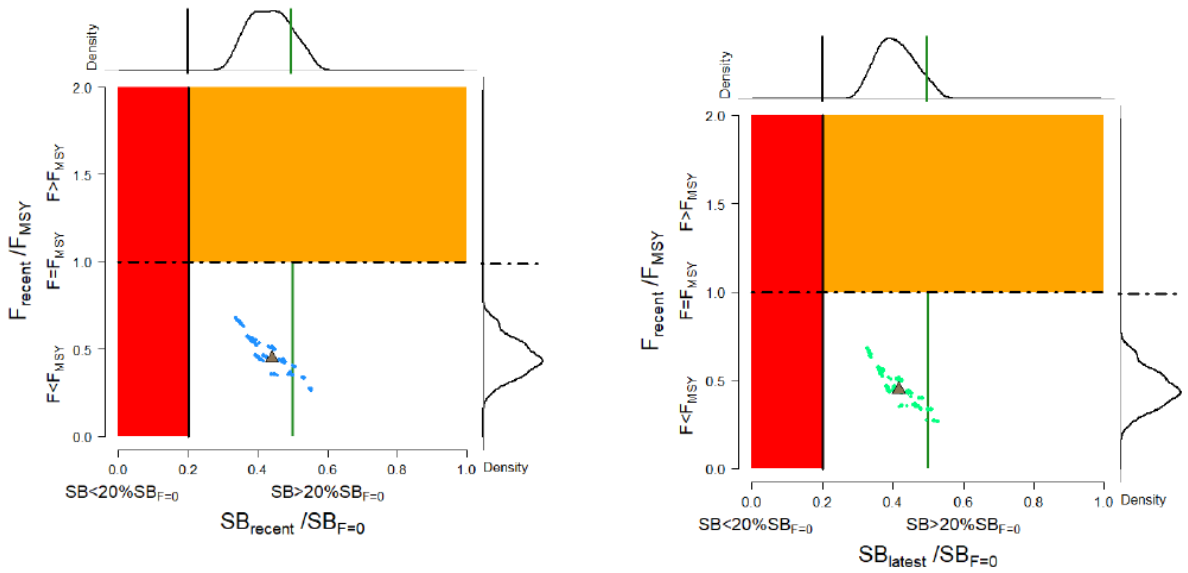


Figure 8. Skipjack tuna: Majuro plot for the recent (2015-2018, left) and latest (2018, right) spawning potential summarizing the results for each of the models in the structural uncertainty grid with weighting. The plots represent estimates of stock status in terms of spawning potential depletion and fishing mortality, and marginal distributions of each are presented. Vertical green line denotes the interim TRP. Brown triangle indicates the median of the estimates. The size of the circle relates to the weight of that particular model run (from WCPFC-SC 2019).

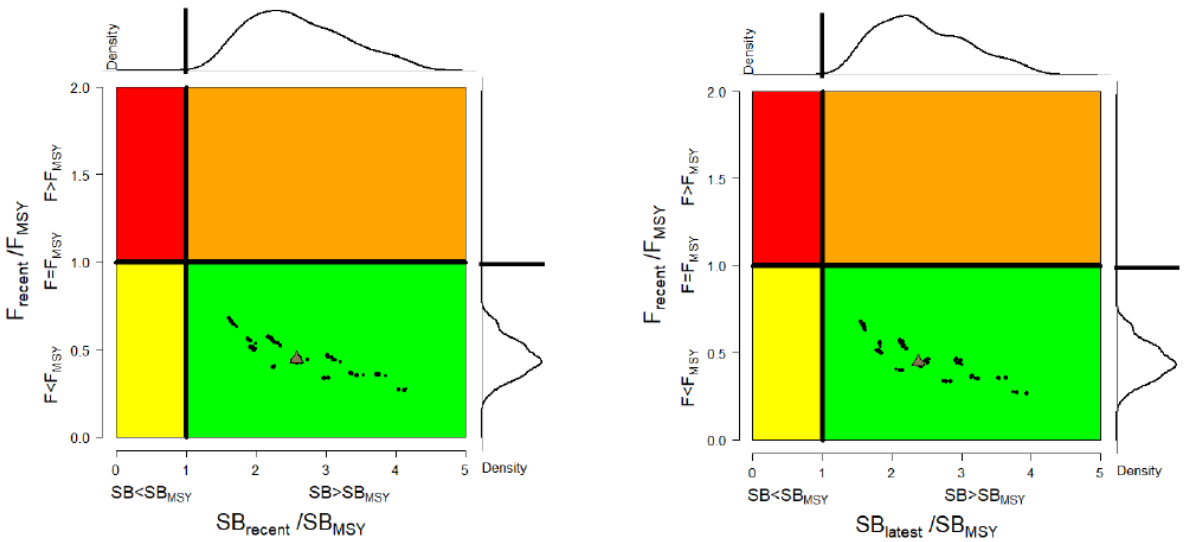


Figure 9. Skipjack tuna: Kobe plot for the recent (2015-2018, left) and latest (2018, right) spawning potential summarizing the results for each of the models in the structural uncertainty grid. The plots represent estimates of stock status in terms of spawning potential depletion and fishing mortality and marginal distributions of each are presented. Brown triangle indicates the median of the estimates. The size of the circle relates to the weight of that particular model run (from WCPFC-SC 2019).

7.2.1.3 Skipjack - Fishing and Management

There are three distinct levels of management for the UoA which are described more fully under Principle 3: 1) RFMO management by the WCPFC, 2) regional management by the PNA and FFA (noting that the vast majority of the catch of both Skipjack and Yellowfin are taken from PNA waters), and 3) management by the Coastal States including Federated States of Micronesia (FSM), Solomon Islands (SI), Chinese Taipei, United States, New Zealand, Cook Islands, and Vanuatu. Note that FSM and SI are member states of the PNA. This section provides some background to the first two of these levels of management. Management by the coastal states are described in Section 7.1.1.4.

WCPFC management

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 all later iterations of this CMM of which CMM 2018-01 is the most recent. It deals with Skipjack, Yellowfin and bigeye tuna and specifies effort limits for purse seine vessels, including for the Solomon Islands and Federated States of Micronesia under the Parties to the Nauru Agreement's (PNA) Vessel Day Scheme (VDS). There are additional effort and catch measures for both purse seines and longline fleets including measures to constrain the FAD-based purse seine fishery, capacity limits, data provision requirements, and monitoring and control provisions.

The PNA Vessel Day Scheme

The objective of the VDS is "To support collaboration between Parties to enable them to maximize their net economic returns from the sustainable use of tuna resources by purse seine vessels" (PNA 2016). It was established in 2006 under the Palau Arrangement (PNA 2016) and became operational on 1 December 2007, initially limiting effort levels of PNA countries to 2004 levels. In brief, fishing days are allocated to each PNA country and can be traded amongst the eight countries in a single licensing year under conditions designed to ensure that the Total Allowable Effort (TAE) is not exceeded.

The VDS applies to purse seine fishing within the EEZs of PNA countries, where the majority of purse seine fishery takes place within the WCPFC Convention Area. Furthermore, the Third Arrangement Implementing the Nauru Agreement prescribed closures to purse seine fishing, by vessels licensed to fish in PNA waters, of areas of the high seas from 1 January 2011 that were surrounded by the EEZs of PNA countries (from 10°N to 20°S latitude and 170°E to 150°W longitude, equating to an area of 4,555,000 sq. km) (PNA 2010, Banks et al. 2011). This scheme (described in detail in Banks et al. 2011) established a limit on the total number of fishing days that could be fished in PNA members' EEZs, with a system of tradable fishing days allocated to each of the PNA Parties as Party Allowable Effort (PAE). The VDS was established to replace the existing limit of 205 purse seine vessels set under the Palau Arrangement for the Management of the Western Purse Seine Fishery. This Arrangement was established in response to concerns over the status of bigeye tuna in particular, as well as a desire to reduce purse seine fishing effort in the WCPO (Dunn et al. 2006, Banks et al. 2011). The VDS was also designed to conserve the target stocks and enhance the value of the purse seine fishery by creating greater competition for access as new foreign fishing partners not currently allocated licences under the 205 limit could enter the fishery.

Since 2008, the VDS has been an important element of the WCPFC purse seine measures to conserve bigeye (CMM 2008-001). Currently, the scheme has aimed to limit the catch to 2010 levels by restricting effort of vessels within the scheme to less than 2010 levels (the reduction being intended to allow for increasing fishing efficiency). CMM 2016-01 reiterated the requirement (initially contained in CMM 2011-01 and subsequently carried over in subsequent measures) that Coastal States within the Convention Area that are PNA members shall restrict the level of purse seine effort in their EEZs to 2010 levels through the PNA Vessel Days Scheme; and that WCPFC Commission Members, Cooperating Non-Members and Participating Territories (CCMs) shall support the ongoing development and strengthening of the PNA VDS including implementation and compliance with the requirements of the VDS as appropriate. Catches from vessels outside the scheme have not been similarly constrained.

Article 12 of the Palau Arrangement (PNA 2016) states that the Total Allowable Effort will be set having regard to:

> *i) The best available scientific, economic, management and other relevant advice and information;*
> *ii) the provisions of the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean;*
> *iii) the objectives of the Management Scheme; and*
> *iv) any submission on this issue from any party, individual or organisation.*

A brief analysis of most of the relevant scientific, economic and management information and advice on which the TAE is based is included in a Working Paper to the annual meeting of the Parties to the Palau Arrangement which is available on the PNA website (PNA 2017). This paper also contains sections concerning WCPFC considerations and MSC considerations, with the stated intention of "clearly recording the link between the TAE and the relevant WCPFC measure and the scientific advice".

Nevertheless, the basis of total number of fishing days allowed, and particularly its relationship to the scientific advice about stock status of Skipjack Tuna (the most economically important species caught by purse seine accounting for about 70% of the total catch (PNA 2015)) is not articulated in the form of a formal harvest control rule. Although the minutes of the PNA meetings at which the recommendations in the TAE Working Papers are discussed and the actual TAEs are set are not publicly available, extracts of the meeting record of these discussions for 2015, 2016 and 2017 which were provided to the assessment team show that the recommendations of the VDS Technical and Scientific Committee have been adopted in each of these years, and without discussion in two of these three years.

There have previously been concerns expressed about a lack of clarity and openness in PNA decision-making with respect to the establishment and operation of the VDS Total Allowable Effort, particularly with respect to links to the requirements of WCPFC CMMs and the scientific advice (Banks et al. 2011). Despite being given copies of PNA meeting minutes, we consider that a lack of clarity about the links between the scientific advice, VDS effort allocations, and CMM provisions persists. Also, a concern from a stock sustainability perspective are concerns over how the VDS will deal with evidence of effort creep from increasing size of fishing vessels and increases in the number of sets per fishing day and tonnage caught per fishing day (Pilling et al. 2017c). More discussion on the VDS is provided in Section 3.5.1.

7.2.1.4 Skipjack - Harvest strategy

The WCPFC has progressed through a stepwise process for implementing the components of a harvest strategy ('the combination of monitoring, stock assessment, harvest control rules and management actions, which may include a Management Plan (MP) or an MP (implicit) and be tested by Management Strategy Evaluation (MSE)', MSCI Vocabulary v1.1).

Establishing a limit reference point (LRP) has involved initially agreeing to a hierarchical approach to identify LRPs for key target species (2011), adopting specific LRPs for Skipjack Tuna (2012), and agreeing to the time period over which the LRP would be calculated (2013). SC9 (noting the results in SC9-MI-WP-02) recommended that the time window (from start year t1 to end year t2) to be used for defining the LRP of 20% of unfished Spawning Biomass (SBF=0,t1-t2) satisfy the following criteria:

a) have a length of 10 years;
b) be based on the years t1=ylast-10 to t2=ylast-1 where ylast is the last year used in the assessment; and
c) the approach used for calculating the unfished biomass levels be based on scaled estimates of recruitment according to the stock recruitment relationship.

For a target reference point (TRP), WCPFC's CMM 2014-01 (WCPFC 2014) reiterated the general objective (contained in previous CMMs) that its management measures aim to ensure that stocks are maintained at a minimum, at levels capable of producing their maximum sustainable yield. This was also expressed in the specific objective that the Fishing Mortality Rate (F) for Skipjack will be maintained at a level no greater than the Fishing Mortality (F) at Maximum Sustainable Yield (MSY) FMSY, i.e. F/FMSY ≤ 1. A series of Management Objectives Workshops were held and there is now an interim target reference point for Skipjack Tuna following the adoption of CMM 2015-06 which specified that

> *"The target reference point for the WCPO Skipjack Tuna stock shall initially be 50 per cent of the estimated recent average spawning biomass in the absence of fishing, (SB F=0, t1-t2)."*

The harvest strategy for Skipjack Tuna is more advanced than for the other main species of tropical tunas. Nevertheless, the workplan that WCPFC adopted in 2017 for Skipjack Tuna (Table 11) indicates that there are still important decisions to be made concerning harvest control rules. This workplan was again modified in 2018 and 2019 but, in response to a Variation Request from all CABs, the 2017 version of the Workplan has been agreed as the fixed timeline for all conditions concerning adoption all elements of harvest strategies for WCPFC tuna stocks. The later updates to the Workplan are therefore not considered further here. More information on this Variation Request is provided in the report section on Harmonized Fishery Assessments.

Table 11. Work plan agreed in 2017 for Skipjack Tuna for the adoption of harvest strategies under CMM 2014-06.

Year	Activity

2017	• Develop harvest control rules (e).
	• Management strategy evaluation (f).
	  ○ SC provide advice on candidate harvest control rules based on agreed reference points.
	  ○ Commission consider advice on progress towards harvest control rules.

2018	• Develop harvest control rules (e).
	• Management strategy evaluation (f).
	  ○ 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.

2019	• Develop harvest control rules (e).
	• Management strategy evaluation (f).
	  ○ 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.
	["TRP shall be reviewed by the Commission no later than 2019" –CMM 2015-06]

2020	• Develop harvest control rules (e).
	• Management strategy evaluation (f).
	  ○ 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.
	Adopt a Harvest Control Rule

* TCC = Technical and Compliance Committee

The VDS system operates alongside WCPFC measures. At the 22nd Annual PNA Meeting in April 2017, the PNA countries agreed to confirm the provisional 2015 TAE of 44,625 days. In addition, a TAE of 44,890 days was adopted for 2016 and set as the provisional PNA TAE for 2017. Purse seine fishing effort (based on logsheet days) have been reported as 36,365 days and 40,349 days for 2015 and 2016 respectively (Clark 2017). In addition, non-PNA member Tokelau joined the VDS in 2015 and was allocated a TAE of 985 days for 2015 and 991 days for 2016 (i.e. a total VDS TAE of 45,610 days for 2015 and 45,881 days for 2016) (PNA 2016a).

7.2.1.5 Skipjack - Catch profiles

The annual purse seine catches of skipjack for the purse seine fleet by flag state, where available. The number of purse seine vessels by flag include 14 vessels from FSM, 11 from Chinese Taipei, 8 from the U.S., 4 from Vanuatu, and 1 from both Cook Islands and New Zealand. No catch is shown for the Solomon Island UoC as vessels are currently not included in the certificate. The Solomon Islands fishery system is being examined nonetheless in case vessels flagged to Solomon Islands need be added to the fishery certificate as a later date. If so, they will be added pending the completion of a gap analysis for those new potential vessels.

Table 12 Skipjack retained catch (mt) by flag state for the UoA vessels, catch for the WCPFC Statistical Area and the UoA's total catch as a % of the total WCPFC Statistical Area catch (2015-2019). Data for WCPFC Statistical Area from SPC-OFC 2019 and UoA flag data from SPC observer records.

Year	Cook Islands	FSM	New Zealand	Chinese Taipei	USA	Vanuatu	WCPFC	UoA Catch/WCPFC Total (%)
2015		13826	834	17347	178351		1,800,440	11.68%
2016		15512	1840	18732	76866		1,797,108	6.29%
2017	4927	11036	4019	17746	82717	911	1,627,901	7.45%
2018	4053	38157	1105	10513	89283	7348	1,842,147	8.11%
2019	1865 (5844 logbook)	30703	NA			12957	NA	NA

7.2.1.6 Skipjack - Total Allowable Catch (TAC) and catch data

There are no TACs in place for the fishery but the total catch data for the two most recent complete fishing years for each UoA are provided in Table 13 a-f.

Table 13. Total Allowable Catch (TAC) and catch data (MT) for skipjack tuna by UoA; Cook Islands (a), FSM (b), New Zealand (c), Chinese Taipei (d), USA (e), Vanuatu (f).

a. Cook Islands

TAC	Year	N/A	N/A	
UoA share of TAC	Year	N/A	N/A	
UoA share of total TAC	Year	N/A	N/A	
Total green weight catch by UoC	Year (most recent)	2018	4,053	MT
Total green weight catch by UoC	Year (second most recent)	2017	4,927	MT

b. FSM

TAC	Year	N/A	N/A	
UoA share of TAC	Year	N/A	N/A	
UoA share of total TAC	Year	N/A	N/A	
Total green weight catch by UoC	Year (most recent)	2018	38,157	MT
Total green weight catch by UoC	Year (second most recent)	2017	11,036	MT

c. New Zealand

TAC	Year	N/A	N/A	
UoA share of TAC	Year	N/A	N/A	
UoA share of total TAC	Year	N/A	N/A	
Total green weight catch by UoC	Year (most recent)	2018	1,105	MT
Total green weight catch by UoC	Year (second most recent)	2017	4,019	MT

d. Chinese Taipei

TAC	Year	N/A	N/A	
UoA share of TAC	Year	N/A	N/A	
UoA share of total TAC	Year	N/A	N/A	
Total green weight catch by UoC	Year (most recent)	2018	10,513	MT
Total green weight catch by UoC	Year (second most recent)	2017	17,746	MT

e. USA

TAC	Year	N/A	N/A	
UoA share of TAC	Year	N/A	N/A	
UoA share of total TAC	Year	N/A	N/A	
Total green weight catch by UoC	Year (most recent)	2018	89,283	MT
Total green weight catch by UoC	Year (second most recent)	2017	82,717	MT

f. Vanuatu

TAC	Year	N/A	N/A	
UoA share of TAC	Year	N/A	N/A	
UoA share of total TAC	Year	N/A	N/A	
Total green weight catch by UoC	Year (most recent)	2018	7,348	MT
Total green weight catch by UoC	Year (second most recent)	2017	911	MT

7.2.2 Principle 1 background: Yellowfin tuna

7.2.2.1 Yellowfin - Life History Information

Taxonomic classification

Class: Actinopterigii
Order: Perciformes
Family: Scombridae
Genus: *Thunnus*
Species: *albacares*

Biology

Yellowfin tuna feed on other fish, crustaceans and squid. Their trophic level has been estimated at 4.4 +/- 0.4 SE. They are not a low trophic level species.

Behaviour

Yellowfin tuna is a large, schooling tuna, common in surface waters of tropical and sub-equatorial oceans (Molony 2008). Tagging with acoustic transmitters or ultrasonic tags has shown Yellowfin spend a majority of their time in the upper mixed layer of the ocean (less than 100 m) and typically in temperatures above 17–18°C (Molony 2008).

Growth and Natural Mortality

Growth in length for Yellowfin Tuna is estimated to continue throughout their life (Figure 10). The estimated mean length of the final age-class is 153.4 cm but the maximum fork length is over 200 cm.

Natural mortality is estimated to vary with age and sex. The generally increasing proportion of males in the catch with the 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.

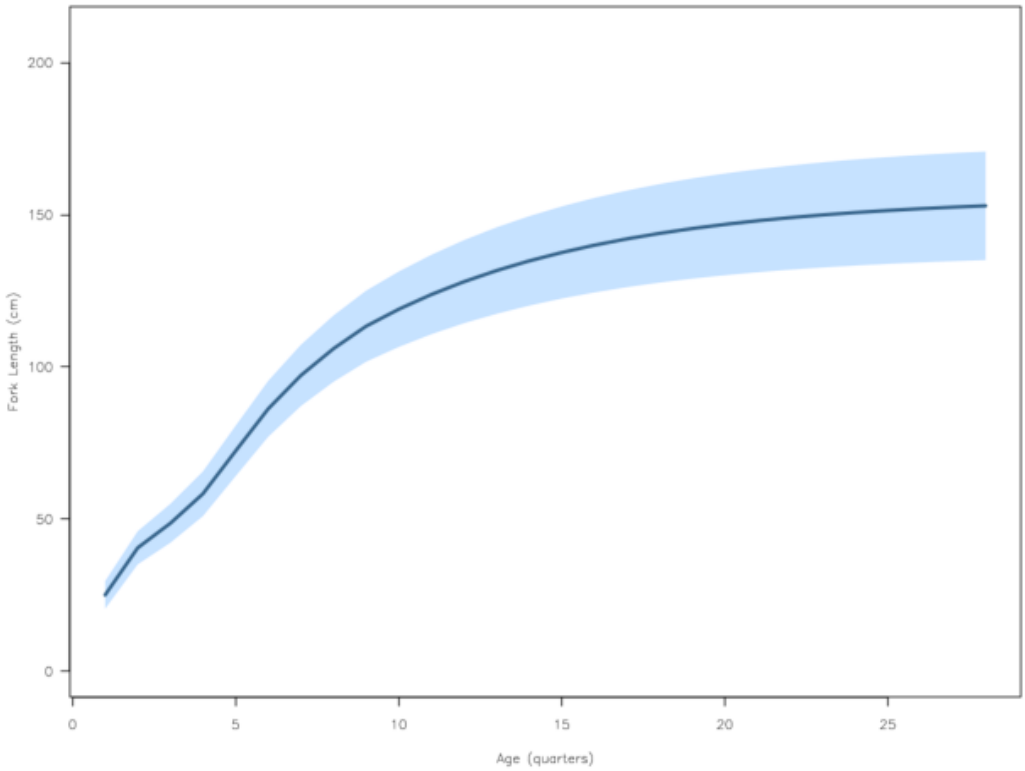


Figure 10. Yellowfin tuna: estimated growth for the diagnostic case model. The blue line represents the estimated mean fork length (cm) at-age and the blue region represents the length-at-age within one standard deviation of the mean, for the diagnostic case model (from Tremblay-Boyer et al. 2017).

Reproduction and Recruitment

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

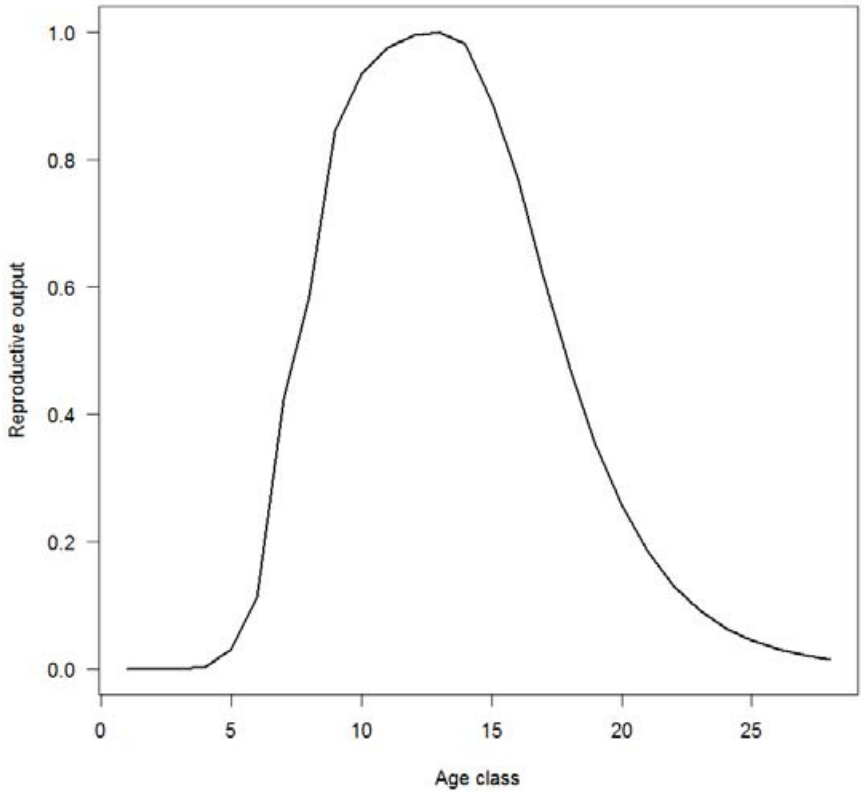


Figure 11. Yellowfin tuna: Index of spawning potential incorporating information on sex ratios, maturity at age, fecundity, and spawning fraction (from Davies et al. 2014).

Distribution and Stock Structure

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 there is little exchange between Yellowfin Tuna from the eastern and the central Pacific, nor between those from the western and the central Pacific (Figure 12). This suggests the existence of subpopulations and although early publications have suggested limited variation within the Pacific (Ward et al. 1994), recent studies with improved techniques have suggested a finer scale genetic stock structure (Aguila et al. 2015; Grewe et al. 2015; Grewe et al. 2016) that is not considered within the current stock assessment (Tremblay-Boyer et al. 2017).

Nevertheless, for the purpose of WCPFC Yellowfin stock assessments, the stock within the domain of the model area (essentially the WCPO, west of 210°E) has been considered as a discrete stock unit (Davies et al. 2014). This area has been disaggregated into model regions (Figure 12) so as to describe to some extent

spatial processes (such as recruitment and movement) and fishing mortality within regions (Tremblay-Boyer et al. 2017).

There is a large amount of tagging data (1989-2012) indicating extensive latitudinal movements among the equatorial regions and a level of longitudinal movements to and from the sub-tropical latitudes (Figure 13) is used in the stock assessment to estimate movement coefficients among different regions. A new regional structure proposed for the current stock assessment, with region boundaries shifted from 20° N to 10° N, was suggested by the PAW based on few movements between tropical tag release sites and temperate zones for bigeye tuna (McKechnie et al. 2017a).

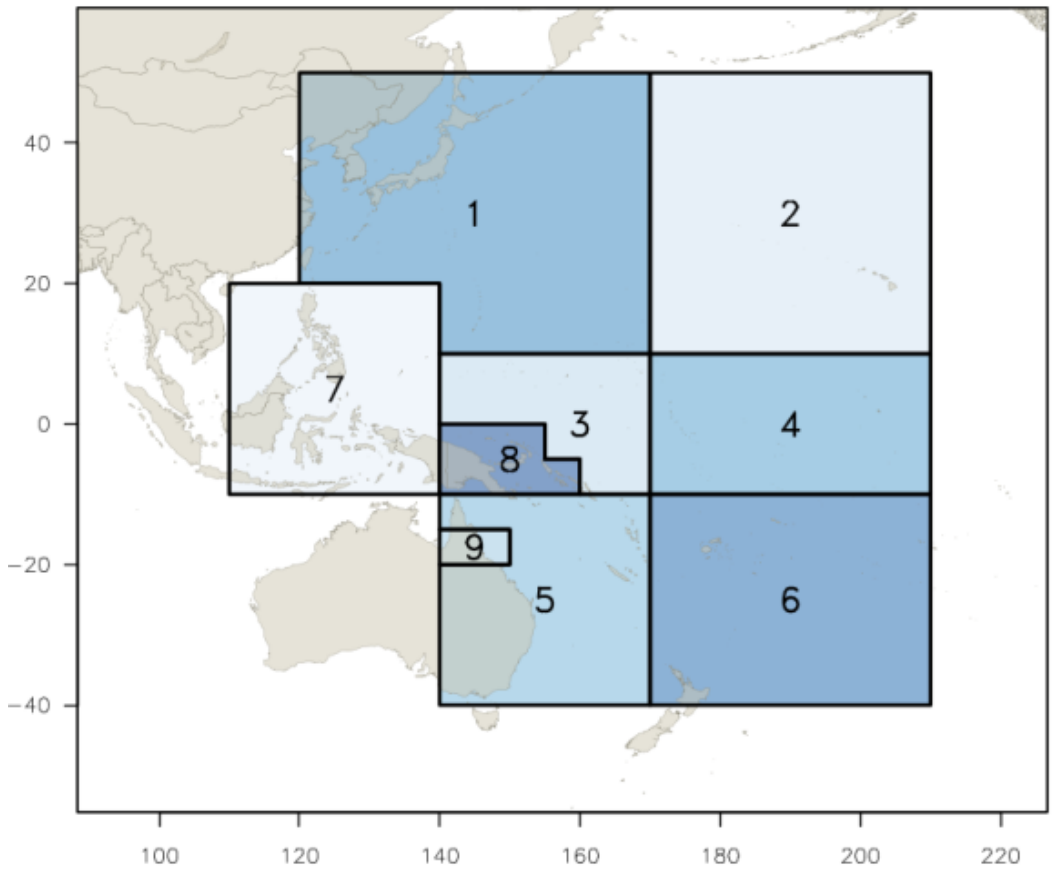


Figure 12. Yellowfin tuna: the geographical area covered by the stock assessment and the boundaries for the 9 regions when using the "2017 regional structure" (from Tremblay-Boyer et al. 2017).

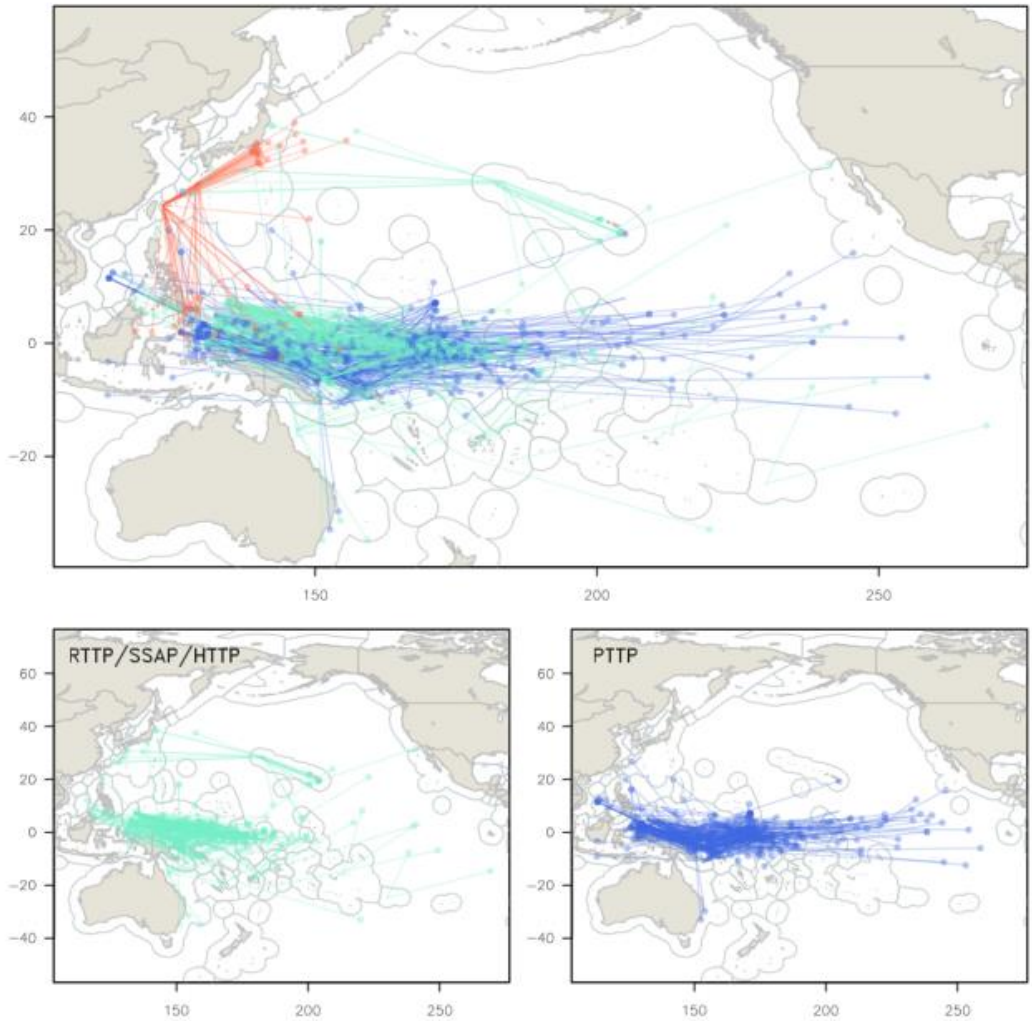


Figure 13. Map of the movements of tagged Yellowfin Tuna released in the Pacific Ocean and subsequently recaptured more than 1,000 nautical miles from their release site. The top panel represents combined recaptures from the tagging programs and the lower panels represent recaptures from different tuna tagging programs. RTTP is the Regional Tuna Tagging Program (1989-1992), SSAP the Skipjack Survey and Assessment Programme (1977-1981), HTTP the Hawaii Tuna Tagging Program (1998-2000), and PTTP the Pacific Tuna Tagging Programme (2006-) (from Tremblay-Boyer et al.2017).

7.2.2.2 Yellowfin - Status of stocks

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 is run in MULTIFAN-CL (MFCL), which provides a Bayesian framework. MFCL requires that 'fisheries' are defined with as near as possible to assume constant selectivity and catchability. For each fishery, the assessment uses catch data, effort data (in the form of standardised CPUE time series), time series of size data, externally estimated growth functions, and tagging data. The model can be considered to consist of several components, (i) the dynamics of the fish population; (ii) the fishery dynamics; (iii) the dynamics of tagged fish; (iv) the observation models for the data; (v) the parameter estimation procedure; and (vi) stock assessment interpretations. Detailed technical descriptions of components (i)–(iv) are given in Hampton and Fournier (2001).

Age / spatial structure: The model is structured into 9 regions and 28 quarterly age classes (the last a plus group).

Growth: Growth was assumed to be invariant by region and sex. It has been noted that growth of smaller fish (up to ~80 cm) may not conform to a von Bertalanffy (VB) curve, so the mean length of the first 8 quarterly age-classes were set as independent parameters, with the mean lengths for the remaining age-classes following a VB growth model.

Steepness: Fixed at 0.8, with 0.65 and 0.95 tested as sensitivities (as all the main WCPFC tuna stocks).

Recruitment: Recruitment occurs in the model at age one, instantaneously at the beginning of each quarter. The stock-recruit relationship is considered weak (i.e. weak penalty for deviating from it); the six terminal quarterly recruitments are set at the mean of assessment period; the distribution of recruitment across regions is allowed to vary over time.

Natural mortality: M assumed to vary between males and females (because there is a larger proportion of males in the largest size classes); M is calculated externally by length and then converted to M-at-age using the growth curve; this M vector is put into the model as fixed values.

Maturity: The assessment estimates 'spawning potential' rather than spawner biomass, with the objective of estimating directly the relevant contribution to the next generation. This is a function of sex ratio at age, female maturity at age, female spawning frequency at age and female fecundity at age. As for M, this function is calculated by length and then back-transformed to age using the growth function.

Selectivity: Modelled using a variety of functions and methods (cubic spline smoothing, logistic function), depending on the fishery. Fisheries can 'share' selectivity if their characteristics are similar, to reduce the number of model parameters

Catchability: Constant catchability is assumed for fisheries where there is standardized CPUE (i.e. the model assumes that standardized CPUE is an index of abundance); otherwise catchability is allowed to vary over time (every 2 years).

The most recent assessment (Tremblay-Boyer et al. 2017) was an update of the previous assessment (Davies et al. 2014) but also addressed relevant recommendations of that assessment report, including an investigation of an alternative regional structure, exploration of uncertainties in the assessment model, particularly in response to the inclusion of additional years of data, and improving diagnostic weaknesses of previous assessments. It used data from 1952 to 2015, in quarterly timesteps; 2016 data being too preliminary at the time of assessment.

In addition to the diagnostic case model, it reported the results of one-off sensitivity models to explore the relative impacts of key data and model assumptions for the diagnostic case model on the stock assessment results and conclusions. It also undertook a structural uncertainty analysis (model grid) for consideration in developing management advice where all possible combinations of the most important axes of uncertainty from the one-off models were included. The grid contains all combinations of two or more parameter settings or assumptions for each uncertainty axis. The axes are generally selected from the one-off sensitivities with the aim of providing an approximate understanding of variability in model estimates due to assumptions in model structure, not accounted for by statistical uncertainty estimated in a single model run, or over a set of one-off sensitivities. The structural uncertainty grid for the 2017 assessment was constructed from 5 axes: steepness (3 settings), tagging data overdispersion (2 settings), tag mixing (2 settings), size data weighting (3 settings) and regional structure (2 settings). Initially the grid consisted of 48 models as only two size weighting had been applied, subsequently a third was added, so the final grid comprised 72 model runs.

In comparison to previous assessments, less emphasis was placed on the diagnostic case model. Instead, Tremblay-Boyer et al. (2017) recommended that management advice be formulated from the results of the structural uncertainty grid and a selection of 48 of the 72 runs were selected by the SC as the basis for this advice (Table 14, Figure 14). In this selection of runs, the lower 10 percentiles for SBlatest/SBF=0 and SBrecent/SBF=0 were 1.02 and 1.05 respectively, indicating that the stock was close to the point at which there would no longer be a high degree of certainty (95% probability) that it was still above the LRP of 20% SBF=0.

Across the range of model runs in this assessment, the key factor influencing estimates of stock status was the size data weighting value. Down-weighting the influence of the size data led to more pessimistic stock status estimates.

Based on the results of the model grid, the general conclusions were:

1. The grid contained a wide range of models with some variation in estimates of stock status, trends in abundance and reference points. However, biomass was estimated to have declined throughout the model period for all models in the grid. Those declines were found across most tropical and temperate regions of the model.

2. Across the model grid, the terminal depletion estimated for the majority of runs estimates stock status levels to be above the 20% SB F=0 . The range of SB latest /SB F=0 values was 0.18 to 0.45. Only two runs

(<5%) fell below the LRP of 20% SB F=0 . The median estimate (0.33) was comparable to that estimated from the 2014 assessment grid, noting the differences in grid uncertainty axes used in the two assessments (Figure 14).

3. Corresponding estimates of F recent /F msy ranged from 0.58 to 1.13, with 2 out of the 48 runs (<5%) indicating that F recent /F msy > 1. The median estimate (0.75) was also comparable to that estimated from the 2014 assessment grid.

4. Fishing mortality for adult and juvenile Yellowfin Tuna was estimated to have increased continuously since the beginning of industrial tuna fishing (seen in the diagnostic case model). In general, these had been on average higher for juveniles, but in recent years adult fishing mortality also increased. A significant component of the increase in juvenile fishing mortality was attributable to the Philippines, Indonesian and Vietnamese surface fisheries, which have the most uncertain catch, effort and size data. The work of the WPEA project to assist in enhancing the current fishery monitoring program and improving estimates of historical and current catch from these fisheries remains important given the contribution of these fisheries in the overall fishing impact analyses from this assessment.

5. The significance of the recent increased recruitment events and the progression of these fish to the spawning potential component of the stock are encouraging, although whether this was a result of management measures for the fishery or beneficial environmental conditions was currently unclear. It was noteworthy, however, that recent favorable recruitment events had also been estimated for Skipjack (McKechnie et al., 2016a, 2016b) and bigeye (McKechnie et al., 2017a) in the WCPO, and bigeye in the EPO (Aires-da Silva et al., 2017), which may give weight to the favorable environmental conditions hypothesis.

6. There remained a range of other model assumptions that should be investigated either internally or through directed research. Briefly, the apparent non-linear impact of the weighing on the size composition data on population estimates, and the conflict between the abundance indices and the tagging data for region 8 were worthy of note. Also, biological studies to improve our estimates of growth of yellowfin within the WCPO, for instance through direct ageing of otoliths as was done in bigeye, should be considered a high priority.

WCPFC and SPC have undertaken extensive work to quantify all sources of removals and include them in the stock assessment. Small-scale (but extensive) fisheries in Indonesia, the Philippines and Vietnam have in the past been a problem, and there has been ongoing work for quite a few years to quantify the catch (and where possible effort) from these fisheries. There has been gradual improvement in the data from these sources over recent years, and catch data are included in the most recent stock assessment.

The impact of longline fishing is important, but it is spatially variable and has declined in recent years (Figure 15). Over the period 1965-2014, recruitment on average displays very little trend and the

uncertainty decreases substantially since the mid 1965s (Figure 16). Biomass has declined steadily over the model period but in the most recent years, that decline has slowed, and shows a small increase in the last two years (Figure 17). Although the age-specific selectivity patterns produce a much higher MSY in the early period of the fishery compared to the recent estimates, the catch has always been less than MSY (Figure 18).

Table 14. Yellowfin tuna: Summary of reference points over the 48 models in the structural uncertainty grid retained for management advice using divisors of 20 and 50 for the weighting on the size composition data. Note that SBrecent/SBF=0 is calculated where SBrecent is the mean SB over 2012-2015 instead of 2011-2014 (used in the stock assessment report), at the request of the Scientific Committee (from WCPFC-SC 2017).

	Mean	Median	Min	10%	90%	Max
C_{latest}	611,982	612,592	606,762	607,517	614,237	614,801
MSY	670,658	670,800	539,200	601,480	735,280	795,200
$Y_{Frecent}$	646,075	643,400	534,400	586,120	717,880	739,600
F_{mult}	1.34	1.36	0.88	1.03	1.61	1.86
F_{MSY}	0.12	0.12	0.07	0.10	0.14	0.16
$F_{recent}/F_{\mathrm{MSY}}$	0.77	0.74	0.54	0.62	0.97	1.13
SB_{MSY}	544,762	581,400	186,800	253,320	786,260	946,800
SB_0	2,199,750	2,290,000	1,197,000	1,366,600	2,784,500	3,256,000
SB_{MSY}/SB_0	0.24	0.24	0.15	0.18	0.28	0.34
$SB_{F=0}$	2,083,477	2,178,220	1,193,336	1,351,946	2,643,390	2,845,244
$SB_{\mathrm{MSY}}/SB_{F=0}$	0.25	0.26	0.16	0.19	0.30	0.35
SB_{latest}/SB_0	0.33	0.34	0.18	0.23	0.42	0.45
$SB_{latest}/SB_{F=0}$	0.35	0.37	0.16	0.22	0.46	0.50
$SB_{latest}/SB_{\mathrm{MSY}}$	1.40	1.39	0.80	1.02	1.80	1.91
$SB_{recent}/SB_{F=0}$	0.32	0.33	0.15	0.20	0.41	0.46
$SB_{recent}/SB_{\mathrm{MSY}}$	1.40	1.41	0.81	1.05	1.71	1.93

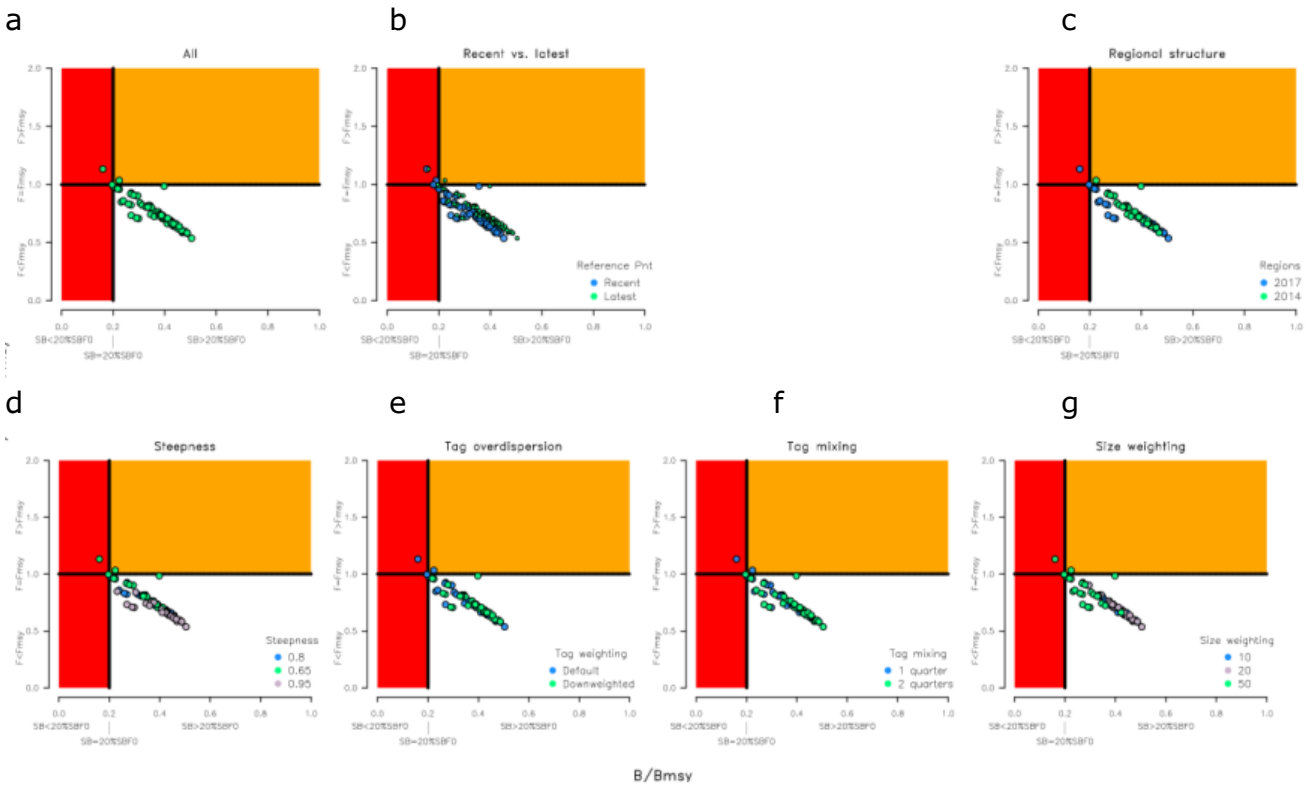


Figure 14. Yellowfin tuna: Majuro plots summarising the results for each of the models in the structural uncertainty grid. The plots represent estimates of stock status in terms of spawning biomass depletion (B/Bmsy - X-axis) and fishing mortality (F/Fmsy – Y-axis). The red zone represents spawning biomass 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 F MSY (F MSY is marked with the black dashed line). The points represent SB latest /SB F=0 for each model run except in panel (b) where SB recent /SB F=0 is also displayed. Panels (c)–(g) show the estimates for the different levels for the five axes of the grid. (from Tremblay-Boyer et al. 2017).

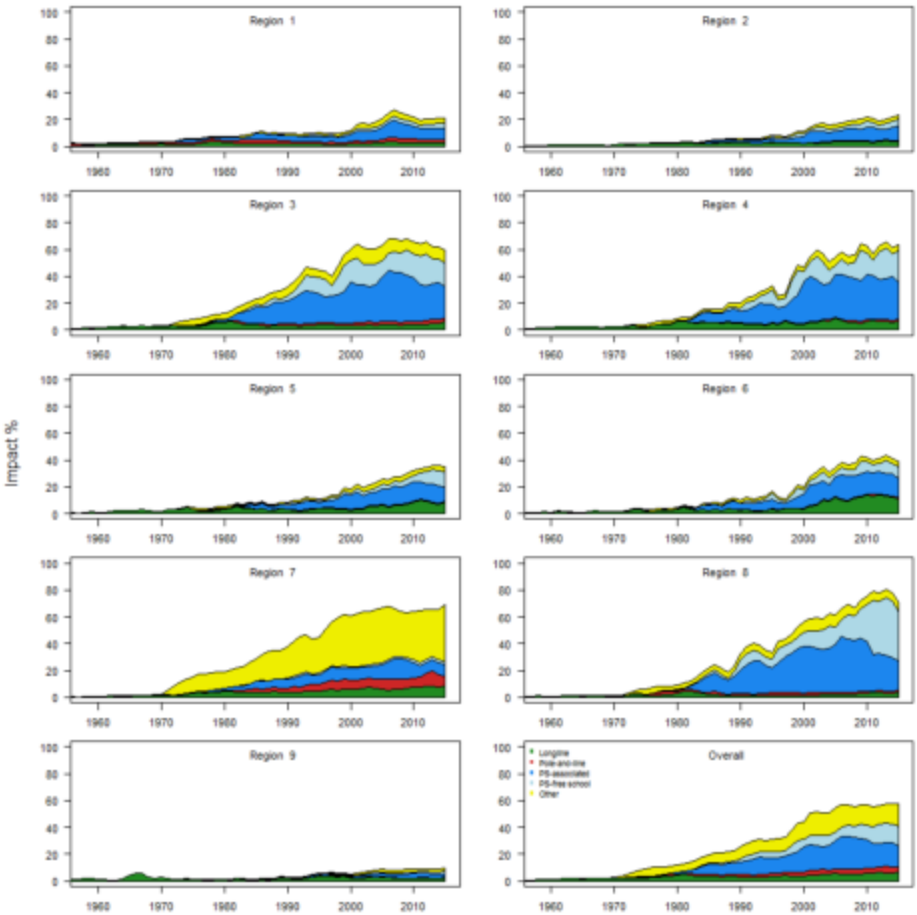


Figure 15. Yellowfin tuna: estimates of reduction in spawning potential due to fishing (fishery impact = 1 −SB latest /SB F=0) by region, and over all regions (lower right panel), attributed to various fishery groups for the diagnostic case model (from Tremblay-Boyer et al. 2017).

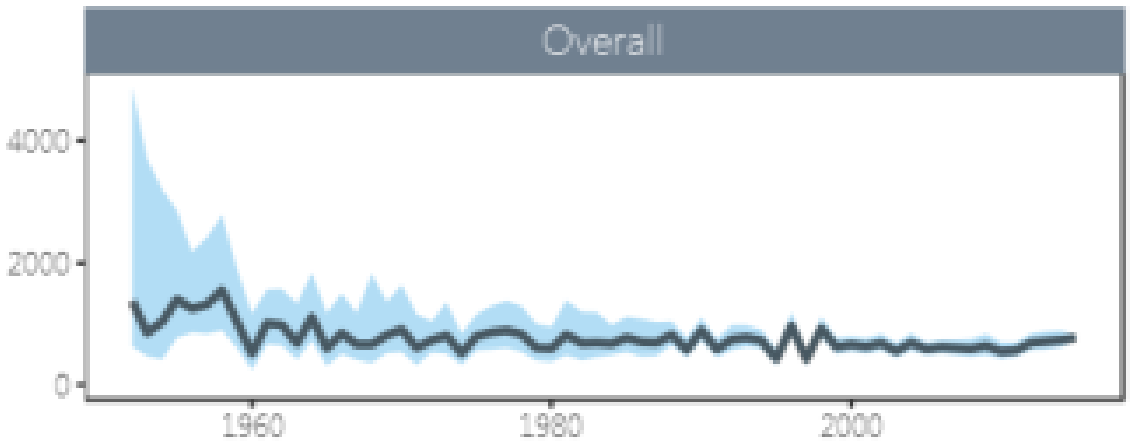


Figure 16. Yellowfin tuna: estimated annual, temporal recruitment (in millions with 95% confidence intervals as the blue shaded regions) for the whole WCPO for the diagnostic case model (from Tremblay-Boyer et al. 2017).

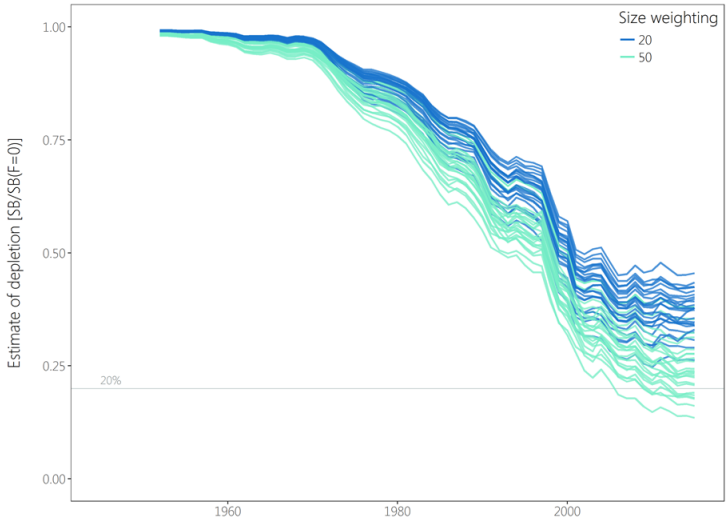


Figure 17. Yellowfin tuna: trajectories of fishing depletion (of spawning potential) for the 48 model runs retained for the structural uncertainty grid used for management advice. The colours depict the models in the grid with the size composition weighting using divisors of 20 and 50 (from WCPFC-SC 2017).

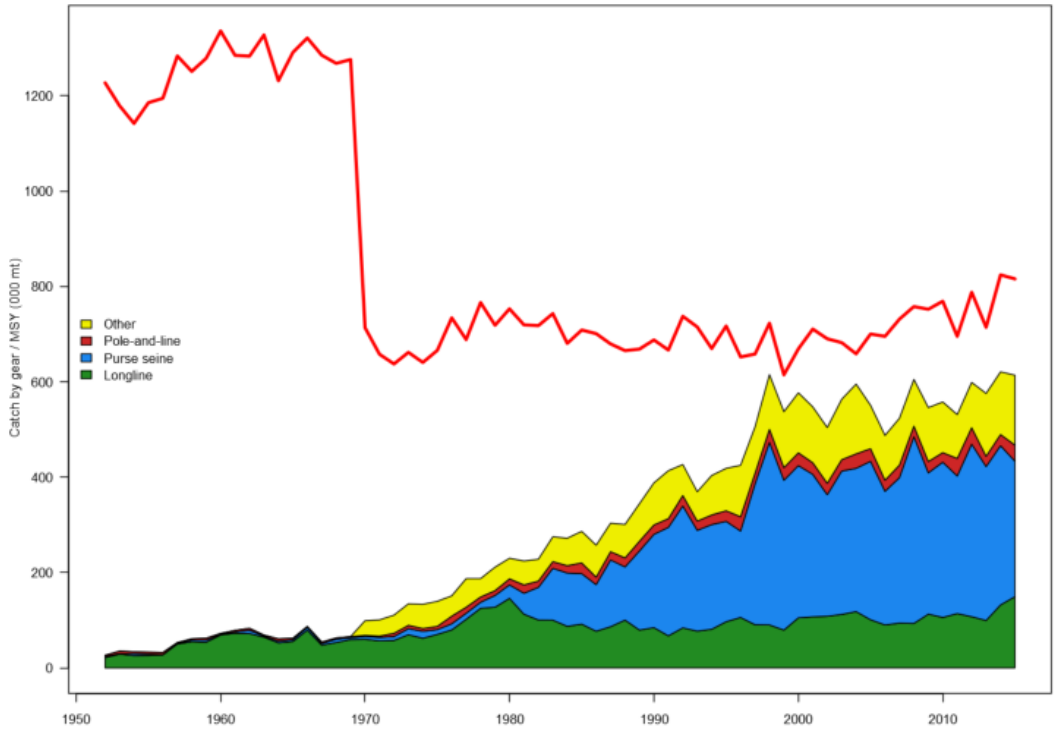


Figure 18. Yellowfin tuna: History of the annual estimates of MSY (red line) for the diagnostic case model compared with an annual catch by the main gear types (from Tremblay-Boyer et al. 2017).

7.2.2.3 Yellowfin - Fishing and Management

As for Skipjack Tuna, there are three distinct levels of management for the UoA which are described more fully under Principle 3: management by the WCPFC, management by the PNA (noting that the vast majority of the catch of both Skipjack and Yellowfin are taken from PNA waters), and management by the Solomon Islands, FSM, Cook Islands, Chinese Taipei, New Zealand, Vanuatu, and the U.S. Background to the first two of these levels of management is provided above under Skipjack and is equally applicable to Yellowfin Tuna.

7.2.2.4 Yellowfin - Harvest strategy

The WCPFC remains the most important level of management for Yellowfin. Progress towards the development of a harvest strategy for yellowfin is evaluated based on the Harvest Strategy Workplan adopted by WCPFC for the key tuna species (Table 15). This indicates that there are still important decisions to be made concerning harvest control rules, but that progress has been consistent with the agreed plan.

Table 15. Work plan from WCPFC14 (2017) for Yellowfin Tuna for the adoption of harvest strategies under CMM 2014-06. Bold items are the six elements that are referred to in CMM 2014-06 (a. Objectives, b. Reference Points, c. Acceptable Levels of Risk, d. Monitoring, e. Harvest Control Rules and f. MSE). Items in brackets are related to harvest strategy development, are part of the plan, but are not one of these six elements.

Year	Activity
2017	**Performance indicators and Monitoring strategy (d).** • SC provides advice on a range of performance indicators for the Tropical Longline Fishery to evaluate the performance of harvest control rules. • Commission noted performance indicators for the Tropical Longline Fishery to evaluate harvest control rules
	2017 Progress summary: • Recognized the importance of developing harvest strategies for key stocks in the WCPO. The Commission recognized that this work requires the consideration of fisheries managers and scientists at different stages. The Commission notes that the time required for harvest strategy discussions is substantial but will also vary from year to year and the Commission recognized the need for this to be accommodated. • Agreed to reprioritize as needed the annual agenda of the Commission and Scientific Committee to allow sufficient additional time for consideration of harvest strategy issues. In addition, WCPFC recognized that there may also be a need for a dedicated science/management dialogue.
2018	• [SC and Commission discussion of management objectives for fisheries and/or stocks, and subsequent development of candidate TRPs for BET and YFT.]
2019	**Agree on Target Reference Point (b).** • SC provides advice on potential Target Reference Points for Yellowfin. • Commission agrees on a TRP for Yellowfin. **Develop harvest control rules (e)** and **Management strategy evaluation (f)** • SC provides advice on the performance of candidate harvest control rules. (ongoing). • Commission consider advice on progress towards harvest control rules. (ongoing).
2020	**Develop harvest control rules (e)** and **Management strategy evaluation (f)** • SC provides advice on the performance of candidate harvest control rules. (ongoing). • TCC consider the implications of candidate harvest control rules. (ongoing). • Commission consider advice on progress towards harvest control rules. (ongoing).
2021	**Develop harvest control rules (e)** and **Management strategy evaluation (f)** • SC provides advice on the performance of candidate harvest control rules. • TCC consider the implications of candidate harvest control rules. • Commission consider advice on progress towards harvest control rules. **Adopt a Harvest Control Rule**

7.2.2.5 Yellowfin - Catch profiles

The annual purse seine catch of yellowfin tuna by flag state for the UoA vessels from 2015 to 2019 is shown in Table 16.

Table 16 Yellowfin retained catch (mt) by flag state for the UoA vessels, catch for the WCPFC Statistical Area, and the UoA's total catch as a % of the total WCPFC Statistical Area catch (2015-2019). Data for WCPFC Statistical Area from SPC-OFC 2019 and UoA flag data from SPC observer records.

Year	Cook Islands	FSM	New Zealand	Chinese Taipei	USA	Vanuatu	WCPFC	UoA Catch/WCPFC Total (%)
2015		1823	37	4706	18130		579,672	4.26%
2016		2827	58	4678	8367		640,246	2.49%
2017	790	2292	421	3864	14636	329	695,107	3.21%
2018	876	5335	992	2,639	13496	908	690,207	3.13%
2019	33 (logbook 134)	4107	NA			1335	NA	NA

7.2.2.6 Yellowfin - Total Allowable Catch (TAC) and catch data

There are no TACs in place for the fishery but the total catch data for the two most recent complete fishing years by flag are provided in Table 17.

Table 17. Total Allowable Catch (TAC) and catch data (MT) for yellowfin tuna by UoA; Cook Islands (a), FSM (b), New Zealand (c), Chinese Taipei (d), USA (e), Vanuatu (f).

- Cook Islands

TAC	Year	N/A	N/A	
UoA share of TAC	Year	N/A	N/A	
UoA share of total TAC	Year	N/A	N/A	
Total green weight catch by UoC	Year (most recent)	2018	876	MT
Total green weight catch by UoC	Year (second most recent)	2017	790	MT

- FSM

TAC	Year	N/A	N/A	
UoA share of TAC	Year	N/A	N/A	
UoA share of total TAC	Year	N/A	N/A	
Total green weight catch by UoC	Year (most recent)	2018	5,335	MT
Total green weight catch by UoC	Year (second most recent)	2017	2,292	MT

- New Zealand

TAC	Year	N/A	N/A	
UoA share of TAC	Year	N/A	N/A	
UoA share of total TAC	Year	N/A	N/A	
Total green weight catch by UoC	Year (most recent)	2018	992	MT
Total green weight catch by UoC	Year (second most recent)	2017	421	MT

a) Chinese Taipei

TAC	Year	N/A	N/A	
UoA share of TAC	Year	N/A	N/A	
UoA share of total TAC	Year	N/A	N/A	
Total green weight catch by UoC	Year (most recent)	2018	2,639	MT
Total green weight catch by UoC	Year (second most recent)	2017	3,864	MT

b) USA

TAC	Year	N/A	N/A	
UoA share of TAC	Year	N/A	N/A	
UoA share of total TAC	Year	N/A	N/A	
Total green weight catch by UoC	Year (most recent)	2018	13,496	MT
Total green weight catch by UoC	Year (second most recent)	2017	14,636	MT

c) Vanuatu

TAC	Year	N/A	N/A	
UoA share of TAC	Year	N/A	N/A	
UoA share of total TAC	Year	N/A	N/A	
Total green weight catch by UoC	Year (most recent)	2018	908	MT
Total green weight catch by UoC	Year (second most recent)	2017	329	MT

7.2.3 Principle 1 Performance Indicator scores and rationales

PI 1.1.1 – Skipjack 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			
	Guide post	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?	Yes	Yes	Yes
Rationale				
The WCPFC-SC (WCPFC-SC 2019) provided advice on stock status based on the 2019 stock assessment results (Vincent et al. 2019). Stock status was determined over an uncertainty grid of 54 models with assumed weightings as illustrated in Table 9. In this assessment SBMSY has been analytically determined to be 0.175 of SBF=0 (from the mean across the uncertainty grid) or 0.176 SBF=0 (from the median across the uncertainty grid) but PRI has not been determined. GSA2.2.3.1 indicates that in such cases (where BMSY is analytically determined to be lower than 27%B0 and there is no analytical determination of the PRI), the default PRI should be 75%BMSY. This equates to 13% SBF=0 (as the SC provides advice based on SBF=0 rather than SB0). The median level of spawning potential depletion from the uncertainty grid was 0.44 SBrecent/SBF=0 (80% prob. int. 0.37 – 0.53) or 0.41 SBlatest/SBF=0 (80% prob. int. 0.37 – 0.49). Recent refers to the average across years 2015-2018; latest to 2018. There were no individual models where SBrecent/SBF=0 or SBlatest/SBF=0 were less than 0.30. The SC concluded that the probability that recent spawning biomass was below the LRP (0.2 SB/SBF=0) was zero. As the default PRI is less than the LRP, the probability that the stock is less than the PRI is lower than the probability of it being below the LRP. 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.				
b	Stock status in relation to achievement of Maximum Sustainable Yield (MSY)			
	Guide post		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?		Yes	Yes
Rationale				
The SC noted that the latest assessment estimated that the median stock levels relative to SBMSY from the uncertainty grid were 2.58 SBrecent/SBMSY (80% prob. int. 1.89 – 3.61) or 2.38 SBlatest/SBMSY (80% prob. int.				

178 – 3.36) (WCPFC-SC 2019). There were no individual models where SBrecent or SBlatest were less than SBMSY. The trend in estimated spawning potential (**Figure 7**) shows that the stock has been fluctuating around current levels over recent years.

There is therefore a high degree of certainty that the stock has been above SBMSY over recent years, meeting SG 80 and SG 100 requirements

References
Vincent et al. 2019; WCPFC-SC 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 (SBF=0) Default PRI = 0.13 SBF=0	SBF=0 = 6,299,363 t 0.13X SBF=0 = 818,917 t	SBlatest/SBF=0 = 0.42 > PRI SBrecent/SBF=0 = 0.44 > PRI
Reference point used in scoring stock relative to MSY (SIb)	Level of spawning biomass in the absence of fishing (SBF=0) relative to MSY (SBMSY).	SBMSY / SBF=0 = 0.176	SBlatest/SBMSY = 2.38 SBrecent/SBF=0 = 2.58

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	100
Condition number (if relevant)	

PI 1.2.1 – Skipjack 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			
	Guide 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?	Yes	No	Not scored
Rationale				

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.
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. 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 sufficiently when they were considered to have been overfished, 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.

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.

These concerns prevent the conclusion that the elements of the strategy are working together to achieve stock management objectives.

This conclusion is consistent with the results of extensive harmonisation discussions among CABs as described elsewhere.

Furthermore, we have considered a previous 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:
There is a lack of a clear link between the PAE and scientific advice on stock status.
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.

Skipjack Tuna is therefore considered to meet the SG 60 level of this scoring issue but not the SG 80 or SG 100 levels.

b	Harvest strategy evaluation			
	Guide post	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Yes	Yes	Not scored

Rationale

The Skipjack stock is assessed as being above SBMSY and the status quo stock projections undertaken concluded that "it was exceptionally unlikely (<1%) that the Skipjack stock would fall below the limit reference point level or that fishing mortality would increase above the FMSY level by 2032" (Pilling et al. 2014).

Furthermore, the most recent stock assessment (Vincent et al. 2016) indicates that fishing mortality for Skipjack Tuna has always been below the FMSY level and that the stock has not declined below BMSY. This constitutes good evidence that the harvest strategy is meeting its objectives.

Therefore, Skipjack Tuna is considered to meet the requirements of both the SG 60 and SG 80 of this scoring issue.

c	Harvest strategy monitoring			
	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Yes		

Rationale

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.

d	Harvest strategy review

	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Not scored
Rationale				
Not scored as not all SG 80 requirements are met.				
e	Shark finning			
	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA
Rationale				
Sharks are not a target species of this fishery and therefore this scoring Issue need not be scored.				
f	Review of alternative measures			
	Guide post	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 biennial 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?	NA	NA	NA
Rationale				
CMM 2018-01 (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 20ºN and 20ºS 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 2018-01 (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 a very small (<2%) proportion of the total catch. Discarded catches of Skipjack across the whole fleet are also estimated to be minor and are ignored in the stock assessment (Vincent et al. 2016). The rules in place indicate that this scoring issue is not relevant to the UoA. .				
References				
Banks et al. 2011; SCS 2017; Vincent et al. 2019; WCPFC-SC 2019				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	60-79
Information gap indicator	Information is sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	70
Condition number (if relevant)	Condition 1-2

PI 1.2.2 – Skipjack 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			
	Guide 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?	Yes	No	Not scored
Rationale				

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.

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 that are also "in place" ; the options for 'available' HCRs are therefore evaluated below.

The second question to address, is whether there are HCRs that meet the requirements for being considered as 'available'.

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".

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 (SBF=0) and 2.56 times SBMSY. The stock is estimated to have never been reduced to SBMSY and has hence been above SBMSY in all years.

According to WCPFC (2014a), paragraph 48, "Future status under status quo 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 (SB2032<0.2SBF=0) or for the spawning biomass to fall below SBMSY, and it is exceptionally unlikely (<1%) for the stock to become subject to overfishing (F>FMSY)."

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 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'.
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 (in this case WCPFC) to adopt HCRs before the stock declines below Bmsy".
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.
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.
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 BMSY 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.
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, HCRSs 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 BMSY.

b	HCRs robustness to uncertainty			
	Guide post		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?		No	Not scored
Rationale				

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			
	Guide post	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?	Yes	No	Not scored

Rationale

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:
"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."
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.
The most recent stock assessment for Skipjack Tuna (Vincent et al. 2016) and the earlier status quo projections (Pilling et al. 2014a) provided 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 FMSY level, that the stock has not declined below BMSY and that it is exceptionally unlikely (<1%) that fishing mortality will increase above the FMSY 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 SG60 level.
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 FMSY 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, Vincent et al. 2016, Pilling et al. 2014a, WCPFC (2014a), WCPFC 2019	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	60-79
Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	60
Condition number (if relevant)	Condition 1-2

PI 1.2.3 – Skipjack 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			
	Guide post	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data are 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?	Yes	Yes	Yes
Rationale				
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 conduct and advance stock assessments, as well as 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			
	Guide post	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?	Yes	Yes	No
Rationale				
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).
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.
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).

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.

This meets the requirements for the SG 60 and SG 80 levels but not the SG 100 level.

c	Comprehensiveness of information			
	Guide post		There is good information on all other fishery removals from the stock.	
	Met?		Yes	

Rationale

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."
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.
The conclusion was that "despite a number of deficiencies in compilation and analysis from the Indonesia and Philippines, this reaches SG 80".
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.

References

Banks et al. 2011; Lewis and Scott 2012; McKechnie et al. 2016; Scott and Stokes 2013

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	90
Condition number (if relevant)	

PI 1.2.4 – Skipjack 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			
	Guide post		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?		Yes	Yes
Rationale				
The most recent assessment applied to Skipjack Tuna (Vincent et al. 2016), 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			
	Guide post	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?	Yes	Yes	
Rationale				
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			
	Guide post	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Yes	Yes	Yes
Rationale				
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			

	Guide post			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			Yes

Rationale

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. The assessment for Skipjack Tuna has been shown to be robust and therefore meets the requirements of this scoring issue.
We note that there has been no simulation testing of the model, but such testing is not necessary to meet the requirements.

e	Peer review of assessment			
	Guide post		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Yes	No

Rationale

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. There have also been external reviews commissioned of different aspects of the data analyses that feed into the Skipjack and other tuna assessments.
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. 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

References

Ianelli et al. 2014, Vincent et al. 2016

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	95
Condition number (if relevant)	

PI 1.1.1 – Yellowfin 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			
	Guide post	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?	Yes	Yes	Yes
Rationale				
This is the agreed harmonized score. The diagnostic case from the 2017 stock assessment (Tremblay-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%SBF=0 .5. Recruitment was also estimated to have been stable since the mid 1960s. The assessment considers both statistical uncertainty in the 'diagnostic case' and structural and data uncertainty across an uncertainty grid. As recommended by the assessment scientists, the SC has adopted the latter approach in framing its management advice and we have also accepted this approach for evaluating stock status here. In the analysis of model structural uncertainty in the assessment (Tremblay-Boyer et al. 2017), using a crosswise grid of 72 alternative model formulations, only two runs (<5%) fell below the limit reference point. Nevertheless, in the selection of 48 of the 72 runs that were selected by the SC as the basis for its advice (Table 4) the lower 10 percentiles for SBlatest/SBF=0 and SBrecent/SBF=0 were 0.22 and 0.20 respectively, indicating that the stock was close to the point at which there would no longer be a high degree of certainty (95% probability) that it was still above the LRP of 20% SBF=0 and will probably not reach it soon if the stock continues to decline. 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. 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 FMSY 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 BMSY. 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.				
b	Stock status in relation to achievement of Maximum Sustainable Yield (MSY)			
	Guide post		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?		Yes	No

Rationale

This is the agreed harmonized score.

There is no explicit target reference point for Yellowfin Tuna but there is considered to be an implicit target of BMSY (supported by CMM 2016-01).

The grid medians for both SBrecent/SBMSY and SBlatest/SBMSY in the most recent assessment were 1.42 (Tremblay-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.

This meets the requirements of scoring issue b at the SG 80 level.

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 SBrecent/SBMSY and SBlatest/SBMSY but across the grid of uncertainties only two runs (<5%) fell below the chance of the stock being below SBMSY over recent years. This finding might suggest that that Yellowfin Tuna now meets the requirements of scoring issue b at the SG 100 level.

Nevertheless, previous assessment scores for Yellowfin tuna, based on the 2014 stock assessment (Davies 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.

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 (SBF=0) LRP: 20% SBF=0	SBF=0 = 2,592,702 t 0.2X SBF=0 = 518,540 t	SBlatest/SBF=0 = 0.46 > LRP SBrecent/SBF=0 = 0.42 > LRP
Reference point used in scoring stock relative to MSY (SIb)	Level of spawning biomass relative to MSY (SBMSY)	SBMSY=750,100 t	SBlatest/SBMSY = 1.58 SBrecent/SBMSY = 1.46

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	90
Condition number (if relevant)	

PI 1.2.1 – Yellowfin 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			
	Guide 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?	Yes	No	Not scored
Rationale				
The harvest strategy for WCPO yellowfin has several contributing components, with WCPFC, PNA and national and archipelagic waters management actions being supported through monitoring, extensive biological research, and robust stock assessments. The information is sufficient to support modern stock assessment platforms that provide estimates of key parameters and their relationship to established reference points (e.g., LRP). Advice from the stock assessment is provided to the WCPFC Commission through the WCPFC-SC and additional work is carried out by SPC, and scientists associated with flag countries, NGOs and universities. This information is sufficient to support annual management decision-making which is progressed through CMMs. On this basis the harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80. There is, however, no formal harvest control in place. An explicit LRP for yellowfin tuna has been adopted for biomass (20%SBF=0). A formal target reference point is under discussion by WCPFC and subject to development under the workplan established through CMM 2014-06, which envisioned implementing the required elements of the harvest control rule (and subsequent harvest strategy) in 2015. This has not happened and progress towards development and implementation of the harvest strategy has been slow. WCPFC16 reviewed the workplan outlined in CMM 2014-06 and agreed to further changes to the workplan (WCPFC, 2019, Attachment H). This update indicates that “the workplan was always intended to be a living document and updated as needed”. The yellowfin tuna harvest strategy is currently scheduled for completion by December 2021. Given this information requirements at the SG 80 level are not met. SG 100 is not scored since all requirements at the SG 80 level are not met. **It should be noted that the score of SG 60 is an agreed harmonized score among all CABs.**				
b	Harvest strategy evaluation			

	Guide post	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Yes	No	Not scored

Rationale

This is the agreed harmonized score.

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 FMSY level by 2032" (Pilling et al. 2014). Furthermore, the most recent stock assessment (Tremblay-Boyer et al. 2017) indicates that fishing mortality for Yellowfin Tuna has always been below the FMSY level and that the stock has not declined below the default target of BMSY. This constitutes good evidence that the harvest strategy is meeting its objectives.
Therefore, Yellowfin Tuna is considered to meet the SG 60 level but not the SG 80 and SG 100levels.

c	Harvest strategy monitoring			
	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Yes		

Rationale

This is the agreed harmonized score.

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.

d	Harvest strategy review			
	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Not scored

Rationale

Not scored because at least one other scoring issue does not reach the SG80 level

e	Shark finning			
	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA
Rationale				
Not scored as sharks are not a target species.				
f	Review of alternative measures			
	Guide post	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 biennial 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?	NA	NA	Not scored
Rationale				
This is the agreed harmonized score. There is negligible unwanted catch of the target stock..				
References				
Pilling et al. 2014. Evaluation of risks of exceeding limit reference points for south Pacific albacore, bigeye, Yellowfin and Skipjack Tunas with implications for target reference points: a case study using south Pacific albacore. https://www.wcpfc.int/node/18513 Tremblay-Boyer, L., McKechnie, S., Pilling, G., and Hampton, J. (2017). Stock assessment of Yellowfin Tuna in the Western and Central Pacific Ocean. WCPFC-SC13-2017/SA-WP-06, Rarotonga, Cook Islands, 9-17 August 2017. https://www.wcpfc.int/node/29519				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	60-79
Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	70
Condition number (if relevant)	Condition 1-3

PI 1.2.2 – Yellowfin 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			
	Guide 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?	Yes	No	Not scored
Rationale				
This is the agreed harmonized score. Not even a generally understood HCR is considered to be in place but one is considered to be available (following guidance in SA2.5.2, SA2.5.3 and SA2.5.5) on the basis that the stock has never been depleted below Bmsy and there is an agreement in place that requires the WCPFC to adopt HCRs before the stock declines below Bmsy.				
b	HCRs robustness to uncertainty			
	Guide post		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?		No	Not scored
Rationale				
This is the agreed harmonized score. There is no HCR in place so it cannot be said that it is robust to the main uncertainties.				
c	HCRs evaluation			
	Guide post	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?	Yes	No	Not scored
Rationale				
This is the agreed harmonized score. The results of the most recent assessment are taken as indicating that tools used or available to implement HCRs are effective at controlling exploitation. The HCRs are only regarded as being 'available' in scoring issue (a) and not 'in place', so it is 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'.				
References				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	60-79
Information gap indicator	Information is sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	60
Condition number (if relevant)	Condition 1-4

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			
	Guide post	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data are 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?	Yes	Yes	No
Rationale				
This is the agreed harmonized score. The range and comprehensiveness of the data available is considered sufficient to meet SG60 and SG80 requirements. Nonetheless, there are some data gaps, bias and lack of precision in some of the data sets, and the stock assessment continues to rely on commercial CPUE as an index of stock abundance. 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. SG60 and SG 80 are considered to be met, but not SG 100				
b	Monitoring			
	Guide post	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?	Yes	Yes	No
Rationale				
This is the agreed harmonized score.				

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. There is not considered to be a high degree of certainty about stock abundance or the robustness of the assessment to this uncertainty. This meets the requirements for the SG 60 and SG 80 levels but not the SG 100 level				
c	Comprehensiveness of information			
	Guide post		There is good information on all other fishery removals from the stock.	
	Met?		Yes	
Rationale				
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, including vessel position, catch of target and non-target species and fishing effort, as well as information from national and international research programs." CCMs submit aggregate catch data by the established WCPFC deadline. WCPFC and SPC review and validate all sources of removals and publish the statistics annually. In preparation of a stock assessment SPC reviews reported catch statistics and the potential for unreported catches in the WCPFC Convention area. Small-scale fisheries in Indonesia, the Philippines and Vietnam have in the past been a problem, and there has been ongoing work (WPEA project) to quantify the catch (and where possible effort) from these fisheries. There has been gradual improvement in the data from these sources over recent years, and catch data are included in the most recent stock assessment. This meets the requirements of the SG 80 level. It should be noted that the current score is the agreed harmonized score.				
References				
List any references here, including hyperlinks to publicly-available documents.				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	80
Condition number (if relevant)	

PI 1.2.4 – Yellowfin 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			
	Guide post		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?		Yes	Yes
Rationale				
This is the agreed harmonized score. The most recent assessment applied to Yellowfin Tuna (Tremblay-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			
	Guide post	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?	Yes	Yes	
Rationale				
This is the agreed harmonized score. 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			
	Guide post	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Yes	Yes	Yes

Rationale
This is the agreed harmonized score. 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. Two approaches were used to describe the uncertainty in key model outputs. The first estimated the statistical uncertainty within a given assessment model, while the second focused on the structural uncertainty in the assessment by considering the variation among a suite of models that encompassed combinations of alternative parameter values from 5 axes: steepness (3 settings), tagging data overdispersion (2), tag mixing (2), size data weighting (3) and regional structure (2). Greater emphasis was placed on the results of the latter approach for the formulation of management advice. This meets the requirements of the SG 60, SG 80 and SG 100 levels of this scoring issue

d	Evaluation of assessment			
	Guide post			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			Yes

Rationale
This is the agreed harmonized score. 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. The assessment for Yellowfin Tuna has been shown to be robust and therefore meets the requirements of this scoring issue. We note that there has been no simulation testing of the model, but such testing is not necessary to meet the requirements.

e	Peer review of assessment			
	Guide post		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Yes	No

Rationale

This is the agreed harmonized score.

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.
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. There has been no external review of the assessment commissioned by the WCPFC.

Therefore we consider that this scoring issue is met at the SG 80 level but not at the SG 100 level.

References

Ianelli, J., Maunder, M. N., and Punt, A. E. (2012). Independent review of the 2011 WCPO bigeye tuna assessment. WCPFC-SC8-2012/SA-WP-01, Busan, Republic of Korea, 7-15 August 2012. https://www.wcpfc.int/node/3131

Tremblay-Boyer, L., McKechnie, S., Pilling, G., and Hampton, J. (2017). Stock assessment of Yellowfin Tuna in the Western and Central Pacific Ocean. WCPFC-SC13-2017/SA-WP-06, Rarotonga, Cook Islands, 9-17 August 2017. https://www.wcpfc.int/node/29519

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	95
Condition number (if relevant)	

7.3 Principle 2

7.3.1 Principle 2 background

7.3.1.1 Overview of Non-target Catch

All species that are affected by the fishery and that are not part of the Unit of Certification are considered under Principle 2. This includes species that are either retained or discarded and considered as primary species (assessed under Performance Indicator 2.1), or secondary species either retained or discarded (Performance Indicator 2.2), and species that are considered endangered, threatened or protected by the government in question or are listed by the Convention of International Trade of Endangered Species (CITES) (Performance Indicator 2.3). This section contains an evaluation of the total impact of the fishery on all components in P2 and includes both observed and unobserved fishing mortality. Unobserved mortality may occur from illegal, unregulated or unreported (IUU) fishing, biota that are injured and subsequently die as a result of coming in contact with fishing gear, ghost fishing, waste, or biota that are stressed and die as a result of attempting to avoid being caught by fishing gear. This section also considers impacts on marine habitats (Performance Indicator 2.4) and the ecosystem more broadly (Performance Indicator 2.5).

Primary species

For the purposes of a MSC evaluation, primary species are those in the catch, and within the scope of the MSC program (fishes or shellfish), and not defined by the client as the target – which by definition is evaluated under Principle 1. Primary species will usually be species of commercial value to either the UoA or fisheries outside the UoA, with management tools controlling exploitation as well as known reference points in place. In addition, the institution or arrangement that manages the species (or its local stock) will usually have some overlap in a jurisdiction with the UoA fishery.

Secondary species

Species associated with the target that is harvested under some management regime, where measures are in place intended to achieve management, and these are reflected in either limit or target reference points are evaluated as Primary species within Principle 2. In contrast, secondary species include fish and shellfish species that are **not** managed according to reference points. Secondary species are also considered to be all species that are out of the scope of the standard (birds/ mammals/ reptiles/ amphibians) and that are not ETP species. These types of species could in some cases be landed intentionally to be used either as bait or as food for the crew or for other subsistence uses, but may also in some cases represent incidental catches that are undesired but somewhat unavoidable in the fishery. Given the often unmanaged status of these species, there are unlikely to be reference points for biomass or fishing mortality in place, as well as a general lack of data availability.

Main species

For Primary and Secondary species, species may be considered “Main” based on either resilience/vulnerability and catch volume. Species that are not “Main” are Minor. Main and Minor species must meet different Performance Indicators (PIs) in P2.

Resilience/vulnerability:

If the species is considered "less resilient" and it is ≥ 2% of the catch, then it is considered Main, otherwise it is considered Minor.

If the species is not considered "less resilient" and it is ≥ 5% of the catch, then it is considered Main, otherwise, it is considered Minor.

ETP Species

ETP species have been classified according to v2.01 SA3.1.5 such that:

- Species that are recognised by national ETP legislation;
- Species listed in the binding international agreements given below:
  - Appendix 1 of the Convention on International Trade in Endangered Species (CITES), unless it can be shown that the particular stock of the CITES listed species impacted by the UoA under assessment is not endangered.
  - Binding agreements concluded under the Convention on Migratory Species (CMS), including:
    - Annex 1 of the Agreement on Conservation of Albatross and Petrels (ACAP);
    - Table 1 Column A of the African-Eurasian Migratory Waterbird Agreement (AEWA);
    - Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS);
    - Annex 1, Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS);
    - Wadden Sea Seals Agreement;
    - Any other binding agreements that list relevant ETP species concluded under this Convention

7.3.1.2 Overview of Species Classification

The analysis for P2 is made considering that the UoA and the UoC (to be determined) are the same and consist of purse seine vessels flagged the USA, FSM, Cook Islands, New Zealand, Vanuatu, and Chinese Taipei fishing with a suite of reported purse seine set types, including associated sets (drifting FADs and logs), unassociated sets, and anchored FADs in the WCPFC area targeting skipjack and yellowfin tuna. The proportion of effort by set type observed in the observer data varies considerably but the majority of effort is associated with drifting FAD sets (60%) and unassociated sets (28%). Fishing effort by other set types contributed significantly less to the overall UoA fishing effort (Log sets = 8%, Anchored FADs = 0.6%, Whale sets = 1.2%, and Whale Shark sets =1%), With respect to the overall contribution of set types to the total volume caught by the UoA drifting FAD and unassociated sets accounted for 99% of the catch (Drifting FADs = 59% Unassociated sets = 49%). While all set types are analyzed the relatively small contributions of log, anchored FAD, whale, and whale shark sets will have insignificant consequences on the outcome of this assessment.

Observer data from 2015-2019 was used to assess species composition. There has been a requirement of 100% observer coverage in purse seine vessels operating in the WCPFC area since 2010. Based on catch data purse seine fishing is a relatively selective gear with minimal volume of bycatch compared to the catch of target species (Table 18). Complete catch tables are in the Appendix (Catch Table). MSC FCP v2.2 UoA definition does not allow for evaluation of the fishery's activity on the basis of 'fishing methods' (i.e. set types), catch composition for the purposes of scoring was assessed by combining data across all set types. Analysis of catch composition by set type is included to provide greater explanation of data—this evaluation is not used in scoring rationales. No species besides Skipjack or Yellowfin comprise more than 3% of the catch; only Bigeye tuna was over 2% and Rainbow runner was over 1% of the catch (Table 18).

The greatest volume of catches came from drifting FADs (54%), followed by unassociated catches (44%) (Table 19). Log catches made up only 1% of the catch volume. No non-target catches were above 3% across any of the set types.

Less than 1 percent of catch volumes came from sets classified as whale sets and whale shark sets. CMM 2011-03 and CMM 2012-04 prohibits vessels from setting on tuna associated with a cetacean and whale sharks, respectively, if the animal is sighted prior to commencement of a set. It should be noted that the majority of whale and whale shark sets were recorded by observers on FSM (96%) UoA vessels and to a lesser extent on Vanuatu (4%) UoA vessels. The assessment team sought clarification from SPC and the WCPFC ROP and was informed that all observer information is subject to rigorous review and evaluation, and observers debriefed after each trip to discuss trip activities and observed "anomalies". Based on the rigor applied to observer data and protocols, and no clarification from SPC/ROP, the assessment team concludes that setting on whales and whale sharks may be occurring on UoA vessels from FSM and

Vanuatu. This is a potential contradiction to CMMs 2011-03 and 2019-04 and is addressed when scoring P3, specifically PI 3.2.3 SIa.

Table 18. Catch Summary for UoA purse seine fishery across all flag states based on UoA observer data from 2015—2019. Only species whose catch comprised more than 0.01% of the catch volume were included in the table. ETP species are recorded separately in for complete catches.

Common Name	Scientific name	Total Catch Discarded (t)	Total Catch Retained (t)	Total Catch (t)	% of UoA Catch	MSC Classification
Skipjack	*Katsuwonus pelamis*	7,672	623,487	631,159	84.79%	Target
Yellowfin	*Thunnus albacares*	692	88,742	89,434	12.0%	Target
Bigeye tuna	*Thunnus obesus*	262	20,235	20,497	2.75%	Primary-minor
Rainbow runner	*Elagatis bipinnulata*	1,020	113	1,133	0.15%	Secondary-minor
Mackerel scad	*Decapturus macarellus*	332	24	356	0.05%	Secondary-minor
Blue marlin	*Makaira nigricans*	96	91	187	0.03%	Secondary-minor
Ocean triggerfish (spotted)	*Canthidermis maculata*	103	15	118	0.02%	Secondary-minor
Sand whiting	*Sillago ciliata*	0	118	118	0.02%	Secondary-minor
Common dolphinfish	*Acanthocybium solandri*	57	28	85	0.01%	Secondary-minor
Black marlin	*Makaira indica*	51	27	78	0.01%	Secondary-minor
Wahoo	*Coryphaena hippurus*	18	33	51	0.01%	Secondary-minor
Total Catch (t)		11,509	732,963	744,472		

Catches of ETP species (# of individuals) are presented in (Table 20). There were 12 marine mammal, 3 Mobulidae, 3 shark, 1 seabird, and 5 sea turtle species caught over the 5 year period spanning 2015-2019. A total of 545 marine mammals were captured, with high variability in survivorship across species; 0-100% of individuals recorded as 'discarded alive' across the different species by observers. As no post-release mortality information is available, observer data is likely an underestimate of full mortality.

As of January 1, 2021, Mobuildae species are protected in the WCPFC, and it is illegal to retain, or intentionally capture any Mobulidae species (CMM-2019-05). Since these species were only recently classified as 'species of special interest,' no status of these species upon discard is available as observers were not previously required to record this information (WCPFC 2007). Of the Mobulidae spp., the giant manta was the most frequently caught, followed by the Devil ray; the vast majority taken by unassociated catches. A total of 34,724 interactions with silky shark were recorded by observers over the 5-year period;

UoA vessels from FSM accounted for 31% of the interactions while UoA vessels from USA accounted for 62% of the interactions. The majority of silky sharks were caught in drifting FAD sets with the remainder incidentally caught in unassociated and log sets. The survivorship of silky sharks was low with only 23% reported as released alive. A total of 104 whale sharks and 412 Oceanic whitetip sharks were caught, with 93% and 65% released alive. In comparison to the other ETP species groups, interactions with sea turtles was low, with 75 to 100% reported released alive.

Table 19. Percent catch summary for the UoA purse seine fishery by set type based on UoA observer data from 2015—2019. Only species whose catch comprised more than 0.01% of the catch volume were included in the table. ETP species are not included in table. (*Associated only with UoA vessels from FSM and Vanuatu)

Common Name	Scientific Name	Anchored FAD	Drifting FAD	Log	Other	Unassoc.	Whale*	Whale Shark*	Grand Total
Skipjack	*Katsuwonus pelamis*	0.02%	42.56%	0.79%	0.38%	37.77%	0.21%	0.07%	84.79%
Yellowfin	*Thunnus albacares*	0.01%	5.52%	0.19%	0.06%	6.15%	0.06%	0.02%	12.01%
Bigeye tuna	*Thunnus obesus*	0.00%	2.50%	0.05%	0.02%	0.18%	0.00%	0.01%	2.75%
Rainbow runner	*Elagatis bipinnulata*	0.00%	0.14%	0.01%	0.00%	0.00%	0.00%	0.00%	0.15%
Mackerel scad	*Decapturus macarellus*	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%
Blue marlin	*Makaira nigricans*	0.00%	0.01%	0.00%	0.00%	0.01%	0.00%	0.00%	0.03%
Ocean triggerfish (spotted)	*Canthidermis maculata*	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%
Sand whiting	*Sillago ciliata*	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.02%
Common dolphinfish	*Acanthocybium solandri*	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
Black marlin	*Makaira indica*	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
Wahoo	*Coryphaena hippurus*	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
Total Catch (mt)		206	401280	7752	3360	328958	2071	778	744406
% of Total		0.03%	53.91%	1.04%	0.45%	44.19%	0.28%	0.1%	

Table 20. Number of individuals classified as ETP species recorded as caught by UoA purse seine vessels based on UoA observer data from 2015—2019. The percentage of individuals recorded as released alive are included (averaged across all set types). Individuals were assumed dead if fate was recorded as unknown. Status for turtles, sharks and rays and mammals are CITES Appendix A species listed (App 1 or App 2) and/or protected by WCPFC Conservation Management Measures (CMMs).

Common Name	Scientific Name	Red List Status	Measure	Set Type							Total Catch	% Alive
				AnchFAD	Drifting FAD	Log	Other	Unasso.	Whale	Whale Shark		
	Sharks											
Silky shark	Carcharhinus falciformis	Vulnerable	CMM 2019-04	9	28,935	1,428	51	4,099	172	30	34,724	23%
Oceanic whitetip shark	Carcharhinus longimanus	Critically Endangered	CMM 2019-04		264	4	1	142		1	412	65%
Whale shark	Rhincodon typus	Endangered	CMM 2019-04		35	1		60	1	7	104	93%
Scalloped hammerhead shark	Sphyrna lewini	Critically Endangered	CMM 2019-04		1			1			2	NA
	Mobula											
Giant manta Ray	Mobula birostris	Endangered	CMM 2019-05		248	7	4	282	2		543	NA
Mobula and Mantas (unidentified)	Mobula sp.	Endangered	CMM 2019-05		131	7	3	337	3		481	NA
	Cetaceans											
Rough-toothed dolphin	Steno bredanensis	Least Concern	CMM 2011-03		52	9	6	9			76	21%
Indo-pacific Bottlenose dolphin	Tursiops aduncus	Near Threatened	CMM 2011-03		7	13					20	0%
Spinner dolphin	Stenella longirostris	Least Concern	CMM 2011-03		5	10					15	0%
Common dolphin	Delphinus delphis	Least Concern	CMM 2011-03					10			10	0%
Common bottlenose dolphin	Tursiops truncatus	Least Concern	CMM 2011-03		6						6	0%
False killer whale	Pseudorca crassidens	Near Threatened	CMM 2011-03		246	12	12	24	5	1	300	77%

Sei whale	Balaenoptera borealis	Endangered	App. 1 CITES		6			26	7		39	100%
Short-finned pilot whale	Globicephala macrorhynchus	Least Concern	CMM 2011-03		3			20			23	100%
Bryde's whale	Balaenoptera edeni	Least Concern	App. 1 CITES;		3			6	5	1	15	83%
Minke whale	Balaenoptera acutorostrata	Least Concern	App. 1 CITES						2		2	100%
Fin whale	Balaenoptera physalus	Vulnerable	App. 1 CITES						1		1	0%
Blue whale	Balaenoptera musculus	Endangered	App. 1 CITES					1			1	100%
	Seabirds											
Black-footed albatross	Phoebastria nigripes	Near Threatened	App. 1 ACAP		1						1	100%
	Marine turtles											
Green turtle	Chelonia mydas	Endangered	App. 1 CITES		3	1		8			12	100%
Loggerhead turtle	Caretta caretta	Vulnerable	App. 1 CITES	1	2			8			11	91%
Olive ridley turtle	Lepidochelys olivacea	Vulnerable	App. 1 CITES		5			2			7	100%
Hawksbill turtle	Eretmochelys imbricata	Critically Endangered	App. 1 CIYES		3						3	100%
Leatherback turtle	Dermochelys coriacea	Vulnerable	App. 1 CITES		2						2	100%

7.3.1.3 Observer Programs/Information Sources

Observer programs are only one part of the system for monitoring, control and surveillance of the fishery but are particularly important for providing data on potential impacts of the fishery on non-target species, including discards and threatened, endangered and protected species.

In the WCPFC, there is a Regional Observer Programme (ROP) that is coordinated by the WCPFC. This program was established under CMM 2007-01 with the objective "to collect verified catch data, other scientific data, and additional information related to the fishery from the Convention Area and to monitor the implementation of the conservation and management measures adopted by the Commission."

The ROP is a collection of National and Regional observer programs that are required to be initially audited before being authorized to join the ROP and are subject to subsequent audits. They are required to comply with an agreed set of standards that cover minimum data fields, observer training, observer trainers, code of conduct, sea safety, placement/deployment, briefing and debriefing, debriefing training, equipment and materials, communications, performance of observers, dispute mechanism, authorisation process, coverage, vessel safety certificate, insurance, and CMM adherence. Further information on standards, audits, and guidelines are available at https://www.wcpfc.int/regional-observer-programme.

Achieved Coverage

When the ROP was initiated there was a requirement for 5% coverage of the fishing effort in each fishery under the jurisdiction of the Commission. There is now a requirement for 100% observer coverage for purse seine fishing (first established under the PNA's Third Implementing Arrangement in 2008; then under WCPFC's CMM 2011-01). The required 5% observer coverage for longline vessels remains in place.

As noted in GSA 3.6.3, MSC recognizes there is "no single optimum level of observer coverage for all fisheries and notes that for more normal species, observer coverage rates above 20% provide only diminishing returns and small incremental improvements in the CV of catch estimates." To confirm the likelihood that shark finning is not taking place MSC recommends that assessment teams use their expert judgement concerning the actual validation methods available (GSA 2.4.5) and provides the following guidance:

- At SG 60 "some external validation" should be understood to indicate a validation level equivalent to a nominal observer coverage of 5% of effort, although the CAB may accept other rates and alternative measures/evidence (e.g., dockside monitoring) with sufficient justification that the same scientific outcome (likely confidence that finning is not taking place) is delivered.
- At SG 80 "good external validation" should be understood to indicate a validation level equivalent to a nominal observer coverage of 20% of effort, although the CAB may accept other rates and alternative measures/evidence with sufficient justification that the same scientific outcome (highly likely confidence that finning is not taking place) is delivered.
- At SG 100 "comprehensive external validation" is required. This gives consideration of the continuity of data collection, precision and accuracy of information, and any bias, etc, that is

capable of supporting the measures in place given the level of precaution that is implicit in the measures and the ability of the measures for detecting any changes.

Status of the observer programs are reported annually by SPC, including flag-specific information on coverage rates (purse seine and longline fisheries), data provisions, and issues (Williams et al., 2020). Annual Reports of the ROP initially noted difficulties in obtaining estimates of the actual level of observer coverage achieved but these concerns have been rectified. Based on submitted observer information from 2015 to 2019, observer coverage by flag is estimated at 100%. This was confirmed during discussions with SPC and ROP staff. We note not all observer data is submitted and processed in a timely manner, and for this assessment 81% - 100% of observer data was provided to the assessment team. It is unclear why submitted data is not processed in a timely fashion, but we note there has been no reported non-compliance related to observer coverage requirements or data submission.

Table 21. Summary of Purse seine Observer data received at SPC, by year and flag (from Williams et al., 2019; Williams et al., 2020).

Fleet	Years Observed	(A) Reported Number of Purse Seine Trips	(B) Trips with Known Observer Placements	(C) Observer coverage Rate (%)	(D) Trips with Observer Data Processed	(E) Available Observer Data (%)
Cook Islands	2019	3	3	100%	3	100%
FSM	2015-2019	731	731	100%	648	87%
New Zealand	2015-2019	17	17	100%	17	100%
Solomon Islands	2015-2019	474	474	100%	417	88%
Chinese Taipei	2015-2019	1031	1031	100%	997	97%
USA	2015-2019	1097	1097	100%	1,096	100%
Vanuatu	2018-2019	54	54	100%	44	81%

It should also be noted that observer data was available from 2015-2019 for all flags except Cooks Islands and Vanuatu; observer data in the Cooks Island was first collected in 2019, as the vessel was previously flagged under Kiribati. Kiribati did not respond to multiple attempts to release the data when the vessel was under their flag. For Vanuatu, the two vessels were purchased by new owners, and only 2018 and 2019 data were provided to the assessment team. Given the high level of observer coverage and no reported non-compliance related to observer coverage requirements, the Assessment Team considers provided observer information sufficient to estimate catch and species interactions.

7.3.2 ISSF membership

Tri Marine helped found and is a member of the International Seafood Sustainability Foundation (ISSF). ISSF is a non-profit organization that seeks to improve the sustainability of global tuna stocks by developing and implementing verifiable, science-based practices, commitments and international management measures that result in fishery's being either MSC certified (with no

conditions) and with the goal of becoming the industry standard for vessel owners, traders, processors and marketers.[7] ISSF frequently advocates for policies at the RFMO level. As a member, Tri Marine is subject to 3rd party audits where compliance with ISSF's Conservation Measures and Commitments are verified. An example of measures include establishing and publishing a policy prohibiting shark finning, purchasing product exclusively from vessels that use 'lesser entangling' FADs, and demonstrating the ability to trace products from can code or sales invoice to vessel and trip. Audit reports are publicly available at ISSF's website.[8] Tri Marine was in full compliance with all ISSF requirements in their 2020 audit (ISSF, 2020).

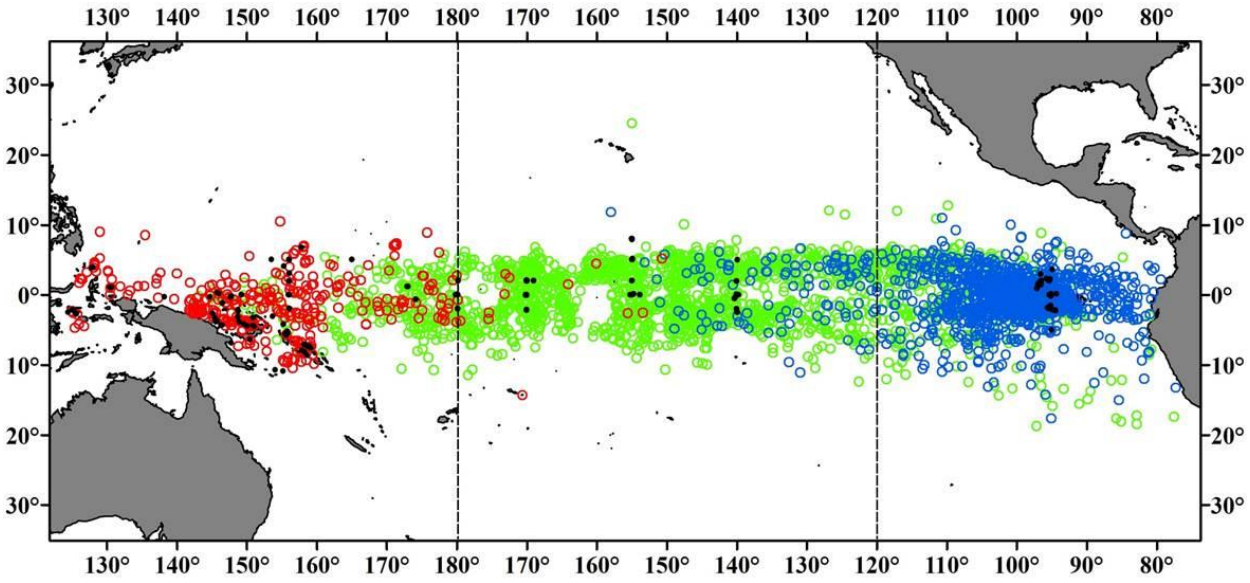
7.3.3 Primary Species

There are no main primary species and bigeye is the only minor primary species.

Bigeye Tuna: Primary Minor Species

Behavior

Bigeye tuna primarily feed on epipelagic and mesopelagic fish, crustaceans and cephalopods. They exhibit distinct diel shifts in vertical behavior, generally descending at dawn to deeper, cooler waters and returning to shallower, warmer waters at dusk. Results from tagging studies show that bigeye tuna are capable of traversing ocean basins, but can also show a high degree of site fidelity to some region (Figure 19).



[7] https://iss-foundation.org/who-we-are/about/

[8] https://iss-foundation.org/what-we-do/verification/participating-company-audit-reports/

Figure 19: Movements of tagged bigeye, divided into three regions. Black points are release locations; red are recapture locations for fish released in the western region; green for recaptures of fish released in the central region; blue for recaptures of fish released in the eastern region. Figure taken from McKechnie, Pilling, et al. (2017a) who in turn took it from Schaefer et al. (2015).

Growth and Natural Mortality

Bigeye tuna are relatively fast-growing, with a maximum length of approximately 200 cm. Individuals reach maturity in the length range 80-120 cm. It appears that bigeye growth is faster in the EPO than the WCPO, for reasons unknown; maturity is reached at a similar age but at a larger size. Growth does not seem to vary significantly by sex (changes in sex ratio after maturity are therefore presumed to be related to differential natural mortality), but growth may vary spatially in the WCPO, although more data are required to map this in detail.

Bigeye age and growth in the WCPO have been revised in recent years ('Project 35'; Farley et al. (2017b), followed by 'Project 81'; Farley, Eveson, et al. (2018)). Initially, the authors sectioned otoliths from 1039 fish caught from 2013-16, in the age range 0.25-13.7 years, mainly from the equatorial regions, and for the 2018 update included an additional 237 age estimates, including 188 from fish >130cm FL, to address concerned expressed at SC13 regarding the accuracy of the revised growth curve at larger sizes, as well as 11 smaller fish (31-39cm).

This work has allowed a new growth curve for bigeye to be estimated, which had a significantly lower asymptotic length than the curve previously used in the stock assessment model (e.g. from 2014), which was more similar to the EPO growth curve (see McKechnie, Pilling, et al. (2017a); Figure 20). The new growth curve from Project 35 was used in the 2017 stock assessment and significantly affected the conclusions of the assessment. The updated 2018 stock assessment incorporated the results of Project 81 as well, but this made very little difference to the 2017 growth curve (Figure 8).

Natural mortality (M) is assumed to be high for the smallest size classes before declining to approximately 0.5/yr for fish > 40cm. Tagging data suggest that significant numbers of fish reach at least 8 years; the longest period at liberty for a recaptured bigeye in the WCPO was approximately 14 years, for a fish released at age 1-2 years. For females, M may increase after maturity because of the physiological stress of spawning; sex ratios of larger size classes tend to be male biased (McKechnie, Pilling, et al., 2017a). Thus, M curves in the stock assessment are sex-specific. Spawning takes place across most months of the year in tropical regions of the Pacific Ocean, becoming seasonal at higher latitudes when sea surface temperatures are above 24 °C.

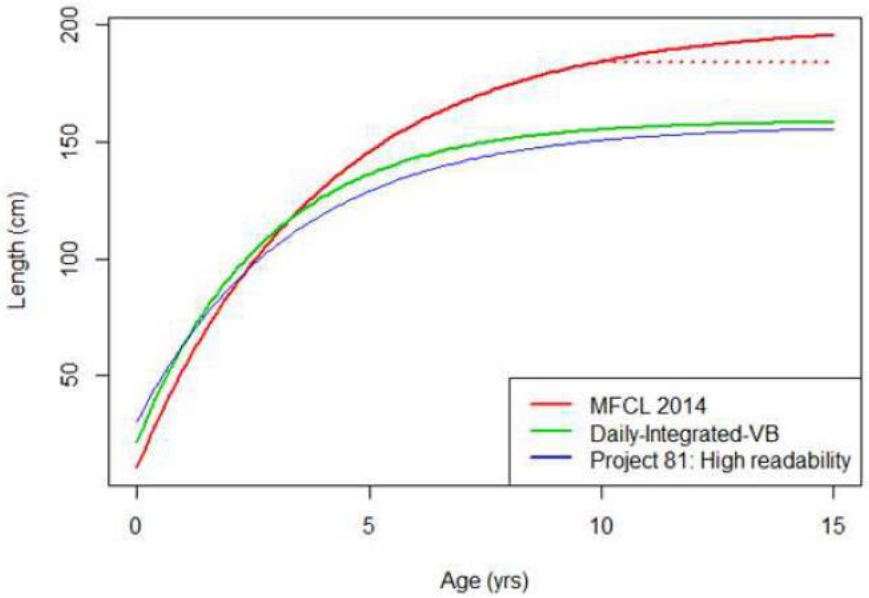


Figure 20: Bigeye growth curves used in the current and previous stock assessments: red – used in previous stock assessments up to 2014; green – used for 2017 assessment (McKechnie, Tremblay-Boyer, et al., 2017) based on the work presented in Farley et al. (2017b); blue – incorporating additional work as set out in Farley, Eveson, et al. (2018); and used in the 2018 update assessment.

Reproduction and Recruitment

Recorded lengths at which sexual maturity is attained varies geographically with a length at which 50% of fishes sampled are mature (L50) at 135 cm in the eastern Pacific Ocean and 102–105 cm in the western Pacific Ocean. This translates to an age of maturity of 2 – 4 years. Bigeye tuna spawn throughout the year in tropical waters and seasonally in cooler waters and spawn almost daily, releasing millions of eggs each time which are found in the top layer of the ocean. In the Pacific Ocean, spawning takes place across most months of the year in tropical regions, becoming seasonal at higher latitudes when sea surface temperatures are above 24 °C.

Distribution and Stock Structure

Bigeye are distributed throughout the tropical and sub-tropical Pacific. Genetic analysis does not suggest significant population differentiation in the Pacific Ocean (Grewe and Hampton, 1998). Tagging suggests that while some individuals may move very large distances (up to 4000 nautical miles over one or more years), most were recaptured much closer to the tagging point. Tagging also suggests that east-west (or in particular west to east movement) is more significant than north-south movement (which is one reason why the regional structure of the stock assessment has been adjusted. The working hypothesis is that bigeye in the far east and far west Pacific have little exchange, but there is likely to be mixing in the central Pacific and there is certainly extensive movement over the nominal WCPO/EPO boundary at 150°W. The consequences of this mixing for stock assessment has been evaluated via a Pacific-wide stock assessment (McKechnie et al., 2015b), the results of which suggest that the current approach is robust to this mixing.

Stock Status

The most recent assessment of stock status was in 2018 (Vincent et al. 2018). This assessment concluded that the stock was not overfished and was not subject to overfishing.

As reported by Vincent et al. (2018) the 2018 assessment was an update that incorporated an updated growth curve resulting from analysis of an enhanced set of otolith data. The updated results of the uncertainty analysis (model grid) used the axes and weightings from SC13 for consideration in developing management advice and recommended that management advice be formulated from the results of the structural uncertainty grid. In addition, it investigated the uncertainty surrounding the spatial structure of the assessment by creating an additional model with the northern boundary of regions 3 and 4 at 15 degrees N, as a one-off sensitivity from two models in the structural uncertainty grid.

Across the range of models in the update assessment, the most important factor with respect to the estimated stock status was once again the choice of growth curve ("Updated New" or "Old" growth). The "Updated New growth" model was considerably more optimistic than the "Old growth" model, but was very similar to the "new growth" model presented in 2017. The second key axis in the structural uncertainty grid was whether the northern boundary of regions 3 and 4 was assumed to be at 10 degrees N or 20 degrees N. The former models estimated more optimistic stock status than the latter, though the effect of this assumption was less than for growth. The 10 degrees N model essentially estimated a larger stock size by assigning more stock to the less exploited temperate regions.

The general conclusions of the re-evaluation (Figure 21 and Table 21) were as follows:

1. Models that assume the "Updated New growth" estimate median depletion (SBrecent/SBF=0) to be 0.358 with an 80% probability interval of 0.295 to 0.412 and all models estimate stock above 20%SBF=0

2. All models that assume "Updated New growth" estimate a recent recruitment event that has increased spawning potential in the last several years, and it is expected that for the "Old growth" models these recruits will soon progress into the spawning potential and improve stock status, at least in the short-term.

3. Only the "Old growth" and 20 degrees N boundary models estimate spawning potential to be below 20%SBF=0 for all models in the set. These models estimate median depletion (SBrecent/SBF=0)to be 0.188 with an 80% probability interval of 0.123 to 0.275, which is consistent with the structural uncertainty grid of the 2017 assessment.

4. Using a weighting of 3:1 "Updated New : Old growth" as defined by SC13, the recent median depletion estimate (SBrecent/SBF=0) to be 0.334 with an 80% probability interval of 0.157 to 0.403. Of the 144 weighted runs, 21 (14.58%) estimated SBrecent/SBF=0 below the LRP of 20%SBF=0.

5. Across the weighted grid, median exploitation (Frecent/FMSY) was estimated to be 0.813 with an 80% probability interval of 0.682 to 1.245, and 32 of the 144 models estimated Frecent/FMSY > 1 (22.22%).

These results also showed that the median estimates of latest and recent spawning biomass are were 1.466 times and 1.285 times that at MSY respectively but that the lower 10 percentiles of these estimates were less than one, indicating that there was a greater than 10% chance of that these spawning biomasses were less than SBMSY (Figure 22).

The WCPFC-SC14 (WCPFC-SC 2018a) agreed to use only the "updated new growth" model to describe the stock status because it considered this to be the best available scientific information. Its advice was:

- Based on the uncertainty grid adopted by SC14, the WCPO bigeye tuna spawning biomass was above the biomass LRP and recent F was very likely below FMSY. The stock was not experiencing overfishing (94% probability F<FMSY) and it was not in an overfished condition (0% probability SB/SBF=0<LRP).
- Although SC14 considered that the updated assessment was consistent with the previous assessment, SC14 also advised that the amount of uncertainty in the stock status results for the 2018 assessment update was lower than for the previous assessment due to the exclusion of old information on bigeye tuna growth.
- SC14 noted that levels of fishing mortality and depletion differ among regions, and that fishery impacts were higher in the tropical region (Regions 3, 4, 7 and 8 in the stock assessment model), with particularly high fishing mortality on juvenile bigeye tuna in these regions. SC14 therefore recommended that WCPFC15 could continue to consider measures to reduce fishing mortality from fisheries that take juveniles, with the goal to increase bigeye fishery yields and reduce any further impacts on the spawning biomass for this stock in the tropical regions.

Table 21. Summary of reference points over the 36 models in the structural uncertainty grid. Note that SBrecent/SBF=0 is calculated where SBrecent is the mean SB over 2012-2015 at the request of the Scientific Committee (from Vincent et al. 2018).

	Mean	Median	Min	10%	90%	Max
C_{latest}	152,148	151,846	148,888	148,936	154,971	155,577
YF_{recent}	154,180	153,220	133,120	141,140	170,720	172,280
f_{mult}	1.291	1.301	0.946	1.075	1.499	1.690
F_{MSY}	0.050	0.049	0.044	0.045	0.054	0.056
MSY	158,551	159,020	133,520	143,040	173,880	180,120
F_{recent}/F_{MSY}	0.789	0.768	0.592	0.667	0.931	1.058
SB_0	1,674,833	1,675,500	1,261,000	1,415,500	1,941,000	2,085,000
$SB_{F=0}$	1,841,609	1,858,775	1,509,007	1,632,014	2,043,108	2,139,644
SB_{MSY}	471,956	476,050	340,700	386,600	577,400	614,200
SB_{MSY}/SB_0	0.281	0.280	0.260	0.262	0.300	0.302
$SB_{MSY}/SB_{F=0}$	0.255	0.255	0.226	0.235	0.280	0.287
SB_{latest}/SB_0	0.456	0.456	0.346	0.392	0.523	0.568
$SB_{latest}/SB_{F=0}$	0.414	0.420	0.298	0.351	0.480	0.526
SB_{latest}/SB_{MSY}	1.633	1.624	1.146	1.306	1.933	2.187
$SB_{recent}/SB_{F=0}$	0.353	0.358	0.251	0.295	0.412	0.452
SB_{recent}/SB_{MSY}	1.394	1.377	0.963	1.117	1.659	1.879

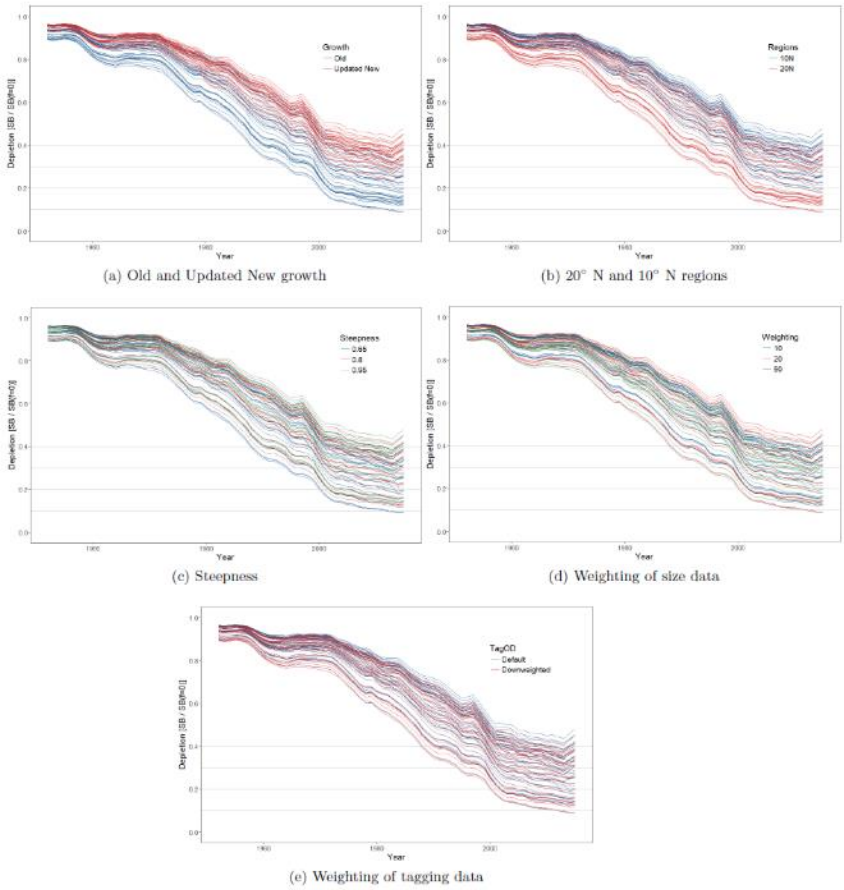
Harvest strategy:

There is an agreed Limit Reference Point (LRP) for all the key tuna species including bigeye tuna of 20% of the unfished spawning biomass (20%SSBcurrent F=0).

There is also an agreed WPFC workplan to progress the development of harvest strategies for key tuna stocks, including bigeye tuna but a TRP and Harvest Control Rules are yet to be agreed. In the absence of these elements of a harvest strategy, the most important management measures for this species are those described in CMM 2017-01 which, for bigeye, states that "Pending agreement on a target reference point the spawning biomass depletion ratio (SB/SBF=0) is to be maintained at or above the average SB/SBF=0 for 2012-2015." Other measures described in this CCM are designed to achieve this outcome but are not explicitly linked to stock status.

The MSC standard requires that a Harvest strategy contain a combination of monitoring, stock assessment, harvest control rules and management actions and that these should work together to maintain stocks at target levels. The absence of an agreed TRP and HCRs that could be expected to maintain stocks at these levels, means that available the current elements of a Harvest Strategy for Western and Central Pacific bigeye tuna are not yet sufficient to meet MSC requirements.

The WCPFC stock of bigeye tuna has been certified as a P1 target species for two longline fisheries, but not the entire WCPFC fishery, and conditions have been established for the two fisheries relative to PI 1.2.1 and PI 1.2.2 (see the MSC website: SZLC CSFC & FZLC FSM EEZ Longline Yellowfin and Bigeye Tuna Fishery and MIFV RMI EEZ Longline Yellowfin and Bigeye Tuna Fishery).



(a) Old and Updated New growth

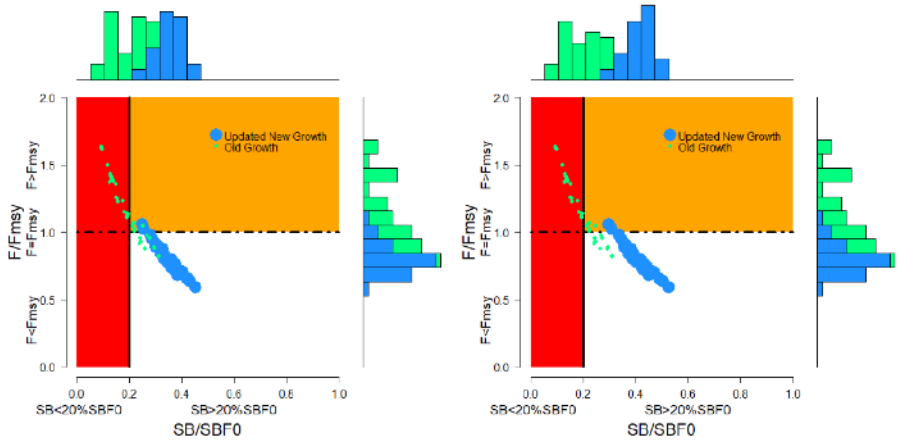
(b) 20° N and 10° N regions

(c) Steepness

(d) Weighting of size data

(e) Weighting of tagging data

Figure 21. Plots showing the trajectories of fishing depletion (of spawning potential) for model runs included in the structural uncertainty grid. The five panels show the models separated on the basis of the five axes used in the grid, with the color denoting the level within the axes for each model (from Vincent et al. 2018).



(a) $SB_{recent}/SB_{F=0}$

(b) $SB_{latest}/SB_{F=0}$

Figure 22: Majuro plots summarizing the results for each of the 72 models in the structural uncertainty grid, which are colored by the growth assumption for the reference point (a) SBrecent/SBF=0 and (b) SBlatest/SBF=0. The plots represent estimates of stock status in terms of spawning potential depletion and fishing mortality where the size of the circle is indicative of the weight in calculating the reference point table. 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 (FMSY is marked with the black dashed line) (from Vincent et al. 2018).

Management

WCPFC Measures CMM 2018-01 contains the latest management measures introduced by the WCPFC for bigeye tuna (and for skipjack and yellowfin). The 2017 and 2018 versions of this CMM removed specific objectives that were in earlier versions that the fishing mortality rates for the key tuna species be reduced to or maintained at levels less than FMSY and replaced these firstly with a general statement of the purpose of the CMM:

> "Pending the establishment of harvest strategies, and any implementing CMM, the purpose of this measure is to provide for a robust transitional management regime that ensures the sustainability of bigeye, skipjack, and yellowfin tuna stocks."

In addition, an interim target is provided for bigeye tuna (paragraph 12):

> "Pending agreement on a target reference point the spawning biomass depletion ratio (SB/SBF=0) is to be maintained at or above the average SB/SBF=0 for 2012-2015."

Nevertheless, the general objective remains articulated under the section titled "Principles for Application of the Measure":

> "… Measures shall ensure, at a minimum, that stocks are maintained at levels capable of producing maximum sustainable yield…"

CMM 2018-01 enacted a suite of purse seine management measures including temporal (3-month) and spatial closure periods/areas, development an adoption of 'lesser entangling' FADS, limits on the number of FADs actively fishing, catch retention measures for bigeye, yellowfin and skipjack tuna, and monitoring and control requirements.

PNA Measures

The PNA has established long term objectives for the PS VDS as outlined in Article 2 of the Management Scheme (PS VDS). These are:

- to support collaboration between Parties to enable them to maximize their net economic returns from the sustainable use of tuna resources by purse seine vessels; and
- to seek to limit the level of fishing by purse seine vessels in their EEZs to the levels of total allowable effort agreed by the Parties to the Palau Arrangement.

Information

Information available on bigeye tuna is generally the same as for the other target species and is collected mainly by the combination of vessel logbooks and observer programs. It includes data on catch weight and effort at an operational level for most fleets, size composition data from observers, tagging data and a range of biological data.

7.3.4 Secondary Species

Based on provided observer data (2015-2019) there were no main secondary species (Table 18). Percent catch summaries of non-target species by year was similar, although the amount caught was minimal. It is unclear if this apparent change results from a change in fishing area or change in observer program protocols.

Percent catch summaries of non-target species by flag was similar for minor secondary species. For completeness, percent catch summaries of non-target species by set type (drifting FAD, unassociated, log, Whale, and Whale Shark) were estimated and catch was generally greater in both number and species composition for purse seine sets on drifting FADs compared to sets on free schools (unassociated); catch associated with log sets was minimal both in number and species composition.

Blue marlin, striped marlin, blue shark and shortfin mako shark are the only minor secondary species for which stock assessments are available (ISC 2019). In 2016 the ISC concluded that, based on the results of a 2016 stock assessment update, the Pacific blue marlin stock was not currently overfished and was not experiencing overfishing. In 2019 the ISC concluded that, based on the results of a 2019 benchmark stock assessment, the Western and Central North Pacific striped marlin stock was overfished and was subject to overfishing relative to MSY-based reference points. In 2019 the ISC concluded based on results of the 2017 stock assessment that North Pacific blue shark was not overfished or experiencing overfishing. In 2019 the ISC concluded based on the 2018 stock assessment that the North Pacific shortfin mako stock is likely (>50%) not in an overfished condition and overfishing is likely (>50%) not occurring relative to MSY-based abundance and fishing intensity reference points. As is the case for all the billfish and most sharks, hook fisheries are responsible for the large majority of the catch.

For all minor secondary species, the management objectives are those outlined in the WCPFC Convention text. These include ensuring long term sustainability, preventing overfishing, monitoring the fishery and assessing its impacts, protecting biodiversity, and enforcing CMMs. Even though there are not stock assessments available, the status of most species is known at some level (e.g. according to IUCN categories) and the low levels of catch of secondary species by the UoAs greatly reduces the risks of these objectives not being achieved. Therefore, even if these species were below any biologically based limits, any catch by purse seine fleets fishing on free schools or FADs would not be hindering their recovery.

Due to the low levels of catch of secondary species and their associated status as ‘minor’, secondary species are not considered in detail in the background.

7.3.5 Endangered, Threatened and Protected (ETP) Species

There are four species of sharks, twelve species of cetaceans, one species of seabird, and five species of turtles which have been recorded as being caught by UoA fishing vessels from 2015-2019, and the catch is higher in drifting FAD sets compared to unassociated and log sets (Tables 19). The total catch of ETP species was 36,810 animals, of which approximately 99.99% were discarded. Silky sharks comprised approximately 94% of the ETP catch, followed by mobula at 2.8%, oceanic whitetip sharks at 1.1%, false killer whales at 0.8%, and whale sharks at 0.3%. The number of silky sharks caught was greater than 34,000 animals with 62% and 31% of the catch coming from the USA and FSM UoCs, respectively. Based on the 2015-2019 observer data, retentions of oceanic whitetip shark and mobula were observed. The retention of mobula occurred in 2016 and 2018, prior to the adoption of CMM 2019-05 specifically aimed at stopping their retention. The retention of oceanic whitetip sharks was observed in 2019 (N=2), which is contrary to CMM 2011-04 that prohibits their retention (now CMM 2019-04). This noncompliance due to the retention of oceanic whitetip sharks will be addressed in the scoring of P3.

Whale Shark

Biology

Whale sharks (*Rhincodon typus*) are globally distributed in tropical and warm temperate seas. Approximately 75% of the global whale shark population lives in the Indo-Pacific region, the remaining 25% in the Atlantic Ocean, and their populations are potentially part of a single, global meta-population (Sequeira et al. 2013). They are known to undertake multi-annual and very long-distance migrations including between different parts of the Pacific Ocean (Norman 2005). They are also known to be resident year-round in some areas but to use a different habitat in different seasons, being visible on the surface at sometimes of year and swimming deeper and further away from shore at others, presumably in response to prey distributions (Cagua et al. 2015).

Because whale sharks are listed as endangered on the IUCN Red List, traditional biological sampling approaches are not permitted and very little in know about their life history. They are known to be ovoviviparous and are reported as highly fecund (for a shark). Their life span has been estimated as 60 to over 100 years, while a recent study in the Maldives estimated a maximum life span of male whale sharks at 130 years (Perry et al, 2018). Age at maturity has been reported as nine years (Norman 2005), 25 years (Perry et al., 2018), and 30 years (Harley et al. 2013). Using minimally invasive techniques over a 10-year period, male whale sharks in the Maldives were estimated to grow to almost 62 feet (Perry et al., 2018). More details of the biology of this species are provided in Molony (2008).

A total of 104 Whale Sharks were caught by UoA vessels between 2015 and 2019, with the majority associated with unassociated sets (58%) (Table 20). Highest catches were associated with U.S.A. vessels (54%), FSM vessels (22%), and Chinese Taipei vessels (18%). Survival rates for discarded Whale Sharks was estimated at 93%.

Status

Whale shark populations have been reported as declining (Norman 2005). Two global-scale genetic studies on whale sharks have estimated genetic effective population size. Castro et al. (2007) used mitochondrial DNA to estimate current genetic effective population size at 119,000 – 238,000 sharks. Schmidt et al. (2009) estimated genetic effective population size to be approximately 103,000. Overall, the global population experienced an estimated decline of 50% over the last 75 years (Pierce & Norman 2016). In addition to the decline in abundance, a decline in mean total length was also reported from a number of locations.

Whale sharks are considered to be a species with low population growth and therefore vulnerable to fishing-related mortality (Rice and Harley 2012b). They have been the subject of some targeted fisheries and significant non-tuna related fishing mortality is likely to have occurred historically, particularly in the coastal waters of the northwest Pacific Ocean (Rice and Harley, 2012b).

Whale sharks are caught in purse seines and WCPFC records indicate that they are generally encountered anywhere significant amounts of fishing occur (Harley et al. 2013). Whale sharks are listed under Appendix II of CITES, not Appendix 1, but qualify as an ETP species because of the binding CMM (2012-04) for them in the WCPFC. The occurrence of whale sharks in free schools sets by purse seiners in the WCPO has been found to have been reduced by about half over the ten years up to 2012 which could be the result of improved identification/avoidance of whale sharks prior to setting or a trend in abundance (Harley et al. 2013).

The results of an assessment of the risk to the Indo-Pacific Ocean whale shark population from interactions with Pacific Ocean purse seine fisheries (Common Oceans (ABNJ) Tuna Project 2018c) concluded that:

- A nominal trend of high interactions in 2006-2008, followed by lower rates thereafter was consistent with trends found in the Eastern Pacific Ocean. These decreasing annual trends in interactions do not appear to result from management measures as prohibitions on intentional setting of purse seines on whale sharks were adopted by the PNA in 2010, by the WCPFC in 2012 and by the IATTC in 2015. Furthermore, the trends may have been influenced by low WCPO observer coverage rates prior to 2010.
- Given the consistency in annual interaction trends over a broad area of the Pacific, it was possible that these trends related to basin-wide oceanographic/ environmental conditions which mediate the overlap of whale sharks and the purse seine fishery.
- Strong correlations were found between environmental variables and whale shark interaction rates for most set types except free school sets which show the highest interaction rates.
- The spatially predictive model was able predict 'hotspots' for whale sharks which were generally in line with known areas of occurrence. However, environmental predictors used in the model did not explain temporal shifts in interaction rates.

- In recent years, the number of interactions recorded as resulting in an immediate whale shark mortality was less than 1 in 1000 sets. However, the probability of post-release mortality, which was estimated at ~10% (with a significant tail extending to higher value) based on an expert survey, was the greatest source of uncertainty in the assessment. Understanding and reducing post-release mortality is recommended as one of most effective approaches to maintaining acceptable risk levels.
- For all scenarios the risk ranged from near 0% to as high as 54% of the most precautionary notional reference point (which is defined as "MSM" or maximum sustainable fishing mortality which is equivalent to half of the maximum population growth rate (rmax)). As the risk of exceeding any one of the three notional limit reference points is generally less than 20% since 2009, the risk from Pacific Ocean fisheries alone is considered moderate to low. The total risk to the Indo-Pacific whale shark population may however be higher if there are differential impacts to more vulnerable population segments within the Pacific and/or higher fishing mortalities outside of the region (e.g. the Indian Ocean).

After considering this report, the WCPF-SC considered there to be a low probability that the Indo-Pacific whale shark was at risk from Pacific purse seine fisheries (median probability of less than 8% that current risk levels exceed life history-based notional reference points FLim and Fcrash) (WCPFC-SC 2018c).

Management

CMM 2019-04 Conservation Management Measure for sharks regulates includes the requirement that "CCMs shall prohibit their flagged vessels from setting a purse seine on a school of tuna associated with a whale shark if the animal is sighted prior to the commencement of the set" and that "[…] in the event that a whale shark is not deliberately encircled in the purse seine net, the master of the vessel shall ensure that all reasonable steps are taken to ensure its safe release".

In addition, it includes the requirement that CCMs "shall implement, as appropriate, the FAO International Plan of Action for the Conservation and Management of Sharks (IPOA Sharks)" and that "CCMs shall advise the Commission (in Part 2 of the annual report) on their implementation of the IPOA Sharks, including, results of their assessment of the need for a National Plan of Action and/or the status of their National Plans of Action for the Conservation and Management of Sharks".

Futhermore, CMM 2019-04 also includes other requirements for key shark species, which include Silky shark (covered above under retained species), Mako sharks and oceanic whitetip sharks that are outlined in the section on shark finning above.

A good practice guide (Poisson et al. 2012) has been produced, which provides measures for the safe release of whale sharks that have been caught in purse seine gear and evidence suggests good survival rates of encircled individuals prior to net hauling (Muir et al. 2013).

Information

Information available on the key shark species is collected mainly by the combination of vessel logbooks and observer programs. It includes data on catch weight and effort at an operation level for most fleets, and some size composition data and biological data.

CMM 2019-04 also contains requirements for CCMs to include information on "key shark species in their annual reporting to the Commission of annual catch and fishing effort statistics by gear type, including available historical data, in accordance with the WCPF Convention and agreed reporting procedures" and that "CCMs shall also report annual retained and discarded catches in Part 2 of their annual report".

There has been a WCPFC requirement for 100% observer coverage on purse seine vessels since 2010 and the estimated levels of compliance by UoA vessels are reported in section 7.3.1.3 Observer Programs/Information Sources. UoA purse seine fishing vessels are required to comply with WCPFC provisions, including those for data reporting, and numbers of whale sharks caught are included in the FSM, Solomon Islands, Chinese Taipei, and USA Part 1 Annual Reports to the WCPFC-SC. Clarke (2015), however, noted that observer reports are more likely to contain accurate data on the frequency of interactions than logbook records.

Silky Shark

Biology

Bonfil (2008) reported that based on differences in life-history parameters, it was possible to identify at least three distinct populations of silky sharks (*Carcharhinus falciformis*), those inhabiting the Northwest Atlantic, the western-central Pacific, and the eastern Pacific. Genetic analysis of animals from the Pacific Ocean has also provided evidence that there are distinct eastern and western Pacific populations (Galván-Tirado et al. 2013) although the possibility of a single stock could not be excluded. Within the WCPO a single stock is assumed for stock assessment purposes.

Silky shark is an abundant offshore, oceanic and epipelagic and littoral, tropical species, found near the edge of continental shelves and islands but also far from land in the open sea. Silky shark occasionally occurs inshore where the water is as shallow as 18 m, are most often found at depths of 200 m or more in the epipelagic zone but also occur down to at least 500 m depth offshore (Bonfil et al. 2009). The silky shark is often found over deep-water reefs and slopes near islands.

Silky sharks are viviparous, with a yolk-sac placenta and have 2 to 14 young per litter. There seems to be no pronounced seasonality in birth of young. The gestation period is not known. It is primarily a fish-eater, eating pelagic and inshore teleost's including sea catfish, mullet, mackerel, yellowfin tuna, albacore, and porcupine fish, but also squid, paper nautiluses, and pelagic crabs. It is associated with schools of tuna but is not a desirable species for tuna purse seiners because of the damage it does to nets. It reaches a maximum size of about 330 cm; males mature at about 187 to 217 cm and reach 270 to 300 cm; females mature at 213 to 230 cm and reach at least 305 cm; the size at birth is about 70 to 87 cm.

The FAO considers the species to have a mid-range intrinsic rebound potential. Rice and Harley (2013) regard silky sharks as a low productivity species. A more detailed description of the distribution, biology and growth of silky sharks is contained in Rice and Harley (2013).

A total of 34,724 Silky Shark were caught by UoA vessels between 2015 and 2019, with the majority associated with FAD sets (83%) (Table 20). Highest catches were associated with U.S.A. vessels (62%) and FSM vessels (31%). Survival rates for discarded Silky Sharks was estimated at 23%.

Status

Using data from observers across all WCPFC fisheries the estimated total catch of silky shark by longlines over the most recent five years (2013-2017) has varied between 126,300 (95% CI 91,000-186,000) animals and 207,300 (95% CI 154,000-287,000) animals (Peatman et al. 2018). Data is yet to be provided on purse seine vessels in the WCPFC.

A previous stock assessment of silky sharks in the West and Central Pacific Ocean using Stock Synthesis (Rice and Harley 2012) concluded that overfishing was occurring and that it was highly likely that the stock was in an overfished state. This assessment also estimated that catches by both the purse seine (associated sets) and longline sectors were important sources of fishing mortality.

The results of new assessment work were presented to the WCPFC-SC in 2018 that included both an attempt at a Pacific-wide assessment (Common Oceans (ABNJ) Tuna Project 2018a) and an updated WCPO only assessment (Common Oceans (ABNJ) Tuna Project 2018b). The Pacific-wide assessment concluded that estimates of management quantities such as SB/SB0 and F/FMSY were unreliable and should not be used as the basis for management advice due to various uncertainties in this Pacific-wide assessment. It did, however, suggest that WCPO and EPO silky shark biomass had substantially declined, and that fishing mortality had considerably increased over the last two decades. The conclusions of the WCPO-only model were:

- That the silky shark population was depleted to 47-50% of its original (virgin) biomass. This level of depletion was less than that determined from the 2013 model which estimated the WCPO stock had been depleted to ~30% of the original biomass.
- That current (2016) biomass was likely to be above the MSY reference biomass (i.e. not overfished) (Pr(SB2016 > SBMSY) = 72%). In contrast, the 2013 assessment concluded that it was highly likely that the stock was in an overfished state.
- That current (2016) F was 1.6 times the MSY fishing mortality (i.e. overfishing was occurring). This estimate of F2016/FMSY was considerably lower than the 2013 assessment's estimate of 4.48.

The WCPFC-SC accepted the WCPO silky shark stock assessment as best available science for this stock but also noted that, given the inherent uncertainty in the current assessment, the current estimates of stock status should be considered indicative only. It also noted that indications from the 2018 WCPO

model show that the stock declined steadily over the model period (1995-2016) (Figure 23). It concluded that the WCPO stock of silky was not considered to be overfished, i.e. there was a 78% probability that SB2016 was greater than SBMSY (Figure 24).

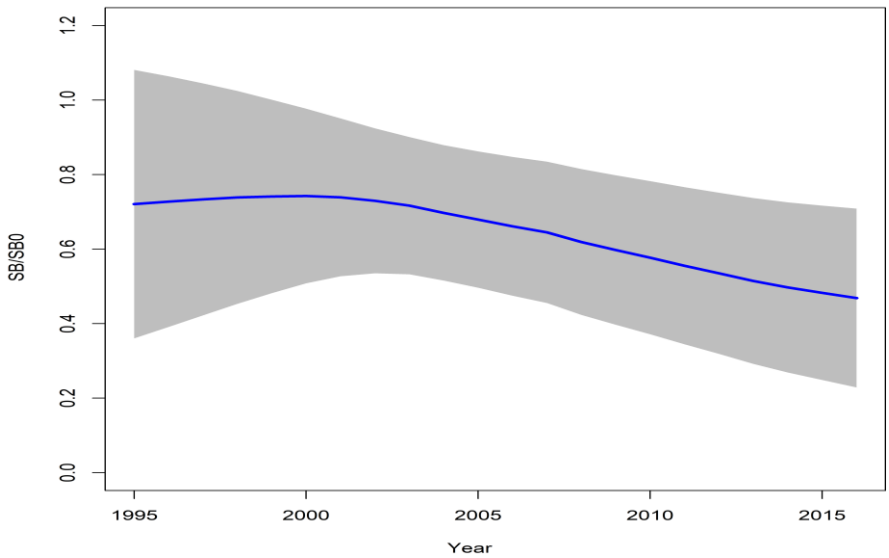


Figure 23. Silky shark. Estimated spawning biomass relative to unexploited biomass (SB0) for the WCPO assessment model (CPUEqdev) (from WCPFC-SC 2018a).

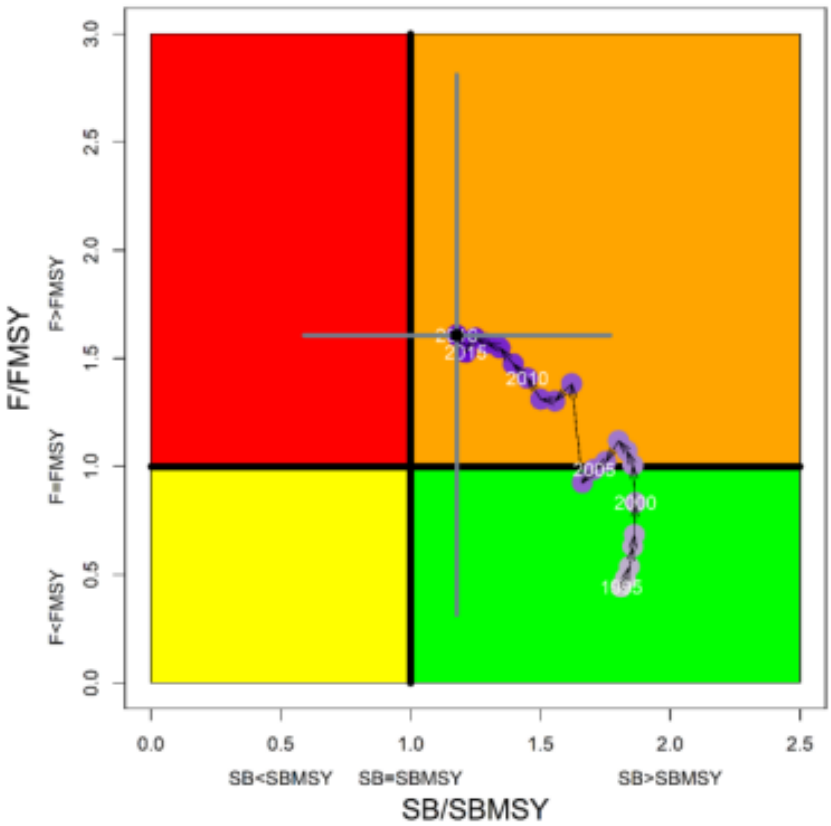


Figure 24. Silky shark. Kobe plot for the WCPO assessment model (from WCPFC-SC 2018a).

Management

CMM 2019-04 Conservation Management measure for sharks, covering silky sharks contains a variety of measures including the following:

- a prohibition on retaining on board, transshipping, storing on a fishing vessel, or landing any silky shark caught in the Convention Area, in whole or in part, in the fisheries covered by the Convention.
- a requirement to release any silky shark that is caught in the Convention Area as soon as possible after the shark is brought alongside the vessel, and to do so in a manner that results in as little harm to the shark as possible.
- a requirement for CCMs to estimate, through data collected from observer programs and other means, the number of releases of silky shark caught in the Convention Area, including the status upon release (dead or alive), and report this information to the WCPFC in Part 1 of their Annual Reports.

In addition, in 2018 the WCPFC adopted an additional section to the main tuna CMM (2018-01) that required only lesser entangling FADs to be in used by 1st January 2020:

> **Non-entangling FADs**
> 19. To reduce the risk of entanglement of sharks, sea turtles or any other species, as from 1st January 2020, CCMs shall ensure that the design and construction of any FAD to be deployed in, or that drifts into, the WCPFC Convention Area shall comply with the following specifications:
>
> - The floating or raft part (flat or rolled structure) of the FAD can be covered or not. To the extent possible the use of mesh net should be avoided. If the FAD is covered with mesh net, it must have a stretched mesh size less than 7 cm (2.5 inches) and the mesh net must be well wrapped around the whole raft so that there is no netting hanging below the FAD when it is deployed.
> - The design of the underwater or hanging part (tail) of the FAD should avoid the use of mesh net. If mesh net is used, it must have a stretched mesh size of less than 7 cm (2.5 inches) or tied tightly in bundles or "sausages" with enough weight at the end to keep the netting taut down in the water column. Alternatively, a single weighted panel (less than 7 cm (2.5 inches) stretched mesh size net or solid sheet such as canvas or nylon) can be used.
>
> 20. To reduce the amount of synthetic marine debris, the use of natural or biodegradable materials for FADs should be promoted. The use of non-plastic and biodegradable materials in the construction of FADs is encouraged.
>
> 21. The Scientific Committee shall continue to review research results on the use of non-entangling material and biodegradable material on FADs, and shall provide specific recommendations to the Commission as appropriate.
>
> 22. The Commission at its 2020 annual session, based on specific guidelines defined by the FAD Management Options Intersessional Working Group and advice from SC16 and TCC16 shall consider the adoption of measures on the implementation of non-entangling and/or biodegradable material on FADs.

Information

Information available on the key shark species is collected mainly by the combination of vessel logbooks and observer programs. It includes data on catch weight and effort at an operation level for most fleets, and some size composition data and biological data.

There has been a WCPFC requirement for 100% observer coverage on purse seine vessels since 2010.

UoA purse seine fishing vessels are required to comply with WCPFC provisions, including those for data reporting, and numbers of silky sharks caught are included in the FSM, Solomon Islands, Cook Islands, Vanuatu, New Zealand, Chinese Taipei, and USA Part 1 Annual Reports to the WCPFC-SC.

Even with bans on the retention of silky shark and the requirement for the early release of any sharks caught, reductions in fishing mortality are dependent on the level of survival among released animals. Poisson et al. (2012) reported that for French purse-seine operations in the Indian Ocean overall mortality

of silky sharks was 81%. Post-release mortality of juvenile silky sharks captured in tropical tuna purse seine fishing operations in the Pacific Ocean was estimated at 84% (Hutchinson et al., 2015)..

Oceanic Whitetip Shark

Biology

The oceanic whitetip (*Carcharhinus longimanus*) is an oceanic-epipelagic shark, usually found far offshore in the open sea in waters 200 m deep, between about 30°N and 35°S in all oceans; it is normally found in surface waters, although it has been recorded to 152 m. It has occasionally been recorded inshore but is more typically found offshore or around oceanic islands and areas with narrow continental shelves. Evidence also suggests a stock segregation between juveniles and adults of the species; with juveniles more commonly found in equatorial waters to the west and adults more predominate to the southwest, near the identified center of abundance (10°S, 190°E) (Clarke et al. 2011b, Lawson 2011). They are viviparous with placental embryonic development, mature at 4 to 5 years of age, and reach 4 m long. Their biology has indicated that it is likely to be a species with low resilience to fishing – even among shark species - and minimal capacity for compensation (Rice and Harley 2012a). More details of the biology of this species are provided in Molony (2008). Oceanic whitetip sharks are most often caught as bycatch in the Pacific tuna fisheries, though some directed mixed species (sharks and tunas/billfish) fisheries do exist. A total of 412 Oceanic Whitetip Shark were caught by UoA vessels between 2015 and 2019, with the majority associated with FAD sets (64%) on U.S.A. vessels and unassociated sets (25%) on FSM vessels. Survival rates for discarded Oceanic Whitetip Shark was estimated at 65%. and for Silky Shark 23%.

Status

Recent analyses of four different datasets for the WCPO show clear, steep and declining trends in abundance indices and median lengths have decreased significantly providing strong evidence for the depleted state of the oceanic whitetip population in the WCPO (Clarke 2011).

A stock assessment for oceanic whitetip sharks has been undertaken (Rice and Harley 2012a) from which some of the main conclusions were:

- Notwithstanding the uncertainties inherent in the input data, the catch, CPUE, and size composition data all showed consistent declines over the period of the model (1995-2009).
- This is a low fecundity species, and this is reflected in the low estimated value for FMSY (0.07) and high estimated value for SBMSY/SB0 (0.424). These directly impacted the conclusions about overfishing and the overfished status of the stock.
- Estimated fishing mortality had increased to levels far in excess of FMSY (FCURRENT / FMSY = 6.5) and across all model runs undertaken estimated F values were much higher than FMSY (the 5th and 95th quantiles are 3 and 20). Based on these results it was concluded that overfishing was occurring.

- Estimated spawning biomass had declined to levels far below SBMSY (SBCURRENT / SBMSY = 0.153) and across all model runs undertaken SBCURRENT was much lower than SBMSY (the 5th and 95th quantiles are 0.082 and 0.409). Based on these results it was concluded that the stock was overfished.
- The greatest impact on the stock was attributed to bycatch from the longline fishery, with lesser impacts from the fleet defined as a targeted longline fleet and from purse seining.

The assessment indicated that both associated and unassociated purse seine sets have a negligible contribution to the total fishing mortality (Figure 25).

Management

CMM 2019-04 Conservation Management measure for sharks, covering oceanic white tips, contains a variety of measures including the following:

- Prohibition of vessels of members, co-operating non-members and participating territories (CCMs) to retain and store on-board, transship, or land, in part or whole, any oceanic whitetip in the fisheries covered by the Commission.
- Their release from fishing gear, in a manner that causes the least amount of practicable harm.
- To record the number of releases and status (dead or alive) in Part 1 of member states' Annual Report to the Commission through observer programme data or other means.

It is too early to expect the impact of this recent CMM on stocks to be detectable.

Information

CMM 2019-04 requires information to be collected and reported on oceanic whitetip sharks. For the WCPFC, Rice and Harley (2012a) noted that commercial reporting of landings had been minimal, as had information regarding the targeting, and fate of sharks encountered in the fisheries.

CMM 2019-04 also contains requirements for CCMs to include information on "*key shark species in their annual reporting to the Commission of annual catch and fishing effort statistics by gear type, including available historical data, in accordance with the WCPF Convention and agreed reporting procedures*" and that "*CCMs shall also report annual retained and discarded catches in Part 2 of their annual report*".

UoA purse seine fishing vessels are required to comply with WCPFC provisions, including those for data reporting, and numbers of oceanic whitetip sharks caught are included in the FSM, Solomon Islands, Chinese Taipei, and USA Part 1 Annual Reports to the WCPFC-SC.

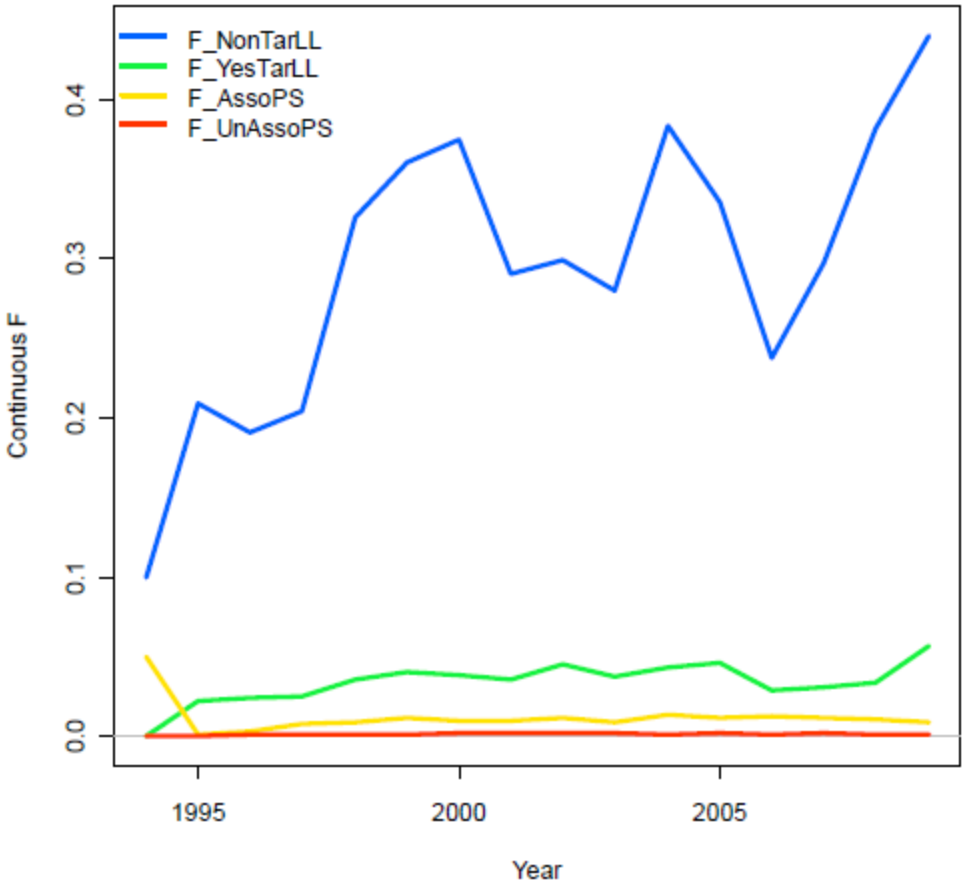


Figure 25. Oceanic whitetip shark: estimated fishing mortality by fleet for the reference case over the model periods (from Rice and Harley 2012a).

Scalloped Hammerhead Shark

Biology

The Scalloped Hammerhead is a coastal and semi-oceanic pelagic shark, found over continental and insular shelves and nearby deep water, ranging from the intertidal and surface usually to 275 m depth, (Moore and Gates 2015). Adults spend most of the time offshore in midwater and females migrate to the coastal areas to pup (Clarke 1971, Stevens and Lyle 1989). They reach a maximum size of 370–420 cm total length (TL) (Ebert et al. 2013). Males mature at 140–198 cm TL and females at 200–250 cm TL (Compagno 1984, Harry et al. 2011). Reported annual litter sizes range from 12–41, and a size at birth of 31–57 cm TL (Clarke et al. 2015, Gallagher and Klimley 2018). Based on bomb radiocarbon analyses female age-at-maturity is estimated at 13.2 years and maximum age is 35 years.

Based on observer data from 2015 - 2019, the UoA caught 2 Scalloped Hammerhead Sharks. Both were caught on Chinese Taipei vessels and discarded; the disposition at the time of release is unknown.

Status

Two distinct populations have been identified in the Pacific Ocean, the Eastern Pacific DPS and the Indo-West Pacific DPS. While the IUCN lists this species as critically endangered throughout its range, the U.S. list the Eastern Pacific PDS as endangered and the Indo-Pacific DPS as threatened. Systematic monitoring of population abundance does not exist for any of the scalloped hammerhead DPSs. Data from shark deterrent programs, diver and fishermen surveys, and catch per unit effort (CPUE) from fisheries-dependent monitoring are used to track population trends.

Indo-West Pacific DPS

Rigby et al. (2019) reported data from the Queensland, Australia, shark bather protection program from 1964 through 2004, indicating an annual rate of decline of 8.4%. The shark control program off South Africa indicated a 4.0% annual rate of decline from 1978 through 2003 (Rigby et al. 2019). Miller et al. (2013) also included these datasets in their risk analysis and concluded significant declines to this DPS from the Queensland and South Africa shark bather protection programs.

It should be noted that after a review of the threats and needs of the Indo-West Pacific DPS, the US has decided not to propose protective regulations for this threatened DPS (https://www.federalregister.gov/documents/2014/07/03/2014-15710/endangered-and-threatened-wildlife-and-plants-threatened-and-endangered-status-for-distinct).

Eastern Pacific DPS

Based on diver observations collected from January 1993 to December 2013 in Cocos Island, Costa Rica, scalloped hammerhead relative abundance declined 45% during the period (White et al. 2015). Although dives were not entirely standardized (e.g., there was no defined field of view), the protocols were consistent throughout the study. Each dive averaged 60 minutes and was led by an experienced professional divemaster. Dive depth ranged from 10 to 40 m depending on the site (n = 17), but depth was consistent within sites. A standardized data sheet was used for all dive sites (White et al. 2015). Peñaherra-Palma et al. (2018) used divers' perceptions about changes in relative abundance of sharks in the Galapagos Marine Reserve (GMR). Based on divers' categorical trend scores and percentage of abundance change from the 1980s through the early 2010s, the authors developed a semi-quantitative virtual abundance change model based on an initial value of 1 then calculated the increase or decrease in subsequent decades. Divers' perceived a 50% decline in hammerhead shark abundance across the decades (Peñaherra-Palma et al. 2018).

Management

CMM 2019-04 Conservation Management measure for sharks, covering Scalloped Hammerhead Sharks, contains a variety of measures including the following:

- Prohibition of vessels of members, co-operating non-members and participating territories (CCMs) to retain and store on-board, transship, or land, in part or whole, any Scalloped Hammerhead Sharks in the fisheries covered by the Commission.
- Their release from fishing gear, in a manner that causes the least amount of practicable harm.

- To record the number of releases and status (dead or alive) in Part 1 of member states' Annual Report to the Commission through observer programme data or other means.

It is too early to expect the impact of CMM 2019-04 on stocks to be detectable.

In addition, in 2018 the WCPFC adopted an additional section to the main tuna CMM (2018-01) that required only lesser entangling FADs to be in used by 1st January 2020. See the above section on Silky Sharks for a detailed description of measures associated with this CMM.

Information

In addition to catch information collected as part of the purse seine observer programs, CMM 2019-04 also requires CCMs to include information on "*key shark species in their annual reporting to the Commission of annual catch and fishing effort statistics by gear type, including available historical data, in accordance with the WCPF Convention and agreed reporting procedures*" and that "*CCMs shall also report annual retained and discarded catches in Part 2 of their annual report*".

UoA purse seine fishing vessels are required to comply with WCPFC provisions, including those for data reporting, and numbers of Scalloped Hammerhead Sharks caught are included in the FSM, Chinese Taipei, and USA Part 1 Annual Reports to the WCPFC-SC. For Cook Islands, Vanuatu, and New Zealand hammerhead sharks are reported to the WCPFC-SC but not detailed at the species level; additional information on catches at the species level will be collected during the Audit.

Cetaceans

There were 12 ETP species of cetaceans recorded as having interacted during fishing operations with UoA vessels from 2015 or 2019, including 7 species of oceanic dolphins (Dolphinidae) and 5 baleen whale species (Table 20). Dolphin interactions included the Rough-toothed Dolphin (N=76), Indo-Pacific Bottlenose Dolphin (N=20), Spinner Dolphin (N=15), Common Dolphin (N=10), Common Bottlenose Dolphin (N=6), False Killer Whale (N=300), and Short-finned Pilot Whale (N=23). Baleen whale interactions included Sei Whale (N=39), Fin Whale (N=1), Minke Whale (N=2), Bryde's Whale (N=15), and Blue Whale (N=1).

Most oceanic dolphin interactions were associated with FAD sets while most baleen whale interactions were associated with unassociated sets. The interaction rate for false killer whales was 60 animals/year, while for Rough-toothed dolphin it was 15 animals/year. Interaction rates for the remaining oceanic dolphins were ≤5 animals/year. Most interactions with False Killer Whale were associated with FSM and USA vessels, while all Rough-toothed Dolphins interactions were associated with FSM vessels. Discard survival rates for oceanic dolphins ranged from 0-77% (Table 20).

The interaction rate for Sei Whale was 8 animals/year and for Bryde's Whale 3 animals/year. Interaction rates for the remaining baleen whales was lower; for Minke Whale 1 animal in three years and for Fin and Blue Whales 1 animal in five-years. Most Bryde's Whale interactions were associated with FSM vessels while most Sei Whale interactions were with Chinese Taipei vessels. Discard survival rates for Sei and Blue Whales was 100%, Bryde's Whales 83% and no Fin Whale survived (Table 20).

The composition and frequency of interactions by flag is consistent with other purse seine FAD fisheries in the WCPO Convention Area. Based on reported observer data in the WCPO Convention Area from 2010 to 2019, highest frequency of cetacean interactions were associated with false killer whale, bryde's whale, rough-toothed dolphin, short-finned pilot whale, and bottlenose dolphin (Williams et al., 2020).

Status

Information on the status of cetaceans in the WCPO is limited and much of the information is available through the IWC (https://iwc.int/status).

Oceanic Dolphins

Rough toothed Dolphin: Rough-toothed Dolphins inhabit oceanic tropical and warm temperate waters in all three major oceans, mostly between 40°N and 35°S. Abundance estimates for Rough-toothed Dolphins are available for only a relatively small proportion of their range. An estimated 145,900 (coefficient of variation (CV) = 0.32) inhabit the eastern tropical Pacific based on shipboard line-transect surveys undertaken from 1986 to 1990 (Wade and Gerrodette 1993). In the Hawaiian Island Exclusive Economic Zone (EEZ), a shipboard line-transect survey conducted in 2010 resulted in an abundance estimate of 72,528 (CV = 0.39) Rough-toothed Dolphins (Bradford et al. 2017).

Indo-Pacific Bottlenose Dolphin: Indo-Pacific Bottlenose Dolphins have a discontinuous distribution in warm-temperate and tropical waters of the Indo-Pacific region. They are found primarily in shallow coastal and estuarine waters and in shallow reef complexes (Jefferson et al. 2015). It is difficult to assign a conservation status to either common or Indo-Pacific bottlenose dolphins on a global or range-wide basis. Indo-Pacific bottlenose dolphins are particularly difficult to assess, because they tend to occur in fragmented coastal populations, and their range includes many countries where little or no formal research has taken place.

Spinner Dolphin: Spinner Dolphins occur throughout tropical and subtropical waters in both hemispheres from approximately 40°N to 40°S. They inhabit the Pacific, Atlantic, and Indian Oceans, including the Persian Gulf and the Red Sea, and is the most common small cetacean in tropical pelagic waters (Perrin 2018). There is no global abundance estimate for this widely distributed species and available abundance estimates add up to more than a million dolphins. However, the vast majority of the species range remains unsurveyed, therefore the actual abundance is presumed to be considerably greater. There were an estimated 801,000 (coefficient of variation (CV)=37%) white-bellied spinner dolphins (S. l. orientalis – S. l. longirostris intergrades) in the ETP in 2000 (Gerrodette et al. 2005) and in the ETP the population of

eastern spinner dolphins was estimated at 613,000 (CV=22%) in 2003 (Gerrodette and Forcada 2005). Despite large reductions in bycatch mortality since the 1970s, this population appeared to be recovering at an estimated rate of only 1.1% per year during the early 2000s.

Common Dolphin: The Common Dolphin is a widely distributed oceanic species that occurs from tropical to cool temperate waters of the Atlantic, Pacific, and Indian Oceans (Perrin 2018). Available abundance estimates are primarily from the Northern Hemisphere and there are very few abundance estimates from the Southern Hemisphere, which constitutes a large portion of the species range. The abundance of Common Dolphins in the eastern Tropical Pacific (ETP) was estimated from vessel line-transect surveys conducted between 1986 and 2000 as 2,963,000 (CV=24%) (Gerrodette and Forcada 2002). In 2006, the population was estimated at 3,127,203 (CV=26%) individuals (Gerrodette et al. 2008). There are an estimated 1.4 million Common Dolphins in the Western Pacific off Japan (Kanaji et al. 2017). Ship survey data from 2009 resulted in an estimated total of 279,000 common dolphins along the west coast of Baja California and the California coast (Carretta et al. 2011).

Common Bottlenose Dolphin: Common Bottlenose Dolphins occur worldwide through tropical and temperate inshore, coastal, shelf, and oceanic waters (Leatherwood and Reeves 1990, Wells and Scott 1999, Reynolds et al. 2000). Abundance of Common Bottlenose Dolphins has been estimated for several parts of the species' range. Summing available estimates, a minimum world-wide abundance estimate would be 750,000, acknowledging that most of the range of the species has not been surveyed for abundance estimation, and some of the estimates included in the summation are out of date. Surveys of the Eastern Tropical Pacific resulted in an estimate of 243,500 (CV = 0.29) (Wade and Gerrodette 1993), but this estimate should be considered with caution as it is more than 25 years old. No recent abundance estimates for Common Bottlenose Dolphins in Japanese waters are available (Kasuya 2017). Japanese surveys prior to 1993 resulted in estimates of 168,000 (CV = 0.26) in the Northwestern Pacific west of 180ºE, including 36,791 (CV = 0.25) in Japanese coastal waters (Miyashita 1993).

False Killer Whale: False Killer Whales are found in tropical to warm temperate zones, generally in relatively deep, offshore waters in all three major oceans and densities are much higher in tropical regions. Due to their predominantly offshore distribution False Killer Whales are difficult to study and not many regional populations have been assessed. In the ETP population abundance was estimated at 38,900 (coefficient of variation (CV) 0.64) based on line-transect surveys from 1986-1991 (Wade and Gerrodette 1993). In the western North Pacific abundance was estimated at 16,668 (CV 0.26) based on line-transect surveys from 1983-1991 (Miyashita 1993). There is serious concern, about the false killer whale population around the main Hawaiian Islands, which was thought to number between 150 and 200 individuals in 2012, demonstrating a decline since 1989. As such, this population is designated as Endangered under the US Endangered Species Act.

Short Finned Pilot Whale: Short-finned Pilot Whales are found in warm temperate to tropical waters, generally in deep offshore areas; two forms of Short-Finned Pilot Whale are found off Japan. Line-transect surveys in Japanese waters generated an abundance estimate of 53,609 (coefficient of variation (CV) 0.22) for the southern form (Miyashita 1993) and an estimate of 4,321 (CV 0.61) for the northern form. Dolar

et al. (2006) estimated their abundance in the Philippines at 7,571. A line transect survey in the ETP in 2000 estimated abundance at 589,000 (CV 0.26), with a steadily increasing trend during the eight surveys that were conducted between 1986 and 2000. Surveys off the Hawaiian Islands in 2010 yielded an abundance estimate of 19,503 (CV 0.49) (Bradford et al. 2017) and 836 (CV 0.79) in 2016 off the west coast of the USA (Barlow 2016).

Baleen Whales

Bryde's Whale: Bryde's Whales occur across the western and central North Pacific, mainly north of 20°N in summer and south of 20°N in winter. In the eastern North Pacific, they are rarely found as far north as southern California (U.S.A.), but they occur throughout the eastern tropical Pacific from the Gulf of California, Mexico southward to Peru (Wade and Gerrodette 1993). They also occur throughout the rest of the tropical Pacific, and across the South Pacific southward to about 35°S (Miyashita et al. 1996). They occur off the coasts of Peru and Ecuador, including the Galápagos Islands (Castro et al. 2017). In the southwestern Pacific, their distribution extends as far south as New Zealand. In the western and central North Pacific (west of 165°W) abundance is estimated at 26,300 (coefficient of variation (CV) = 18.5%) based on summer surveys during 1988-2016 (Hakamada et al. 2017) and 137 for the East China Sea stock (IWC 1996). Wade and Gerrodette (1993) estimated 13,000 (CV = 20%) Bryde's Whales for the eastern tropical Pacific from data collected during 1986-90.

Minke Whale: The Common Minke Whale is a cosmopolitan species found in all oceans and in nearly all latitudes, from nearly 70°S to 80°N. The most recent abundance estimate for the western North Pacific (west of 170°E) derive from data collected during 2005-12 and total 27,000 animals (CV 0.16) (Allison et al. 2014). Minke Whale densities in the eastern North Pacific are generally lower than in the western region: 636 (CV 0.72) for the U.S. west coast during 2008-14 (Barlow 2016), 522 (CV 0.30) for the waters of British Columbia during 2004-08 (Best et al. 2015), 2,020 (CV 0.73) for the eastern Bering Sea shelf (Friday et al. 2013), and 1,232 (CV 0.34) for coastal waters of the northern Gulf of Alaska and the eastern and central Aleutian Islands (Zerbini et al. 2006). No estimates are available for the South Pacific Ocean.

Sei Whale: The Sei Whale is a cosmopolitan species, with a mainly offshore distribution. The species occurs in the North Atlantic, North Pacific, and Southern Hemisphere. From sighting surveys conducted under the IWC POWER programme in July and August 2010-2012, Hakamada et al. (2017) estimated 29,632 (CV 0.24) Sei Whales in the North Pacific area east of 170°E. Additionally an estimate of 5,086 (CV 0.38) was obtained from national surveys west of 170°E in the same months in 2008 (Hakamada and Matsuoka 2016). Combining these estimates gives a total population size of about 35,000 Sei Whales and the population is assumed to be increasing at a rate of 2% per year. Based on population assessments, estimates for the aged 1+ population size was 35,000 in 2011 in the North Pacific and 10,000 in 1983 in the Southern Hemisphere (IWC 2017).

Fin Whale: Fin Whales occur worldwide, mainly in offshore waters of the temperate and subpolar zones, and are considered rare or absent in most tropics regions (Edwards et al. 2015). Fin whale global

population estimates range from less than 100,000 to roughly 119,000. While distinct populations exist, data is limited to estimate the present status of region fin whale populations. Based on an assessment to classify Fin Whales under ICUN, the North Pacific population was estimated at 50,000 animals in 2011 and the population trend is considered to be increasing (https://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T2478A50349982.en). The IWC has issued a moratorium on the hunting of finback whales, however Japan and Iceland have claimed research exemptions to the IWCs order and have collectively killed nearly 150 Finback Whales in the last two years (https://iwc.int/estimate).

Blue Whale: The Blue Whale is a cosmopolitan species, found in all oceans but absent from some regional seas. During the summer Blue Whales occur north of 35°N in the western North Pacific, and north of 40°N in the central North Pacific and Gulf of Alaska. They occur year-round off Baja California, Mexico, and the California coast (Calambokidis and Barlow 2004). Analysis of song types suggest that Blue Whales in the eastern North Pacific are a separate population from those in the central and western North Pacific, but that whales from the eastern population mingle with whales from the western population in the Gulf of Alaska in summer (Monnahan et al. 2014). Blue Whales are present year-round on the Costa Rica Dome but it is unclear whether any animals are resident. Monnahan et al. (2015) concluded that the eastern North Pacific population had recovered to near its pre-whaling abundance, estimated to be 1,750-2,500 whales. The population seems to have been roughly stable since the early 1990s (Carretta et al. 2017). In the Southern Hemisphere blue whales were estimated to number around 2,300 in 1998 and to be increasing between 2.4-8.4% per year (https://iwc.int/estimate).

Management

A CMM exists for cetaceans (CMM-2011-03) and came into force on January 1st, 2013. The requirements of the CMM include:

- CCMs shall prohibit their flagged vessels from setting a purse seine net on a school of tuna associated with a cetacean in the high seas and exclusive economic zones of the Convention Area, if the animal is sighted prior to commencement of the set.
- CCMs shall require that, in the event that a cetacean is unintentionally encircled in the purse seine net, the master of the vessel shall:
    - Ensure that all reasonable steps are taken to ensure its safe release. This shall include stopping the net roll and not recommencing fishing operation until the animal has been released and is no longer at risk of recapture; and
    - Report the incident to the relevant authority of the flag State, including details of the species (if known) and number of individuals, location and date of such encirclement, steps taken to ensure safe release, and an assessment 2 of the life status of the animal on release (including, if possible, whether the animal was released alive but subsequently died).
- In taking steps to ensure the safe release of the cetacean, CCMs shall require the master of the vessel to follow any guidelines adopted by the Commission for the purpose of this measure.
- CCMs shall include in their Part 1 Annual Report any instances in which cetaceans have been encircled by the purse seine nets of their flagged vessels.

- The Secretariat shall report on the implementation of this conservation and management measure on the basis of observer reports, as part of the Annual Report on the Regional Observer Programme.

In addition, as detailed in the section on silky sharks, in 2018 the WCPFC adopted an additional section to the main tuna CMM (2018-01) that required only 'lesser entangling' FADs to be in use by 1st January 2020.

There is also a ban on large scale drift net fishing in the High Seas by WCPFC under CMM 2008-04 partly because this fishing method was known to catch a large number of non-target species such as marine mammals.

Information

Data on the bycatch of cetaceans is collected by observers under the ROP following the data collection protocols. Mandatory logbooks with daily catch and effort records for each fishing operation is required under CMM 2013-05 and this includes "interaction information about other species not listed in those sections but required to be reported by CCMs under other Commission decisions such as, inter alia, key cetaceans, seabirds and sea turtles." For species of special interest, such as cetaceans, the fate of caught and released animals is also recorded.

There has been a WCPFC requirement for 100% observer coverage on purse seine vessels since 2010 and the estimated levels of compliance by Tri-Marine vessels is reported in section 7.3.1.3 Observer Programs/Information Sources.

UoA purse seine fishing vessels are required to comply with WCPFC provisions, including those for data reporting, and numbers of cetaceans caught are included in the FSM, Solomon Islands, New Zealand, Cook Islands, Chinese Taipei, and USA Part 1 Annual Reports to the WCPFC-SC.

Mobula

There were 2 known species of mobula rays recorded as having been caught during fishing operations by UoA vessels from 2015 or 2019, including 543 giant manta rays and 267 devil rays. Additionally, there were 207 unidentified mobula rays caught by the UoA; all mobula rays were released. While most of the interactions were observed in unassociated sets (N=619; 61%), a large number were associated with FAD sets (N=313; 37%). Based on observer data, interaction rates for the giant manta were highest (108 animals per year), followed by devil rays (53 animals per year) and unidentified mobula (41 animals per year). The estimated high interaction rate for the Giant Manta results from significantly higher interactions with unassociated sets during a single year, which is likely influenced by fishing location and environmental conditions.

Status

The global population size of giant manta and devil rays is not known, but local and regional abundance has been estimated and is mostly small, numbering less than 500 individuals, except for Ecuador where abundance is estimated at more than 2,000 individuals. There are no stock assessments for mobulids, however, information on population trends are available for some species and areas based on long time series of sightings at diving sites. Within the Indo-Pacific the estimated decline for devil and manta ray populations is estimated to be at least 78% (https://www.cms.int/sharks/sites/default/files/document/cms_sharks-mos3_inf.15_e_mobulid%20rays.pdf). In areas where devil ray catch data is available population declines of 50-99% have been inferred (Croll et al. 2016, Rohner et al. 2017)

Giant Manta Rays are targeted or taken as bycatch in artisanal small-scale fisheries, as well as taken as bycatch in large-scale tuna fisheries. In areas where Giant Manta Ray are protected, the sighting trends appear stable. Elsewhere, however, rapid declines have been noted in sightings records and landings where they are targeted or caught as bycatch; these range from 71 to 95% declines over 13- to 21-year periods (all less than the assumed one generation length of 29 years). It is estimated that the Giant Manta Ray has undergone a population reduction of 50–79% over the past three generation lengths (87 years) from 1931 to 2018, with further population reduction estimated over the next three generation lengths from 2018 to 2105) due to current and ongoing levels of exploitation, and a reduction in area of occupancy due to suspected local and regional extinctions (https://www.iucnredlist.org).Devil rays are a bycatch component of many small and large-scale fisheries, with much of this catch aggregated and reported as Mobula spp. The lack of comprehensive species-specific catch, fishing effort, and population data necessitates the use of genus-wide inferences to assess population reductions and based on a combination of declining sightings-per-unit-effort (SPUE) data from monitored populations, catch landings data, and evidence of depletions, significant population declines have been inferred (Fernando and Stevens 2011, Couturier et al. 2012, Hall and Roman 2013, Ward-Paige et al. 2013, Lewis et al. 2015, Croll et al. 2016, Rohner et al. 2017). In areas where catch data is available population declines of 50-99% over the last three generations (38 years; from 1980-2018) has been inferred, with a further population reduction suspected over the next three generation lengths (2018–2056). Note, as the data in many regions are uncertain and are provided at the genus level (not at the species level), caution is required when extrapolating overall declines.

Management

CMM-2019-05, Conservation and Management Measure on Mobulid Rays Caught in Association with Fisheries in the WCPFC Convention Area, enters into force on January 1st, 2021 and applies to all fishing vessels operating in the high seas and/or exclusive economic zones of the Convention area and flagged to CCMs authorized to fish for highly migratory fish stocks in the Convention Area. For the purpose of this CMM, “mobulid rays” means species of the family Mobulidae, which includes manta rays and mobula rays. Specific measures of the CMM include:

- CCMs shall prohibit their vessels from targeted fishing or intentional setting on mobulid rays in the Convention Area.

- CCMs shall prohibit their vessels from retaining on board, transhipping, or landing any part or whole carcass of mobulid rays caught in the Convention Area.
- CCMs shall require their fishing vessels to promptly release alive and unharmed, to the extent practicable, mobulid rays as soon as possible, and to do so in a manner that will result in the least possible harm to the individuals captured. CCMs should encourage their fishing vessels to implement the handling practices detailed in Annex 1, while taking into consideration the safety of the crew.
- In the case of mobulid rays that are unintentionally caught and landed as part of a purse seine vessel's operation, the vessel must, at the point of landing or transhipment, surrender the whole mobulid ray to the responsible governmental authorities, or other competent authority, or discard them where possible. Mobulid rays surrendered in this manner may not be sold or bartered but may be donated for purposes of domestic human consumption.
- CCMs shall advise the Commission (in Part 2 of their Annual Report) on implementation of this CMM.
- CCMs shall ensure that fishers are aware of proper mitigation, identification, handling and releasing techniques and should encourage them to keep on board all necessary equipment for the safe release of mobulid rays. For this purpose, CCMs are encouraged to use the handling practices included as Annex 1.

There is also a ban on large scale drift net fishing in the High Seas by WCPFC under CMM 2008-04 partly because this fishing method was known to catch a large number of non-target species such as marine mammals.

Information

Data on the bycatch of mobula rays is collected by observers under the ROP following the data collection protocols. Mandatory logbooks with daily catch and effort records for each fishing operation is required under CMM 2013-05 and this includes "interaction information about other species not listed in those sections but required to be reported by CCMs". For species of special interest, such as mobula rays, the fate of caught and released animals will also be recorded.

There has been a WCPFC requirement for 100% observer coverage on purse seine vessels since 2010 and the estimated levels of compliance by Tri-Marine vessels is reported in section 7.3.1.3 Observer Programs/Information Sources.

While catches of mobula rays by CCMs is already reported by the ROP, commencing on January 1, 2021, UoA purse seine fishing vessels will be required to comply with WCPFC CMM 2019-05, and FSM, Solomon Islands, New Zealand, Cook Islands, Chinese Taipei, Vanuatu, and USA must advise the Commission (in Part 2 of their Annual Report) on implementation of this CMM.

Marine Turtles

Based on observer data five species of marine turtles were recorded as having interacted with UoA vessels during fishing operations between 2015 and 2019: Green Turtle *Chelonia mydas*, Loggerhead Turtle *Caretta caretta*, Olive Ridley Turtle *Lepidochelys olivacea*, Hawksbill Turtle *Eretmochelys imbricate,* and Leatherback Turtle *Dermochelys coriacea*. Across all UoA vessels 41% of the interactions were associated with green turtles (N=29), followed by loggerhead turtles at 27% (N=19), olive ridley turtles at 23% (N=16), hawksbill turtles at 7% (N=5), and leatherback turtles at 2% (N=2). All turtles were reported as released alive.

Differences in reported interaction compositions and numbers by flag was observed. FSM UoA vessels interacted with 43 turtles (21 green turtle, 5 hawksbill turtles, 11 olive ridley turtles, 4 loggerhead turtles, and 2 leatherback turtles). Chinese Taipei UoA vessels interacted with 23 turtles (5 green turtles, 13 loggerhead turtles, and 5 olive ridley turtles). UoA vessels from the USA interacted with 5 turtles (3 green turtles and 2 loggerhead turtles). While we cannot state with certainty the reasons for the observed differences it is likely influenced by fishing location and environmental conditions

A review of turtle bycatch in the WCPFC (Anon 2001) concluded that, for purse seine caught animals, in most cases, turtles are encountered alive in the net and are subsequently scooped up and released over the side and that observers had reported a 17% mortality rate in the WCPO purse seine fishery. The report indicated that mortalities are mostly due to drowning after entanglement in the net but that some are crushed during the process of loading the net onboard. The report also indicated that marine turtle encounters in the purse seine fishery appear to be more prevalent in the western areas of the western Pacific Ocean. Set type was the main factor affecting marine turtle encounters in the WCPO purse seine fishery and animal-associated, drifting log and anchored-FAD sets had the highest incidence of marine turtle encounters, compared to drifting FAD and sets on free-swimming schools (free school sets). Based on observer data for the UoA from 2015-2019 highest interactions were associated with unassociated sets (52%) followed by drifting FADs (34%).

Status

The status of turtles encountered by fisheries in the WCPO have not been specifically examined by WCPFC. All sea turtle species are currently listed as vulnerable, endangered, or critically endangered by the International Union for Conservation of Nature (IUCN), which broadly categorizes the conservation status of species. However, the Hawaiian green turtle subpopulation was recently listed as “least concern” in 2012, reflecting a long-term increase in the size of this population (Kittinger et al., 2013). While sea turtle population estimates_ are limited, Mazaris et al (2017) document a tendency for published estimates of population size in sea turtles to be increasing rather than decreasing across the globe. The positive trends in abundance were thought to be linked to the effective protection of eggs and nesting females, as well as reduced bycatch. However, conservation concerns remain, such as the decline in leatherback turtles in the Eastern and Western Pacific Ocean.

Management

The WCPFC has adopted CMM 2018-04 for sea turtles which requires CCMs to implement the FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations and to ensure the safe handling of all captured sea turtles, in order to improve their survival. Best practice guidelines to ensure the survival of captured sea turtles is also outlined and obligatory to follow.

It also includes the requirements that purse seine vessels must

"Ensure that operators of such vessels, while fishing in the Convention Area:

1. *To the extent practicable, avoid encirclement of sea turtles, and if a sea turtle is encircled or entangled, take practicable measures to safely release the turtle.*

2. *To the extent practicable, release all sea turtles observed entangled in fish aggregating devices (FADs) or other fishing gear.*

3. *If a sea turtle is entangled in the net, stop net roll as soon as the turtle comes out of the water; disentangle the turtle without injuring it before resuming the net roll; and to the extent practicable, assist the recovery of the turtle before returning it to the water.*

4. *Carry and employ dip nets, when appropriate, to handle turtles."*

In addition, as detailed in the section on silky sharks, in 2018 the WCPFC adopted an additional section to the main tuna CMM (2018-01) that required only 'lesser entangling' FADs to be in use by 1st January 2020.

There is also a ban on large scale drift net fishing in the High Seas by WCPFC under CMM 2008-04 partly because this fishing method was known to catch many marine turtles and other marine animals.

Although specific requirements have not yet been adopted, there is ongoing work on materials and guidelines for the construction and use of biodegradable and 'lesser entangling' FADs in the WCPO (Escalle et al. 2018a, WCPFC-SC 2018b).

Information

CMM 2008-03 details reporting requirements for CCMs and includes the obligation to specifically report in CCM annual reports the progress of the implementation of the FAO Guidelines and this CMM, including information collected on interactions with sea turtles in fisheries managed under the Convention.

Information available on the turtles is also collected by the combination of vessel logbooks and observer programs. Mandatory logbooks with daily catch and effort records for each fishing operation is required under CMM 2013-05 and this includes "interaction information about other species not listed in those sections but required to be reported by CCMs under other Commission decisions such as, inter alia, key

cetaceans, seabirds and sea turtles." For species of special interest, such as turtles, the fate of caught and released animals is also recorded.

There has been a WCPFC requirement for 100% observer coverage on purse seine vessels since 2010 and the estimated levels of compliance by UoA vessels is reported in section 7.3.1.3 Observer Programs/Information Sources.

UoA purse seine fishing vessels are required to comply with WCPFC provisions, including those for data reporting, and numbers of marine turtles caught are included in the FSM, Solomon Islands, Chinese Taipei, and USA Part 1 Annual Reports to the WCPFC-SC.

Data from observers for the UoA showed that interactions with marine turtles are higher for FAD sets compared to free school sets. Observers reported that 94% of the turtles caught on FAD sets were released alive. However, there is likely to be an unobserved level of mortality of turtles that are entangled in FADs.

Seabirds

Based on observer data from 2015-2019 a single black-footed albatross was reported interacting with UoA vessels and animal was released alive. Given the low interaction rates and recent management measure requiring the safe release of seabirds, the interactions are likely to not hinder recovery of black-footed albatross.

Status

Based on observer data a single interaction with a black-footed albatross was reported. The ACAP lists the black-footed albatross under Appendix 1 as near threatened. In the Pacific Ocean the population size is estimated at 64,500 breeding pairs of which approximately 98% of the pairs are found in the protected Northwestern Hawaiian Islands (BirdLife International, 2008).

Fishery interactions are the major source of mortality with this species, the overwhelming majority associated with longline fishing. Between 1992 and 2001 it was reported that the population declined by approximately 10%. While all nesting sites in the U.S. are protected, a 50 nmi (93 km) buffer zone around the Hawaiian Islands prohibiting longline fishing was established in the mid-2000s, which may have mediated the declining trend. Almost 80% of the breeding population in the Hawaiian Islands is counted or sampled each year by US scientists and most fisheries utilize seabird bycatch prevention measures.

Management

Measures to manage the bycatch of seabirds are not species-specific. The WCPFC has adopted CMM 2018-03 for seabirds which also requires CCMs to implement the safe handling and release guidelines outlined in Suppl_CMM 2018-03. Additionally, CCMs are required annually provide to the Commission, in Part 1 of their annual reports, all available information on interactions with seabirds reported or collected by observers to enable the estimation of seabird mortality in all fisheries to which the Convention applies.

All nesting sites in the U.S. are protected and a 50 nmi buffer zone has been established around the Northwestern Hawaiian Islands where all fishing is prohibited. International and domestic regulations have been established requiring the use of seabird bycatch mitigation measures (e.g., tori lines).

Information

CMM 2018-03 details reporting requirements for CCMs and includes the obligation to specifically report in CCM annual reports the progress of the implementation of the safe handling and release protocols outlined in Suppl_CMM 2018-03, including information collected on interactions with seabirds in fisheries managed under the Convention.

Information available on the seabirds is also collected by the combination of vessel logbooks and observer programs. Mandatory logbooks with daily catch and effort records for each fishing operation is required under CMM 2013-05 and this includes "interaction information about other species not listed in those sections but required to be reported by CCMs under other Commission decisions such as, inter alia, key cetaceans, seabirds and sea turtles."

UoA purse seine fishing vessels are required to comply with WCPFC provisions, including those for data reporting, and numbers of seabirds caught are included in the FSM, New Zealand, Cook Islands, Chinese Taipei, Vanuatu, Solomon Islands, and USA Part 1 Annual Reports to the WCPFC-SC.

7.3.6 Habitat Impacts

Overview

When assessing the status of habitats and the impacts of fishing, teams are required to consider the full area managed by the local, regional, national, or international governance body(s) responsible for fisheries management in the area(s) where the UoA operates (this is called the "managed area" for assessment purposes).

According to MSC FCPV2.1 GSA 3.13.3, the assessment team must determine and justify which habitats are commonly encountered, vulnerable marine ecosystems (VMEs), and minor (i.e., all other habitats) for scoring purposes, [where]:

"A commonly encountered habitat shall be defined as a habitat that regularly comes into contact with a gear used by the UoA, considering the spatial (geographical) overlap of fishing effort with the habitat's range within the management area(s) covered by the governance body(s) relevant to the UoA; and

A VME shall be defined as is done in paragraph 42 subparagraphs (i)-(v) of the FAO Guidelines (definition provided in GSA 3.13.3.29) [as having one or more of the following characteristics: uniqueness or rarity, functional significance, fragility, Life-history traits of component species that make recovery difficult, and/or structural complexity]. This definition shall be applied both inside and outside EEZs and irrespective of depth."

Both commonly encountered and VME habitats are considered 'main' habitats for scoring purposes (GSA 3.13.3).

Habitat Type: Commonly Encountered

Free school sets

The fishing gear does not physically interact with benthic habitat during its operation. Any impacts of the fishery will be confined to direct or indirect effects on the surface waters in which the fishery operates. This constitutes a single habitat type, open ocean water. The ability of this habitat to support the target fish populations is related to both physico-chemical (temperature, salinity, frontal structures) and biological (nutrient levels) factors which determine the productivity of the lower trophic levels. These are primarily driven by variations in basin wide weather patterns through their effect on the frequency, location and strength of upwelling events, eddy systems and thermal fronts. Purse seine fishing is not considered capable of affecting these key habitat drivers at a broad scale or even local levels of productivity.

[9] According to MSC FCPV2.1 GSA 3.13.3.2: VMEs have one or more of the following characteristic, as defined in paragraph 42 of the FAO Guidelines:

- Uniqueness or rarity – an area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by similar areas or ecosystems
- Functional significance of the habitat – discrete areas or habitats that are necessary for survival, function, spawning/reproduction, or recovery of fish stocks; for particular life-history stages (e.g., nursery grounds, rearing areas); or for ETP species
- Fragility – an ecosystem that is highly susceptible to degradation by anthropogenic activities
- Life-history traits of component species that make recovery difficult – ecosystems that are characterised by populations or assemblages of species that are slow growing, are slow maturing, have low or unpredictable recruitment, and/or are long lived
- Structural complexity – an ecosystem that is characterised by complex physical structures created by significant concentrations of biotic and abiotic features"

It is therefore appropriate that no management measures are in existence which are designed to avoid or mitigate impacts on this marine habitat and no further consideration of impacts of free school sets on such habitats is warranted.

FAD sets

The operation of the purse seine net when fishing on FADs interacts with marine habitats in the same way and to the same extent as described for free school sets. Therefore it is appropriate that no particular management measures exist which are designed to avoid or mitigate impacts on this marine habitat, and no further consideration of impacts of FADs sets on such habitats during fishing operations is warranted.

However, consideration concerning potential impacts of the FADs themselves on habitats is considered by the assessment team with regard to habitat. For this assessment, FADs have been defined to include both natural objects such as logs and manufactured FADs, but for the evaluation of habitat impacts we consider it necessary to include only manufactured FADs which have potential impacts if they are lost and wash up on coastlines, especially those with coral reefs, which are defined as a Vulnerable Marine Ecosystem (VME). The assessment team considered these impacts of FADs on VMEs which is summarized below in the next section.

Information is available about the benthic marine habitats in the areas fished by UoA vessels. Much of the fishing by UoA vessels occurs in the Solomon Seas, as well as the Caroline, Melanesian and Central Pacific Basins (WCPFC-SC15-AR/CCM-06 (Rev.02), WCPFC-SC15-AR/CCM-22, WCPFC-SC15-AR/CCM-23 (Rev.01), WCPFC-SC15-AR/CCM-27). These areas contain numerous underwater features such as seamounts and trenches, of which only a very few have been sampled, or even visited (Pante et al. 2012).

Habitat Type: Vulnerable Marine Ecosystems (VMEs)

Neither fishing on free school or on FADS has any interaction with VMEs. As noted above, however, drifting FADs have potential impacts if they are lost and wash up on coral reefs which are considered to be VMEs.

Status

The following information on coral reefs is from Burke et al. 2011 and 2012. The coral reefs of the western Pacific (Figure 26) include the Coral Triangle, the region with the highest diversity of corals, fish, and other reef species anywhere in the world.

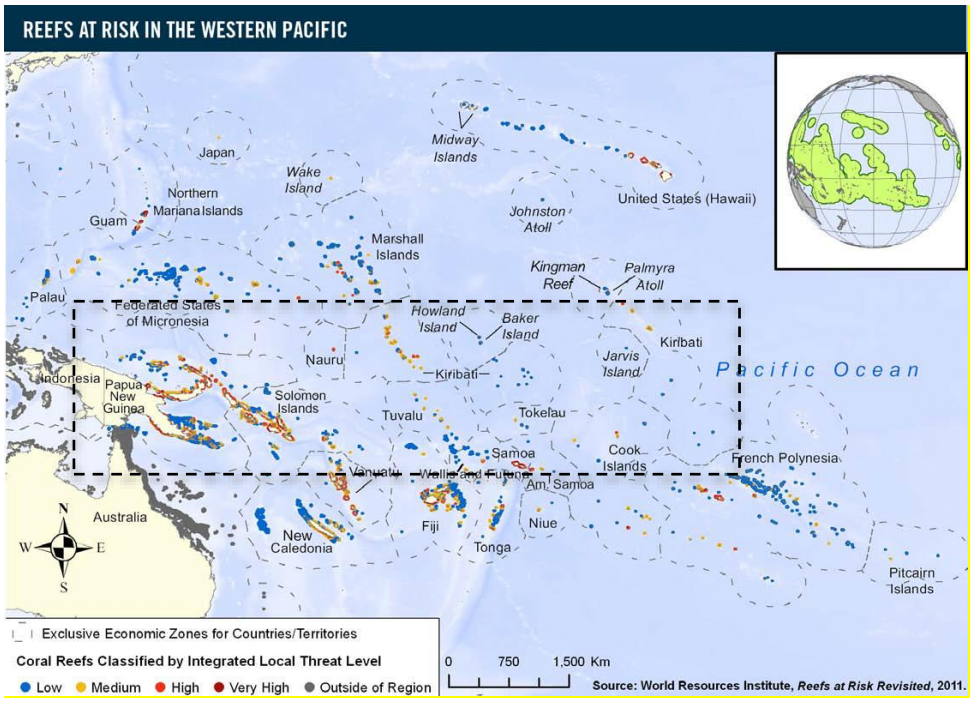


Figure 26. Distribution of reefs at risk in western Pacific region (from Burke et al. 2011). The dashed box depicts the general location of the UoA fishery.

Coral reefs face a range of threats. Local threats come from coastal development, watershed based pollution, marine-based pollution and damage, overfishing and destructive fishing. Overfishing is the largest threat, linked to densely settled areas not only around the larger islands, but also in some smaller archipelagos. The relative risks to coral reefs from the local threats has been evaluated for countries in the Coral Triangle (Figure 27).

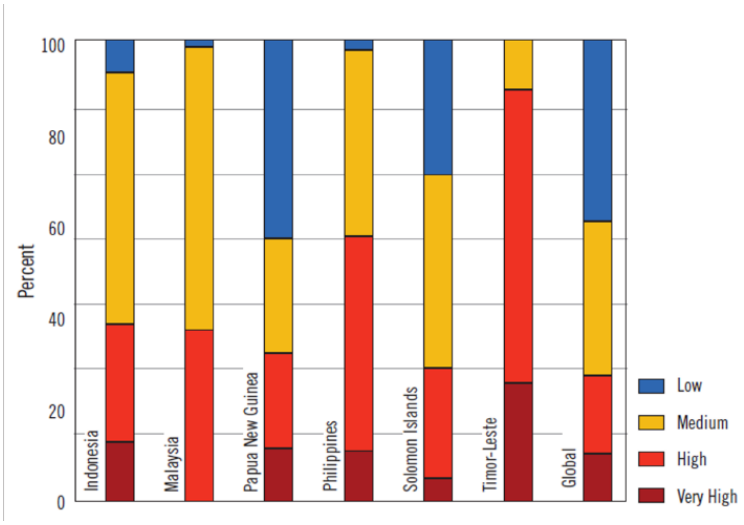


Figure 27. Reefs at risk from integrated local threats for the countries of the Coral Triangle Region. These threats consist of overfishing and destructive fishing, marine pollution and damage, coastal development, and water-shed based pollution (from Burke et al. 2012).

Global threats arise from changing climate and ocean chemistry such as warming seas, acidifying seas, sea level rise and storms. Future climate change impacts are projected to bring the proportion of threatened reefs up to 90 percent by 2030 and by 2050, almost all reefs in the Pacific are rated as threatened, with more than half rated at high, very high, or critical levels (Burke et as., 2011). The ability of corals to recover from impacts varies. It has been demonstrated that coral may recover from bleaching (Connell,1997, Gilmore et al., 2013 Marshall and Schuttenberg. 2006, Zahir et al., 2016), and from physical damage caused by hurricanes (Shinn, 1976). The recovery time may be slow, and depending on the scale of the damage and its frequency, sometimes on the decadal time scale. In other instances recovery from a mass bleaching event has been shown to be possible within one year (Kubicek et al. 2012). Furthermore, a quantitative review of recovery rates of coral cover from pulse disturbance events among 48 different reef locations, found that reefs in the western Pacific Ocean had the fastest recovery globally (Graham et al. 2011).

FAD Impacts on VME Habitats

Lost FADs contribute to marine-based pollution which also includes a range of other threats from the thousands of commercial, recreational, and passenger vessels that pass near reef areas every day. These potential threats include contaminated bilge water, fuel leakages, raw sewage, solid waste, and invasive species. In addition, reefs are exposed to more direct physical damage from groundings, anchors, and oil spills.

A study of DFADs across the WCPFC estimated that between 44,700 and 64,900 FADs were deployed annually from 2017-2019 (Banks and Zaharia 2020). Data from the PNA FAD Tracking Programme estimated[10] that 52% of FADs were classified as lost, 11% were retrieved; 8% were beached; 15% were

[10] The FAD tracking program only tracked 40% of FADs deployed, so the number of beaching events were estimated based on total deployments.

deactivated due to unknown causes and 14% were deactivated by the fishing company and left drifting, unmonitored at sea (Lauriane Escale, pers com, 22 Oct 2019 in Banks and Zaharia 2020). Of these interactions, 31% occurred in Solomon Islands, 30% in PNG, 17% in Kiribati, Gilbert Islands, 8% in Tuvalu, 6% in F. S. Micronesia, 4% in Marshall Islands, 1% in Nauru, and 0.5% in Palau, with the rest in non PNA countries (Figure 28). An over-whelming majority (92%) of beaching events occurred on coral reef habitat. It is estimated that the range of dFADs and coral reefs interactions were between 8,534 and 12,391 per annum in the period 2017-2019. The annual impact on coral reefs collectively was assessed as affecting 4 and 6 km^2 of coral reef habitat per year; it was assumed highly likely none of corals survived the impact (Banks and Zaharia 2020). Based on this estimate, the beaching of one FAD impacts 2 m^2 of coral reef (Banks and Zaharia 2020). There were 567 beaching events recorded in the Solomon Islands from 2016-2018, with over 90% of these occurring on coral reefs.[11] A total of 1.1 km2 of habitat was impacted in the Solomon Islands from 2016-2018. All of these habitat types are classified as VMEs in the MSC standard. Flag states that contributed the most to beaching events included Korea (31%), Taiwan (16%) and Kiribati (14%) (Escalle et al. 2019; Figure 29). FSM, China, PNG, Philippines, US and Marshall Islands account for lower levels of beaching (4-8%), and Japan, much lower levels (2%) (Escalle et al. 2019). The over-whelming majority of FADs washing ashore on PNG and Solomon Islands coastlines have not been deployed by vessels from these flag states (Figure 29). Information on the fate of FADs outside PNA is limited because fishing companies tend to turn off FAD buoy tracking capabilities once the FADs are outside PNA EEZ's (i.e. a phenomena known as geo-fencing) (Escalle et al. 2019).

[11] Banks and Zaharia 2020 report the distribution of beached events across Solomon Islands as 97% on coral reef, 10% mangroves, 4% seagrass and 2% deep habitat. As these percentages are greater than 100%, it is unclear where the errors are.

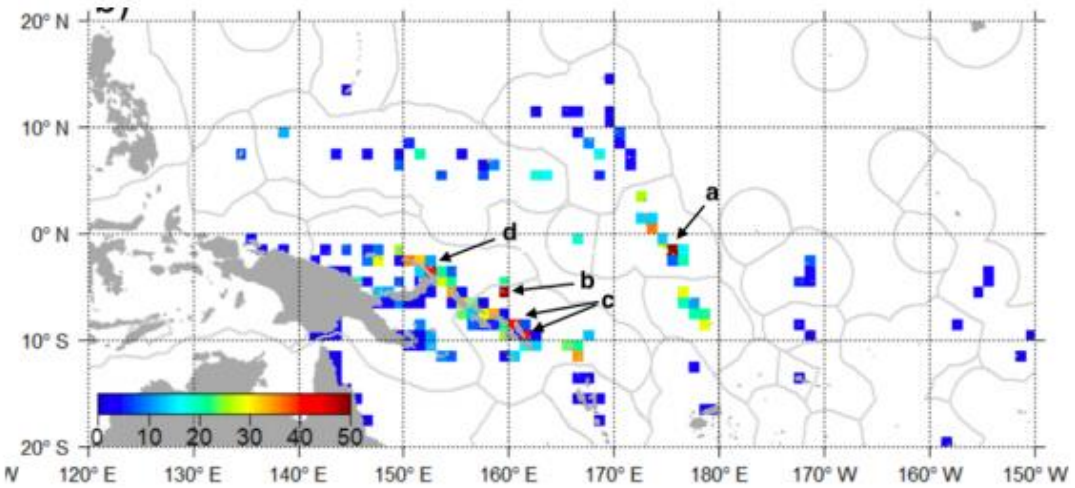


Figure 28. Density map of final position of FADs considered beached in 2016–2018 period - (in number of beachings per cell) (adapted from Escalle et al 2019). Note: highest density hotspots are indicated with letters: a) Kiribati, Gilbert Islands, b), c) Solomon Islands, d) PNG. (Figure from Banks and Zaharia 2020)

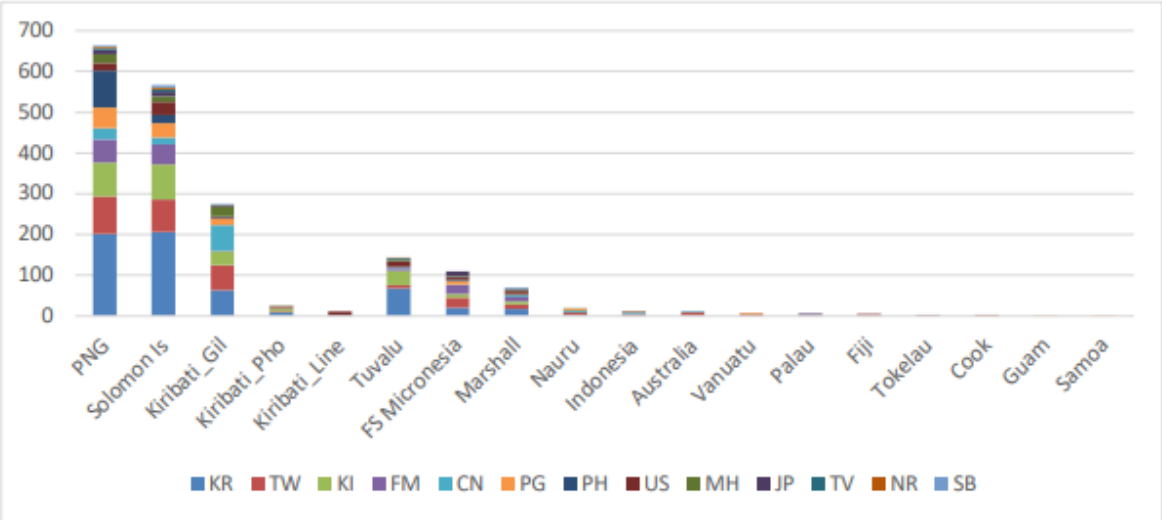


Figure 29. Number of FADs beached in Pacific Island countries by flag, 2016-2018. (Source: PNA FAD programme, figure from Banks and Zaharia 2020)

There are four main forms of manufactured dFADs, and the modifications in design effect the potential impact they may have on coral reefs (Figure 30). These include: Highest Entanglement Risk FADs (HER FAD), Lesser Entanglement Risk FADs (LER FAD), No Entanglement Risk FADs (NER FAD) and Biodegradable No Entanglement Risk FADs (BNER FAD) (Banks and Zaharia 2020). As of January 1 2020, all FADs deployed in the WCPFC must be LER FADs (WCPFC 2020). LER and HER FADs have the same expected average life-span of 10-12 months, up to 2 years (Banks and Zaharia 2020). The more the amount of netting used, the greater the risk of entanglement with corals and trapping of animals (Zudaire et al., 2018). The change to LER FADs is expected to reduce animal entanglements, but given the large amount of netting, no reduction in beaching events or impact to coral reefs is expected (Banks and Zaharia 2020).

Figure 30. Drifting FAD types, figure from ISSF 2018.

Management

We are unaware of any measures currently in place that are designed to promote the recovery of lost FADs or to mitigate any potential impacts of beached FADs on sensitive coastal habitats such as coral reefs.

For the WCPFC, the main FAD management measures under CMM 2019-01 include a three month closure each year specified in the main tuna CMM, and an additional two months of closure on the high seas:

FAD Set Management

16. A three (3) months (July, August and September) prohibition of deploying, servicing or setting on FADs shall be in place between 0001 hours UTC on 1 July and 2359 hours UTC on 30 September each year for all purse seine vessels, tender vessels, and any other vessels operating in support of purse seine vessels fishing in exclusive economic zones and the high seas in the area between 20°N and 20°S.[1]

17. In addition to the three month FAD closure in paragraph 16, except for those vessels flying the Kiribati flag when fishing in the high seas adjacent to the Kiribati exclusive economic zone,[2] and Philippines' vessels operating in HSP1 in accordance with Attachment 2, it shall be prohibited to deploy, service or set on FADs in the high seas for two additional sequential months of the year. Each CCM shall decide which two sequential months (either April – May

In addition, under the WCPFC Although this has been designed as a stock conservation measure for tuna, it also has the additional potential benefit of reducing the number of lost FADs.

For the WCPFC, the use of 'lesser entangling' FADs is mandated (CMM 2018-01, para. 19). There has also been an ongoing program to address a range of impacts from FADs, including promoting (but not yet mandating) the use of biodegradable materials for drifting FADs to reduce the impact of any that are lost (CMM 2018-01, paras. 20-21). Since 2017, there has also been a requirement in the main tuna CMM that each flag CCM "shall ensure that each of its purse seine vessels shall have deployed at sea, at any one time, no more than 350 drifting Fish Aggregating Devices (FADs) with activated instrumented buoys" (CMM 2018-01, para. 23) This maximum limit has been scheduled for review in 2019.

Information

The PNAO has initiated a FAD tracking program using its Fish Information Management System (FIMS). Escalle et al. (2018c) has used data from this program to estimate the numbers of FADs that become beached across the WCPO, but there seems to be no systematic collection of information on the numbers of FADs deployed or that become lost across the WCPFC's fleet as a whole.

There are other ongoing research programs involving scientific staff involved in WCPO fisheries that have been examining various impacts of FADs with papers in scientific journals (e.g. Leroy et al. 2013; Phillips et al. 2017) or presented to the WCPFC-SC (e.g. Pilling et al. 2017).

WCPFC established the FAD Management Options Intersessional Working Group in 2015 (FADMO-IWG). The terms of reference of this group include reviewing reference papers on FADs, as well as relevant information from WCPFC's Scientific and Technical and Compliance Committees. The working group is also tasked with providing recommendations on a variety of FAD-related issues including collection of additional data on FADS and their use in WCPO fisheries, FAD identification and use of electronic signatures, FAD monitoring, tracking and control, FAD management options, FAD marking and monitoring (WCPFC12-2015-22). The FADMO-IWG has convened four times since its establishment (2015, 2016, 2018 and 2020). Most recently in 2020, the FADMO-IWG-04 drafted revised guidelines for 'lesser entangling' and biodegradable FADs, which the Commission has tasked SC17 and TCC17 in 2021 with reviewing (WCPFC17-2020).

7.3.7 Ecosystem Impacts

Status

The MSC defines 'key ecosystem elements' as "the features of an ecosystem considered as being most crucial to giving the ecosystem its characteristic nature and dynamics, and are considered relative to the scale and intensity of the UoA. They are features most crucial to maintaining the integrity of its structure and functions and the key determinants of the ecosystem resilience and productivity" (SA3.16.3 MSC 2014).

Further MSC guidance states that "key ecosystem elements may include trophic structure and function (in particular key prey, predators, and competitors), community composition, productivity pattern (e.g. upwelling or spring bloom, abyssal, etc.), and characteristics of biodiversity" (GCB3.18.1, MSC 2014).

Defining the key ecosystem elements that are applicable to the UoAs is not clear cut and for the purposes of this assessment we have considered a broad range of features and measures from studies at a range of scales. The pelagic ecosystems that support the skipjack and yellowfin tuna fisheries in the WCPO are spread over very broad spatial scales and are influenced by oceanographic and climatic factors beyond the fishery boundaries. Relevant studies include studies of trophic relationships (e.g. Kitchell et al. 1999), studies at scales that are smaller than the whole fishery (e.g. modelling of the 'warm pool' by Allain et al. 2015), and modelling of the whole Pacific Ocean (e.g. Sibert et al. 2006). Also of relevance to this assessment is the potential ecosystem impacts of FADs themselves, including both on target and non-

target species. Each have been examined for evidence of impacts of the fishery on the structure and function of the ecosystem.

Trophic Relationships

Adult skipjack and yellowfin tuna are high trophic level species, second tier apex predators below sharks, swordfish, marlin and other billfish (Kitchell et al., 1999). They are major biomass components of the apex guild, represented by strong responses in a diversity of food web components (Kitchell et al., 1999). Their diet of a variety of pelagic and mesopelagic species, and their trophic position assure an important role as they themselves are prey for higher apex predators. Tunas are considered the most effective generalists in the system as they are abundant opportunistic carnivores with high degrees of trophic interaction and diet overlap (Kitchell et al., 1999). Ecosystem modelling indicated that adult skipjack and yellowfin have critically important ecosystem roles. Their removal evoked substantial and sustained changes in the structure of the system (Kitchell et al., 1999).

Allain et al. (2007) constructed a trophic mass-balance ecosystem model of the Warm Pool/Cold tongue pelagic ecosystem using Ecopath with Ecosim software. They describe the warm pool as an oligotrophic system characterized by low salinity, low nitrates, high temperature, deep thermocline, low surface chlorophyll and maximum chlorophyll located at 90m depth. Conversely, the cold tongue in the Eastern equatorial Pacific is described as an upwelling system with high salinity, high nitrates, low temperature, shallow thermocline, high surface chlorophyll and maximum chlorophyll at the surface (Figure 30). This model indicated that the ecosystem responds to both top-down and bottom-up processes and has the characteristics of a complex form of 'wasp-waist' structure where the majority of the system's biomass is comprised of mid-trophic level groups. Significant complexity was further added through the effects of climate change, including increased sea surface temperature leading to changes in ocean stratification dynamics and changes in the depth of the thermocline. A combination of increased fishing and climate change produced complex trophic cascades, causing unpredictable increases and decreases in the biomass of groups representing all trophic levels, similar to unpredictable wasp-waist ecosystems in productive temperate ecosystems. This study noted that skipjack tuna appears to be a very resilient species, such that it was nearly impossible to eliminate it from the system with a top-down control (i.e., fishing), which is probably related to its high production rate and internal density-dependence induced by cannibalism.

The available model-based predictions provide only indirect evidence of the trophic impacts associated with declining apex predator abundance, as there are difficulties applying detailed trophic models to open ocean systems in which ecological and fishery data uncertainties are large (Cox et al., 2002).

Warm Pool Pelagic Ecosystem Evaluation

A further study (Allain et al. 2015) has examined a more restricted area of the warm pool pelagic ecosystem (Figure 31) using Ecopath with Ecosim (www.ecopath.org) to provide information on the potential impacts of tuna fishing. This ecosystem model was characterized by five trophic levels, a high

number of trophic links between groups, and a diverse pool of prey for predators. In the model, the majority (74%) of the ecosystem's biomass was in trophic levels 1–2 (phytoplankton, zooplankton), whereas 89% of the industrial fish catch (tuna, edible bycatch and other top predators) was in trophic levels 3–5. The model was used to explore nine different scenarios of fishing effort, ranging from measures designed to reduce and/or increase the amount of bycatch, decrease and/or increase the amount of tuna harvested by altering the amount of longline fishing and purse-seine fishing effort on free swimming schools and on schools associated with FADs. The modelling showed that the warm pool ecosystem structure is resistant to considerable perturbation (e.g. large changes in the harvest of the surface fish community). The intrinsic resistance of the ecosystem to perturbation appears to be related to the high diversity of predators in the food web that consume a wide range of prey. The structure of the ecosystem was most sensitive to changes in the biomass of prey groups (e.g. small pelagic fish such as anchovy).

This more recent model of the warmpool (Allain et al. 2015), however, covered only a part of the WCPO (Figure 31) and substantial catches of skipjack and yellowfin tuna are taken from waters outside the modeled area and the application of this model to other areas of the WCPO is statistically inappropriate without further investigation

Pacific Ocean Ecosystem Evaluation

At a broader scale, Sibert et al. (2006) described biomass trends of exploited populations of top level predators in the whole Pacific Ocean (the WCPO and the Eastern Pacific Ocean combined) (Figure) and compares them to estimated biomass projections had the fishery never been exploited. This study found that the trophic level of the catch had decreased slightly, but no such decrease was apparent in the population trophic level (Sibert et al., 2006). Overall, findings indicated that tuna fishery impacts on the Pacific Ocean ecosystem were likely to be minor.

Ecosystem impacts of FADs and other considerations

Leroy et al. (2013) have critiqued the ecosystem impacts of drifting and anchored FADs use by purse-seine tuna fisheries in the Western and Central Pacific Ocean. The direct impacts of removals and their impact on stock status are well known. There is greater uncertainty about other effects such as impacts on fish behavior, predator and prey interactions, entanglement, post release mortality, and the potential flow on effects of these to population level impacts. The use of FADs varies spatially across the WCPO and the effects may also vary by species (Leroy et al. 2013) and ontogenetically (Fuller et al. 2015). Responses to FADs may also vary among individual fish (Phillips et al. 2017). Leroy et al. (2013) indicated that FADs both attract and retain tuna (by unknown but probably different mechanisms), and may affect distribution and migrations of tuna. FADs have been shown to influence the behavior and movement patterns of skipjack, yellowfin, and bigeye tuna, with the juveniles of each species occupying shallower habitats when associated with FADs. Leroy et al. (2013) also document residence time of tunas up to 55 days and noted that the ways in which FADs affect tuna environmental preferences (prey concentration, increased feeding on juvenile conspecifics, or incorrect habitat utilization) required further investigation. Other residence times are more variable, including a recent study in the Indian Ocean using information from echo-sounder bouys attached to FADs – tuna and non-tuna species aggregated around FADs for 13.5 and

21.7 days on average, respectively (Orue et al 2019). In addition, a yellowfin tuna studying employed internal acoustic tags with anchored FADs in the Pacific Ocean yielded residence times from as little as 13 minutes to over 20 days (Robert et al 2013).

The results of more recent studies by Phillips et al. (2017) suggest that processes working at different scales may explain the inter- and intra-individual variability in fish behavior that they observed for bigeye and yellowfin tuna. They suggested that there was an interaction between fine scale variability in the availability of prey, the local density of conspecifics, and the multi-species composition of the schools themselves whilst islands and other bathymetric features may affect vertical behavior at larger spatial scales. They concluded that purse-seiners set on floating objects because they bring tuna to a more easily found locality in horizontal space, and then aggregate them in relative shallow water through this surface behavior. The surface-association events they identified varied greatly. While some events were clear and prolonged, the large majority are not, and extended surface-association behavior was rarely exhibited immediately prior to capture.

Estimates of purse seine post release mortality, as well as FAD entanglement rates and associated mortality are not well documented. Initial estimates of silky shark entanglement mortality in the Indian Ocean was reported to be high, and size-specific (Filmalter et al., 2013). While there are no comparable entanglement estimates in the WCPO it is believed to be high. CMM 2018-01 requires the use of 'lesser entangling' FADs for all deployed FADs starting 1 January 2020 and the ROP has initiated collection of data.

Another important consideration in the relationship between fishing and the ecosystem is the impact of climate change. Tuna stocks are particularly susceptible to the effects of environmental change. In addition to the seasonal, inter-annual and decadal variability in the WCPO (e.g. the El Niño Southern Oscillation - ENSO), projected changes in the marine environment over the coming decades include increases in sea surface temperature, sea level rise, ocean acidification and increases in precipitation. Recent climate change modelling predicts slight increases in skipjack tuna catch and biomass in the western and central Pacific until 2050, followed by biomass stabilization and subsequent decrease after 2060 as the catch plateaus (Lehodey et al., 2013a). A shift in feeding and spawning grounds is also anticipated to shift to more favorable conditions in the eastern Pacific Ocean away from the current western equatorial region, as well as an extension to higher latitudes (Lehodey et al., 2013a).

The available model-based predictions provide only indirect evidence of the trophic impacts associated with declining apex predator abundance, as there are difficulties applying detailed trophic models to open ocean systems in which ecological and fishery data uncertainties are large (Cox et al., 2002).

Overall, the above modelling studies, together with results of the stock assessments of the main species (described under Principle 1) suggests it is unlikely that the tuna harvested by UoA vessels in WCPO waters is having an irreversible impact on ecosystem functioning. The ongoing productivity of the purse seine fishery in the WCPO also provides evidence that the structure and function of the ecosystem has not been compromised by the fishery.

Ultimately, for this assessment against the MSC requirements, a key question about all these effects is whether they could affect populations in ways that would not be detected by current monitoring and assessment programs. Because if monitoring and assessment programs are able to detect any such changes and the harvest strategy is responsive to them, then the Principle 1 and 2 objectives are still likely to be achieved. The monitoring and assessment programs in place are very comprehensive, the scientists involved are well aware of theses issues and are active in the research on them, so we consider it highly likely that they would disrupt key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.

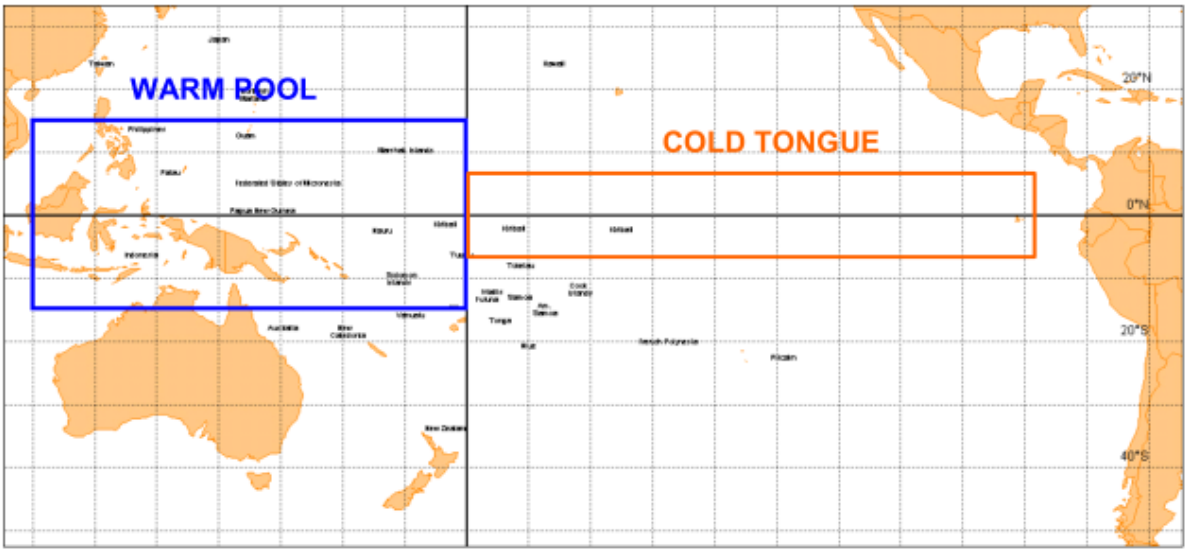


Figure 31. Spatial extent of the warm pool – cold tongue system in the Pacific Ocean (from Allain et al. 2007).

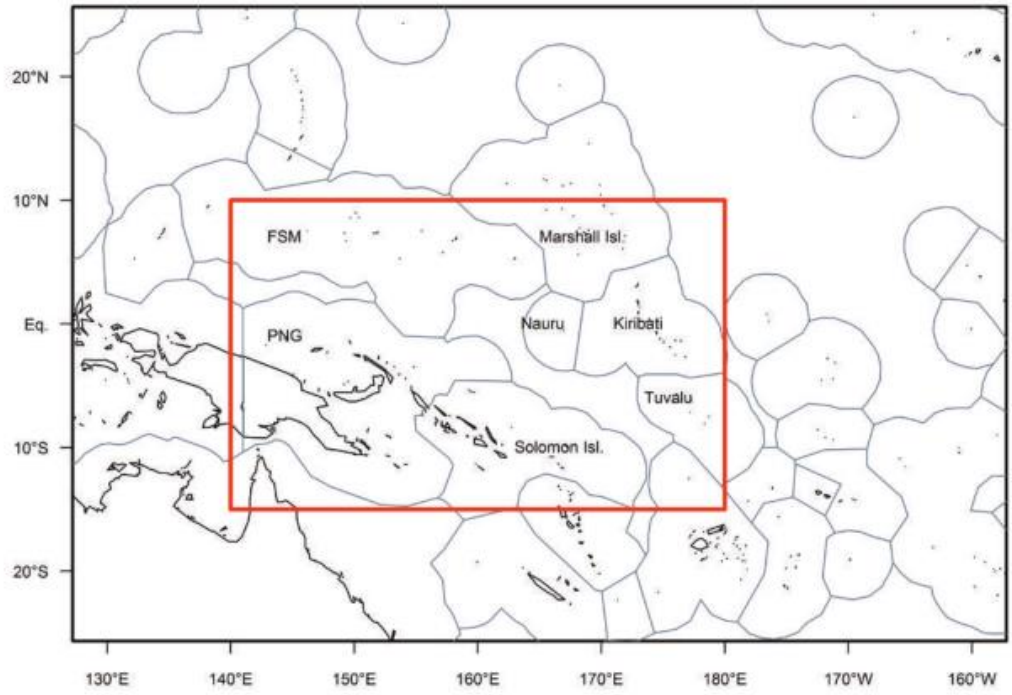


Figure 31. The boundaries of the area covered by the warm pool ecosystem model, and the exclusive economic zones of the countries included in the model. FSM = Federated States of Micronesia; PNG = Papua New Guinea (from Allain et al.2015).

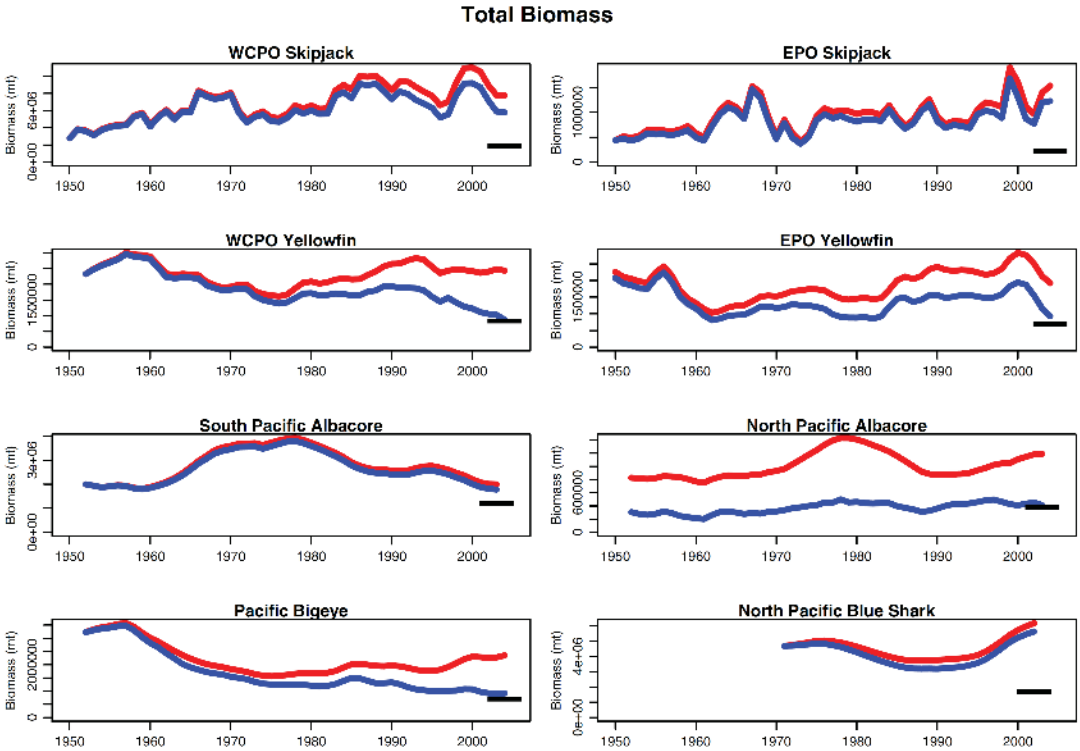


Figure 32. Trends in total biomass for eight stocks of large predators in the Pacific Ocean. The blue line represents the former case, the red line the latter. The single black line indicates the equilibrium biomass corresponding to maximum sustainable yield conditions, assuming current levels of recruitment and distribution of fishing mortality among fisheries. (from Sibert et al., 2006)

Management

The FAO Code of Conduct for Responsible Fisheries (1995) provides a reference framework for sustainable fisheries addressing ecosystem considerations, principles and goals needed for an Ecosystem Approach to Fisheries Management (EAFM). The Code is voluntary, although parts are based on international law, including the 1982 United Nations Convention on the Law of the Sea (UNCLOS). One of the principles of the Code is that management measures should not only ensure the conservation of target species but also species belonging to the same ecosystem. This approach is now explicit in the WCPFC Convention, although tuna fisheries remain managed on single-species basis and there does not appear to be integrated domestic and international strategies to manage the ecosystem components of this fishery.

The ecosystem roles of skipjack and yellowfin tuna are not explicitly considered within management decisions, but the overarching goal of managing to MSY levels (or above) implicitly takes this into account assuming ecosystem stability. In turn, consideration of the wider fishery implications, through the basis of management on the outcomes of the WCPFC assessments, supports the management strategy.

Information

As well as collecting data on target species taken in the WCPO fishery, there has been and continues to be collection of information for and assessments of a wide range of other components of the WCPO ecosystem, including:

- data on the bycatch of large purse-seine vessels and other fishing operations;
- data on the spatial distribution of the bycatch and the bycatch/catch ratios, collected for analysis of policy options to reduce bycatches;
- information to evaluate measures to reduce bycatch, such as closures, effort limits;
- assessment of habitat preferences and the effect of environmental changes.

This effort occurs through observer programmes (e.g. bycatch composition and quantities), trophic analyses (e.g. stomach contents, stable isotopes), and mid-trophic level sampling (e.g. acoustics and net sampling of micronekton and zooplankton). Allain et al. (2011) discuss a number of projects which contribute to EAFM. These include but are not limited to:

- Regional Observer Programme: has the objective to collect verified catch data, other scientific data, and additional information related to the fishery from the Convention Area and to monitor the implementation of the CMMs adopted by the Commission. The Programme is based on the use of existing regional, sub-regional and national observer programmes already in place amongst WCPFC members. Although there have been problems with data obtained under this programme, including biases introduced through operational changes and historically low coverage, recent improvements in the Programme, including 100% coverage in the purse seine fishery from 2010 and a minimum of 5% coverage in the longline fishery from 2012 should improve the quantity and quality of data available.
- data on species' diet has been used to develop Pacific Ocean food-web models (Eastern Tropical Pacific, Central North Pacific, Pacific Warm pool, and the Australian Eastern Tuna and Billfish Fisheries) developed with the Ecopath with Ecosim (EwE) modelling tool.
- the bycatch mitigation information system (BMIS) is the result of a WCPFC project to centralise and make information available on the mitigation and management of bycatch in WCPO. The database is a reference and educational tool that supports the Commission's responsibilities with regard to the sustainable management of non-target, or bycatch, species in WCPO fisheries targeting highly migratory species, including tuna and billfish (see http://bmis.wcpfc.int/index.php) (Fitzsimmons, 2011).

The ecosystem model, SEAPODYM, was developed to investigate spatial population dynamics of fish under the influence of both fishing and environmental effects. In addition to fisheries and other fish relevant data (e.g. tagging data, acoustic biomass estimates, eggs and larvae density), the model utilizes environmental data in a manner that allows high resolution prediction (Lehodey et al., 2008). SEAPODYM

was initially developed for tuna species and complements the WCPFC Scientific Committee's MULTIFAN-CL models by providing additional information on how tuna distributions are structured in space and time.

Additional focus on ecosystem information has been provided through Kobe By-catch Technical Working Group (KBTWG) which was established in 2009 with the aim of supporting, streamlining, and seeking to harmonize the by-catch related activities of Ecosystems/By-catch working groups across RFMOs. The KBTWG's terms of reference include (from Nicol et al., 2013):

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

Leroy et al. (2013) noted that an important shortcoming for data analyses that would help evaluate the ecosystem impacts of FADS is the lack of information on the number and location of FADs in use in the WCPO. Additional information on this is forthcoming and investigations are also continuing into issues such as the impacts of FADs on target and non-target species (Escalle et al. 2018b, Phillips et al. 2017).

At the WCPFC level, ecosystem considerations have been a long-standing area of investigation by the Scientific Committee. Ecosystem and bycatch is one of the themes that is addressed at all SC meetings and papers considered cover a broad range of topics under this heading

7.3.8 Principle 2 Performance Indicator scores and rationales

This assessment evaluates seven purse-seine gear types targeting Yellowfin and Skipjack tuna (drifting FAD, anchored FAD, logs, unassociated, whale, whale shark, and other) for seven flag states (USA, Chinese Taipei, FSM, Cook Islands, New Zealand, Vanuatu, Solomon Islands) under MSC FCP v2.2. As no vessels are included in the Solomon Islands UoC, we could not assess the species composition or information related

to observer records. We have adopted scores similar to the other flag states. A gap analysis will need to be conducted and likely observer data reviewed for consistency with scores estimated here if/when in the future the client adds vessels flagged to the Solomon Islands onto the certificate.

We scored the PI's against the most potentially impactful set type, however, only a single score is provided as required under FCP2.2. Skipjack and yellowfin are evaluated jointly, as there is no impact of target species on Principle 2 for this fishery. Where there is an important distinction between flag states regarding management/information, the PI has been scored with flag states used in a scoring element approach. Where there are no important differences on the basis of flag state, a single rationale has been presented.

PI 2.1.1 – Primary species outcome

PI 2.1.1		**The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI**		
Scoring Issue		SG 60	SG 80	SG 100
a	Main primary species stock status			
	Guide post	Main primary species are likely to be above the PRI. OR If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are highly likely to be above the PRI. OR If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs which categorise this species as main, to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.
	Met?	NA	NA	NA
Rationale				
There are no main primary species (Table 18).				
b	Minor primary species stock status			
	Guide post			Minor primary species are highly likely to be above the PRI. OR

				If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species.
	Met?			Yes

Rationale

Bigeye tuna is the only minor primary species for this set type with a catch proportion of 2.4%.
The WCPFC fishery for bigeye tuna is MSC certified with no conditions under P1 1.1.1. As detailed in the background, the most recent stock assessment (Vincent et al. 2018) indicated that the stock is well above the PRI and above levels that are consistent with MSY. The total bigeye catch in 2018 was 145,402 mt, a 13% increase from 2017 and a 1% decrease from the average 2013-2017. Longline catch in 2018 (71,305 mt) was a 23% increase from 2017 and a 7% increase from the 2013-2017 average. Purse seine catch in 2018 (64,119 mt) was a 10% increase from 2017 and a 4% increase from the 2013-2017 average. Pole and line catch (1,677 mt) was a 3% increase from 2017 and a 60% decrease from the average 2013-2017 catch. Catch by other gear (8,301 mt) was a 25% decrease from 2017 and 45% decrease from the average catch in 2013-2017.

The bigeye stock is initially projected to increase as recent estimated recruitments support adult stock biomass. Adult stock biomass is then projected to decline slightly before again increasing. Projected fishing mortality is below FMSY (median F2020/FMSY = 0.62, the risk of F2020 > FMSY = 0%) and projected median spawning biomass is above the LRP (SB2020/SBF=0 = 0.2) (median SB2020/SBF=0 = 0.41; median SB2020/SBMSY = 1.79. Risk that SB2020 < LRP = 0%). Projections are from the updated model runs of Vincent et al. (2018).

This meets SG 60, SG 80 and SG 100 requirements.

References

Vincent, M.T., G.M. Pilling and J. Hampton. 2018. Incorporation of updated growth information within the 2017 WCPO bigeye stock assessment grid, and examination of the sensitivity of estimates to alternative model spatial structures. WCPFC-SC14-2018/ SA-WP-03, 41pp. , WCPFC-SC 2018

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information is sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	100
Condition number (if relevant)	

PI 2.1.2 – Primary species management strategy

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI.	There is a strategy in place for the UoA for managing main and minor primary species.
	Met?	Yes	Yes	Yes
Rationale				
Bigeye Tuna is the only primary minor retained species. The catch of bigeye tuna by UoA vessels is small relative to the total WCPFC catch and its impact is negligible and would not hinder recovery, if it was needed. Therefore, neither measures nor a partial strategy are considered necessary, and SG60 and SG80 requirements are considered to be met. The strategy for bigeye includes the provisions of the main tuna CMM (CMM 2018-01), and the stock assessments and the data collection systems that support them such as logbooks, observers and VMS. CMM 2018-01 creates a bridge to the adoption of a harvest strategy for bigeye, skipjack, and yellowfin tuna stocks and/or fisheries in accordance with the work plan and indicative timeframes set out in the Agreed Work Plan for the Adoption of Harvest Strategies under CMM 2014-06, which includes the development of management objectives and target reference points. Pending agreement on a target reference point for bigeye tuna the spawning biomass depletion ratio (SB/SBF=0) is to be maintained at or above the average SB/SBF=0 for 2012-2015. The most recent stock assessment indicates this strategy has been effective for maintaining stocks above the point where recruitment would be impaired. These are considered to constitute a strategy that has been highly likely to maintain bigeye above the PRI. This is considered to meet SG 100 requirements.				
b	Management strategy evaluation			
	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Yes	Yes	No
Rationale				

Bigeye tuna is considered to have a partial harvest strategy that includes regular monitoring, data collection and assessment research; no harvest control rule exists as yet. The agreed harmonized score for bigeye tuna meets SG60 for PI 1.2.1a, indicating that the harvest strategy is expected to achieve stock management objectives. This conclusion is supported by results of assessments and projections made under a range of scenarios and constitutes an objective basis for confidence that the strategy will work based on information about the species involved. Projections from the updated model runs of Vincent et al. (2018) indicated that the bigeye stock is initially projected to increase, then decline slightly before again increasing. Projected fishing mortality is below FMSY and projected median spawning biomass is above the LRP; median SB2020/SBMSY = 1.79. The risk that SB2020 < LRP = 0%). Therefore, the requirements for SG60 and SG80 are met for this PI.

However, there has been no testing of the management system for other species to support there being a high level of confidence about this, so SG100 requirements are not met. Higher scores may be possible in the future with the implementation of MSEs being developed by SPC for tropical tunas.

c	**Management strategy implementation**			
	Guide post		There is some evidence that the measures/partial strategy is being implemented successfully.	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a).
	Met?		Yes	Yes

Rationale

Bigeye tuna is the only minor primary species. Results of the stock assessments provide evidence that management measures, and the strategy for implementation is successful. This meets the requirements of SG80.

For SG100 the requirement is for clear evidence of implementation that meets the objectives set out in scoring issue a. These objectives are to maintain at, or to not hinder rebuilding to, levels which are highly likely to be above the point where recruitment would be impaired. The low levels of bigeye tuna catch by the UoA, combined with the status of both species being well above PRI, is clear evidence that these objectives are being met (Vincent et al., 2018). Therefore, SG100 requirements are considered to be met.

d	**Shark finning**			
	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NA	NA	NA

Rationale

Not scored. No primary species are sharks.

e	**Review of alternative measures**			
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of

		unwanted catch of main primary species.	unwanted catch of main primary species and they are implemented as appropriate.	unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	NA	NA	NA

Rationale
There are no unwanted catches of primary species, as indicated by the very low levels of discarding recorded.
References
Vincent et al., 2018

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	> 80
Information gap indicator	Information is sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	95
Condition number (if relevant)	

PI 2.1.3 – Primary species information

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species			
	Guide post	Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status.
	Met?	Yes	Yes	Yes
There are no main primary species in the fishery, however, quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status through the 100% observer coverage requirements on purse seine vessels in the UoA. SG100 requirements are met.				
b	Information adequacy for assessment of impact on minor primary species			
	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			Yes
Rationale				
Bigeye tuna is the only minor primary species. There is quantitative information available from the high level of observer coverage on vessels in the UoA (requirement is for 100% coverage), and comprehensive catch data from logbooks and landings records, as well as independent life history research. These data sources provide requisite information to conduct bigeye stock assessments and support management decision making. It also provides quantitative data that, should there be a change in catch composition that leads to other main primary species being identified in the future, it would be adequate to assess, with a high degree of certainty, the impact of the UoA on them. This meets SG60, SG80 and SG100 requirements.				
c	Information adequacy for management strategy			

	Guide post	Information is adequate to support measures to manage main primary species.	Information is adequate to support a partial strategy to manage main primary species.	Information is adequate to support a strategy to manage all primary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Yes	Yes	Yes

Bigeye tuna is the only minor primary species. There is quantitative information available from the high level of observer coverage on vessels in the UoA (requirement is for 100% coverage) and comprehensive catch data from logbooks and landings records, as well as independent life history and ecological research. This information forms the basis of a framework to explore impacts on bigeye tuna stock status (as well as yellowfin and skipjack tuna) using projection analyses under varying levels of parameter uncertainty and fishery input controls (e.g., spatiotemporal closures) and output controls (e.g., allowable catch). This framework results in the development of risk profiles (e.g., Prob SSB2020<LRP) that determine the efficacy of different management strategies relative to specified short- and long-term goals (Vincent et al. 2018). The results are reviewed annually during the SPC Stock Assessment Workshop, WCPFC-SC and WCPFC Commission meetings.

Thus, the information collected, has been sufficient to support the measures and strategy in place for the species and to determine that that there is a high degree of certainty that the species is above the PRI (the objective required for PI 2.1.2). This meets the requirements of the SG 60, SG 80 and SG 100 levels.

References

Vincent et al. 2018

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	>80
Information gap indicator	Information is sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	100
Condition number (if relevant)	

PI 2.2.1 – Secondary species outcome

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit		
Scoring Issue		SG 60	SG 80	SG 100
a	**Main secondary species stock status**			
	Guide post	Main secondary species are likely to be above biologically based limits. OR If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.	Main secondary species are highly likely to be above biologically based limits. OR If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding. AND Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main secondary species are above biologically based limits.
	Met?	NA	NA	NA
Rationale				
There are no main secondary species therefore this scoring issue is not relevant.				
b	**Minor secondary species stock status**			
	Guide post			Minor secondary species are highly likely to be above biologically based limits. OR If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species

	Met?			No

Rationale

There is a wide range of minor secondary species caught by UoA vessels (See Appendix), including rainbow runner and mackeral scad. For the majority of the teleost species and elasmobranchs, biologically based limits have not been established. Requisite information and data (e.g., life history parameters, ecological requirements, etc.) to establish biologically-based limits are generally not available. In many cases, available data is limited to reported fishery removals.

No stock assessments are available for the mackeral scad or rainbow runner in the WCPO ocean. The very low catch levels of these species, as well as all other minor secondary species indicate that there is a negligible interaction between the UoA vessels and these secondary species such that, even if these species were below any biologically based limits, any catch by them would not be hindering their recovery.

The MSC v2.2 requirements (Table 3) trigger use of the RBF for any secondary (or primary) species without reference points, regardless of whether the impact of the fishery can be assessed. MSC FCP v2.2 requirement Annex PF 4.1.4 allows the assessment team to not conduct the required RBF evaluation (a Productivity Susceptibility Analysis (PSA)) on minor species, in which case the outcome PI cannot be scored above 80 (MSC FCP v2.1) The assessment team elected not to conduct the RBF because the very low levels of catch indicates low impact by the UoA on these species, due the time and cost implications of conducting an RBF.

Thus, SG100 is not met.

References

Observer reports

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	>80
Information gap indicator	Information is sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	80
Condition number (if relevant)	

PI 2.2.2 – Secondary species management strategy

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a partial strategy in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a strategy in place for the UoA for managing main and minor secondary species.
	Met?	All - Yes	All - Yes	All - No
Rationale				
There are no main secondary species caught in the fishery. Therefore, following the explanation of the term 'if necessary' in Table GSA3, a management strategy is not required at SG60 or SG80 and no specific rationale need be given in order to achieve the SG60 and SG80 levels. To attain the SG100 score a management strategy should be in place for the UoA for managing interactions with both main and secondary species. While some minor secondary species have been assessed, management strategies do not exist for these species. For all other secondary species data is limited and management strategies do not exist. The SG 100 is not met.				
b	Management strategy evaluation			
	Guide post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
	Met?	All - Yes	All - Yes	All - No
Rationale				
There are no main secondary species caught is this fishery, and consistent with the requirements under scoring issue a, neither measures nor a partial strategy are considered necessary, the SG 60 and SG 80 requirements are considered to be met. While some minor secondary species have been assessed, there has been no testing to support there being a high level of confidence about the measures that are in place for these species. For all other secondary species data is scant and management strategies do not exist. The SG 100 is not met.				

c	**Management strategy implementation**			
	Guide post		There is some evidence that the measures/partial strategy is being implemented successfully.	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
	Met?		All -Yes	All - Yes
Rationale				
There are no main secondary species and consistent with the requirements under scoring issue a, neither measures nor a partial strategy are considered necessary, SG80 requirements are considered to be met for this scoring issue. Data from the observer programmes and logbooks provide clear evidence that there continues to be such a low level of catch of all secondary species that fishing by UoA vessels is not causing overfishing or hindering the recovery of any species. On this basis SG100 is met. It should be noted that this result is based on analyses of 95% of available observer data and there is no evidence to indicate that the provided data is not representative of the full data set.				
d	**Shark finning**			
	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Yes: Cook Islands, FSM, New Zealand, Chinese Taipei, USA, Vanuatu, Solomon Islands	Yes: USA, FSM, New Zealand, Chinese Taipei, Solomon Islands No: Cook Islands, Vanuatu	No: Cook Islands, FSM, New Zealand, Chinese Taipei, USA, Vanuatu, Solomon Islands
Rationale				
WCPFC and all the national jurisdictions have prohibitions on shark finning as detailed in the background. Also, there is a requirement for 100% observer coverage on all purse seine vessels; observers are required to record any instances of shark finning and these data are recorded on the databases held by SPC. MSC also provides guidance on levels of external validation (observer coverage) required to demonstrate the likelihood that shark finning is not taking place (SA2.4.4.1), and for SG60 it's 5% coverage and for SG80 it's 20% coverage. Status of the observer programs are reported annually by SPC, including flag-specific information on coverage rates (purse seine and longline fisheries), data provisions, and issues (Williams et al., 2020). Based on submitted observer information from 2015 to 2019, observer coverage by flag was estimated at 100%. This was confirmed during discussions with SPC and ROP staff. We note not all observer data is submitted and processed in a timely manner, and for this assessment 86% - 100% of observer data was provided to the assessment team. It is unclear why submitted data is not processed in a timely fashion, but we note there has been no reported non-compliance related to observer coverage requirements or data submission (7.3.1.3 Observer Programs/Information Sources)				

It should also be noted that observer data was available from 2014-2019 for all flags except Cooks Islands and Vanuatu; observer data in the Cooks Island was first collected in 2019, as the vessel was previously flagged under Kiribati. For Vanuatu only 2018 and 2019 data were provided to the assessment team.

Given the high level of observer coverage for UoA vessels flagged to USA, FSM, New Zealand, and Chinese Taipei (> 20%), as well as no reported non-compliance related to observer coverage requirements and no incidents of shark finning observed in the last five years, the Assessment Team considers provided observer information sufficient to estimate the likelihood of shark finning and the SG 60 and SG 80 levels are met. While some port sampling measures are in place to provide independent evidence of finning, we were not provided sufficient information on the sampling programs. On this basis SG 100 is not met.

As there are no vessels currently flagged to the Solomon Islands, we consider SG80 met here as well, given that SI also needs to meet the requirement for 100% observer coverage. This scoring issue would be evaluated in the gap analysis should vessels be added in the UoC at a later date.

While observer coverage for UoA vessels from Cook Islands and Vanuatu also meets the 100% observer coverage requirement, the assessment team received only observer data for a single year for the vessels flagged under Cook Island, and two years of observer data for the vessels flagged under Vanuatu. Given the limited timeline of the available evidence the team was not able to conclude that it's highly likely that shark finning is not taking place to meet the SG80. As a result, the Assessment Team took a more precautionary approach; Cook Islands and Vanuatu meet the SG 60 level but not the SG 80 level.

e	**Review of alternative measures to minimise mortality of unwanted catch**			
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.
	Met?	All - Yes	All - Yes	All - No

Rationale

There are no main secondary species and under scoring issue a, neither measures nor a partial strategy are considered necessary, SG 60 and SG 80 requirements are considered to be met for this scoring issue.

The level of catch of secondary species by the UoA is clearly already very low, but we were not satisfied that a regular review of alternative measures to minimise UoA-related mortality of unwanted catch of all secondary species was undertaken.

The requirements of the SG 100 level are therefore not met

References

TCC 2014

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	Cook Islands and Vanuatu 60-79 USA, Chinese Taipei, FSM, New Zealand, Solomon Islands - ≥80
Information gap indicator	No Gaps
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	Cook Islands and Vanuatu - 75 USA, Chinese Taipei, FSM, New Zealand - 85
Condition number (if relevant)	2-1 (Cook Islands) 2-2 (Vanuatu)

PI 2.2.3 – Secondary species information

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species			
	Guide post	Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status. OR If RBF is used to score PI 2.2.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.
	Met?	Yes	Yes	Yes
Rationale				
There are no main secondary species but following SA3.3.1 this scoring issue is still required to be scored. There is good information from the high level of observer coverage on vessels in the UoA (requirement is for 100% coverage), and comprehensive catch data from logbooks and landings records. This provides quantitative data that, should there be a change in catch composition that leads to main secondary species being identified in the future, it would be adequate to assess, with a high degree of certainty, the impact of the UoA on them. Therefore, the requirements of SG 60, SG 80 and SG 100 levels are met				
b	Information adequacy for assessment of impacts on minor secondary species			
	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	Met?			Yes
Rationale				
There is a range of minor secondary species caught during purse seining, and both the magnitude and composition of the catch is significantly greater with FAD fishing. There is good information from the high level of observer coverage on vessels in the UoA (requirement is for 100% coverage), and comprehensive catch data from logbooks and landings records, and SG100 is met.				

c	Information adequacy for management strategy			
	Guide post	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Yes	Yes	No

Rationale

Management strategies with defined objectives have not been specified for all secondary species. While stock assessments have been conducted for some secondary species (Pacific blue marlin, striped marlin, albacore tuna, blue shark, and short-finned mako shark), harvest strategies with defined objectives have not been developed for these species (ISC19). Available data for the remaining secondary species caught by UoA vessels is scant, consisting of fishery interactions data collected by either observers, or through logbook reports. These data document "removals", and alone are inadequate to evaluate with a high degree of certainty whether management strategy objectives are being achieved.

Therefore, the SG100 requirements is not met.

References

ISC 2019

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	95
Condition number (if relevant)	

PI 2.3.1 – ETP species outcome

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	**Effects of the UoA on population/stock within national or international limits, where applicable**			
	Guide post	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/ stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population /stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.
	Met?	Not Relevant	Not Relevant	Not Relevant
Rationale				
There are no national and/or international requirement that set limits for the ETP species that interact with the UoA. This SI is therefore considered to be not relevant				
b	**Direct effects**			
	Guide post	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	Yes all Elements	No: False Killer Whale, Rough-toothed Dolphin, Indo-Pacific Bottlenose Dolphin, Sei Whale, Giant Manta Ray, and Mobulas and Mantas Yes: All other elements	Yes: Scalloped Hammerhead Shark and Black Footed Albatross No: All other ETP elements
Rationale				
The ETP species considered here are listed in Table 20, and includes 4 species of sharks, five species of turtles, one species of seabird, and 12 species of cetaceans. **Whale shark** The results of an assessment of the risk to the Indo-Pacific Ocean Whale Shark population from interactions with Pacific Ocean purse seine fisheries (Common Oceans (ABNJ) Tuna Project 2018c) were considered by the WCPFC-SC who concluded that there was a low probability that the Indo-Pacific Whale Shark was at risk from Pacific purse seine fisheries (median probability of less than 8% that current risk levels exceed life history-based notional reference points F-Lim and F-crash) (WCPFC-SC 2018a). This assessment used observer-reported interactions which average 235 per year from 2010 to 2016. Whale sharks have represented less than 0.1% of the total catch of the UoA, averaging about 21 animals per year. The fate of most released animals is unknown, but observers on UoA vessels reported 93% having been released				

alive. There were differences in the number of interactions between flag states which appears to be due to the number of sets observed. Highest and similar interaction rates were associated with Chinese Taipei and USA vessels (0.01/set), followed by vessels from Vanuatu (0.008/set), FSM (0.004/set) and New Zealand (0.005/set).

While there are no direct estimates of post release mortality its estimated to be approximately 10% (with a significant tail in its probability extending to higher values) based on an expert survey, and represents the greatest source of uncertainty in the assessment (Neuibauer et al., 2018).

At these levels of catch and mortality it considered likely that the fishery is not hindering the recovery of whale shark populations, should such a recovery be required. This meets the requirements of SG 60 and 80. Because of uncertainty about post release mortality (see GSA3.4.3) the requirements for SG 100 are not met.

Silky Shark

Following the most recent stock assessment of silky shark for the WCPP-only (Common Oceans (ABNJ) Tuna Project 2018b) the WCPFC-SC concluded that silky sharks were subject to overfishing (fishing mortality is 1.6 times the MSY fishing mortality) in the WCPO but were likely not to be in an overfished state (Pr (SB2016 > SBMSY) = 72%) (WCPFC-SC 2018a). Therefore, rebuilding of silky sharks is not required.

Estimates of the quantities of silky shark taken by different gear types consistently indicate that longlines are responsible for the majority of the catch of silky sharks (Peatman 2017 and 2018 as reported in Clarke 2018).
The catch reported by observers on UoA vessels is about 6,950 animals per year of which at least 23% were released alive (Table 20). The average number of silky sharks caught varies by flag; approximately 4,300 animals per year for USA, 2,150 animals per year for FSM, 294 animals per year for Chinese Taipei, and 100 animal per year for both New Zealand and Vanuatu.

The retention of silky sharks is prohibited, and all landings are monitored. Given the high observer coverage rates there is confidence in the representativeness and magnitude of observed catches. Clarke et al. (2018) estimated the annual catch of silky sharks in the WCPO at 38,000 mt. In comparison, the catch by UoA vessels has averaged around 196 mt annually, of which approximately 45 mt would be released alive. As there is likely to be an unobserved level of direct mortality and given the observed high discard mortality (77%), it is best to assume 100% mortality of silky sharks caught in the fishery. Even with this assumption the total mortality (based on removals) attributed to the UoA represents a small portion of the total fishing mortality (0.5%). On this basis the assessment team concluded known direct effects of the UoA are likely to not hinder recovery of silky sharks, the SG 60 is met.

There is a risk of unobserved mortality on account of silky shark entanglement with FAD netting. CMM 2018-01 mandates the deployment of lower entanglement Risk FADs, the design elements of these FADs reduce the risk of entanglement events. Filmater et al. (2013) estimated that silky shark that are entangled in FADs and in the Indian Ocean this was estimated to be up to 10 times the observed mortality. There are important limitations in the design and sample size of this study, and its conclusions cannot be easily applied to the Western Pacific. Nevertheless, even when including both observed and unobserved mortality, the level of mortality attributable to the UoA would still represent a small proportion of the total fishing mortality. . Also, indicators of relative abundance used in the stock assessment of Silky shark would reflect the impact of all mortality, whether observed or not, so its findings about the species being likely to not be overfished also include a level of cryptic mortality from FADs. Based on this information the effects of the UoA are highly likely to not hinder recovery of this species and SG 80 is met.

Without more comprehensive information on post release survival and entanglement data the assessment team cannot assert with a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species. The SG100 is not met.

Oceanic whitetip shark

The stock assessment of oceanic whitetip shark (Rice and Harley 2012a) concluded that oceanic whitetips have been overfished and remain subject to overfishing. The catch reported by observers on UoA vessels is approximately 82 animals per year and varied by flag, 53, 21, 6, 2, and 1 animal per year for USA, FSM, Chinese Taipei, Vanuatu, and New Zealand UoA vessels, respectively. The fate of animals was recorded by observers on USA, FSM, Vanuatu, and Cooks Island UoA vessels and assuming it's representative of the UoA at least 65% of the animals were released alive (Table 20). Annual catches of oceanic whitetip sharks by longline fisheries alone in the Pacific Ocean is estimated at 40,000 animals (Peatman et al., 2018). Assuming all oceanic whitetip shark interactions result in mortality the catch attributed to the UoA amounts to approximately 1% of the total fishing mortality (based on removals)

The retention of oceanic whitetip sharks is prohibited, and all landings are monitored. Given the high observer coverage rates there is confidence in the representativeness and magnitude of observed catches.. Assuming all oceanic whitetip shark interactions result in mortality the catch attributed to the UoA amounts to approximately 1% of the total fishing mortality (based on removals). On this basis the assessment team concluded known direct effects of the UoA are likely to not hinder recovery of oceanic white tip sharks, the SG 60 is met

There is a risk of an unobserved level of mortality from animals entangled in FADs but with the adoption of CMM 2018-01 that requires the use of lesser entangling FADs this source of mortality has likely been mitigated. Publications reporting shark entanglement in drifting FADs (Filmalter et al. 2013, Poisson et al. 2014, Hutchinson et al. 2015) only report silky sharks, the assessment team did not find evidence of oceanic white tip entanglement in FADs.

As noted, the catch of oceanic whitetip sharks by longline vessels, which generally results in 100% mortality, exceeds the catch in purse seine fisheries, and accounts for the majority of fishing mortality. Also, catch of the target species by UoA vessels is a very low-level percentage of the total WCPFC Convention Area catch. Indicators of relative abundance used in the stock assessment of Oceanic Whitetip Shark would reflect the impact of all mortality, whether observed or not, so its findings about the species being likely to not be overfished also include a level of cryptic mortality from FADs. Based on this information the effects of the UoA are highly likely to not hinder recovery of this species and SG 80 is met.

Without more comprehensive information on post release survival and entanglement data the assessment team cannot assert with a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species. The SG100 is not met.

Scalloped Hammerhead Shark

Two distinct population have been identified in the Pacific Ocean, the Eastern Pacific DPS and the Indo-West Pacific DPS. While IUCN lists this species as critically endangered, the US lists the Eastern Pacific PDS as endangered and the Indo-Pacific DPS as threatened under the U.S. Endangered Species Act (ESA). As required under the US Endangered Species Act, every 5-years a review of a species' status must be conducted to ensure that the listing classification of a species as threatened or endangered on the List of Endangered and Threatened Wildlife and Plants is accurate. A 5-year review was conducted by NOAA in 2020 endorsing the findings of the initial listing and concluding that the major threat to recovery of the EPO DPS was unregulated fishing activities in the EPO region, in particular IUU fishing.

Based on observer data from 2015 to 2019, two Scalloped Hammerhead Sharks were caught by UoA vessels, accounting for less than 0.0008% of the catch over the 5 years. This is a significantly small level of interaction and based on the high observer coverage rates is considered accurate. It is inconceivable that the removal of two animals by the UoA over 5-years could impact the population and the assessment team concluded

there is a high degree of confidence that there are no significant detrimental direct effects of the UoA on this species. On this basis SG 60, SG 80, and SG 100 are met.

Cetaceans

Twelve species of cetaceans interacted with UoA fishing vessels from 2015 or 2019, including seven species of oceanic dolphins (Dolphinidae) and five baleen whale species (Table 20). Oceanic dolphin interactions, from 2015-2019, included Rough-toothed Dolphin (N=76), Indo-Pacific Bottlenose Dolphin (N=20), Spinner Dolphin (N=15), Common Dolphin (N=10), Common Bottlenose Dolphin (N=6), False Killer Whale (N=300), and Short-finned Pilot Whale (N=23). Baleen whale interactions included Sei Whale (N=39), Fin Whale (N=1), Minke Whale (N=2), Bryde's Whale (N=15), and Blue Whale (N=1). Most oceanic dolphin interactions were associated with FAD sets while most baleen whale interactions were associated with unassociated sets. Some information on the status of these species in the WCPO is available through the IWC (https://iwc.int/status).While abundance information for many of the cetaceans is dated we note that IUCN and CITES continue to use this information when making status determinations (i.e., Critically Endangered), even as recent as 2020. On this basis the assessment team concluded the estimates are still relevant when determining UoA impacts.

Overall for all cetacean species, the team notes that cetacean mortality on account of FAD entanglement is considered to be small (Anderson 2014) and thus direct effects of the UoA on account of FAD entanglement of ceteceans were considered highly likely to not hinder recovery of these species.

False Killer Whales:

Interactions with false killer whales (Pseudorca crassidens) were significantly higher than other cetaceans (N=300), accounting for approximately 60% of all observed cetacean interactions. False killer whales are classified as near threatened by the IUCN with bycatch from fisheries one of the primary threats (Baird 2018). While bycatch is greatest in longline and other hook-and-line fisheries, mortality also occurs in purse seine fisheries (at least 23% based on UoA observer information). The population estimate of false killer whales in the WCPO is 16,000 animals (Odell and McClune, 1999), and UoA vessels interact with 60 animals annually, of which 14 are killed annually, this equates to an estimated mortality rate of < 0.09% of the total population. This is a low level of known direct mortality relative to the population size, and the UoA is likely to not hinder recovery of false killer whales in the WCPO, meeting the SG 60 level. In the absence of more up to date estimates of population size and given the recorded number of annual mortalities and the risk that some whales may be injured when released or when escaping the net we cannot state with certainty that directs effects of the UoA are highly likely to not hinder recovery of ETP species; SG 80 is not met.

Short-Finned Pilot Whale

Short-finned Pilot Whales are found in warm temperate to tropical waters, generally in deep offshore areas; two forms of Short-Finned Pilot Whale are found off Japan. Line transect surveys in Japanese waters generated an abundance estimate of 53,609 (coefficient of variation (CV) 0.22) for the southern form (Miyashita 1993) and an estimate of 4,321 (CV 0.61) for the northern form. Dolar et al. (2006) estimated their abundance in the Philippines at 7,571. A line transect survey in the ETP in 2000 estimated abundance at 589,000 (CV 0.26), with a steadily increasing trend during the eight surveys that were conducted between 1986 and 2000. Surveys off the Hawaiian Islands in 2010 yielded an abundance estimate of 19,503 (CV 0.49) (Bradford et al. 2017) and 836 (CV 0.79) in 2016 off the west coast of the USA (Barlow 2016). Short-finned Pilot Whale are classified as a species of least concern by the IUCN and based on data from 2015 to 2019 the UoA interacted with 4-5 Short-finned Pilot Whales annually and all animals were released alive. Given the relevancy of the Hawaiian estimate and assuming it represents a population estimate for the WCPO, the UoA annually interacts with approximately 0.02% of the population, which is a relatively small interaction rate. Also, the UoA catch from 2015-2019 (N=23) represents only 3% of the total reported catch of Short-finned Pilot Whales by all purse seine vessels operating in the WCPO, which is a relatively small interaction rate (Williams et al, 2020). Based on this information, known direct effects of the UoA are likely to not hinder recovery of this ETP species, meeting the SG 60 level. Given that all animals that interacted with the fishery were release alive, and the species is considered as 'least concern' by the IUCN classification, the assessment team determined direct effects of the UoA are highly likely to not hinder recovery of short-finned pilot whales, meeting the SG80. In the absence of more up to date estimates of population size

and post release mortality we cannot state with a high degree of confidence that there are no significant detrimental direct effects of the UoA on this species, the SG100 is not met.

Rough-Toothed Dolphin

Abundance estimates for Rough-toothed Dolphins are available for only a relatively small proportion of their range. An estimated 145,900 (coefficient of variation (CV) = 0.32) inhabit the eastern tropical Pacific based on shipboard line-transect surveys undertaken from 1986 to 1990 (Wade and Gerrodette 1993). In the Hawaiian Island Exclusive Economic Zone (EEZ), a shipboard line-transect survey conducted in 2010 resulted in an abundance estimate of 72,528 (CV = 0.39) Rough-toothed Dolphins (Bradford et al. 2017). Rough-toothed Dolphin are classified as a species of least concern by the IUCN and based on data from 2015 to 2019 the UoA interacted with 15 Rough-toothed Dolphin annually of which 12 are killed annually, this equates to a mortality rate of 0.02% of the Hawaiian Island population. This is a low level of mortality relative to the population size, and the UoA is likely to not hinder recovery of Routh-toothed Dolphin, meeting the SG 60 level. In the absence of more up to date estimates of population size and given the low percentage of captured individuals released alive (21%) we cannot state with certainty that directs effects of the UoA are highly likely to not hinder recovery of this ETP species; SG 80 is not met.

Indo-Pacific Bottlenose Dolphin

Indo-Pacific Bottlenose Dolphins have a discontinuous distribution in warm-temperate and tropical waters of the Indo-Pacific region. They are found primarily in shallow coastal and estuarine waters and in shallow reef complexes (Jefferson et al. 2015). Indo-Pacific bottlenose dolphins are particularly difficult to assess, because they tend to occur in fragmented coastal populations, and their range includes many countries where little or no formal research has taken place. They are classified as near threatened by the IUCN and based on data from 2015 to 2019 the UoA interacted with five Indo-Pacific Bottlenose Dolphin annually of which all were killed. Given that the preferred habitat for this species is shallow coastal and estuarine waters, and shallow reef complexes and noting that purse seine fishing activities of the UoA occurs in deep water environments away from shallow coastal and estuarine areas, the overlap of the species with fishing activities will be minimal. Therefore, the UoA is likely to not hinder recovery of Indo-Pacific Bottlenose Dolphin, meeting the SG 60 level. Despite the extremely low number of annual interactions (n=5), n the absence estimates of population size estimates, their fragmented population structure, their IUCN categorization as 'Near Threatened', and low percentage of captured individuals released alive (0%)we cannot state with certainty that directs effects of the UoA are highly likely to not hinder recovery of this ETP species; SG 80 is not met.

Spinner Dolphin

There is no global abundance estimate for this widely distributed species and available abundance estimates add up to more than a million dolphins. However, the vast majority of the species range remains unsurveyed, therefore the actual abundance is presumed to be considerably greater. There were an estimated 801,000 (coefficient of variation (CV)=37%) white-bellied spinner dolphins (S. l. orientalis – S. l. longirostris intergrades) in the ETP in 2000 (Gerrodette et al. 2005) and in the ETP the population of eastern spinner dolphins was estimated at 613,000 (CV=22%) in 2003 (Gerrodette and Forcada 2005). Despite large reductions in bycatch mortality since the 1970s, this population appeared to be recovering at an estimated rate of only 1.1% per year during the early 2000s. Spinner Dolphin are classified as a species of least concern by the IUCN and based on data from 2015 to 2019 the UoA interacted with three Spinner Dolphin annually of which all were recorded as dead, this equates to a mortality rate of 0.0002% of the total ETP population. Also, the UoA catch from 2015-2019 (N=15) represents only 3% of the total reported catch of Spinner Dolphin by all purse seine vessels operating in the WCPO (Williams et al, 2020). Based on the low level of mortality relative to the population size and relatively small contribution of UoA vessels to the overall catch in the WCPO, direct effects of the UoA are highly likely to not hinder recovery of ETP species; SG 60 and SG 80 are met. In the absence of more up to date estimates of population size and post release mortality we cannot state with certainty there is a high degree of confidence that there are no significant detrimental direct effects of the UoA on this ETP species; SG 100 is not met.

Common Dolphin

Available abundance estimates are primarily from the Northern Hemisphere and there are very few abundance estimates from the Southern Hemisphere, which constitutes a large portion of the species range. The abundance of Common Dolphins in the ETP was estimated at 3,127,203 (CV=26%) individuals in 2006 (Gerrodette et al. 2008). There are an estimated 1.4 million Common Dolphins in the Western Pacific off Japan (Kanaji et al. 2017). Ship survey data from 2009 resulted in an estimated total of 279,000 common dolphins along the west coast of Baja California and the California coast (Carretta et al. 2011). Common Dolphin are classified as a species of least concern by the IUCN and based on data from 2015 to 2019 the UoA interacted with 2 Common Dolphin annually of which all were killed, this equates to a mortality rate of 0.00004% of the estimated North Pacific population. Also, the UoA catch from 2015-2019 (N=10) represents only 8% of the total reported catch of Common Dolphins by all purse seine vessels operating in the WCPO (Williams et al, 2020). Based on the low level of mortality relative to the population size and relatively small contribution of UoA vessels to the overall catch in the WCPO, direct effects of the UoA are highly likely to not hinder recovery of this ETP species; SG 60 and SG 80 are met. In the absence of more up to date estimates of population size and post release mortality we cannot state with certainty there is a high degree of confidence that there are no significant detrimental direct effects of the UoA on this ETP species; SG 100 is not met.

Common Bottlenose Dolphin

Surveys of the Eastern Tropical Pacific resulted in an estimate of 243,500 (CV = 0.29) (Wade and Gerrodette 1993), but this estimate should be considered with caution as it is more than 25 years old. No recent abundance estimates for Common Bottlenose Dolphins in Japanese waters are available (Kasuya 2017). Japanese surveys prior to 1993 resulted in estimates of 168,000 (CV = 0.26) in the Northwestern Pacific west of 180°E, including 36,791 (CV = 0.25) in Japanese coastal waters (Miyashita 1993). Common Bottlenose Dolphin is classified as a species of least concern by the IUCN and based on data from 2015 to 2019 the UoA interacted with 1 Common Bottlenose Dolphin annually, of which all were killed. This equates to a very small mortality rate relative to population size, but this should be considered with caution given the timing of the estimate. However, the UoA catch from 2015-2019 (N=6) represents only 1% of the total reported catch of Spinner Dolphins by all purse seine vessels operating in the WCPO (Williams et al, 2020). Based on the presumed low level of mortality relative to the population size and relatively small contribution of UoA vessels to the overall catch in the WCPO, direct effects of the UoA are highly likely to not hinder recovery of this ETP species; SG 60 and SG 80 are met. In the absence of more up to date estimates of population size and post release mortality we cannot state with certainty there is a high degree of confidence that there are no significant detrimental direct effects of the UoA on this ETP species; SG 100 is not met.

Sei Whale:

The current abundance estimate for sei whales in the North Pacific Ocean is at 35,000 animals. In the Southern Hemisphere there are no recent accepted estimates of abundance or trends. Sei Whales are categorized as 'Endangered' by the IUCN. Observer records indicate that all Sei whales that interacted with the UoA (N=39) were released alive. Based on the available population estimates, and that all Sei whales were release alive, the interactions with UoA vessels are likely to not hinder recovery of sei whales; SG 60 is met. In the absence of more up to date estimates of population size, their classification as 'Endangered' by the IUCN and absence of detailed data on the condition of the whales when released alive, we cannot state with certainty that effects of the UoA are highly likely to not hinder recovery of ETP species; SG 80 is not met.

Blue Whale:

Insufficient data exists to comment on present status of blue whales in the western Pacific Ocean. There are over 2,000 animals in the eastern North Pacific and the population has almost recovered (https://iwc.int/estimate). In the Southern Hemisphere blue whales were estimated to number around 2,300 in 1998 and to be increasing between 2.4-8.4% per year (https://iwc.int/estimate). Based on available population estimates and status information, the low level of observed UoA interactions (one blue whale in 5 years), and release of the blue whale alive, it is inconceivable that the UoA is impacting the blue whale stock. Based on this information the direct effects of the UoA are highly likely to not hinder recovery of this ETP species; SG 60 and SG 80 are met. In the absence of more up to date estimates of population size we cannot state with certainty there is a high degree of

confidence that there are no significant detrimental direct effects of the UoA on this ETP species; SG 100 is not met.

Fin Whale:
Global fin whale population estimates range from less than 100,000 to roughly 119,000 animals (https://iwc.int/status). The IWC has issued a moratorium on the hunting of finback whales, however Japan and Iceland have claimed research exemptions to the IWCs order and have collectively killed nearly 150 Finback Whales in the last two years.

While distinct populations exist, region estimates of population size, including those in the WCPO, are presently not available. However partial estimates for the eastern North Pacific show around 10,000 fin whales with some evidence of annual increase rates of 4-5%. Based on available population estimates and status information, the low level of observed UoA interactions (one Fin Whale in 5 years), release of the Fin Whale alive, it is inconceivable that the UoA is impacting the Fin Whale stock in the WCPO. Based on this information the direct effects of the UoA are highly likely to not hinder recovery of this ETP species; SG 60 and SG 80 are met. In the absence of more up to date estimates of population size we cannot state with certainty there is a high degree of confidence that there are no significant detrimental direct effects of the UoA on this ETP species; SG 100 is not met.

Bryde's Whale
In the western and central North Pacific (west of 165°W) abundance is estimated at 26,300 (coefficient of variation (CV) = 18.5%) based on summer surveys during 1988-2016 (Hakamada et al. 2017) and 137 for the East China Sea stock (IWC 1996). Wade and Gerrodette (1993) estimated 13,000 (CV = 20%) Bryde's Whales for the eastern tropical Pacific from data collected during 1986-90. From 2015 to 2019 the UoA interacted with 15 Bryde's whales resulting in an annual interaction rate of 3 whales/year.

Based on the low level of UoA interactions with Byrde's Whales (3 animals/year) which represents 0.01% of the WCPO population, the reliability of observer data based on observer coverage rates approaching 100%, prohibition on the retention of cetaceans and the release of 83% of whales alive, the direct effects of the UoA are highly likely to not hinder recovery of this ETP species; SG 60 and SG 80 are met. In the absence of more up to date estimates of population size we cannot state with certainty there is a high degree of confidence that there are no significant detrimental direct effects of the UoA on this ETP species; SG 100 is not met.

Minke Whale
Recent abundance estimates for the western North Pacific (west of 170°E) derive from data collected during 2005-2012 and total 27,000 animals (CV 0.16) (Allison et al. 2014). Minke Whale abundance in the eastern North Pacific are generally lower than in the western region and was estimated at 4,410 animals: 636 (CV 0.72) for the U.S. west coast during 2008-2014 (Barlow 2016), 522 (CV 0.30) for the waters of British Columbia during 2004-08 (Best et al. 2015), 2,020 (CV 0.73) for the eastern Bering Sea shelf (Friday et al. 2013), and 1,232 (CV 0.34) for coastal waters of the northern Gulf of Alaska and the eastern and central Aleutian Islands (Zerbini et al. 2006). No estimates are available for the South Pacific Ocean. From 2015 to 2019 the UoA interacted with 2 Minke Whales resulting in an interaction rate of 1 whale every 2-3 years.

Based on the low level of UoA interactions with Minke Whales (1 animal every 2-3 years) which represents 0.007% of the WCPO population, the reliability of observer data based on observer coverage rates approaching 100%, prohibition on the retention of cetaceans and the release of all Minke Whales alive, the direct effects of the UoA are highly likely to not hinder recovery of this ETP species; SG 60 and SG 80 are met. In the absence of more up to date estimates of population size we cannot state with certainty there is a high degree of confidence that there are no significant detrimental direct effects of the UoA on this ETP species; SG 100 is not met.

Mobulas and Mantas (Giant Manta Rays and Devil rays)
Interactions reported by observers on UoA vessels from 2015 to 2019 was 1,024 animals. The majority of the interactions were with giant manta's (N=543) followed by unidentified mobula and mantas (N=481), resulting in

annual interaction rates of 109 Giant Manta Rays and 96 unidentified Mobula and Mantas. Most interactions occurred with unassociated sets and all animals were released alive except for two Giant Manta Rays retain by Chinese Taipei before the prohibition on retention was implemented through CMM 2019-05; unfortunately, information on their condition of all mobulas at the time of release is not available.

The population size of the giant manta rays and devil rays is difficult to assess, but abundance trajectories have been estimated based on long time series of sightings at diving sites. Locally, abundance varies substantially and may be based on food availability and the degree that they were, or are currently, being fished (https://www.iucnredlist.org/species/198921/68632946#threats). In most regions, Giant Manta Ray population sizes appear to be small ranging from 100 to 1,500 individuals (https://www.fisheries.noaa.gov/species/giant-manta-ray). Photo-identification studies at specific aggregation sites have yielded minimum estimates of 42 to 500 individuals over almost a decade of monitoring in most locations, including: Mozambique, Thailand, Myanmar, Indonesia (Holmberg and Marshall 2018), Japan (Kashiwagi et al. 2010), Brazil (Luiz et al. 2008), and Mexico (Rubin 2002). A 6-year study has catalogued more than 2,000 individuals in a single site, off mainland Ecuador (Holmberg and Marshall 2018). The trend of the number of individuals varies widely across the range of the Giant Manta Ray, but trends appear stable where they are protected and declining rapidly where fishing pressure is greater (Ward-Paige et al. 2013; Holmberg and Marshall 2018).

Unidentified Mobula and Mantas is a bycatch component of many small and large-scale fisheries, with much of this catch being aggregated across multiple devil rays species. The lack of comprehensive species-specific catch, fishing effort, and population data necessitates the use of genus-wide inferences to assess population reductions and based on a combination of declining sightings-per-unit-effort (SPUE) data from monitored populations, catch landings data, and evidence of depletions, significant population declines have been inferred (Fernando and Stevens 2011, Couturier et al. 2012, Hall and Roman 2013, Ward-Paige et al. 2013, Lewis et al. 2015, Croll et al. 2016, Rohner et al. 2017). In areas where catch data is available population declines of 50-99% over the last three generations (38 years; from 1980-2018) has been inferred, with a further population reduction suspected over the next three generation lengths (2018–2056).

Between 2000 and 2007, total landings of Giant Manta Rays and devil rays increased from 900 mt to over 3,300 mt according to the FAO Fishstat Capture Production database (Lack and Sant 2009). This equates to an average of 1,593 mt being landed per annum with this average increasing to 4,462 mt per annum from 2008 to 2017 (Oakes and Sant 2019). In 2018, reported catches of Giant Manta Rays in the western Pacific Ocean was estimated at 201 mt. Based on observer data from the UoA the annual catch of Giant Manta Rays was estimated at 6 mt, which accounts for approximately 3% of the annual western Pacific Ocean catch. Reported catches of devil rays from the western Pacific Ocean in 2018 is estimated at 5,500 mt, while the reported annual catch by the UoA is estimated at 2 mt, accounting for approximately 0.04% of the annual western Pacific Ocean catch.

Given the low mortality of the UoA relative to other sources of mortality, the representativeness of observer data based on observer coverage rates approaching 100%, the release of all mobulas alive, the broad distribution of mobula and manta species throughout the Pacific Ocean, the prohibition on retaining mobulas and mantas, interactions with UoA vessels are likely to not hinder recovery of Giant Manta Rays and unidentified Mobula and Mantas , (devil rays); SG 60 is met.

In the absence of more up to date information on population size, better species identifications, and more detailed data on condition of species when released, we cannot state with certainty that effects of the UoA are highly likely to not hinder recovery these ETP species; SG 80 Is not met.

Marine Turtles

There are five species of marine turtles recorded as caught during fishing operations by UoA vessels between 2015 and 2019: Green Turtle (*Chelonia mydas*), Loggerhead Turtle (*Caretta caretta*), Olive Ridley Turtle (*Lepidochelys olivacea*), Hawksbill Turtle (*Eretmochelys imbricate*), and Leatherback Turtle (*Dermochelys coriacea*). Across all UoA vessels 34% of the interactions were associated with green turtles (N=12), followed by

loggerhead turtles at 31% (N=11), olive ridley turtles at 20% (N=7), hawksbill turtles at 9% (N=3), and leatherback turtles each at 6% (N=2) (Table 20). All turtles were reported released alive, except for one Loggerhead turtle, resulting in an overall loggerhead turtle survival rate of 91% at the time of discarding. This results in the loss of approximately one loggerhead turtle every five years.

There is likely to be an unobserved level of mortality, however, of turtles that are entangled in FADs, but with the adoption of CMM 2018-01 that requires the use of lesser -entangling FADs this source of mortality has likely been mitigated. Nevertheless, the recent Common Oceans (ABNJ) Project (2017) reported that a recent ecological risk assessment conducted for the Atlantic suggested that overall mortality from purse seine fisheries is inconsequential compared to longline fisheries (Angel et al. 2014) Research conducted in the Atlantic and India ocean on Marine turtle interactions with purse-seine fishery, indicates that entanglement in DFADs was not a main source of incidental captures of marine turtles (Bourjea et al 2014).

In the Pacific, there are two distinct population segments (DPS) of loggerheads; the North Pacific Ocean DPS and the South Pacific Ocean DPS. In the North Pacific DPS total nesting abundance is estimated at approximately 8,733 nesting females. In the South Pacific DPS total nesting abundance is estimated at approximately 500 nesting females (https://www.fisheries.noaa.gov/species/loggerhead-turtle). The other species of turtle with high observed UoA interactions is the green turtle and based on nesting abundance information for the Hawaiian green turtle subpopulation there has been a long-term increase in the size of the population (Kittinger et al., 2013).

The olive ridley turtles inhabits tropical and subtropical waters of the Pacific, Indian and Atlantic Oceans. In the Pacific, large nesting populations occur in Mexico and Costa Rica. A single arribada nesting beach remains in La Escobilla, Mexico, where an estimated 450,000 turtle nests, and the Pacific coast of Costa Rica supports an estimated 600,000 nesting Olive Ridleys Turtles between its two major arribada beaches, Nancite and Ostional. Approximately one olive ridley turtle is caught annually by the UoA and all turtles were released alive. While there is likely to be an unobserved level of direct mortality resulting from interactions with UoA fishing operations the loss of 1 Olive Ridley Turtle annually, which amounts to < 0.001% of the total population, would not impact the population.

The largest nesting populations of hawksbill turtles occur in Australia and Solomon Islands. Approximately 2,000 hawksbills nest annually on the northwest coast of Australia and 6,000 to 8,000 nest annually in the vicinity of the Great Barrier Reef. The largest rookery for hawksbill turtles in the South Pacific Ocean is in the Arnavon Islands of the Solomon Islands, where approximately 2,000 hawksbill turtles nest each year. Approximately, one hawksbill turtle is caught every two years by the UoA and all turtles were released alive. If we assumed all UoA turtle interactions resulted in mortality, the loss of one hawksbill turtle annually would amount to approximately 0.01% of the population and likely result in negligible impact.

The Pacific leatherback populations are most at-risk for extinction as evidenced by ongoing precipitous declines in nesting through their range. Primary nesting habitats of the Eastern Pacific leatherback turtle population are in Mexico and Costa Rica, with some isolated nesting in Panama and Nicaragua. Over the last three generations, nesting in this region has declined by over 90 percent. In the Western Pacific, leatherback nesting in Malaysia has essentially disappeared, declining from about 10,000 nests in 1953 to only one or two nests per year since 2003. The largest remaining nesting population, which accounts for 75 percent of the Western Pacific population, occurs in Papua Barat, Indonesia and has also declined by over 78 percent. Approximately, one leatherback turtle is caught every three years by the UoA and all turtles were released alive.

Retention of turtles is prohibited, and all landings are monitored. The very low-level percentage of the total WCPFC Convention Area catch of the target species by UoA vessels, the broad distribution of all the species, research indicating mortality on account of entanglement is low, and the 100% observer coverage makes it highly likely that the known direct effects of fishing by UoA vessels on all populations of marine turtles are not hindering their recovery. This meets the requirements of the SG 60 and SG 80 levels but not the SG 100 level.

Seabirds
In the Pacific Ocean the population abundance of black footed albatross is estimated at 64,500 breeding pairs, of which approximately 98% of the pairs are found in the protected Northwestern Hawaiian Islands (BirdLife International, 2008). Based on UoA observer data from 2015-2019 only one interaction with a black-footed albatross was observed and the bird was released alive. While there is likely to be an unobserved level of direct mortality resulting from interactions with UoA fishing operations the loss of one black footed albatross in five years would clearly not impact the population. Longline fishing is recognized as a major threat to seabird populations worldwide, and interactions with purse seine fisheries considered infrequent (Brooke (2004).

Based on available population estimates and the low level of observed UoA interactions (one seabird in 5 years), the representativeness of observer data based on observer coverage rates approaching 100%, it is inconceivable that the UoA is impacting the population of Black Footed Albatross. Based on this information there is a high degree of confidence that there are no significant detrimental direct effects of the UoA on this ETP species; SG 60, SG 80 and SG 100 are met.

C	**Indirect effects**			
	Guide post		Indirect effects have been considered for the UoA and are thought to be highly likely to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species.
	Met?		Yes: All Elements	No: All Elements

Rationale

Indirect effects of the UoA tuna fishery on ETP species are those arising from impacts to feeding efficiency/prey availability caused by direct extraction of the prey, or trophic effects resulting from removing skipjack tuna, yellowfin tuna and bigeye tuna from the ecosystem. Indirect trophic effects of fishing for tuna on the tropical pelagic ecosystem have been considered through a variety of modelling approaches (Kitchell et al. 1999, Sibert et al. 2006, Allain et al. 2007, Allain et al. 2015, Lehodey et al. 2014). The results suggest that although the UoA fishery will impact the relative biomass at different trophic levels through indirect relationships (increasing the catch of smaller tuna decreases the biomass available to sharks and other apex predators but increase the biomass of other prey and smaller predatory species) the warm pool ecosystem was found to be resistant to considerable perturbation (e.g. large changes in the harvest of the surface fish community) a feature apparently related to the high diversity of predators in the food web that consume a wide range of prey (Allain et al. 2015). Based on this information Indirect effects have been considered for the UoA and are thought to be highly likely to not create unacceptable impacts; SG 80 is met for all ETP species. While the ecosystem modelling results provide insights into the impact of the tropical tuna fisheries on Pacific pelagic ecosystems they are in some ways dated and likely require updates to advance their relevancy. This is not to say that the results are not applicable rather additional and updated information is available and could be incorporated into existing modelling platforms or used to develop new approaches. On this basis there is not a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species; SG 100 is not met. Information on then reported diets of taxonomic groups is provided below which provides evidence for the score of SG 80.

Sharks
While Silky, Oceanic Whitetip, and Scalloped Hammerhead Sharks are both apex predators and opportunistic feeders, capable of feeding through multiple trophic levels. The removal of tuna species allows for the proliferation of other prey species (e.g., rainbow runner) that can be utilized by shark species (Allian et al., 2015). Whale sharks are plankton feeders and the UoA does not directly impact this resource.

Ceteceans
Oceanic dolphins and some whale species (Minke and Bryde's whale) feed on a variety of small mid-water fishes, including myctophids, as well as squids and shrimps. As these prey species are not targeted by the UoA there is little chance for indirect impacts on oceanic dolphins and whales. Noting that the removal of tuna species allows for the proliferation of other small prey species and predatory species that can be utilized by oceanic dolphins (Allian et al., 2015).

Mobula and Manta
This group of species feeds primarily on plankton and the UoA does not impact this resource. These is no reason to suspect that fishing operations of the UoA will indirectly impact mobula and manta rays.

Marine Turtles
Marine turtles, depending on the species, may eat seagrasses, algae, sponges, sea squirts, squid, shrimp, crabs, jellyfish, cuttlefish or sea cucumbers. As the UoA does not target these species or are they caught as bycatch, there are minimal, if any, indirect effects stemming from UoA fishing operations.

Seabirds
Black-footed Albatross are both a carnivores and scavengers. Their diet is dominated by small fish. squid, crustaceans, other invertebrates, and carrion. As these prey species are not targeted by the UoA there is little chance that fishing operations would impacts this species.

References

Common Oceans (ABNJ) Tuna Project 2018b & 2018c, Clarke 2018, Kitchell et al. 1999, Sibert et al. 2006, Allain et al. 2007, Allain et al. 2015, Lehodey et al. 2014, Peatman et al. 2018, Rice and Harley 2012a, WCPFC-SC 2018a; Baird 2018; Odell and McClune, 1999; Wade and Gerrodette, 1993; Bradford et al. 2017; Jefferson et al. 2015; Gerrodette et al. 2005; Gerrodette and Forcada 2005; Williams et al, 2020; Carretta et al. 2011; Kanaji et al. 2017; Gerrodette et al. 2008; Kasuya 2017; Miyashita 1993; Hakamada et al. 2017; Wade and Gerrodette, 1993; Allison et al. 2014; Barlow 2016; Best et al. 2015; Friday et al. 2013; Zerbini et al. 2006; Holmberg and Marshall 2018; Kashiwagi et al. 2010; Luiz et al. 2008; Rubin 2002; Ward-Paige et al. 2013; Fernando and Stevens 2011; Couturier et al. 2012; Hall and Roman 2013; Ward-Paige et al. 2013; Lewis et al. 2015; Croll et al. 2016; Rohner et al. 2017; Angel et al. 2014; Kittinger et al., 2013; Brooke 2004;

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	60-79
Information gap indicator	More information is sought on post release mortality estimates for ETP species.
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	All Flag states: 75
Condition number (if relevant)	2-3

PI 2.3.1 Scoring Calculation

UoA	Element	SI a	SI b	SI c	Element score	PI score
All Vessels	**Sharks**					
	Whale shark	N/A	80	80	80	75
	Silky shark	N/A	80	80	80	
	Oceanic whitetip shark	N/A	80	80	80	
	Scalloped hammerhead shark	N/A	100	80	90	
	Cetaceans					
	False Killer Whale	N/A	60	80	70	
	Rough-toothed Dolphin	N/A	60	80	70	
	Indo-pacific bottlenose dolphin	N/A	60	80	70	
	Spinner dolphin	N/A	80	80	80	
	Common dolphin	N/A	80	80	80	
	Common bottlenose dolphin	N/A	80	80	80	
	Short-finned pilot whale	N/A	80	80	80	
	Bryde's whale	N/A	80	80	80	
	Minke whale	N/A	80	80	80	
	Sei Whale	N/A	60	80	70	
	Fin Whale	N/A	80	80	80	
	Blue Whale	N/A	80	80	80	
	Mobula and Manta					
	Giant Manta Ray	N/A	60	80	70	
	Unidentified Mobula and Mantas	N/A	60	80	70	
	Marine turtles					
	Green turtles	N/A	80	80	80	
	Loggerhead turtle	N/A	80	80	80	
	Olive ridley turtle	N/A	80	80	80	
	Hawksbill turtle	N/A	80	80	80	
	Leatherback turtle	N/A	80	80	80	
	Seabirds					
	Black-footed Albatross	N/A	100	80	90	

PI 2.3.2 – ETP species management strategy

PI 2.3.2		The UoA has in place precautionary management strategies designed to: - meet national and international requirements; - ensure the UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	**Management strategy in place (national and international requirements)**			
	Guide post	There are measures in place that minimise the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	NA	NA	NA
Rationale				
As SIb is scored, SIa is not scored (SA3.11.2 states that: The team shall evaluate either scoring issue (a) or scoring issue (b) on the ETP species management strategy: SA3.11.2.1 "Where there are requirements for protection and rebuilding provided through national ETP legislation or international agreements, the team shall score scoring issue (a). SA3.11.2.2 Where there are no requirements for protection and rebuilding provided through national ETP legislation or international agreements, the team shall score scoring issue (b)." Although there are requirements for protection of ETP species, there are no explicit rebuilding requirements thus SI b is scored.				
b	**Management strategy in place (alternative)**			
	Guide post	There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species.
	Met?	Yes—All ETP elements and flags	No—All mobula and manta rays Yes: All other ETP elements	No—All ETP elements
Rationale				
Whale shark CMM 2019-04 includes the requirement that "CCMs shall prohibit their flagged vessels from setting a purse seine on a school of tuna associated with a whale shark if the animal is sighted prior to the commencement of the set"				

and that "in the event that a whale shark is not deliberately encircled in the purse seine net, the master of the vessel shall ensure that all reasonable steps are taken to ensure its safe release". WCPFC has adopted guidelines for the safe release of encircled whale sharks.[12]As a member of ISSF, Tri Marine only purchases from vessels where skippers have completed ISSF Skipper Best Practices training, which is relevant to all ETP species mentioned below.[13]
CMM 2019-04 also contains measures to reduce mortality of sharks generally. The general provisions of Article 5 of the WCPFC Convention, including the requirement to avoid overfishing, apply to whale shark. The requirement for 100% observer coverage is a measure that allows management to be able to assess compliance with CMMs and the need any additional measures should they be required. The introduction of 'lesser entangling' FADs, as required by CMM 2018-01 (para 19), addresses the issue of potential unobserved mortality of whale sharks from FAD due to entanglement. The requirement for 'lesser entangling' FADs came into effect January 1st 2020. In addition, ISSF requires members source from purse seine vessels with a public policy regarding the use of only 'lesser entangling' FADs. Tri Marine is in compliance with this requirement in their latest audit report.

The measures in place included in CMM 2019-04 and CMM 2018-01,as well as ISSF voluntary measures and the observer program requirements are expected to ensure the UoA does not hinder the recovery of whale sharks , meeting the SG60. Noting, there is monitoring, analyses, and management systems via observer records to gauge compliance against CMM 2019-04 requirements these linked measures provide a strategy to manage the impacts of fishing on whale sharks. The assessment team concludes there is a strategy in place (a cohesive arrangement of several management measures designed to manage impact of the UoA on whale sharks) that is expected to ensure the UoA does not hinder the recovery of whale sharks, meeting the SG80.

Given the lack of testing and analysis of the management measures and responses, this is not considered a "comprehensive strategy", thus the SG100 is not met.

Silky, Oceanic Whitetip, and Scalloped Hammerhead Sharks
CMM 2019-04 contains specific conservation measures for silky, oceanic whitetip, and scalloped hammerhead sharks and CMM 2019-04 also contains measures to generally reduce mortality of sharks. The general provisions of Article 5 of the WCPFC Convention, including the requirement to avoid overfishing, apply to silky, scalloped hammerhead, and oceanic whitetip sharks. There is monitoring through logbooks and 100% observer coverage. A stock assessment for silky sharks has been undertaken (Common Oceans (ABNJ) Tuna Project 2018a and 2018b), and CMM 2013-08 (now CMM 2019-04) responded to the findings of a previous assessment. A stock assessment has also been undertaken (Rice and Harley 2012a). The introduction of 'lesser entangling' FADs, as required by CMM 2018-01 para 19 and detailed in the background, is one of the measures and addresses the issue of potential unobserved mortality due to the entanglement of sharks in for FADs.

The measures in place included in CMM 2019-04, CMM 2018-01, as well as ISSF voluntary measures and the observer program requirements are expected to ensure the UoA does not hinder the recovery of Silky, Scalloped Hammerhead, and Oceanic Whitetip shark species, meeting the SG60. Noting there is monitoring, analyses, and management systems via observer records, to gauge compliance against CMM 2019-04 requirements, these linked measures provide a strategy to manage the impacts of fishing on silky, scalloped hammerhead, and oceanic whitetip sharks. The assessment team concludes there is a strategy in place (a cohesive arrangement of several management measures designed to manage impact of the UoA on silky, scalloped hammerhead, and oceanic whitetip sharks) that is expected to ensure the UoA does not hinder the recovery of these shark species, meeting the SG80.

[12] https://www.wcpfc.int/doc/supplcmm-2012-04/guidelines-safe-release-encircled-animals-including-whale-sharks

[13] https://iss-foundation.org/what-we-do/verification/participating-company-audit-reports/download-info/tri-marine-final-compliance-report-for-activities-in-2019/

Given the lack of testing and analysis of the management measures and responses, this is not considered a "comprehensive strategy", thus the SG100 is not met.

Cetaceans
CMM 2011-03 contains measure specifically designed to reduce the impacts of fishing on cetaceans, as detailed in the background, including a prohibition on the deliberate setting of purse seines on them and the requirement for safe release for unintentionally captured animals. The general provisions of Article 5 of the WCPFC Convention, including the requirements to assess impacts on non-target species and protect biodiversity, apply to cetaceans. The WCPFC process for regularly reviewing catch data, updating stock or risk assessments, and revising CMMs when a need to do so has been identified, is evidence that there is a mechanism for modifying fishing practices in light of the identification of unacceptable impacts, as required for there to be a strategy. These processes include consideration of all known issues including post-release survival of released animals. The introduction of 'lesser entangling' FADs, as required by CMM 2018-01, is one of the measures and addresses the issue of potential unobserved mortality due to entanglement of cetaceans in FADs.

These WCPFC measures, with which all UoA fleets are required to comply, are considered to constitute a strategy that is sufficient to ensure that the UoA does not hinder the recovery of any cetacean populations, meeting the SG80. Given the lack of testing and analysis of the management measures and responses, this is not considered a "comprehensive strategy", thus the SG100 is not met.

Mobula and Manta Rays
CMM 2019-05, which enters into force on January 1, 2021, contains measure specifically designed to reduce the impacts of fishing on mobula rays, as detailed in the background, including a prohibition on the deliberate setting of purse seines on them and the requirement to implement safe handling and release protocols for unintentionally captured animals. The general provisions of Article 5 of the WCPFC Convention, including the requirements to assess impacts on non-target species and protect biodiversity, also applies to mobula rays. The introduction of 'lesser entangling' FADs, as required by CMM 2018-01, addresses the issue of potential unobserved mortality due to the entanglement of pelagic species in FADs, which may also benefit mobula rays (currently there is no information of FAD entanglement in the Pacific Ocean).

These WCPFC measures, with which all UoA fleets are required to comply, are considered to constitute a strategy as defined in Table SA8 of the FCR v2.0 that is sufficient to ensure that the UoAs do not hinder the recovery of mobula and manta ray populations should that be considered. However, CMM 2019-05, which stipulates a suite of conservation measures, recently entered into force and the UoAs have yet to develop protocols to address the measures. On the basis the requirements of SG 60 are met, but not the requirements000 of SG 80 and SG 100.

Marine turtles
CMM 2008-03 contains measures specifically designed to reduce the impacts of fishing marine turtles. As detailed in the background, these include avoiding encirclement of sea turtles, and if a sea turtle is encircled or entangled, take practicable measures to safely release it. The general provisions of Article 5 of the WCPFC Convention, including the requirements to assess impacts on non-target species and protect biodiversity, apply to marine turtles.

The WCPFC process for regularly reviewing catch data, updating stock or risk assessments, and revising CMMs when a need to do so has been identified, is evidence that there is a mechanism for modifying fishing practices in light of the identification of unacceptable impacts, as required for there to be a strategy. These processes include consideration of all known issues including post-release survival of released animals. The introduction of 'lesser entangling' FADs, as required by CMM 2018-01, is one of the measures and addresses the issue of potential unobserved mortality due to entanglement of marine turtles in FADs.

The measures in place included in CMM 2008-03, CMM 2018-01, as well as ISSF voluntary measures and the observer program requirements are expected to ensure the UoA does not hinder the recovery of marine turtles, meeting the SG60. Noting, there is monitoring, analyses, and management systems via observer records, to gauge compliance against CMM 2008-03 requirements, these linked measures provide a strategy to manage the impacts of fishing on marine turtles. The assessment team concludes there is a strategy in place (a cohesive arrangement of several management measures designed to manage impact of the UoA on marine turtle species) that is expected to ensure the UoA does not hinder the recovery of these turtle species, meeting the SG80.

Given the lack of testing and analysis of the management measures and responses, this is not considered a "comprehensive strategy", thus the SG100 is not met.

Seabirds

The general provisions of Article 5 of the WCPFC Convention, including the requirements to assess impacts on non-target species and protect biodiversity, apply to seabirds. The WCPFC has adopted CMM 2018-03 for seabirds which also requires CCMs to implement the safe handling and release guidelines outlined in Suppl_CMM 2018-03. Additionally, CCMs are required annually to provide to the Commission, in Part 1 of their annual reports, all available information on interactions with seabirds reported or collected by observers to enable the estimation of seabird mortality in all fisheries to which the Convention applies**.** The WCPFC process for regularly reviewing catch data, updating stock or risk assessments, and revising CMMs when a need to do so has been identified, is evidence that there is a mechanism for modifying fishing practices in light of the identification of unacceptable impacts, as required for there to be a strategy. On this basis SG60 is met.

Noting there is monitoring, analyses, and management systems via observer records, to gauge compliance against CMM 2018-03 and CMM Suppl, 2018-03 requirements, these linked measures provide a strategy to manage the impacts of fishing on seabirds. The assessment team concludes there is a strategy in place (a cohesive arrangement of several management measures designed to manage impacts of the UoA on seabird) that is expected to ensure the UoA does not hinder the recovery of seabird species, meeting the SG80.

Given the lack of testing and analysis of the management measures and responses, this is not considered a "comprehensive strategy", thus the SG100 is not met.

c	**Management strategy evaluation**			
	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Yes—All ETP elements	Yes—All ETP elements	No—All ETP elements

Rationale

Whale shark

Information from observers and logbooks, and the CMM measures detailed above in SIb that are based on best practice and understanding of what works for the particular species and is practicable within the constraints of purse seine operations, coupled with a recent risk analysis (Common Oceans (ABNJ) Tuna Project 2018c), which is based on information directly about the fishery and the species involved, provides an objective basis for confidence that the strategy in place for whale sharks will be effective. We do not consider there to be a high

level of confidence, however, because sets on whale sharks are still occurring, and post-release survival is a major source of uncertainty in the risk assessment, which depends in part on the development and implementation of better safe handling practices (Common Oceans (ABNJ) Tuna Project 2018c).

This meets the requirements of the SG 60 and SG 80 levels but not of the SG 100 level.

Silky shark
Information from observers and logbooks, and the CMM measures detailed above in SIb that are based on best practice and understanding of what works for the particular species and is practicable within the constraints of purse seine operations, coupled with continued WCPFC stock assessments, provides an objective basis for confidence that the strategy in place for silky sharks will be effective. The quantitative analysis of stock status (Common Oceans (ABNJ) Tuna Project 2018a), which is based on information directly about the fishery and the species involved, also provides confidence that previous fishing has not greatly depleted the WCPFC component of the stock. There is not a high level of confidence to this, however, because of the new uncertainties with the latest Pacific wide stock assessment.

This meets the requirements of the SG 60 and SG 80 levels but not of the SG 100 level.

Oceanic whitetip shark
Information from observers and logbooks, and the CMM measures detailed above in SIb that are based on best practice and understanding of what works for the particular species and is practicable within the constraints of purse seine operations, coupled with continued WCPFC stock assessments, provides an objective basis for confidence that the strategy in place for oceanic whitetip shark will be effective. Oceanic whitetip shark was assessed in 2012 (Rice ad Harley, 2012) and 2019 (Tremblay-Boyer et al., 2019). The results of the recent assessment using logbook reported catch and observer records suggest that the adoption of the no-retention measure for this species in 2013 for WCPFC Members, Cooperating Non-Members and Participating Territories (CMM2011-04) may not have been ineffective at rebuilding the stock, clearly indicating that a strategy involving monitoring and stock assessments provides an objective basis for confidence. There is not a high level of confidence to this, however, because of the new uncertainties with the latest Pacific wide stock assessment.

This meets the requirements of the SG 60 and SG 80 levels but not of the SG 100 level.

Scalloped Hammerhead Shark
Information from observers and logbooks, and the CMM measures detailed above in SIb that are based on best practice and understanding of what works for the particular species and is practicable within the constraints of purse seine operations, provides an objective basis for confidence that the strategy in place for this shark species will be effective. This meets the requirements of the SG 60 and SG 80 levels but not of the SG 100 level.

Cetaceans, Mobula, Marine turtles, and Seabirds
Information from observers and logbooks, and the CMM measures detailed above in SIb that are based on best practice and understanding of what works for the particular species and is practicable within the constraints of purse seine operations, provides an objective basis for confidence that the strategies in place will be effective. This meets the requirements of the SG 60 and SG 80 levels but not of the SG 100 level.

d	**Management strategy implementation**			
	Guide post		There is some evidence that the measures/strategy is being implemented successfully.	There is clear evidence that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective

				as set out in scoring issue (a) or (b).
	Met?		No: All ETP elements	No: All ETP elements

Rationale

There is some evidence that measures/strategies are being implemented successfully through the data collected from the observer programs and through the information on mortalities contained in the National Reports to the WCPFC. This would meet requirements at the SG80 level. However there is no clear evidence indicating that the strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).

The requirement for 'lesser entangling' FADs came into effect January 1 2020. In addition, ISSF requires members source from purse seine vessels with a public policy regarding the use of only 'lesser entangling' FADs. Tri Marine was in compliance with this requirement in their latest audit report. However, more information on the monitoring mechanisms regarding implementation of 'lesser entangling' FADs is necessary to evaluate the successful implementation of CMM 2018-01 para 19. It should be noted that the ROP will be collecting information to assess compliance with CMM 2018-01 once the observer program resumes.

Observer records from Vanuatu and FSM have identified 'live whale or live whale shark' sets (approximately 3% of total number of sets) in their reports. As stipulated in CMM 2012-04, it is prohibited for purse seine vessels to intentionally set on Whales or Whale sharks in the WCPFC. However, the WCPFC has not issued a non-compliance against FSM or Vanuatu related to this matter.

Finally, CMM 2011-04, Conservation and Management Measure for Oceanic Whitetip Shark, prohibits the retention of oceanic whitetip shark on all CCM fishing vessels. However, based on observer data oceanic whitetip sharks (N=2) were retained on UoA vessels from Vanuatu..

Based on the culmination of this information the SG80 requirement is not met.

e	**Review of alternative measures to minimize mortality of ETP species**			
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	Yes: All ETP elements and flags	No: All cetaceans and mobula and manta rays, and flag Yes: All other ETP elements and flags	No: All elements and flags:

Rationale

<u>Whale shark</u>
There is a WCPFC Shark Research Plan (WCPFC-SC13-2017/EB-IP-09) that contains a detailed list of projects concerning sharks that include updated assessments, improved data collection, stock discrimination studies, mitigation practices, training guides, and other activities. Actions specific to whale sharks are included in this plan together with another general shark work. Progress against this plan is regularly reviewed at WCPFC-SC meetings.

Proposals to improve mitigation measures are also considered at WCPFC-SC meetings (e.g. Jones and Francis 2017). This meets the SG60 level.

WCPFC also supports third party initiatives including the Common Oceans (ABNJ) Project that has initiated a range of projects including studies on post-release survival of sharks (WCPFC-SC13-2017/EB-IP-06). This is evidence of an ongoing commitment to the review of the effectiveness of mitigation measures. Furthermore, data on bycatch are collected by observers on all trips, results are presented annually to the relevant meetings, bycatch is a standing item on the agenda of the WCPFC-SC and the WCPFC-SC reviews the relevant CMMs at each annual meeting. So, in practice, the potential effectiveness and compliance of measures is reviewed annually, and SG80 is met.

Whale sharks are not routinely assessed and without population assessments and estimates of post release mortality its unclear if the implemented measures are achieving their goal(s). The SG 100 level is not met.

Silky shark and oceanic white-tip shark

There is a WCPFC Shark Research Plan (WCPFC-SC13-2017/EB-IP-09) that contains a detailed list of projects concerning sharks that include updated assessments, improved data collection, stock discrimination studies, mitigation practices, training guides, and other activities. Actions specific to silky sharks are included in this plan together with other general shark work. Progress against this plan is regularly reviewed at WCPFC-SC meetings. Proposals to improve mitigation measures are also considered at WCPFC-SC meetings (e.g. Jones and Francis 2017). On this basis SG60 is met.

WCPFC also supports third party initiatives including the Common Oceans (ABNJ) Project that has initiated a range of projects including studies on post-release survival of sharks (WCPFC-SC13-2017/EB-IP-06). For the sharks considered here, this is evidence of an ongoing commitment to the review of the effectiveness of mitigation measures. Furthermore, data on bycatch are collected by observers on all trips, results are presented annually to the relevant meetings, bycatch is a standing item on the agenda of the WCPFC-SC and the WCPFC-SC reviews the relevant CMMs at each annual meeting. So, in practice, the potential effectiveness and compliance of measures is reviewed annually, and SG80 is met. However, there is no biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality on silky and oceanic whitetip sharks. Estimates of the full spectrum of mortality sources (e.g. post-release and FAD entanglement) are not available but are required to assess the utility of alternative measures aimed at minimizing mortality. On this basis SG100 is not met.

Scalloped Hammerhead Sharks

There is a WCPFC Shark Research Plan (WCPFC-SC13-2017/EB-IP-09) that contains a detailed list of projects concerning sharks that include updated assessments, improved data collection, stock discrimination studies, mitigation practices, training guides, and other activities. Actions specific to hammerhead shark biology is included in the plan and viewed as a precursor to a quantitative assessment. Progress against this plan is regularly reviewed at WCPFC-SC meetings. Proposals to improve mitigation measures are also considered at WCPFC-SC meetings (e.g. Jones and Francis 2017). On this basis SG60 is met.

Data on bycatch are collected by observers on all trips, results are presented annually to the relevant meetings, bycatch is a standing item on the agenda of the WCPFC-SC and the WCPFC-SC reviews the relevant CMMs at each annual meeting. So, in practice, the potential effectiveness and compliance of measures is reviewed annually, and SG80 is met.

As scalloped hammerhead sharks are not routinely assessed and without population assessments and estimates of post release mortality it's unclear if any implemented measures are achieving their goal(s). For scalloped hammerhead sharks, the SG100 level is not met.

Cetaceans
There are no research programs for cetaceans that is comparable to that for sharks. There is ongoing attention to areas where interactions are considered a problem, such as the required prohibition of setting on cetaceans, and data on interactions are collected by observers on all trips and presented annually to the relevant meetings. Bycatch is a standing item on the agenda of the WCPFC-SC and the WCPFC-SC reviews compliance of the relevant CMMs at each annual meeting. On this basis SG60 is met.

However, once an initial review of the potential effectiveness of an alternative measure(s) is completed there is no regular review of the (potential) effectiveness and practicality of alternative measures to minimize UoA-related mortality of cetacean species, rather compliance monitoring is initiated. On this basis SG80 is not met.

Mobula and Manta Rays

There are no research programs for mobula and manta rays that is comparable to that for sharks. There is ongoing attention to areas where interactions are considered a problem, such as the required prohibition of setting on setting on mobula and manta rays as well as protocols for their release, and data on interactions are collected by observers on all trips and presented annually to the relevant meetings. Bycatch is a standing item on the agenda of the WCPFC-SC and the WCPFC-SC reviews compliance of the relevant CMMs at each annual meeting. On this basis SG60 is met.

However, once an initial review of the potential effectiveness of an alternative measure(s) is completed there is no regular review of the (potential) effectiveness and practicality of alternative measures to minimize UoA-related mortality of mobula and manta ray species, rather compliance monitoring is initiated. On this basis SG80 is not met.

Seabirds

There are no research programs for seabirds that is comparable to that for sharks but a plan to review the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of seabird species has been adopted as part of CMM 2018-03. While there is ongoing attention to areas where interactions are considered a problem, such as the required use of mitigation measures on longline vessels (e.g., tori lines), data on interactions are collected by observers on all trips and presented annually to the relevant meetings. Also, bycatch is a standing item on the agenda of the WCPFC-SC and the WCPFC-SC reviews compliance of the relevant CMMs at each annual meeting. On this basis SG60 is met.

CMM 2018-03 stipulates:

- **The SC and TCC will annually review any new information on new or existing mitigation measures or on seabird interactions from observer or other monitoring programmes. Where necessary, an updated suite of mitigation measures, specifications for mitigation measures, or recommendations for areas of application will then be provided to the Commission for its consideration and review as appropriate.**
- **The provisions in this section shall be reviewed no later than 3 years from the implementation date by the SC, based on the best available scientific information. The review shall consider both the efficacy of the mitigation measures being used and the risk to vulnerable seabirds in areas where mitigation measures are not required and make recommendations to the Commission if needed.**

Based on this information the assessment team concluded there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are

implemented as appropriate; SG80 is met. However, the review process is not considered to rise to the level of biennial review and SG100 is not met.

Marine Turtles

There are no research programs for marine turtles that is comparable to that for sharks but a plan to review the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of marine turtle species has been adopted as part of CMM 2018-04. While there is ongoing attention to areas where interactions are considered a problem, such as requiring, if practical, fishers to resuscitate comatose turtles prior to their release, data on interactions are collected by observers on all trips and presented annually at relevant WCPFC meetings. Also, bycatch is a standing item on the agenda of the WCPFC-SC and the WCPFC-SC reviews compliance of the relevant CMMs at each annual meeting. On this basis SG60 is met.

CMM 2018-04 stipulates:

- **The WCPFC SC and TCC will review information reported by CCMs pursuant to this measure. Where necessary an updated suite of mitigation measures, specifications for mitigation measures, or recommendations for their application will be developed by these committees and provided to the Commission for its consideration and review.**
- **The measures in CMM 2018-04 will be reviewed by the Commission in 2021 to consider expanding the scope of the measure to include mitigation measures for deep-set longline fisheries, based on advice from the SC and TCC and on information provided by CCMs pursuant to this measure.**

Based on this information the assessment team concluded there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate; SG80 is met. However, the review process is not considered to rise to the level of biennial review and SG100 is not met.

References	
Common Oceans (ABNJ) Tuna Project 2018a, 2018b, 2018c; Jones and Francis 2017; Pilling et al 2017b; Poisson et al., 2012; Rice and Harley 2012a	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	USA, Chinese Taipei, Cook Islands, New Zealand, Vanuatu, FSM, Solomon Islands – 60-79
Information gap indicator	More information sought regarding observer records for live whale/whale shark sets from Vanuatu and FSM flagged vessels.
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	USA, Chinese Taipei, Cook Islands, Solomon Islands, Vanuatu, FSM, New Zealand - 75
Condition number (if relevant)	2-4

Table 22. PI 2.3.2 Element Scoring Calculation - Cook Islands, USA, Chinese Taipei, Solomon Islands, Vanuatu, FSM, and New Zealand

UoA	Element	SI a	SI b	SI c	SI d	SI e	Element score	PI score
All Vessels	**Sharks**							
	Whale shark	N/A	80	80		80	80	75
	Silky shark	N/A	80	80		80	80	
	Oceanic whitetip shark	N/A	80	80		80	80	
	Scalloped Hammerhead Shark	N/A	80	80		80	80	
	Cetaceans							
	False Killer Whale	N/A	80	80		60	75	
	Short-finned Pilot Whale	N/A	80	80		60	75	
	Rough-toothed Dolphin	N/A	80	80		60	75	
	Indo-Pacific Bottlenose Dolphin	N/A	80	80		60	75	
	Spinner Dolphin	N/A	80	80		60	75	
	Common Dolphin	N/A	80	80		60	75	
	Common Bottle nose Dolphin	N/A	80	80		60	75	
	Sei Whale	N/A	80	80		60	75	
	Fin Whale	N/A	80	80		60	75	
	Blue Whale	N/A	80	80		60	75	
	Bryde's Whale	N/A	80	80		60	75	
	Minke Whale	N/A	80	80		60	75	
	Mobula							
	Giant Manta Ray	N/A	60	80		60	75	
	Unidentified Mobula and Manta Rays	N/A	60	80		60	75	
	Marine turtles							
	Green turtles	N/A	80	80		80	80	
	Loggerhead turtle	N/A	80	80		80	80	
	Olive ridley turtle	N/A	80	80		80	80	
	Hawksbill turtle	N/A	80	80		80	80	
	Leatherback turtle	N/A	80	80		80	80	
	Seabirds							
	Black-footed Albatross	N/A	80	80		80	80	

PI 2.3.3 – ETP species information

PI 2.3.3		Relevant information is collected to support the management of UoA impacts on ETP species, including: - Information for the development of the management strategy; - Information to assess the effectiveness of the management strategy; and - Information to determine the outcome status of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guide post	Qualitative information is adequate to estimate the UoA related mortality on ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.	Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Yes - All ETP elements	No – Giant Manta Ray and Unidentified mobula and manta rays Yes: All other ETP elements	Yes – Fin whale, minke whale, blue whale, and seabirds No - All other ETP elements
Rationale				

Catch data is collected by observers through the ROP following established data collection protocols. There has been a requirement for 100% observer coverage on purse seine vessels since 2010 and based on published information by SPC the estimated observer coverage rate for the UoA from 2015 to 2019 is 100% (Williams et al 2020). Differences in available observer data at the flag level over the same period were noted and available data provided for this assessment ranged from 86% to 100%; differences are due to data submission and processing issues. With this level of observer coverage there is confidence in the representativeness of the catch data. It should be noted that non-compliance with the observer coverage requirement has not been raised for any of the flags.

Whale shark

Information available on the key shark species is collected mainly by the combination of vessel logbooks and observer programs. It includes data on catch weight and effort at an operational level for most fleets, and some size composition data and biological data. These measures are supported by a Shark Research Plan that provides additional information on specific topics of relevance to the assessment of the impact of purse seine fishing. A quantitative assessment of the level of mortality is available and a risk assessment for the impact of purse seine

fishing on WCPO whale sharks. On this basis, **s**ome quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of this ETP species, SG80 is met. This information does not yet support a high degree of certainty however, because sets on whale sharks are still common, and post-release survival remains a source of uncertainty in the risk assessment (Common Oceans (ABNJ) Tuna Project 2018c), SG100 is not met.

Silky shark

Information available on silky shark is collected mainly by the combination of vessel logbooks and the observer program. It includes data on catch weight and effort at an operation level for most fleets, and some size composition data and biological data. These measures are supported by a Shark Research Plan that provides additional information on specific topics of relevance to the assessment of the impact of fishing by longlines. There is some quantitative information available on the level of mortality for the UoA from the observer program and it is expected to be small relative to the broader impact of fishing on the whole stock. There is a stock assessment for silky shark that has estimated the consequences of fishing on their status in the WCPO (Clarke et al., 2018). On this basis, some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of this ETP species, SG80 is met.

With reference to SA3.1.8, estimates of post-release survival and mortality resulting from FAD entanglement, both considered to be unobserved direct mortalities, have not been sufficiently estimated for purse seine fisheries, including the UoA. . However, the impact of entanglement mortality is likely to be mitigated with the requirement for all purse seine fisheries to deploy low-entanglement risk FADs starting in January 2020 (CMM 2018-01). The assessment team notes that despite these limitations on information the available quantitative data on silky sharks (catch and stock assessment) is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of silky sharks, thus the SG80 continues to be met. On this basis, quantitative information is not available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of this ETP species, SG100 is not met.

Oceanic whitetip shark

Information available on oceanic whitetip sharks is the same as for silky sharks (logbooks and observer records). These measures are supported by a Shark Research Plan that provides additional information on specific topics of relevance to the assessment of the impact of fishing by longlines. There is some quantitative information available on the level of mortality for the UoA from the observer program and it is expected to be small relative to the broader impact of fishing on the whole stock (see Figure 24). The recent stock assessment (Tremblay-Boyer et al., 2019). provided an estimate of the consequences of fishing on the status of oceanic whitetip shark, and the stock is still considered to be overfished and experiencing overfishing. While the no retention policies adopted in 2013 by WCPFC (CMM 2011-04, now CMM 2019-04) significantly reduced fishing mortality, the stock still suffers from excessive fishing pressure and mortality, especially by longlines. On this basis, some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of this ETP species, SG80 is met.

Estimates of post-release survival and mortality resulting from FAD entanglement, both considered to be unobserved direct mortalities, have not been sufficiently estimated for purse seine fisheries, including the UoA. Oceanic whitetip shark is a species potentially at risk from entanglement (ISSF 2019). However, the impact of entanglement mortality is likely to be mitigated with the requirement for all purse seine fisheries to deploy low-entanglement risk FADs starting in January 2020 (CMM 2018-01). On this basis, quantitative information is not available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of this ETP species, SG100 is not met.

Scalloped hammerhead shark

Information available on scalloped hammerhead shark is collected mainly by the combination of vessel logbooks and the observer program. It includes data on catch weight and effort at an operation level for most fleets, and some size composition data and biological data. These measures are supported by a Shark Research Plan that provides additional information on specific topics of relevance to the assessment of the impact of fishing by longlines. There is some quantitative information available on the level of mortality for the UoA from the observer program and it is expected to be small relative to the broader impact of fishing on the whole stock. Given the low likely impact of the UoA on this particular species, the quantitative information available is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of this ETP species, SG80 is met.

Estimates of post-release survival and mortality resulting from FAD entanglement, both considered to be unobserved direct mortalities, have not been sufficiently estimated for purse seine fisheries, including the UoA. Scalloped hammerhead shark is a species potentially at risk from entanglement. However, the impact of entanglement mortality is likely to be mitigated with the requirement for all purse seine fisheries to deploy low-entanglement risk FADs starting in January 2020 (CMM 2018-01). On this basis, quantitative information is not available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of this ETP species, SG100 is not met.

Cetaceans

As there is confidence in the UoA observer data, adequate estimates of total catch for all cetacean species are available. While there are population estimates for many cetaceans interacting with the UoA, the estimates are generally based on older information and/or from only a segment of the full population. While contemporary data does exist, it has yet to be analysed (pers. comm. NOAA Fisheries, SWFSC).

Given the confidence in observer data and noting the low number of interactions with fin, minke, and blue whales, we contend quantitative information is adequate to assess with a high degree of certainty the magnitude of UoA related impacts, mortalities and injuries and the consequences for the status of these ETP cetacean species; SG 60, SG 80, and SG 100 levels are met.

For the remaining cetacean species (spinner, common, rough-toothed, common bottlenose, and indo-pacific, dolphins; false killer whales, short-finned pilot whale, sei whale, and bryde's whale) there is confidence in the UoA observer data, and adequate estimates of total catch and FATE of these cetacean species is available. On this basis, some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of these ETP species, SG80 is met. To assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of these ETP species, contemporary estimates of population size will likely be required, as well as estimates of post release mortality; SG100 is not met. The WCPFC has recommended CCMs conduct studies to assess the impacts of purse seine fishing on cetaceans but progress on any such research is not known at this time. Also, note that the risk to cetacean populations can be determined without accurate estimates of post release mortality.

Mobula

Given the confidence in UoA observer data, adequate estimates of total catch for all mobula species are available. Although the concern with unobserved mortality discussed in the scoring of sharks, above, may also apply to rays, it is less of a concern and the use of the low entanglement risk FADs are designed to reduce risks considerably.
While all animals interacting with purse seining operations were released, the condition of released animals is not sufficiently known, and at present only adequate qualitative information is available to estimate UoA related mortality on mobula species. On this basis SG 60 is met but not SG 80 or SG 100.

Marine turtles

Given the confidence in UoA observer data, adequate estimates of total catch for all turtle species are available. Although the concern with unobserved mortality due to entanglement in FADs discussed in the scoring of sharks, above, also applies to turtles, it is less of a concern. The majority of turtle interactions in the UoA is associated

with unassociated and log sets (65%), and the use of the low-entanglement risk FADs are designed to reduce remaining risks considerably. On this basis quantitative information is adequate to assess the UoA related mortality and impact, and to determine whether the UoA may be a threat to protection and recovery of ETP turtle species; SG80 is met. As there is likely to be some level of unobserved post release mortality it is not possible to say that the status of these species is known with a high degree of certainty; SG 100 is not met**.**

Seabirds
Given the confidence in observer data and noting the low number of interactions with black-footed albatross (N=1), we contend quantitative information is adequate to assess with a high degree of certainty the magnitude of UoA related impacts, mortalities and injuries and the consequences for the status of this ETP species; SG 60, SG 80, and SG 100 levels are met.

b	**Information adequacy for management strategy**			
	Guide post	Information is adequate to support measures to manage the impacts on ETP species.	Information is adequate to measure trends and support a strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	Yes - All ETP elements	Yes – All ETP elements	No - All ETP elements

Rationale

All ETP Species

Catch data is collected by observers through the ROP following established data collection protocols. There has been a requirement for 100% observer coverage on purse seine vessels since 2010 and based on published information by SPC the estimated observer coverage rate for the UoA from 2015 to 2019 is 95% (Williams et al 2020). While differences in observer coverage rates at the flag level were observed, ranging from 86% to 100%, there is confidence in the representativeness of the catch data and collected ancillary information to determine where and when catches of different species are made, as well as the performance of established best practice guidelines (both handling and safe release). All of the CMMs directed at ETP species stipulate reporting requirements to support a strategy to manage impacts on ETP species. While some of the information for ETP species was considered qualitative in SIa (mobula and manta rays), such data is routinely used in statistical analysis, including trend analysis. On this basis information is considered adequate to measure trends and support a strategy to manage impacts on ETP species; SG 60 and SG 80 are met.

Estimates of post release mortality would be required to support a comprehensive strategy to manage impacts and such estimates are not available for all ETP species. We note that population risk analyses can still be performed without these estimates but there could be significant uncertainty with the outcome. On this basis Information is not considered adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives, SG100 is not met.

References

Common Oceans (ABNJ) Tuna Project 2018c, Tremblay-Boyer et al., 2019; Filmalter et al., 2013; ISSF 2019

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	60-79
Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	75
Condition number (if relevant)	2-5

PI 2.3.3 Scoring Element Calculation

UoA	Element	SI a	SI b	Element score	PI score
All Vessels	**Sharks**				75
	Whale shark	80	80	80	
	Silky shark	80	80	80	
	Oceanic whitetip shark	80	80	80	
	Scalloped hammerhead shark	80	80	80	
	Cetaceans				
	False Killer Whale	80	80	80	
	Short-finned pilot whale	80	80	80	
	Rough-toothed dolphin	80	80	80	
	Indo-pacific bottlenose dolphin	80	80	80	
	Spinner dolphin	80	80	80	
	Common dolphin	80	80	80	
	Common bottlenose dolphin	80	80	80	
	Bryde's Whale	80	80	80	
	Minke Whale	100	80	90	
	Sei Whale	80	80	80	
	Fin Whale	100	80	90	
	Blue Whale	100	80	90	
	Mobula				
	Giant Manta Ray	60	80	70	
	Unidentified mobula and mantas	60	80	70	
	Marine turtles				
	Green turtles	80	80	80	
	Loggerhead turtle	80	80	80	
	Olive ridley turtle	80	80	80	
	Hawksbill turtle	80	80	80	
	Leatherback turtle	80	80	80	
	Seabirds				
	Black-footed Albatross	100	80	90	

PI 2.4.1 – Habitats outcome

PI 2.4.1		The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates		
Scoring Issue		SG 60	SG 80	SG 100
a	Commonly encountered habitat status			
	Guide post	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	Met?	Yes	Yes	Yes
Rationale				
The assessment team has included in the assessment of each UoA(s) all set types (anchored FADs, unassociated, logs, whale, whale shark, and associated), these are scored as part of each UoA and not separated as individual scoring elements. The fishery employs pelagic purse seine gear uniquely operating in open ocean and deep waters, thus the water column is considered to be the commonly encountered habitat by the fishery, to be scored under SI a. Purse seine nets deployed on any of the set types observed in the fisher would never routinely contact demersal habitats and there is no potential for serious or irreversible harm to pelagic habitats from the use of this fishing gear (Brown 2016). Impacts to pelagic ecosystems are assessed under PI 2.5.1. Knowledge in relation to the way purse seine fishing gear is used as well as the sea areas where the fleet operates (open ocean, deep waters) is sufficient to discount any significant impacts on seabed habitats from the fishery. In 2010, the WCPFC adopted measures for 100% coverage of purse seine vessels operating between 20°N and 20°S. Data from logbooks, VMS tracks of vessels and observer reports, provides good evidence that the fishery operates in areas and in a manner in which there is no serious or irreversible harm to demersal habitats. The UoA also employs drifting FADs, there are potential impacts to coastal habitats, particularly coral reefs, when derelict FADs become stranded. Coral reefs are considered habitats and thus scored under SI b. Based on the evidence, mainly gear type and areas of operation, the assessment team concludes that the UoA(s) is unlikely and highly unlikely to reduce structure and function of the water column to a point where there would be serious or irreversible harm, thus meeting the requirements of the SG 60, SG 80 and SG 100 levels.				
b	VME habitat status			
	Guide post	The UoA is unlikely to reduce structure and function of the VME habitats to a point	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats

		where there would be serious or irreversible harm.	be serious or irreversible harm.	to a point where there would be serious or irreversible harm.
	Met?	Yes	No	No

Rationale

Note on Harmonization: As Per MSC requirements outlined in the FCP v2.2 Table GPB1 only partial harmonisation is required for PI 2.4.1b, CABs are only required to harmonise recognition of VMEs where both UoAs operate in the same 'managed area'. CABs have agreed for the WCPO and EPO that coral reefs are recognized as VMEs.

Although there is no evidence of the fishery itself interacting with VME habitats. There is the potential for lost or derelict FADs becoming beached on coral reefs or drifting into marine protected areas both considered to be VMEs. Escalle et al. (2018c), have estimated that at least 5% of buoys in the Pacific (used to track individual drifting FADs) ended up beached with the connected FAD potentially damaging sensitive ecosystems such as coral reefs. This was considered to be an underestimate as buoys may be deactivated before reaching coastlines.

A study of DFADs across the WCPFC estimated that between 44,700 and 64,900 FADs were deployed annually from 2017-2019 (Banks and Zaharia 2020). Data from the PNA FAD Tracking Programme estimated that 52% of FADs were classified as lost, 11% were retrieved; 8% were beached; 15% were deactivated due to unknown causes and 14% were deactivated by the fishing company and left drifting, unmonitored at sea. Of these interactions, 31% occurred in Solomon Islands, 30% in PNG, 17% in Kiribati, Gilbert Islands, 8% in Tuvalu, 6% in F. S. Micronesia, 4% in Marshall Islands, 1% in Nauru, and 0.5% in Palau, with the rest in non PNA countries. Information on the fate of FADs outside PNA is limited because fishing companies tend to turn off FAD buoy tracking capabilities info once the FADs are outside PNA EEZ's (i.e. a phenomena known as geo-fencing) (Escalle et al. 2019). An over-whelming majority (92%) of beaching events occurred on coral reef habitat. It is estimated that the range of dDFADs and coral reefs interactions were between 8,534 and 12,391 per annum in the period 2017-2019. The annual impact on coral reefs collectively was assessed as affecting 4 and 6 km^2 of coral reef habitat per year; it was assumed highly likely none of corals survived the impact (Banks and Zaharia 2020). Based on this estimate, the beaching of one FAD impacts 2 m^2 of coral reef (Banks and Zaharia 2020).

There are variations in the design of drift FAD, traditionally FADs employed in the WCPO are also known as Highest entanglement FADs. With the implementation of CMM 2018-01, as of January 1st 2020, all FADs deployed in the WCPFC must be Lesser Entanglement Risk (LER) FADs, which require only small mesh netting to be used and for rafts to be tightly wrapped with no loose netting hanging. These design elements are expected to reduce the risk of entanglement events. Banks and Zaharia (2020) point out that the "[…] wildlife entangling impacts are reduced with LER FADs, but the number of beachings and habitat impacts are expected to remain similar (when netting panels are used, the impact surface per FAD will still be large while for "sausage" designs, the coiled netting can unravel creating a large impact surface)." They conclude that only the use of Non-entangling FADs, which do not use netting, is likely to significantly reduce the impact on coral reefs.

The MSC defines serious or irreversible harm to structure or function as "[…] the reduction in habitat structure, biological diversity, abundance and function such that the habitat would be unable to recover to at least 80% of its unimpacted structure, biological diversity and function within 5-20 years, if fishing were to cease entirely" (MSC Fisheries Standard v2.01 Table GSA3). According to the estimates by Banks and Zaharia (2020) the annual impact on coral reefs collectively was assessed as affecting 4 and 6 km2 of coral reef; the WCPO region coral reef in the South Pacific covers in excess of 90,000 km^2 . Following MSC requirements, for habitats cumulative impacts are evaluated in the management PI (2.4.2), thus the assessment team focused solely on the impacts of the UoA when scoring PI 2.4.1. It's challenging to clearly link the impact of derelict FADs to a specific fleet or UoA, given that purse seine vessels will set on FADs that were not deployed by their own fleet. The assessment team used the 350 'active FAD per vessel' limit introduced by the WCPFC as a reference to estimate the impact

of the UoA (This is considered an overestimate given most years the majority of vessels deploy <150 FADs per year (Escalle et al, 2020). Given the number of vessels in the UoA (N=7), the overall impact of the UoA on coral reefs in the region is negligible and unlikely to reduce structure and function of coral reef habitats to a point where there would be serious or irreversible harm, thus meeting the SG60.

While the overall risk and impact of FAD is small in scale of the WCPO coral reefs, there are still challenges in estimating the number of FAD deployed, active buoys, and tracking data. While there is information from the PNA FAD tracking programme, the information is still incomplete as FAD trajectories outside PNA waters are removed prior to submission to PNA (Escalle et al, 2020). There is limited understanding of impacts of sunk FADs (lost FADs that are not retrieved and not beached) (Banks and Zaharia 2020). Given these uncertainties, the team is unable to conclude that the UoA is highly unlikely to reduce structure and function of coral reefs to a point where there would be serious or irreversible harm, as required to meet the SG80.

c	**Minor habitat status**			
	Guide post			There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.
	Met?			No

Rationale

The vast majority of the Pacific Ocean is comprised of deep-water habitats (deep slope, abyssal, ridges, seamounts, mud plains, and trenches) that comprises approximately 180,000,000 km^2 (Harris et al, 2014) and within the WCPFC Convention Area deep-water habitats comprise approximately 100,000,000 km^2. While the UoA fishery does not interact with deep demersal habitats during purse seining, lost dFADs will eventually sink if they are not retrieved or do not become beached on a coastline. For the purposes of this analysis deep-water habitats are treated as minor habitats.

Given that the WCPFC Convention Area encompasses approximately 100,000,000 km^2, and the UoA is comprised of 7 vessels or 2% of the total number of active purse seine vessels registered in the WCPFC, it is extremely unlikely that the loss of dFADs from the UoA could reduce structure and function of these deep, demersal habitats to a point where there would be serious or irreversible harm. However, this is not based on evidence, but rather deductive reasoning. On this basis SG100 is not met.

References

Escalle et al. 2018; Brown 2016 ; Hall and Roman 2019, Escalle et al, 2020,

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Better information on the number of FADs lost from UoA vessels coupled with movement trajectories would provide information to assess risks to habitats from derelict FADs

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	70
Condition number (if relevant)	2-6

PI 2.4.2 – Habitats management strategy

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guidepost	There are **measures** in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a **partial strategy** in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a **strategy** in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	Yes all elements	Yes -Commonly Encountered Habitats No- VME	No all elements
	Justification	The commonly encountered habitat is considered to be the WCPO pelagic region. Shallow coral reef is considered to be a VME habitat. <u>Commonly Encountered Habitat</u> Purse seine sets on FADs themselves do not interact with any seafloor habitat during fishing. The requirement for 100% observer coverage and VMS tracking provides confidence that set types are appropriately reported as well as interactions with the sea floor. This is considered to be a partial strategy for managing pelagic habitat impacts and would ensure that any change to this situation would be detected. Moreover, given the gear employed a partial strategy is not necessary to mitigate impacts of the UoA on the commonly encountered habitat (water column). On this basis SG 60 and SG 80 levels are met. There does not appear to be a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on pelagic habitats in the WCPFC region, as the MSC defines strategies as component-specific, cohesive and strategic arrangements (Table SA8). On this basis SG 100 is not met. VME Habitat While there is no potential for purse seine nets to come in contact with reefs, FADs may become lost a drift ashore and potentially impact coral reef habitat. There are various measures in place to mitigate this potential, including a limit of 350 dFAD activated instrument buoys in place for vessels operating in the WCPFC Convention area, a three-month FAD closure through the summer, the requirement of lesser-entanglement risk FADs deployed after January 1, 2020, and encouraging the use of biodegradable FADs (CMM 2018-01). The use of lesser-entanglement-risk FAD designs has also been identified as a good option to minimize impacts to coastal habitats while the development of biodegradable dFAD designs continues (Banks & Zaharia 2020). Abandoned lost or otherwise discarded fishing gear (ALDFG) can potentially damage marine habitats including reefs, and CMM 2017-04 encourages CCMs to retrieve, and report lost gear. Additionally, the requirement for 100% observer coverage provides confidence that measures are followed.		

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.
		Based on deployment locations of dFADs that were known to have drifted ashore, as well as underlying oceanographic and atmospheric conditions, in the equatorial region Escalle et al (2019) assessed the likelihood of deployed FADs beaching based on modeled trajectories from different deployment locations within the WCPO. Their analysis showed that the likelihood (probability) of beaching was highest inside EEZs in the central to eastern end of the WCPO, irrespective of the time spent drifting. The extent to which these higher-probability areas are outside of areas normally fished by all UoA vessels is unknown at this time, but from available data it appears that some of the fishing areas are outside the higher-probability area. SA3.14.2 (MSC Standard v2.01) requires that UoAs encountering VMEs shall include, at the SG60 level: Implementation by the UoA of precautionary measures to avoid encounters with VMEs, based on commonly accepted move-on rules, and at the SG80 level: Implementation by the UoA of precautionary measures to avoid encounters with VMEs, such as scientifically based, gear- and habitat-specific move-on rules or local area closures to avoid potential serious or irreversible harm on VMEs. The MSC guidance move-on rules are an avoidance measure with the objective that the UoA avoid any further encounter with potential VMEs (GSA3.14.2.2). The premise of a move-on rule is that once a threshold is surpassed an action to modify the fishing activity is triggered. Move-on rules would not be effective measures to mitigate impact of lost gear, which are unintended impacts occurring in remote areas from the fishing location. In PI 2.4.2 SI (a) at the SG60 the standard requests for "commonly accepted move-on rules". There are no explicit 'commonly accepted move-on rules' for derelict FADs, as explained previously this management approach is not appropriate to mitigate impacts of lost gear. However, the measures mentioned in the rationale for SI a. (FAD closure periods, zonal restrictions for deployment areas of drifting FADs, Lesser Entangling FAD design and limits to the number of instrumented FADs deployed) are those implemented by the WCPFC, as a result of a review of FAD management options, scientific information, and guidelines employed in other RFMOs. The measures implemented are also in line with recommendations proposed by workshops and NGOS, and thus are commonly accepted measures to avoid impact of FADs on habitats. The guidance of the standard itself in GSA3.14.2.2 states that a partial strategy for the UoA may not be required to meet the requirements outline in SA3.14.2.2 if it is a low-impacting bottom gear. As noted above this is a low-impact gear. As such, a move on rule is not considered appropriate. Noting that the UoA comprises approximately 2% of the total number of active purse seine vessels registered in the WCPFC Convention Area the impact of the UoA fishery on coral reef habitats is likely to be negligible. There are measures in place that are not directly designed to manage the impact of FADs on corals reefs (closure periods, zonal restrictions for deployment areas of drifting FADs, use of Lesser Entangling FAD design and limits to the number of instrumented FADs deployed) but that have a beneficial effect on impact of dFADs on coral reefs, thus meeting the SG60. While there is information from the PNA FAD tracking programme, the information is still incomplete for FAD trajectories outside PNA, the development of biodegradable FADs or non-entangling FADs are only recommendations at this point in CMM 2018-01. There is not a truly cohesive arrangement of several measures intended to achieve an outcome as it relates to impact of FADs on coral reefs, thus the assessment team considers a partial strategy is not fully in place, thus the SG80 is not met.

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
b	Management strategy evaluation			
	Guidepost	The measures are **considered likely** to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some **objective basis for confidence** that the measures/partial strategy will work, based on **information directly about the UoA and/or habitats** involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on **information directly about the UoA and/or habitats** involved.
	Met?	Yes - All elements	Yes - Commonly Encountered Habitats No- VME	No - All elements
	Justification	Common Encountered Habitat There is no evidence that pelagic habitats are impacted by purse seine gear and given the location of fishing (high-seas deep-ocean habitat) there is no possibility that the purse seine gear itself would come in to contact with the seabed. While FADs from the UoA may become lost and sink the impact would be minimal given the size of the fleet relative to the WCPFC purse seine fleet (≈ 2%) and the area of the deep-ocean habitat, approximately 100,000,000 km^2. As purse seine gear is expensive and held up with buoys, there is very low possibility of gear loss. This information provides an objective basis for confidence that the partial strategy will work, based on information directly about the UoA and the habitats involved. On this basis SG 60 and SG 80 are met. As there has not been 'testing' of the partial strategy the SG 100 is not met. VME Habitat The team evaluated the measures in place described in SI a of this PI (gear type, closure periods, zonal restrictions for deployment areas of drifting FADs, use of Lesser Entangling FAD design and limits to the number of instrumented FADs deployed). The measures in place are likely to work based on plausible argument: • Purse seine fishing nets would not come in contact with coral reefs given the location of fishing activities in the WCPO (high-seas deep-ocean habitat). As noted above purse seine gear is expensive so there is little chance for the gear to drift ashore and impact coral reef habitats. • Use of Lesser entangling FADs, zonal and temporal restrictions on deployment of FADS, and limits on the number of 'active' FADs are in place and implemented. • There is a FAD tracking system in place within PNA • Based on available data on modelling of impacts of FADs (Banks and Zaharia, 2020) the team has information on the estimated level of impact of DFADs. This in additional with the number of vessels in the UoA (N=7), provide a plausible argument that given the negligible impact of the UoA on coral reefs, that measures in place are likely to work, thus the SG60 is met. However, as noted in SI a of this PI, the assessment team determined a partial strategy is not in place, the following objective evidence is missing for the SG80 to be met:		

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
		• The FAD limit on 350 active bouys, does not directly limit the number of deployed FADs, only the number of 'active' FADs • The DFAD tracking programme in PNA does not extend to FAD trajectories outside PNA waters • There is little evidence that lesser entangling FADs reduce impact on VMEs • There is no evidence of progress in biodegradable materials or non-entangling FADs implementation.		
c	Management strategy implementation			
	Guidepost		There is **some quantitative evidence** that the measures/partial strategy is being implemented successfully.	There is **clear quantitative evidence** that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		Yes	No
	Justification	Information on the spatial extent and on the timing and location of use of the purse-seine fishing gear is collected by at-sea observers and by VMS (100% coverage), and thus there is accurate monitoring that provides quantitative evidence of successful implementation in that all purse seine sets are correctly classified and required data are reported. CMM 2018-01 was passed requiring use of Lesser Entangling FADs, the UoA has provided evidence that based on their ISSF review they comply with this requirement. The ROP has established collection protocols to ensure compliance with the use and deployment of low-entanglement-risk FADs and this information is currently being collected. The commitment to use low-entanglement-risk FADs is reviewed annually by the UoA as is the requirement to limit the number of active dFADs with instrumented buoys to 350. On this basis there is *some* quantitative evidence that the existing measuresare being implemented successfully and SG80 is met. There has not been a definitive study to determine if the implemented strategy is achieving objectives outlined in Sia. On this basis SG100 is not met.		
d	**Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs**			
	Guidepost	There is **qualitative evidence** that the UoA complies with its management requirements to protect VMEs.	There is **some quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is **clear quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	Yes	Yes	No
	Justification	The only potential impacts from the UoA on VMEs is from lost FADs beaching on coral reefs.		

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.
		The assessment team did not find evidence of protection measures afforded to coral reefs from impacts from DFAD, thus the focus of the assessment of this PI is on UoA complies with its management requirements that may indirectly mitigate impact of DFAS on coral reefs: There is qualitative and some quantitative evidence that the UoA complies with these management requirements: UoA vessels comply with WCPFC time-area closures and because purse seine fishing gear does not interact with the benthos, move on rules have not been established. The UoA has limited dFADs with instrumented buoys to 350 and is complying with the use of lesser-entanglement -risk FAD, as evidenced by the ISSF audit reports. Compliance with existing CMMs are monitored regularly. Thus the SG60 and SG80 are met.
References		Burke et al., 2011, Burke et al., 2012

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	60-79
Information gap indicator	More information is sought on the number of lost FADs, reporting protocols for lost FADS and compliance.
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	70
Condition number (if relevant)	2-7

PI 2.4.2 Scoring Calculation

Element	SI a	SI b	SI c	SI d	Element score	PI Score
Commonly encountered Habitat	N/A	80	80	NA	80	70
VME	N/A	60	60	80	65	

PI 2.4.3 – Habitats information

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	The types and distribution of the main habitats are broadly understood. OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.	The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
	Met?	: Yes	Yes	No
Rationale				

For this assessment the commonly encountered habitat is considered to be the WCPO pelagic region and shallow coral reefs is considered to be a VME habitat; following GSA3.13.3 both are considered main. The North and South Pacific Oceans have been mapped, and the distribution of reef habitats are known (UNEP-WCMC, WorldFish Centre, WRI and TNC 2018).

Commonly Encountered Habitat
FAD sets take place in the epipelagic habitat and so purse seines themselves do not interact with benthic habitat during their operation. The distribution of the pelagic habitat is known over the spatial range within which the fishery operates from widely available sea charts and bathymetric maps of the Western Pacific Ocean. There are no vulnerable pelagic habitats.

VME Habitat
As described above, derelict FADs potentially impact coral reefs. However, coral reefs are vulnerable to a wide range of potential threats. As outlined in PI 2.4.1, the vulnerability specifically to derelict FADs can be estimated at a level that is appropriate to limited scale of the likely impact. The nature, distribution and vulnerability of the main habitats including coral reefs in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. On this basis SG80 is met.

However, the distribution of all habitats that might be impacted by the FAD fishery is not well known. Given that the spatial distribution and resolution of potentially impacted VMEs can occur at small scales (10s of meters), far less than scales of main reefs (100 of meters), finer resolution maps of VMEs would be required to understand the distribution of all vulnerable habitats and potential impacts. On this basis SG100 is not met

b	**Information adequacy for assessment of impacts**			
	Guide post	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	The physical impacts of the gear on all habitats have been quantified fully.
	Met?	Yes	No	No

Rationale

Commonly Encountered Habitat
Information on the spatial extent and on the timing and location of use of the purse seine fishing gear is collected by at-sea observers and by VMS (100% coverage) and thus there is accurate, near real-time monitoring of the spatial extent of interaction, and the timing and location of use of this component of the fishing gear. FAD purse seine sets are not considered capable of affecting the epipelagic habitat and does not interact with benthic habitat during its operation.

VMEs: There is sufficient information on loss rates and FAD tracks to know that many drifting FADs become beached on coral reefs (Escalle 2019; Banks and Zaharia 2020). The potential impacts of such beaching are also broadly understood and the impacts of other marine debris (that would have similar impacts) has been incorporated in an analysis of risks to coral reefs (Burke et al. 2012). There is reliable information on the spatial locations of fishing, but there is still uncertainty on the number of active FADs per vessel per month, the number of new FADs deployed per year, locations of FADs that are lost and become beached. This limited reliable information on the spatial extent, timing and location of FAD interactions with coral reefs hinders a full understanding of the nature of the impacts of the gear on these habitats.

This meets the requirements of the SG 60 level but not of the SG 80 level.

c	**Monitoring**			
	Guide post		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.
	Met?		Yes	No

Rationale
Commonly encountered habitats: For FAD sets, the habitat relevant to the use of a purse seine is the pelagic water column and no hard substrate is impacted by this component of the gear. The client vessels all operate under a VMS scheme and thus there is accurate, near real-time monitoring of the spatial extent of interaction, and the timing and location of use of the fishing gear. VMEs: The following information continues to be collected: • There is a requirement for 100% observer coverage, following the WCPFC ROP Minimum Standard Data Fields, observers collect a minimum of data on FADs, including: location of FAD sighted, FAD construction materials, FAD ID and deployment of FADS • PNA FAD tracking programme, implemented in 2016, is a very detailed dataset providing position and date/time, as mentioned in other PIs, the challenge is geofencing and obtaining information on FAD trajectories outside PNA waters. Despite the challenges in the PNA FAD tracking programme, there is sufficient to provide an estimate on number of FADs deployed and their impact on coral reefs as evidenced by Banks and Zaharia (2020) and Escalle (2020) to permit the detection of any increase in risk to the coral reefs, meeting the SG80 requirement. Changes in all habitat distributions is not monitored, thus the SG100 is not met.
References
Burke et al, 2012

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	60-79
Information gap indicator	More information is sought on the number of deployed and lost FADs, reporting protocols for lost FADS and compliance.

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	75
Condition number (if relevant)	2-8

PI 2.5.1 – Ecosystem outcome

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	**Ecosystem status**			
	Guide post	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Yes	Yes	No

Rationale

The MSC defines 'key ecosystem elements' as "the features of an ecosystem considered as being most crucial to giving the ecosystem its characteristic nature and dynamics, and are considered relative to the scale and intensity of the UoA. They are features most crucial to maintaining the integrity of its structure and functions and the key determinants of the ecosystem resilience and productivity" (SA3.16.3).

Further MSC guidance states that "key ecosystem elements may include trophic structure and function (in particular key prey, predators, and competitors), community composition, productivity pattern (e.g. upwelling or spring bloom, abyssal, etc.), and characteristics of biodiversity" (GSA3.18.1).

The UoA fishery occurs primarily in the equatorial region of the western central Pacific Ocean in the warm pool-cold tongue convergence zone. Allain et al. (2007) describe the warm pool as an oligotrophic system characterized by low salinity, low nitrates, high temperature, deep thermocline, low surface chlorophyll and maximum chlorophyll located at 90m depth.

The trophic structure of warm pool-cold tongue convergence zone ecosystems has been characterised using Ecopath and Ecosim models based on diet data (Allain et al. 2007). Skipjack tuna occupied a central position in the system as a key predator and prey species, with high biomass, high production, high consumption and important cannibalism. Juvenile skipjack tuna was a major source of food for all the top predators.

For this assessment, the ecosystem is therefore defined as the WCPO warm pool – cold tongue pelagic ecosystem. The key ecosystem elements are then defined as 1) the WCPO warm pool – cold tongue oceanographic convergence zone, and 2) skipjack tuna as a key predator and prey species within the warm pool foodweb.

Noting that the warm pool-cold tongue convergence zone is a large oceanographic feature the UoA fishery would not disrupt this key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. For this element requirements at the SG 60, SG 80, and SG 100 levels are met.

Noting that estimates of spawning biomass for skipjack tuna in the WCPO are well above the level that will support MSY and current fishing mortality is approximately half the MSY level the stock is not overfished or considered to be experiencing overfishing. Modelling of the trophic dynamics in the warm pool-cold tongue convergence zone

noted that skipjack tuna appears to be a very resilient species, and nearly impossible to eliminate it from the system due to fishing. Griffiths et al. (2019) most recently used the ecosystem model of the western Pacific Warm Pool Province to explore the potential ecological impacts of varying FAD fishing effort (±50%) over 30 years. Their results indicated that reduction of FAD effort by at least 50% was predicted to increase the biomass of tuna species and sharks and return the ecosystem structure to a pre ‐ industrial ‐ fishing state within 10 years. The intrinsic resistance of the ecosystem to perturbation is likely related to the high diversity of predators in the warm pool-cold tongue food web that consume a wide range of prey (Allain et al 2015). Thus, resiliency of the ecosystem has not been impacted, and biological diversity would return to pre-fishing conditions. As per SA3.16.2, this study fulfills evidence required to determine that the UoA is highly unlikely to disrupt key elements underlying ecosystem structure and function to a point where there would be serious or irreversible harm, thus meeting the SG80	
References	
Allain et al. 2007, Griffiths et al. 2019,	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information is sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	80
Condition number (if relevant)	

PI 2.5.2 – Ecosystem management strategy

PI 2.5.2		There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	**Management strategy in place**			
	Guide post	There are measures in place, if necessary which take into account the potential impacts of the UoA on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan, in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.
	Met?	Yes –	Yes –	No –
Rationale				
At the regional level, the 1995 FAO Code of Conduct for Responsible Fisheries is used as the framework for sustainable fisheries for an "Ecosystem Approach to Fisheries Management (EAFM)". Tuna are important predatory species in the Pacific Ocean. The WCPFC's application of the FAO code extends to the highly migratory fish species including tuna through Conservation and Management Measures such as CMM 2018-01 on the management of bigeye, yellowfin and skipjack, as well as to the management of non-target species, in particular through Resolution 2005-03 on Non-Target Fish Species and CMMs to improve the protection of sharks. The aim of CMM 2018-01 in relation to skipjack is to maintain spawning biomass on average at a level consistent with the interim target reference point of 50% of the spawning biomass in the absence of fishing. CMM 2018-01 also lays out catch controls, measures for FAD set managements, and capacity limitation measures. Tools adopted by WCPFC include effort limits in major purse seine fisheries, FAD closures, high seas closures, and a discard ban in purse seine fisheries. Explicit LRPs have also been adopted for biomass and the fishing mortality rate, together with an explicit MSY-related interim TRP. Although not specifically designed to manage impacts on the ecosystem, the range of measures in place are considered which take into account the potential impacts of the UoA on key elements of the ecosystem (the WCPO warm pool – cold tongue oceanographic convergence zone and skipjack tuna as a key predator and prey species within the warm pool foodweb) thus the SG60 is met. The measures in place are considered to be working cohesively, mainly through the monitoring, evaluation and implementation of fishing controls for main tuna species, the team considers these arrangements to be a partial strategy in place, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem, thus meeting the SG80 While there is monitoring of skipjack removals and regular determinations of stock status conducted, there is no harvest strategy in place for skipjack. We note that there is no specific ecosystem management plan for the WCPO but also SA3.17.3.2 states that 'It may not be necessary to have a specific "ecosystem strategy" other than that which comprises the individual strategies for the other componentunder P1 and P2.' There are measures in place to address the main impacts of the UoA as these would arise from the directed fishing at skipjack and yellowfin tuna. However, SA3.17.2 further states that the 'plan and measures in place at SG 100 should be based on well-understood functional relationships between the UoA and the components and elements of the ecosystem.' While ecosystem modelling activities in the WCPO have occurred they are not based well-understood functional relationships.				

On this basis there is no strategy in place to address all main impacts of the UoA on the ecosystem and SG 100 is not met.

b	**Management strategy evaluation**			
	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ ecosystems).	There is some objective basis for confidence that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved.	Testing supports high confidence that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved.
	Met?	Yes –	Yes –	No –

Rationale

The regional stock assessments indicate that current harvest strategies and management measures have been successful in maintaining target species about the BMSY level. The strategy considers the significant sources of fishery related risks to the WCPO ecosystem, namely the removal of target species, risks associated with impacts of bycatch and discarding of a wide range of non-target ETP species. Overall, the strategy is considered likely to work. The extensive ecosystem modelling (described under PI 2.5.1), together with the current and projected future healthy status of skipjack tuna, a key predator and prey species, are results of a form of testing for the specific ecosystem that provides high confidence that the strategy will work..

The measures are considered likely to work, based on plausible argument, mainly that the current harvest strategies and management measures have been successful in maintaining target species about the BMSY level, thus the SG60 is met.

The current status of main tuna stocks in the WCPO in addition with the existing fishing effort controls, provide information collected about the UoA, which in combination with expert knowledge (outputs of the ecosystem models described in PI 2.5.1) provide an objective basis for confidence, meeting the SG80.

Given the lack of systematic monitoring and research on ecosystem impacts, the SG100 is not met.

c	**Management strategy implementation**			
	Guide post		There is some evidence that the measures/partial strategy is being implemented successfully.	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
	Met?		Yes –	No

Rationale

Stock assessments show that current management measures have largely been successful in maintaining target species well above PRI and at about the BMSY level. Available ecosystem modelling suggests it is unlikely the client fishery is having an impact on ecosystem functioning. The introduction of 100% observer coverage for the purse seine fisheries provides a platform for gathering information to monitor changes to the ecosystem. All these activities constitute a partial strategy which meets requirements at the SG80. Given that there is not a strategy in place with a clear objective the SG100 is not met.

References	
Allain et al. 2007, Allain et al. 2015, Kirby and Hobday, 2007, Gilman et al., 2014	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥80
Information gap indicator	Information is sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	80
Condition number (if relevant)	

PI 2.5.3 – Ecosystem information

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	**Information quality**			
	Guide post	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Yes – Both elements	Yes – Both elements	
Rationale				
A number of organisations are collecting data to improve the knowledge of the structure of the Pacific Ocean pelagic ecosystem. This occurs through observer programmes (e.g. bycatch composition and quantities), trophic analyses (e.g. stomach contents, stable isotopes), movement studies, mid-trophic level sampling (e.g. acoustics and net sampling of micronekton and zooplankton), ecosystem modelling, and stock assessments on non-target species. The adoption of 100% observer coverage for the purse seine fleet provides relevant catch or removal data. However, trophic analyses, movement studies, ecosystem modelling, and mid-trophic level sampling are conducted on a project-by-project basis and are not continuous in space and time. Key elements include: The WCPO warm pool-cold tongue convergence has been well studied, in particular its impact on ocean temperature, salinity, stratification, circulation and production (An et al. 2012, Ganachaud et al. 2012, Lehodey et al. 1997, Lehodey et al. 2003, Miller 2007, Tascheto et al. 2014). Ocean variability and its ecological impacts in the warm pool-cold tongue region has been studied through the advancement of the SEAPODYM model (Lehody 2001) which is actively pursued as an alternative modelling platform in WCPFC through the multi-agency Project 62 which affiliates the independently funded work on SEAPODYM into the SC's work programme (Lehodey et al., 2013b). The warm pool area produces almost 80% of the tuna caught by purse-seine and other surface gears in the WCPO and the large-scale movements of tropical tuna in the western central equatorial Pacific have been correlated with the position of the oceanic convergence zone (where the warm pool meets the cold tongue) (Lehodey et al. 1997). This is a nutrient rich zone that attracts large concentrations of forage fish which in turn attracts tuna. Information is adequate to understand this key element of the ecosystem and the SG60 and SG80 levels are met. Skipjack tuna as a key predator and prey species is considered to be another key element, particularly in the warm pool where extensive studies have been carried out to understand their role in the ecosystem (Allain et al, 2015, Lehodey et al., 2014). Assessments on skipjack are routinely conducted from a single species perspective incorporating advances to their biology and ecology as information becomes available. Based on this information the SG 60 and SG 80 levels are met.			
b	**Investigation of UoA impacts**			
	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information,	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail.	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail.

		but have not been investigated in detail.		
	Met?	Yes – Both elements	Yes _ Both elements	No – Both elements

Rationale

There does not appear to be any main impacts of the UoA on the WCPO warm pool-cold tongue oceanographic convergence zone. The continued development and application of the SEAPODYM model to the work of the WCPFC Scientific Committee, including its application to tuna and billfish fisheries in the Pacific Ocean, provides information to assess consequences of the UoA on the warm pool-cold tongue oceanographic convergence zone. This meets the SG 60 and SG 80 requirements. Impacts of the UoA on this key ecosystem element can be inferred from existing information and some have been investigated in detail, though not to the extent to meet SG 100 requirements.

Advancing our understanding of the role skipjack play as both a key predator and prey species has been investigated using Ecopath and Ecosim models based on diet data (Allain et al. 2007) as well impacts due to fishing pressure using the SEAPODYM model (Lehodey et al 2014). This meets the SG 60 and SG 80 requirements. Impacts of the UoA on this key element can be inferred from existing information and some have been investigated in detail, though not to the extent to meet SG 100 requirements.

c	**Understanding of component functions**			
	Guide post		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known.	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood.
	Met?		Yes	No

Rationale

Information on target and non-target species (bycatch and ETP species) is gathered by the SPC through logbook data and the regional observer programme, as well as being available via a number of historical research projects. Sufficient information is available to identify the range of species that are impacted and to determine their respective roles e.g. their trophic level and potential roles in transfer of energy and nutrients between various pelagic habitats (epipelagic, mesopelagic and bathypelagic) or between pelagic and demersal habitats.

In order to improve the availability of data, the Kobe Bycatch Technical Working Group (KBTWG) was established in 2009 with the aim to Identify, compare and review the data fields and collection protocols of logbook and observer bycatch data being employed by each Tuna RFMO. The KBTWG provides guidance for improving data collection efforts and, to the extent possible, the harmonization of data collection protocols among tuna RFMOs. These data will improve future analysis of ecosystem functions.
Tuna fishing in the WCPO is a large-scale fishery and as such considerable research is conducted annually to understand drivers of the warm pool-cold tongue ecosystem and the consequences of fishing. Main functions of the target species (yellowfin, skipjack, and bigeye tuna), primary species (albacore tuna), secondary species (billfish), ETP species (sharks, rays, cetaceans, turtles, and seabirds), and habitats (pelagic, coastal, and reef) are understood and known. On this basis SG 80 is met. Due to deficiencies with some UoA data its full impact on all components in the ecosystem may not be fully understood. On this basis SG 100 is not met.

d	**Information relevance**			
	Guide post		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Yes	No
Rationale				
Considerable research has been conducted to understand the warm pool-cold tongue pelagic ecosystem and advancing our understanding of the role skipjack play as both a key predator and prey species has been investigated using complex models (Allain et al. 2007, Allain et al. 2015, Lehodey et al. 2014) allowing for some the main consequences of the UoA on the ecosystem to be inferred. On this basis SG 80 is met. The data is not considered to be adequate to meet the SG 100 level.				
e	**Monitoring**			
	Guide post		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?		Yes	No
Rationale				
Within the WCPO extensive data (logbooks, observer programs, and independent research) continue to be collected that allow an increase in risk to be detected. On this basis SG 80 is met. However, in the absence of a comprehensive strategy for ecosystem management which incorporates the collection of broader ecosystem information than existing systems, SG 100 is not met.				
References				
Allain et al. 2007; Lehodey et al. 2013b; An et al. 2012; Ganachaud et al. 2012; Lehodey et al. 1997; Lehodey et al. 2003; Miller 2007; Tascheto et al. 2014.				

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	≥ 80
Information gap indicator	Information is sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	80
Condition number (if relevant)	

7.1 Principle 3

7.1.1 Principle 3 background

7.1.1.1 Area of Operation and Relevant Jurisdictions

The Tri Marine WCPO fishery for yellowfin, Thunnus albacares, bigeye, Thunnus obesus, and skipjack tuna, Katsuwonus pelamis, occurs in the Western Central Pacific Ocean (WCPO) within the boundaries of the waters managed by the Western Central Pacific Fisheries Convention. (see Figure 32below). Although the western boundary notionally extends to the east Asian seaboard, it is understood that the Convention Area does not include the South China Sea. In the east, the Convention Area adjoins, or overlaps, the area of competence of the Inter-American Tropical Tuna Commission. The southern boundary extends to 60 degrees south and the northern boundary extends to Alaska and the Bering Sea (https://www.wcpfc.int/frequently-asked-questions-and-brochures).

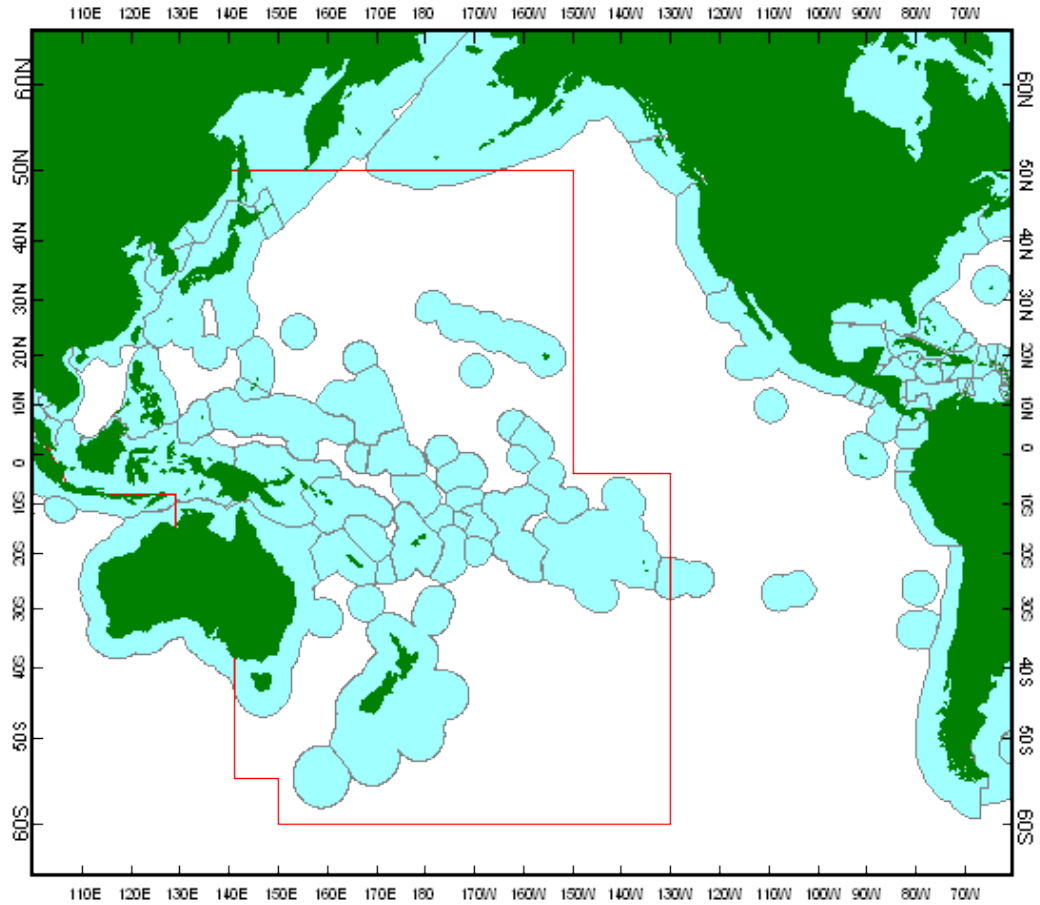


Figure 32. WCPFC Convention area. EEZs in blue. Boundaries shown are those used for catch compilation estimates. Source: http://www.spc.int/oceanfish/en/tuna-fisheries/170-tuna-fisheries-of-the-western-and-central-pacific-ocean

Management of tuna fisheries across the WCPO involves a complex mix of national and international bodies and agreements. Key components of the regional and sub-regional governance arrangements and fishery management framework relevant to the UoA include:

- The Western and Central Pacific Fisheries Commission (WCPFC);
- The Parties to the Nauru Agreement (the PNA Agreement);
- The Vessel Day Scheme (VDS) established under the Palau Arrangement;
- The United States Multilateral Treaty (USMT) (also known as the South Pacific Tuna Treaty, SPTT) (USA fleet only); and
- The Pacific Islands Forum Fisheries Agency (not a regulatory organisation but plays an important role in providing support, liaison, and technical assistance to members).
- Flag state governance systems of the fleets under assessment (United States, Chinese Taipei, Solomon Islands, Cook Islands, New Zealand, Vanuatu, and the Federated States of Micronesia)

Regional Frameworks and Institutions

The Western and Central Pacific Fisheries Commission (WCPFC)

The Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean established the WCPFC in 2004 to conserve and manage migratory fishery resources in the WCPO. More than half of the world's tuna catch is taken within the WCPFC Convention Area. The WCPFC is the overarching regional management framework relevant to this assessment.

The WCPFC Secretariat is based in Pohnpei, Federated States of Micronesia and the Commission has three subsidiary bodies the 'Scientific Committee' (SC) the 'Technical and Compliance Committee' (TCC) and the "Northern Committee" (NC). The WCPFC comprises member nations, participating territories and the fishing entity of Chinese Taipei (also referred to as Chinese Taipei). The 'Northern Committee' was established to deal with management and conservation issues to the north of 20° N. The International Scientific Committee (ISC) was established in 1995 to enhance scientific research and cooperation for conservation and rational utilization of the species of tuna and tuna-like fishes which inhabit the North Pacific Ocean during a part or all of their life cycle. The ISC provides information to the WCPFC Scientific Committee (introduced below) and directly to the Northern Committee.

In addition to these bodies specified in the Convention, the Commission may establish other subsidiary bodies (e.g., the Finance and Administration Committee) and employs ad hoc working groups as required. Ad hoc working groups have been established for data-related issues, the Commission's vessel monitoring system, the regional observer program, and other issues.

Scientists of the Secretariat of the Pacific Community's Oceanic Fisheries Programme (SPC- OFP) are responsible for leading much of the scientific research utilized by the Committees. WCPFC has a Memorandum of Understanding (MoU) with the SPC to provide scientific services, including data

management services. Under the MoU, the SPC's Oceanic Fisheries Programme collects, compiles, and disseminates fisheries data; undertakes regional stock assessments of key target and non-target species; conducts ecosystem analyses; and advises on the WCPFC's observer program and other strategies to monitor and control fishing activities.

The SC is required to work closely with the Inter-American Tropical Tuna Commission, particularly in areas of overlap. Flag states in areas of overlap must nominate whether they will apply IATTC or WCPFC measures. The USA has chosen to apply WCPFC measures in such areas. The Chinese Taipei fleet does not fish in the overlap area, however, does apply WCPFC measures in this area. The SC also works closely with the International Scientific Committee (ISC).

The Convention incorporates provisions of the United Nations Fish Stocks Agreement (UNFSA), in particular:

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

The Convention provides a framework for the participation of fishing entities in the Commission which legally binds fishing entities to the provisions of the Convention, it also provides for participation by territories and possessions in the work of the Commission. The Convention specifically provides recognition of the special requirements of developing States, small island developing states (SIDS) and cooperation with other RFMOs whose respective areas of competence overlap with the WCPFC.

The Commission has 26 Members, of which most are SIDS. The current members are: Australia, Canada, People's Republic of China, Cook Islands, European Union (EU), Federated States of Micronesia (FSM), Fiji, France, Indonesia, Japan, Kiribati, Korea, Republic of the Marshall Islands (RMI), Nauru, New Zealand, Niue, Palau, Papua New Guinea (PNG), Philippines, Samoa, Solomon Islands, Chinese Taipei, Tonga, Tuvalu, United States of America (USA) and Vanuatu. Participating Territories include American Samoa, Commonwealth of the Northern Mariana Islands, French Polynesia, Guam, New Caledonia, Tokelau and

Wallis and Futuna. In addition, the following States are Cooperating Non-members: Ecuador, El Salvador, Mexico, Liberia, Vietnam, Panama and Thailand[14].

A list of the Conservation and Management Measures (CMMs) relevant to the purse seine fishery can be sourced on the WCPFC website (www.wcpfc.int/conservation-and-management-measures).

Roles and responsibilities of WCPFC members are clearly described in the Convention[15], especially Articles 23 and 24, the Commission Rules of Procedure, Conservation and Management Measures, and other Commission rules and decisions, including the Rules for Scientific Data to be provided to the Commission, and the Rules and Procedures for Access to and Dissemination of Data Compiled by the Commission.

Article 30 recognizes special requirements for developing states in regard to high dependence on marine resources and the need to avoid adverse impacts on subsistence fishers and indigenous people. To this end, the Article established a fund to facilitate effective participation through provision of financial and technical resources and assistance to developing States.

The WCPFC allows participation by non-members and territories, with opportunities for cooperating non-Members. Observers can participate in meetings of the Commission and its subsidiary bodies, including the Scientific Committee, the Northern Committee, the TCC and the Finance and Administration Committee although some parts of these meetings are closed to Observers. As part of the conditions for Cooperating Non-Member status, applicants are required to provide annually "a commitment to cooperate fully in the implementation of conservation and management measures adopted by the Commission and to ensure that fishing vessels flying its flag and fishing in the Convention Area and, to the greatest extent possible, its nationals, comply with the provisions of the Convention and Conservation and Management Measures adopted by the Commission." (*CMM 2009-11*)

The Parties to the Nauru Agreement (PNA)

The Nauru Agreement is a regional agreement made to facilitate cooperation in the management of fisheries resources of common interest. The EEZs of the Pacific island states party to this Agreement collectively account for a significant bulk of the region's tuna catch and most of the purse seine catch. The Nauru Agreement is a binding Treaty-level instrument considered to be a sub-regional or regional fisheries management arrangement from the perspective of the UNFSA and the WCPF Convention. The Solomon Islands, Tuvalu, Kiribati, Marshall Islands, Papua New Guinea, Nauru, Federated States of Micronesia and Palau, commonly referred to as the Parties to the Nauru Agreement (PNA), have worked collaboratively since 1982 to manage the tuna stocks within their national waters. Tokelau is not a member but in 2012 signed an agreement with the PNA countries to join the VDS. It has its own TAE, which it brings to the VDS and which is transferable with PNA members. This was initially established at 1000 days and is adjusted proportionately with changes in the PNA TAE. The TAEs are allocated to purse seine vessels fishing under

[14] Cooperating non-member roles and requirements are detailed in CMM 2009-11. A non-member of the Commission, with an interest in the fishery, or whose vessels fish or intend to fish in the Convention Area, may request the Commission for the status of Cooperating non-member (CNM).
[15] Available online: https://www.wcpfc.int/system/files/text.pdf

three types of agreement: (1) the US Tuna Treaty (UST), (2) the Palau Arrangement, and (3) the 'joint venture and flag state arrangements' under the Federated States of Micronesia Arrangement (FSMA).

This is an alliance of Pacific island states whose EEZs collectively account for a significant bulk of the region's tuna catch and most of the purse seine catch. The PNA coordinates the implementation of management measures with a view to enhancing economic benefits from the fishery. The PNA secretariat is in Majuro in the Marshall Islands. Its objectives are to enhance regional solidarity and to promote economic control and participatory rights over the tuna resources in PNA waters, with a primary focus to:

- Develop strategic fisheries conservation and management initiatives;
- Develop initiatives to maximise the sustained direct and indirect economic benefits to the Parties; and
- Maximise the profitability of the fishery and ancillary industries within the PNA.

PNA's functions include operating an access and management regime to optimise revenue for the parties and promoting development of the Parties' indigenous fishery sector. The Nauru Agreement is implemented through binding Implementing Arrangements and associated Arrangements, which include:

- The 1st Implementing Arrangement, 1983, setting minimum licensing standards, including reporting, inspection and on-board observation, vessel identification and "good standing" on the FFA regional register;
- The 2nd Implementing Arrangement, 1990, adding additional conditions relating to VMS, high seas reporting and a prohibition on transshipment at sea;
- The FSM Arrangement: 1994, establishing arrangements for preferential access among the parties for vessels meeting certain standards for the provision of domestic economic benefits;
- The Palau Arrangement, 1995, limiting the purse seine fishery, initially by limiting vessel numbers, but now through the VDS which is described separately in more detail below;
- The 3rd Implementing Arrangement (3IA) 2008, applying a purse seine FAD closure, 100% observer coverage and catch retention/no tuna discards in PNA EEZs, prohibition of sets associated with whale sharks, establishing minimum net mesh size, prohibition of bunkering in the high seas and prohibition of fishing in high seas pockets for licensed vessels.

The Nauru Agreement is an important component of the regional management system within the UoA, noting a large proportion of the total Western Pacific tuna catch is taken within PNA waters.

The Vessel Day Scheme (VDS)

The Palau Arrangement for the Management of the Purse Seine Fishery in the Western and Central Pacific was developed by the Parties to the Nauru Agreement and entered into force in November 1995 (Banks et al. 2011). The Palau Arrangement is a multilateral treaty governing the operation of purse seine vessels in the national, EEZ waters of the PNA member nations. Its initial intent was to limit the number of vessels operating in the waters of the PNA. The Arrangement was originally a 205 vessel limit, which could be licensed by the Parties and allocated by fleet. This was replaced by the VDS, an input control framework which allows Parties to set a limit on the number of purse seine days to be fished. The VDS was established in response to scientific advice regarding overfishing, to allow new entrants to the fishery to create competition for access and in turn, increase PNA members' control over the fishery and increase the value of fishing access (Dunn et al. 2006). The VDS was also introduced to better manage "effort creep" (increased efficiency per fishing effort) experienced under the 205-vessel limit. Under the VDS Scheme the PNA set the total number of days that can be fished in their combined waters and the apportionment of the total number of days between each country. These allocations of fishing days are set for 12-month periods and can be set up to 3-years in advance. Allocated fishing days are tradable as Party Allowable Effort (PAE). The most recent stock assessment information on the target species of skipjack, yellowfin and bigeye tuna and economic information relating to maximizing economic returns and the optimal utilization of the resource is used to determine the number and allocation of fishing days. However, note that this relationship between VDS day allocation and stock status is not explicit. See Principle 1 for more information.

The VDS is now integral to management of the WCPO purse seine fishery in national waters and has been adopted as a major component of the purse seine fishery management framework by the WCPFC, through CMM 2014-01 (para 20 and 21). Key features of the VDS are:

1. Parties set the Total Allowable Effort (TAE) in fishing days for each Management Year (calendar years);
2. A fishing day is defined as any day or part of a day where fishing activity occurs in the waters of a Party outside archipelagic waters;
3. Initially, allowances for the FSM Arrangement fleet effort and the USA Treaty effort were deducted from the TAE. Current arrangements require individual PNA parties to contribute days from their PAEs into pools for the FSM Arrangements and the USA Treaty;
4. The adjusted TAE is allocated amongst the Parties as their PAE for each management year based on the distribution of estimated biomass and historical effort;
5. Parties may transfer days freely between themselves within a single management year; days cannot be transferred and/or borrowed between management years;

6. Each Party is required to take all necessary measures to ensure that the number of fishing days by purse seine vessels in its EEZ does not exceed that Party's PAE or adjusted PAE in any management year;
7. As a capacity adjustment, a fishing day of a small vessel (<50 m length overall (LOA)) is counted as half of a fishing day, and large vessels (>80 m LOA) one and a half fishing days;
8. The VDS is overseen and reviewed by an Inter-Party VDS Committee (VDSC), and reports to the annual meeting of the Parties to the Palau Arrangement. The role of the VDSC is to have oversight on the operational aspects of the VDS and provide recommendations as appropriate to the plenary meetings of the Parties to the Palau Arrangement: the committee may also be mandated to decide on certain operational aspects of the VDS.

At their 22nd annual meeting in Majuro, Marshall Islands, on 5-7 April 2017, the Parties to the Palau Arrangement agreed that the 2018 PNA TAE be set at 44,033 days; and this amount also be adopted as the provisional PNA TAE for 2019 and 2020. Including the additional Tokelau TAE of 972 days for 2018-2020, the total VDS TAE for this current period is 45,005 days for 2018; and 45,005 days provisionally for 2019 and 2020.

The USA fleet operates through fishing days allocated via the USA Treaty when fishing in FFA (Pacific Island Parties) waters. On 25 June 2016, the Pacific Island Parties and the USA agreed to a revised text and structure of the Treaty. Accordingly, on 1 January 2017, the amended Treaty commenced for a period of six years (described in more depth under flag state governance descriptions below). The USA is provided 3,200 days in the EEZs of PNA members and Tokelau where the Vessel Day Scheme (VDS) is being applied, with the exception of Kiribati, for which it is provided an additional 300 days.

It should be recognised that the VDS is a very large management program being applied by a group of developing countries of varying capacities. Taken together with the various other conservation and management measures, the VDS provides a central element in the management of the key target stocks and is also an important element in the current regional strategy to rebuild bigeye tuna stocks.

In PNA waters, use of VDS days is tracked via the PNA 'Fisheries Information Management System' (FIMS), which is based in Australia. Finer level operational information about operational management of the FIMS system by the PNA is not readily available.

FSM Arrangement (FSMA)

The FSMA was signed in 1994 and came into force in 1995. The FSM Arrangement was developed as a mechanism for domestic vessels of the PNA to access the fishing resources of other parties.[16] Signatories include Federated States of Micronesia, Marshall Islands, Nauru, Palau, Papua New Guinea and Solomon Islands.

[16] https://www.ffa.int/taxonomy/term/443

The specific objectives of the arrangement include:

- to cooperate to secure, for the mutual benefit of the Parties, the maximum sustainable economic benefits from the exploitation of the tuna resources of the Central and Western Pacific;
- to promote greater participation by nationals of the Parties in fisheries and assist in the development of national fisheries industries of the Parties;
- to establish a licensing regime under which fishing vessels of the Parties may gain access to the waters within the Arrangement Area on terms and conditions no less favourable than those granted by the Parties to foreign fishing vessels under bilateral and multilateral access arrangements;
- to establish and enforce agreed criteria to ensure that only those fishing operations which are capable of providing genuine and quantifiable economic benefits to the Parties, in the form of domestic or locally based vessels or on-shore development, including processing, are eligible for licences pursuant to this Arrangement;
- to allow access to the exclusive economic and fisheries zones of the Parties by purse seine fishing vessels on terms and conditions which are consistent with the provisions of the Palau Arrangement for the Management of the Western Pacific Purse Seine Fishery; and
- to further the objectives of the Nauru Agreement Concerning Cooperation in the Management of Fisheries of Common Interest, 1982.
- PNA members are incentivized to participate in domestic fishing rather than allocating VDS to DWFN by allowing members to enter into joint ventures and flag state arrangements with foreign companies (Yeeting et al. 2018). Table 23 shows the relative fishing allocation days under the four schemes.

Table 23 Fishing days allocation by country in the waters of the Parties to the Nauru Agreement (PNA) 2014 (Table from Yeeting et al. 2018)

PNA countries	Total allowable effort (TAEs) in days under VDS[a]	Days to bilateral agreements[b]	Days to FSMA[c]	Days to UST[d]	Days in the high seas[e]	Days in the achipelagic waters[f]
	A = B + C + D + E	B	C	D	E	F
FSM	6135	4530	462	243	900	721
Kiribati	11,187	3499	627	4737	2324	4593
Marshall	3292	1887	992	413	0	464
Nauru	2292	1354	0	670	268	557
Palau	510	495	0	0	15	123
PNG	15,495	11,435	1732	54	2274	1079
Solomon	2805	2466	0	11	328	80
Tuvalu	1764	700	0	699	365	27
Totals	43,480	26,365	3813	6827	6475	7644

Source: fieldwork

[a]Total days in the countries' EEZ used by the three agreements and in fishing in the high seas

[b]Adjusted 2014 total allowable efforts from VDS outcomes, extracted from report of the purse seine VDS administrator 2014 and 2015

[c]Fishing days used by FSMA vessels in 2014, extracted from the 20th meeting of the Palau Agreement paper on purse seine VDS PAEs for 2015 to 2017

[d]Fishing days used by US vessels in 2014, extracted from the 20th meeting of the Palau Agreement paper on purse seine VDS PAEs for 2015 to 2017

[e]Estimated efforts in the high seas (see Supplementary material for details)

[f]Estimated efforts in the archipelagic and days fished by EU vessels (see Supplementary material for details)

VDS Implementation at the National Level

From the VDS system administration perspective, fishing days are allocated to fleets, but permission for viewing usage is provided by vessel. FIMS doesn't know which vessel is allocated which days and is thus unable to display the information. If days were allocated by vessel or by Flag then FIMS would be able to display days allocated, but there are situations where an association is buying some days for the fleet, then the company goes and negotiates additional bilateral fishing days for just their company's vessels. Therefore, while from the management perspective the analysis of the VDS is useful, it says little in terms of compliance, which is left to both coastal and flag states.

It is up to each vessel owner or association to provide data access to its flag state regarding VDS days usage. All owners have access to see their days usage and can provide access for the flag state authority to see their days usage. The USA flag fleet is different as access is granted under the USA Tuna treaty. The National Marine Fisheries Service (NMFS) of the National Oceanic and Atmospheric Administration (NOAA) has access to data captured in FIMS for the USA fleet and provides a monthly summary of VDS fishing day usage to the Executive Director of the American Tuna Boat Association (ATA), who in turn notify all of the USA vessels of their VDS usage. Chinese Taipei vessels have provided data access to the Chinese Taipei Fisheries Agency.

Strengths and weaknesses of the VDS

An external review of the VDS system was conducted in 2015 as part of the Client Action Plan for PNA's MSC certificate (Blythe-Skryme and McLoughlin, 2018). The effectiveness of the VDS is a key issue in this assessment because of the importance of the VDS as a tool for managing the WCPO tropical tuna fisheries, including the fisheries for skipjack. Information noted in *Banks et al.* (*2011)* indicated that the Scheme has not been fully implemented, and there have been difficulties and inadequacies in the early stages of implementation. The shortfalls in the performance were not considered to be reflective of a concern that the VDS is an inappropriate or ineffective tool, but rather that its full implementation is required.

The VDS review (*PNA 2015b*) concludes that the FIMS is a well-designed information system capable of providing timely information to the VDS-members and that the system has greatly increased the transparency of the VDS operation, including vessel location, fishing day use and trade, catches etc., to all its members. One aspect of the VDS examined by the review related to concerns about the lack of compliance with VDS rules by individual partners. The review found that the concerns most often mentioned were:

- The way certain partners define "so-called" non-fishing days, i.e. subtract them from their PAEs;

- the failure of some partners to actually close the fishery in their EEZs when their PAE has been exhausted; and

- the willingness of certain partners to undercut the minimum benchmark price in their sales of days. The review concludes that interviews undertaken provided a general perception that compliance improved considerably in 2013 and continued to improve in 2014 and that there is some support for this perception from official documentation (*PNA 2015b*).

The review has compiled a long list of recommendations for consideration by the PNA (*PNA 2015b*). The terms of reference for the review required consideration of the VDS with regard to the broad headings of:

- governance and management;
- design objectives;
- allocation mechanisms;
- participation and management of substitutes (i.e. fishing outside the VDS);
- trading arrangements;
- integrity of systems and processes;
- compliance with the rules;
- transparency;
- amount of fees; and
- level of fishing effort (TAE).

A number of the recommendations of the review would further address concerns over the VDS if implemented and these recommendations provide valuable guidance to ongoing improvements for the system. Key recommendations include:

- formal adoption of a clear and simple objective for the VDS e.g. “to maximize fee revenues from the tuna fisheries on a sustainable basis”;

- the durability of vessel day rights held by Parties should be strengthened. In particular, there are great efficiency advantages in the Parties having a long-term share in the TAE that would be unaffected by the fishing in their EEZ and their own trading in their PAE;

- steps be taken to substantially increase transferability. In particular, trades of the PAE to other Parties should not affect future years PAE;

- a study be undertaken into the costs and benefits of altering VDS to a system where the fishing rights are in terms of harvest volume rather than effort;

- the current process of determining PAE be replaced with an allocation mechanism which gives long-term certainty to Parties regarding their entitlement to a share of the VDS and increased flexibility in the way in which VDS can be transferred to other Parties without a penalty in the form of reduced future PAE;

- whilst a fishing effort-based system is retained, the PNAO carefully manage fishing effort creep by more closely relating individual vessel performance to its calculated use of a standard VD;
- the PA be amended, or provision made in a new integrated legal instrument allowing for a range of appropriate mechanisms to be integrated into the VDS to manage effort creep.
- VDS-partners should do their utmost to exclude fishing from the high seas' pockets (doughnut holes) between or bordering their EEZs;
- free trading of VDs between partners be formally allowed within the VDS-structure;
- the VDS rules should be as clear and complete as possible to minimize the room for alternative interpretation and loopholes;
- the rules and/or applicable legal instruments should have clear statements of the process of dealing with infringements as well as the type and level recompense for violations;
- a clear system of sanctions for deviations from VDS rules designed to make deviations unattractive should be set up;
- there is a considerable uncertainty about both the short run and long run optimal level of vessel days. Bio-economic analysis undertaken for the review indicates that the fee revenue maximizing vessel days could be somewhat higher than those today, however, the evidence is not very conclusive. This suggests that a more careful bio-economic study should be conducted before the current vessel day policy is altered;
- there should be a substantially enhanced role of the PNAO with added functions including facilitating trades of VD, overseeing auctions of VDs, bio-economic research, expanded VD registry.

PNA has subsequently developed a work plan to consider the key issues for implementation, with a focus on addressing the application of Non-Fishing Days (NFD) that is causing 'leakage' in the VDS (Blyth-Skyrme et al. 2017). Differing definitions of non-fishing days (NFDs) has been raised as a concern leading to leakage and the 3rd MSC surveillance audit of the initial certificate cycle for the PNA fishery examined this issue (Daume and Morison 2014). The audit team reports that PNA acknowledged the problem of inconsistent application of the definition of NFDs and processing on NFDs. PNA have undertaken measures including use of e-Reports for verification of NFDs, time limits for the submission of NFDs by vessel operators and for processing, which have led to a decrease in the percentage of NFDs (Morgan et al. 2018). The surveillance audit concluded that "…this weakness in the VDS is not currently considered sufficient to compromise the effectiveness of the VDS as a tool for limiting fishing effort to the desired levels (Daume and Morison 2014).

Most recently, greater electronic integration of the FIMS system (now referred to as iFIMS) has provided a more efficient platform to integrate VDS and other key fisheries management and MCS information across the UoA and encompassing a large proportion of regional tuna catches. The platform now integrates fishing industry reporting of catch, vessel position and activity data generated by the Vessel

Monitoring System (VMS), and fisheries observer reporting. The system includes a user friendly "dashboard" where managers can monitor vessel locations within PNA EEZ's and how much tuna has been caught in the region in almost real-time. Via an industry portal, fishing companies can see their own boats and catch information and apply electronically for licenses through their own portal. Data related to catch and vessel activity within EEZs can be viewed through iFIMS by individual PNA Parties[17].

The Pacific Islands Forum Fisheries Agency (FFA)

The Pacific Islands Forum Fisheries Agency's was established through a treaty in 1979, with a mission "to drive regional cooperation to create and enable the maximum long term social and economic benefit from the sustainable use of our shared offshore fishery resources."

FFA was established under the South Pacific Forum Fisheries Agency Convention and the governing body is the Forum Fisheries Committee (FFC). The FFA Secretariat is based in Honiara, Solomon Islands. The FFA presently has seventeen members - Australia, Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, and Vanuatu, each of which is represented on the FFC.

FFA is an expertise based organisation providing advice, technical assistance and other support to its members who make sovereign decisions about their fisheries resources, especially their tuna resources, and participate in regional decision making on tuna management through organizations' such as the PNA and WCPFC.

The FFA Secretariat focuses its work on:

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

The Forum Fisheries Committee is comprised of one representative of each of the 17 members. The representative may be assisted by deputies. Observers may also participate, and this allows review and engagement by other relevant organizations. The FFC meets once a year at its annual session, normally held in the first week of May and again in special meetings held at other times of the year, according to its discretion and agenda. Meetings are closed to the public and an attempt is made to reach decisions by consensus among member countries, although there is also the ability to take issues to a vote (each party has one vote and a two thirds majority is required of all parties present for the vote to pass).

The FFC reviews the FFA's performance, consider regional policies, the budget and the future work programme of FFA. The development and operation of FFA's Annual Work Plan and Budget is driven by

[17] See: https://www.pnatuna.com/content/ifims-backbone-pna-fisheries-management

the Statement of Intent, which is a rolling three-year bridging arrangement to ensure achievement of the longer term Strategic Plan.

FFA's fisheries management programme is designed to assist members, including PNA members, to refine and maintain effective policy and legal frameworks for the sustainable management of the shared tuna fisheries resources of the region (*Banks et al., 2011*). This programme provides advice on:

- Appropriate legal frameworks for national tuna management, including members' obligations under various treaties and arrangements;
- Appropriate fisheries management frameworks including the incorporation of the principles of ecosystem-based fisheries management;
- Effective fisheries administration, including access arrangements, licensing of foreign and domestic fishing vessels, economic implications of different management systems, and the use of new systems and technologies;
- Development and implementation of monitoring, control and surveillance systems and effective compliance regimes; and provides these services assisting members to keep abreast of best practice fisheries management models, and develop stronger and deeper regional co-operation in fisheries management;
- Providing effective oversight, and where appropriate management of a regional vessel register, vessel monitoring system, and observer program;
- Servicing regional fisheries treaties and arrangements; and improving capacity in fisheries management.

Two key instruments in the implementation of these programmes are the *Regional Tuna Management and Development Strategy* and national Tuna Management Plans for FFA members, and the *Regional Monitoring Control and Surveillance Strategy*.

In addition to providing services to FFA Members, the FFA Secretariat supports the WCPFC regional Vessel Monitoring System (VMS), providing establishment, maintenance, diagnostic and support infrastructure and services, automatic location communicator (ALC) management services and communication gateways for the Commission VMS, along with training for Commission staff.

<u>Licensing</u>

In 1982, FFA established standardization of minimum terms and conditions of fisheries access throughout the Pacific region. Members agreed to adopt these minimum standards and conditions in licensing distant-water fishing nations' fleets. They included the regional register of fishing vessels and conditions such as licensing procedures, rights of authorized law enforcement officers, requirements for reporting catch and maintaining logbooks, reporting requirements and procedures for entering and exiting zones and for identifying vessels.

These conditions are updated from time to time by the FFA by agreement of all member countries and territories. The Harmonized Minimum Terms and Conditions (HMTCs) as they are known, are given national effect through vessel licensing conditions or by incorporation into national law as appropriate. The current HMTCs are as amended by FFC11018 (May 2019). The HMTCs constitute a key strategic tool for FFA members to regulate access to their waters and set standards to protect, as well as maximise the benefits from, their fisheries resources. The current HTMCs include:

- Compliance with national laws;
- Vessels to carry Common Regional Licence Form on board at all times;
- Vessels and operators to have "good standing" on the FFA Vessel Register;
- Vessels to be registered on the WCPFC Record of Fishing Vessels;
- Transshipment: no purse seine vessel to transship at sea (except for group seiners), 72 hours notice to transship in port; submit full reports on transshipping;
- Maintain and Submit Catch Logs in Zones and on High Seas;
- Reporting: each Wednesday; within a reasonable time of entry into and departure from the zone; and entry into a port;
- Observers to be allowed and assisted to undertake their duties; operators shall ensure 100% observer coverage on purse seine vessels and at least 5% on longline vessels;
- An agent to be appointed to receive and respond to any legal process;
- Vessels in transit to have fishing equipment stowed or secured in such a manner that it is not readily available to use for fishing;
- FFA members shall take measures through legislation or regulations and in accordance with international law to exercise powers of port State overfishing vessels in their ports;
- Operators to comply with instructions and directions given by an authorised and identified officer;
- Vessel monitoring system shall be implemented by the operator;
- Fish Aggregating Devices to be clearly marked and identified and the area of deployment must be provided to the licensing member;
- Compulsory pre-fishing inspections to be carried out;
- Labour/employement conditions, including having a written contract and abiding by particular safety/health restrictions.

The Secretariat of the Pacific Community (SPC)

[18] FFA's current HMTC's are available at https://www.ffa.int/system/files/HMTC_as_revised_by_FFC110_May_2019_-_FINAL.pdf

The SPC-OFP, based in Noumea, New Caledonia, provides scientific (and policy) support services to all Pacific Island countries and Territories, including members of the Forum Fisheries Agency. SPC was founded in 1947 and has 26 member countries, including American Samoa, Australia, Cook Islands, Federated States of Micronesia, Fiji Islands, France, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, New Zealand, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn Islands, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, United States of America, Vanuatu and Wallis and Futuna. SPC is the science service provider for the WCPFC and as such provides services including provision of data and scientific stock assessment support services for all major tuna species.

Coastal States

Coastal states are those nations whose EEZ is fished by the UoA under the afore-described regional management framework. This contrasts with a flag state, defined as a state with vessels fishing in the WCPO. Chinese Taipei, New Zealand, and the USA are considered flag states in this assessment. The national laws of coastal states are important to the extent that they influence fishing behavior in the WCPFC convention area (e.g. UoA waters).

National legislation requirements under WCPFC

As Parties to the WCPF Convention and members of the WCPFC, all members are required to apply the precautionary approach to fisheries management in accordance with Articles 5 and 6 and Annex II of the UNFSA which is specifically referenced in the WCPF Convention. The approaches to implementation of these requirements in national laws across members and Pacific Island Parties (PIPs) are broadly similar, reflecting the long period of collaboration of the Parties in tuna management through PNA, FFA and more recently, the WCPFC. Most WCPFC CMMs and PNA arrangements apply obligations to Parties or Members, rather than vessels, but Members are expected to reflect CMM arrangements in their domestic laws and therefore apply them to their vessels. Implementing arrangements are then required at national level to legally bind boat owners and operators based on these flag state obligations. These arrangements can take the form of legislation, regulations, Gazette Notices, Authority decisions (which in some cases have the power of regulations), access agreement provisions or license conditions.

In addition to measures deriving from the various global and regional instruments, the Parties apply specific additional measures nationally. These are generally focused on managing interactions between large scale distant water fleets and local fleets, especially small-scale fishers. There are relatively very few issues associated with traditional rights over offshore resources in the Pacific Islands region, compared with the extensive systems of rights over the resources of nearshore reefs and lagoons (Banks et al., 2011). Where offshore rights exist, they typically apply to the shallow water resources around offshore banks and reefs. In archipelagic waters, purse seine fishing is often prohibited inside the 12-mile territorial seas, and in many cases inside a 50-mile radius around main islands. At national levels, tuna policies and decisions are the subject of extensive consultations of varying forms, particularly where there are established domestic interests in the tuna fisheries.

As WCPFC Members, all UoA flag states (i.e. . Solomon Islands, Cook Islands, Vanuatu, FSM, US, Chinese Taipei and New Zealand) provide Annual Reports in two parts to the WCPFC:

- Part 1. Research and Statistics – reports for 2015 available at http://www.wcpfc.int/meetings/11th-regular-session-scientific-committee ;
- Part 2. Management and Compliance. These reports are confidential to the WCPFC Secretariat and CCMs.

National legislation requirements for FFA members

FFA Members have applicable fisheries legislation including the following features: definition of limits of national jurisdiction, definitions of fishing vessel types, fisheries management plans, licensing requirements, access agreements, transshipment restrictions (generally prohibited at sea), regulations on the use of gear such as FADs and conservation provisions such as prohibitions on the use of destructive fishing practices, closed areas and harmonisation with regional and international agreements. All flag states in this assessment are FFA members, except for the US and Chinese Taipei. A general feature of national-level tuna management in the region is the use of tuna management plans (TMPs). FFA has played an important role in developing TMPs. The TMPs characteristically give a description of the current national tuna fisheries, the status of the tuna resources, overall government goals in the fisheries sector, specific objectives for the management of the fishery and the interventions used to obtain the objectives (Gillett, 2010). As well as tuna resource sustainability objectives in the TMPs typically relate to increasing employment, increasing access fees and creating and/or enhancing domestic tuna fisheries. Whilst TMPs have been developed for all national jurisdictions covered, several are out of date.

PNA Parties' management arrangements

The fisheries management arrangements in place vary across PNA national governments. The management of tuna fisheries is the responsibility of government departments for Kiribati, Palau, Solomon Islands and Tuvalu. In the other four PNA Parties (FSM, Nauru, PNG and Marshall Islands) fisheries management is the responsibility of statutory authorities.

All PNA members have legal, institutional and policy frameworks, including tuna management/development plans in place to manage purse seine fishing in PNA waters. National legal frameworks for offshore fisheries management are based on the implementation of global and regional instruments including UNCLOS, the UN Fish Stocks Agreement, WCPFC Conservation and Management Measures and other decisions, the Nauru Agreement and its subsidiary and associated arrangements, and the FFA Convention and subsidiary FFA arrangements including the Niue Treaty on Cooperation in Fisheries Surveillance and Law Enforcement adopted in 1993.

As Parties to the UNFSA and the WCPF Convention, all PNA Parties have accepted the obligation to comply with the provisions of those Agreements, including the obligation to apply the principles in those agreements, including the precautionary approach, in their EEZs (Banks et al., 2011). Approaches to implementation of these instruments in national laws are broadly similar, reflecting the long period of collaboration of the Parties in tuna management through PNA, FFA and the WCPFC. A detailed summary of the national arrangements for PNA Parties is provided by *Banks et al. (2011)*.

7.1.1.2 Decision Making Processes

The WCPFC is the principal fisheries management decision-making body for the UoA. Commission members, and the Commission as a whole, seek to use the best available information, apply a precautionary approach, and ensure deliberations and decisions are well documented. Decision-making occurs predominantly at the annual Commission meeting and is usually based on consensus. If consensus cannot be reached, voting, grounds for appealing decisions, conciliation and review are all part of the established decision-making process. These approaches are described in Article 20 of the Convention.

Provisions include the option of a two-chambered voting process requiring a 75% majority in both chambers (where all efforts to reach a decision by consensus have been exhausted - WCPFC 2004a; Rule 22). To date, this voting provision has not been used for deciding on conservation and management measures. In addition, there are provisions for a decision to be reviewed by a review panel at the request of a Member (*WCPFC 2000; Annex II*). The WCPFC dispute mechanism is set out in Article 31 of the Convention.

Decision-making is generally open, with the process, outcomes and basis for decisions recorded in records of Commission sessions, and publicly available papers. The subsidiary bodies of the Commission, including formal Working Groups, provide detailed reports back to the Commission, including advice and recommendations (see meeting reports at http://www.wcpfc.int/meetings).

Noting the complex and at times protracted processes inherent in regional fisheries management, the WCPFC decision-making framework has relatively quickly delivered an extensive and contemporary set of Conservation and Management Measures (CMMs) and strategies to respond to sustainability issues. However, the degree to which the decision-making processes at the Commission result in measures that achieve fishery specific objectives could be questioned in respect of the historic control of fishing effort on bigeye tuna. Stock assessment and studies presented at the Commissions Scientific Committee (SC) meetings have previously identified some serious management issues at regional level. The Commission typically addresses these via agreed Conservation and Management Measures (CMMs). A summary of current CMMs relevant to the UoA is provided below.

The WCPF Convention (Art. 6) requires the application of the precautionary approach and the use of a Scientific Committee to ensure that the Commission obtains the best scientific information available for its consideration and decision-making. In 2012, WCPFC adopted Resolution 2012-01 to promote the use of the best available science in management decision making.

Information on fishery performance is also made publicly available through SPC data, and Part 1 Country Reports submitted annually by Commission members provide detailed reporting on catch, fleet size and other issues relating to the fishery at a country level and in aggregate. The WCPFC SC and TCC papers and reports available online provide a high level of public access and transparency. They generally illustrate how scientific information is used to inform management actions, and how these actions are monitored for effectiveness and further discussed at the Commission.

Table 24. WCPFC binding conservation management measures (CMM) and Resolutions of particular relevance to the Units of Assessment[19].

Purpose	WCPFC CMM
Bigeye, yellowfin & skipjack (longline and purse seine fisheries)	CMM 2018-01
Pacific Bluefin	CMM 2019-02
North Pacific Striped Marlin Swordfish Striped marlin in the West Pacific	CMM 2010-01 CMM 2009-03 CMM 2006-04
Non-target species	Resolution 2005-03
Silky shark, Oceanic whitetip shark, Sharks, Whale sharks (purse seine)	CMM 2014-05; CMM 2013-08; CMM 2011-04; CMM 2019-04; CMM 2012-04; CMM 2019-04
Mobulidae	CMM 2019-05
Sea turtles	CMM 2008-03
Seabirds	CMM2018-03
Cetaceans (purse seine)	CMM 2011-03
Scientific observers	CMM 2017-03; CMM 2018-05; CMM 2006-07
FAD management	2009-02
Monitoring, control and surveillance activities	CMM 2018-06; CMM 2014-03; CMM 2014-02; CMM 2019-06; CMM 2013-05; CMM 2013-04; CMM 2010-06; CMM 2009-10; CMM 2009-09; CMM 2009-06; CMM 2004-03
High seas controls	CMM 2016-02; CMM 2009-02; CMM 2008-04
List of IUU vessels	CMM 2019-07
Climate change	Resolution 2019-01
Marine Pollution	CMM 2017-04

7.1.1.3 Fishery-Specific Management

Long Term Objectives for the Fishery

Long-term objectives for fisheries within the waters of the Convention area are found within the WCPF Convention text. Under Article 2 the Commission has the objective to "*ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stocks within the Convention area, consistent with UNCLOS and UNSFA*". Article 5 provides principles and measures for achieving this conservation and management objective. Article 10(c) provides the explicit long-term objective of *'maintaining or restoring populations'* to "*above levels at which their reproduction may become seriously threatened"*. Article 5 (c) explicitly requires CCMs to apply the precautionary approach and Article 6 outlines the means by which this will be given effect, including through the application of the guidelines set out in Annex II of UNSFA. These guidelines provide additional objectives to guide decision-making, including the use of target reference points and adoption of fisheries management

[19] A full list of current WCPFC Resolutions and CMM's is available at https://www.wcpfc.int/system/files/booklets/31/CMM%20and%20Resolutions.pdf

strategies to ensure that target reference points are not exceeded on average. Evidence that these objectives guide decision-making is provided in various reports of the Commission.

These long term fisheries management objectives are developed and agreed to via WCPFC processes. Longer term objectives are also laid out in some national plans and agreements (e.g. the Palau Arrangement and the VDS). For USA vessels, the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) authorizes fishery management councils to create fishery management plans (FMP) which include specific objectives. For example, the USA Western Pacific Regional Fishery Management Council (WPRFMC) developed a Fishery Ecosystem Plan (FEP) as an FMP, consistent with the MSFCMA and the national standards for fishery conservation and management.

Fishery-specific objectives

WCPFC's recently revised CMM 2018-01, which provides the operational fishing reference points guiding management of bigeye, yellowfin, and skipjack tuna in the WCPO. It includes the following explicit objectives:

> *"**Principles - Compatibility** 2. Conservation and management measures established for the high seas and those adopted for areas under national jurisdiction shall be compatible in order to ensure conservation and management of bigeye, skipjack, and yellowfin tuna stocks in their entirety. Measures shall ensure, at a minimum, that stocks are maintained at levels capable of producing maximum sustainable yield, pending agreement on target reference points as part of the harvest strategy approach, as qualified by relevant environmental and economic factors including the special requirements of developing States in the Convention Area as expressed by Article 5 of the Convention..*
>
> > ***Bigeye** 12. Pending agreement on a target reference point the spawning biomass depletion ratio ($SB/SB_{F=0}$) is to be maintained at or above the average $SB/SB_{F=0}$ for 2012-2015.*
> >
> > ***Skipjack** 13. the Fishing Mortality Rate (F) for skipjack will be maintained at a level no greater than Fmsy, i.e. F/Fmsy ≤ 1.*
> >
> > ***Yellowfin** 14. the fishing mortality rate is not greater than Fmsy, i.e. F/Fmsy ≤ 1."*

These objectives are consistent with the MSC Principles 1 and 2, although there has previously been some deficiencies in the definition and measurability of the objectives. These are gradually being addressed as a formal WCPFC harvest strategy for these species is developed and implemented.

Fisheries Regulations to Meet Objectives

In addition to key target species' reference points outlined above, WCPFC CMM 2018-01 is also directed at reducing FAD related fishing impacts likely to undermine sustainable harvests of Yellowfin, Bigeye and Skipjack Tuna in the UoA. It implements a three month (July, August and September) prohibition on deploying, servicing or setting on FADs for all purse seine vessels, tender vessels, and any other vessels operating in support of purse seine vessels fishing in exclusive economic zones and five months in high

seas in the WCPFC area between latitudes 20° North and 20° South [20]. The closure is intended to reduce incidental or deliberate catch of small bigeye and yellowfin tuna to help maintain these stocks at levels consistent with the target and limit reference points for these stocks.

In addition, effective January 2020, CMM 2018-01 now requires FADs used in the WCPFC area to be designed in a way to reduce the likelihood of trapping and/or entangling sharks, cetaceans, sea-turtles and other species. To reduce pollution and broader environmental impacts, use of FAD's constructed of natural and/or bio-degradable materials is also encouraged.

CMM 2018-01 also requires that flag CCM's ensure purse seine vessel deploy, at any one time, no more than 350 active drifting FAD's. The effectiveness of these new measures is to be reviewed by the WCPFC Scientific Committee and relevant working groups at each annual meeting and out of session as required.

As part of recent remote audits for this WCPO reassessment process, SCS Auditors have identified a range of interpretations in relation to implementation of Paragraph 19 of this Measure, requiring 'lesser entangling' designs. For example, Chinese Taipei do not consider Paragraph 19 to be binding, other Flag States consider it to be binding, and others within the UoA consider it binding but have not yet given effect to this in their domestic vessel licencing or regulatory frameworks.

To develop more effective FAD management strategies and measures, and to support evaluation of existing FAD management measures, WCPFC also has an intersessional FAD Management Options Working Group. This Working Group, with assistance from the SC and SPC, and ISSF [21], has recently developed Draft Guidelines for Biodegradable and 'lesser entangling' FADs.

There is ongoing debate from WCPFC CCM's about the definition of FADs, and whether these definitions should be clarified/updated to reduce confusion between vessel crews and observers. The definition of a FAD as used by WCPFC is the PNA definition, and was intentionally made strict and inclusive, to minimise confusion between observers and vessel operators about FAD definitions. There is also ongoing discussion about FAD management effectiveness in the context of managing bigeye tuna mortality and outcomes (e.g. CMM 2017-01, and 2018-01). In addition, at the Fourteenth annual Commission meeting in 2017, the EU observed that the compliance sub-committee (TCC14[22]) had difficulties assessing compliance with the

[20] Members of the PNA may implement the FAD set management measures consistent with the Third Arrangement Implementing the Nauru Agreement of May 2008. Members of the PNA shall provide notification to the Commission of the domestic vessels to which the FAD closure will not apply. That notification shall be provided within 15 days of the arrangement being approved. 2 Those vessels fishing within a 100 nautical mile buffer zone extending from the high seas adjacent to the Cook Islands shall inform Kiribati and the Cook Islands authorities at least 24 hours prior to entry into and 24 hours prior to the exit from the buffer zone with estimated coordinates for entry and exit. Each report shall contain the vessel name, international radio call sign and position at time of reporting.

[21] See https://iss-foundation.org/knowledge-tools/guides-best-practices/non-entangling-fads/

[22] Meeting reports for TCC14 are available at: https://www.wcpfc.int/meeting-folders/technical-and-compliance-committee.

CMM related to FAD closures and indicated that there was a risk this would continue at subsequent meetings.

Tuna Management Plans

Tuna Management Plans (TMPs) as required under WCPFC guidelines are in place for all countries included in this UoA. The FFA has supported development of members' TMPs which typically include a description of the respective national current national tuna fishery, status of tuna resources, and overall government objectives for, and related to, the fisheries sector. TMPs also contain objectives and strategies to deliver on these. Some plans include a monitoring and evaluation component to improve the effectiveness and efficiency of their implementation. Prior to the development of TMP's, the FFA introduced its Regional Tuna Management and Development Strategy 2009-2014 [23] to guide sustainability and economic performance of regional tuna fisheries.

In addition to over-arching tuna resource sustainability objectives, TMPs typically include objectives relating to increasing national employment, both for fishing participation and related to onshore processing. They are also aimed at creating and/or enhancing revenue available from fishing access fees.

For the USA, FSM, Solomon Islands, Cook Islands and New Zealand, these plans are largely consistent with WCPFC requirements. New Zealand has developed an overarching Highly Migratory Species Management Plan (HMSMP) covering its skipjack and yellowfin tuna fisheries, as well as other fisheries taking HMS. A subsidiary HMS Annual Operational Plan is used to give effect to the more strategic framework of the NZ HMSMP; the Annual Operation Plan details annual objectives and priorities, and the key work areas and tasks needed to give effect to these. A formal and documented annual review process is included as part of this HMS management framework.

For the Cook Islands, under the Marine Resources Act (2005), purse seine fishery specific regulations are given effect through the Marine Resources (Purse Seine Fishery) Regulations 2013[24]. These regulations provide the operational framework to guide and manage purse seine fishery activity within the Cook Islands EEZ. They include:

- Designation of the fishery (Part 1): including limits on fishing effort, protection of non-target species and management of discarded species;
- Licencing and conditions of licences (Part 2): including licencing criteria, conditions of fishing and transhipment guidance and requirements;
- Offences (Part 3): specified penalties for any breach of the regulations.

For the USA, the Western Pacific Regional Fishery Management Council has developed a Fishery Ecosystem Plan (FEP), also meeting the requirements for a regional Tuna Management Plan. The FEP for the Western Pacific Region:

[23] See: https://www.ffa.int/system/files/Regional%20Tuna%20Management%20and%20Development%20Strategy.pdf
[24] Available at: https://www.mmr.gov.ck/content/MarineResourcesPurseSeineFisheryRegulations2013.pdf

1. Identifies the management objectives of the Pacific Pelagic FEP;
2. Delineates the boundaries of the Pelagic FEP;
3. Designates the management unit species included in the Pacific Pelagic FEP;
4. Details the federal fishery regulations applicable under the Pacific Pelagic FEP; and
5. Establishes appropriate Council structures and advisory bodies to provide scientific and management advice to the Council regarding the Pacific Pelagic FEP.

Oversight and guidance for the development of key elements of regional (including WCPFC) management arrangements for migratory tuna species in the more southern waters of the convention area (e.g. below 10° South) is also provided by an FFA sub-committee on South Pacific Tuna and Billfish (FFC's Southern Committee). Membership of the Southern Committee comprise: Australia, Cook Islands, Fiji, New Zealand, PNG, Samoa, Solomon Islands, Tonga, Tokelau, Tuvalu and Vanuatu. Kiribati, New Caledonia, French Polynesia, American Samoa and Western Pacific Regional Fishery Management Council are permanent observers and FFA members are observers.[25] This sub-committee focuses on the South Pacific longline albacore fishery.

Review and Audit of the Management Plan

WCPFC has mechanisms in place to evaluate key aspects of the management system, including a range of committees and working groups that meet regularly and report their findings back to the Commission's annual meeting and out of session as required. The WCPFC Secretariat submits a report on compliance of members with the reporting provisions of the Commission, with CMM implementation progress monitored through the reporting provisions within the CMMs themselves, or the members Annual Reports to the Commission. Several of the formal sub-committees and working groups also work closely with members and other stakeholders to develop CMM's and to evaluate and refine these after they have been implemented. Stock assessments conducted by the SPC are subject to peer review by other members of the Scientific Committee, occasional external review, and are scrutinized by member countries and their scientific representatives.

WCPFC initiated an independent review of its performance, consistent with the Kobe Course of Actions for the period 2011 to 2013 (*Anon. 2012*). As a result, the Commission established several working groups to address the different recommendations of the report, which can be found on the WCPFC website. An independent review (*MRAG, 2009*) has been conducted of the Commission's science structure and functions resulting in overhauling of the operation of the SC and adoption of a peer review process and other changes to the data and science functions.

The VDS, as a key operational component of the overall WCPFC fisheries management system, is overseen and reviewed internally by a VDS Committee, and externally with advice and reviews of performance by the FFA. There have been a series of internal and external reviews of other key parts of the PNA processes,

[25] Southern Committee Terms of Reference are available at: https://www.ffa.int/node/59

including the VDS. There are also regular internal reviews of national fisheries administration performance, and frequent, but ad hoc, external reviews of key features of national performance (*Banks et al. 2011*).

A 2013 report by the Pacific Association of Supreme Audit Institutions (PASAI) examined fisheries management arrangements in nine Pacific island states (*PASAI 2013*), including the FSM, and Solomon Islands. Both are also members of the WCPFC and the PNA. The report noted several positive aspects including the presence of comprehensive and contemporary legislation for each country, guiding sustainable management of their tuna fisheries. The report also noted scope to improve fisheries governance coordination arrangements, and to ensure that Tuna Management Plans were consistent with guidelines and up to date. The PASAI report has served to initiate and guide further improvements to fisheries management and governance arrangements across the WCPFC area, and for member countries.

7.1.1.4 Flag State Governance Frameworks

United States

<u>The Magnuson-Stevens Fishery Conservation and Management Act 1976 (USA)</u>

The Magnuson Fishery Conservation and Management Act 1976 is the primary law governing marine fisheries management in USA federal waters. It was enacted to promote the USA fishing industry's optimal exploitation of coastal fisheries by “consolidating control over territorial waters” and establishing eight regional councils to manage fish stocks. The Act has been amended several times in response to continued overfishing of major stocks. In 1996, it was amended to mandate the use of annual catch limits and accountability measures to end overfishing, provide for widespread market-based fishery management through limited access privilege programs, minimize by catch, establish fishery information monitoring systems, protect fish habitat and promote increased international cooperation. As part of this reform, it was renamed the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA).

The reforms to the MSFCMA occurring in 1996 established an overarching approach that called on the Secretary of Commerce to work multilaterally through various fora, such as Regional Fishery Management Organizations (RFMOs), to address illegal, unreported and unregulated (IUU) fishing and bycatch of protected living marine resources. The NMFS is the implementing agency within the Department of Commerce for the authorities and responsibilities under the MSFCMA.

The most recent version, authorized in 2007, includes seven objectives:

- Acting to conserve and manage fishery resources;
- Supporting implementation and enforcement of international fishing agreements;
- Promotion of domestic commercial and recreational fishing under sound conservation and management principles;
- Providing for the preparation and implementation of fishery management plans (FMPs) which achieve optimal yield;

- Establishing Regional Fishery Management Councils to steward fishery resources through the preparation, monitoring, and revising of plans which; (a) enable stakeholders to participate in the establishment and administration of such plans; and (b) take into account social and economic needs of states;
- Developing underutilized fisheries; and
- Promotion of the protection essential fish habitats.

Of relevance to the UoA, the MSFCMA also established the Western Pacific Regional Fishery Management Council (WPRFMC) as one of eight USA regional fishery management councils. WPRFMC decisions are based on the best available scientific information provided largely by the Pacific Islands Fisheries Science Centre and the Pelagic Fisheries Research Program and are provided to the Secretary of Commerce for approval. Management measures created by the Council and approved by the Secretary are implemented by the NMFS Pacific Islands Regional Office and enforced by the NOAA Office of Law Enforcement, the USA Coast Guard and local enforcement agencies.

The MSFCMA is the main overarching fisheries legislation governing management of fisheries operating in USA national waters and extends to USA fleets operating on the high seas. The WCPO purse seine fishery is also subject to the authority of the High Seas Fishing Compliance Act, which governs the conduct of USA fishing vessels on the high seas, and under which a high seas fishing permit is required for a USA fishing vessel to be used for commercial fishing anywhere on the high seas.

<u>The Western and Central Pacific Fisheries Convention Implementation Act 2000 (USA)</u>

The Western and Central Pacific Fisheries Convention Implementation Act is the legislation used to implement the Convention on the Conservation and Management of Highly Migratory Stocks in the Western and Central Pacific Ocean (the Convention) in the USA. It authorizes the Secretary of Commerce to implement regulations needed to carry out the obligations of the USA under the WCPF Convention. It includes regulations applicable to owners and operators of USA vessels used to fish for highly migratory fish stocks in the WCPO, possibly including requirements to, among other things, obtain authorization to fish, carry position-fixing transmitters as part of the vessel monitoring system, accommodate observers from the WCPFC regional observer program, report fishing activity, accept boarding and inspection by authorized inspectors of other members of the Commission, and prohibit trans-shipping at sea from purse seine vessels. The Act also outlines details of USA representation at the WCPFC.

<u>The United States Multilateral Treaty</u>

Known colloquially as the US Treaty, and more formally as the Treaty on Fisheries Between the Governments of Certain Pacific Island States and the Government of the United States of America, this is a multilateral fisheries access agreement established between the USA and 16 Pacific Island Parties (PIPs). The USA Treaty provides a framework for granting USA-flagged purse seine vessels access to fish in the EEZs of any of the PIPs. The Treaty is also referred to as the South Pacific Tuna Treaty (SPTT). As part of this Treaty, the US Government provides an economic assistance fund to the participating nations for the purposes of fisheries development

The Treaty was first implemented because USA legislation did not recognize national jurisdiction over trans-boundary fish stocks such as tuna, despite Pacific Island countries declaring their EEZs between 1977and 1984. USA legislation allowed sanctions to be imposed on coastal states that acted against USA vessels for breaching national laws. In order to ensure that USA vessels complied with national laws and to protect Pacific Island countries from trade sanctions, the Treaty was established in 1987. At this time, it was necessary to establish the Treaty with all Pacific Island Countries, not just those in the equatorial band with rich skipjack resources supporting purse seine fisheries. The Treaty was first enacted for a period of five years from 1988-1993. Since then it has been extended, and following the completion of the latest 10-year agreement in 2013 there were further negotiations culminating in a 2016 agreement. Each of the phases of the Treaty has involved variations and different monetary values associated with the access.

The 2016 Treaty is considered valid through 2022, though prices were only established and agreed through to 2020. The total number of days made available via the new Treaty are similar to the past iteration, but there are several material differences to the structure of the agreement. The obligatory buy-in price is lower, as the Treaty stipulates a maximum, but not a minimum, number of days USA vessels may buy. There is more opportunity for vessels to establish bilateral arrangements with PIPs outside of the days and prices established by the Treaty. These vessels may still receive a Treaty license so long as they enter into one or more bilateral or multilateral agreements with PIPs under the Treaty. Vessels may sell days purchased under the Treaty. Subject to agreeing on price, USA vessels have access to the days specified in the Treaty until July 1st of each year, at which point the PIPs are free to sell any days remaining to other fishing entities. Lastly, the 2016 Treaty removed the specification of USA limits on high seas days (USA Treaty 2016).

Under the 2016 agreement, days to be made available to USA Vessels under the Treaty were as follows, with changes to the previous Treaty noted in italics:

- 3200 days in the EEZs of PNA members and Tokelau where the Vessel Day Scheme (VDS) is being applied, with the exception of Kiribati (*a decrease of 2200 days from the previous Treaty*);
- 300 days in the Kiribati EEZ;
- 350 days in the Cook Islands EEZ (*increase of 100 days*); and
- 600 days in the EEZs of Fiji, Niue, Samoa, Tonga, and Vanuatu (increase of 300 days).

As an example of the revised Treaty's more flexible approach to arranging access for 2021 there are four different access arrangements:

- 105 days in Cook Islands EEZ;
- 378 days in Kiribati EEZ;
- 275 days in Tokelau/Tuvalu EEZs; and
- Up to 600 days in the EEZs of Fiji, Niue, Samoa, Tonga and Vanuatu

The USA Treaty is administered by the Pacific Islands FFA on behalf of PIPs. The funds are paid to the Forum Fisheries Agency (FFA) which then distributes funds to its member states. While USA purse seine vessels are licensed to fish in all PIP waters, most fishing activity takes place within PNA waters. There is a maximum of 40 USA purse seine vessels permitted to operate under the USA Treaty. In the original text of the VDS, USA Treaty vessels were exempted from a limit on fishing days, unlike other fleets operating under bilateral access arrangements. Under the current arrangements, purse seine fishing days allocated to the USA fleet under the USA Treaty are now managed as part of the VDS.

Effort limits on the high seas and within USA EEZ waters

In addition to fishing days allocated to the USA fleet in PIPs EEZs under the USA Treaty, USA purse seine vessels have an allocation for high seas fishing and for fishing within the EEZ of USA territories. The USA fleet operates on the high seas under the allocation of USA high seas purse seine fishing days with shared access to a competitive TAE of 1270 days fishing on the high sea. The applicable limit for the USA EEZ is the same as that implemented by NMFS since 2009, which is 558 fishing days per year. These effort limits are determined via WCPFC processes and given effect through CMM 2018-01. They are then implemented by Flag States via their own domestic enabling legislation. The USA combines these amounts for high seas and EEZs of the Territories referred to above, as well as the USA Pacific monuments of Palmyra Atoll, Howland and Baker Islands, and Kingman Reef, referring to this limit as the Effort Limit Area for Purse Seine (ELAPS). In 2013, collectively the USA ELAPS limit for the U.S purse seine fleet was 2588 fishing days, applying between the latitudes of 20°N and 20°S in the Convention area. This total number of fishing days was reduced to 1828 fishing days in 2014, to conform to new WCPFC Conservation and Management Measures requiring flag states to reduce fishing mortality on bigeye. The same limit currently remains in place.

Fishing day usage on the high seas and in USA national waters is monitored using a log sheet system managed by the NMFS. NMFS monitors the number of fishing days spent in the ELAPS using data submitted in logbooks and other available information. If and when NMFS determines that the limit of 1,828 fishing days is expected to be reached by a specific future date, it will publish a notice in the Federal Register announcing that the purse seine fishery in the ELAPS will be closed starting on a specific future date and will remain closed until the end of calendar year 2015. NMFS will publish that notice at least seven days in advance of the closure date (NOAA 2015).

There is a recent example of this occurring. On October 1 2019, NFMS issued a notice announcing that the purse seine fishery in the ELAPS would close as a result of reaching the limit of 1616 fishing days, effective 9 October 2019 until 31 December 2019 for all USA purse seine fishing vessels.

Chinese Taipei

The management of Chinese Taipei's fishing vessels both within its EEZ, on the high seas in the Pacific, and in PICT waters is governed by a relatively contemporary suite of legislation and regulations. The two key Acts are the Fisheries Act 2016and the Distant Water Fisheries Act (2016a). In operation since January 2017, these were developed, in part, because of identification of Chinese Taipei by the European Union

as a possible non-cooperating nation in regards to IUU fishing – e.g. a "yellow card". This new legal framework is pivotal to the performance of the flag state fleet relative to the MSC standard, however there is limited information available about the practical effects of this updated legislation on Chinese Taipei vessels' fishing practices to date.

The relevant new legislative arrangements include:

Act Governing Distant Water Fisheries (遠洋漁業條例)

Amendments to the Fisheries Act (漁業法) passed in early July 2016

The Ordinance to Govern Investment in the Operation of Foreign Flag Fishing Vessels (投資經營非我國籍漁船管理條例

The Enforcement Rules of the Fisheries Act.

The Fisheries Act (2016) is the more general of the two Acts and deals predominantly with domestic fisheries management, aquaculture and enforcement. It has a range of provisions including who can be granted a license, build a fishing vessel, work on fishing vessels, receive access rights etc. It also has chapters on recreational fishing, fishery development, conservation and management and penalty provisions.

The Distant Water Fisheries (DWF) Act (2016) is specifically tailored to the management and enforcement of Chinese Taipei vessels fishing on the high seas or a third country's EEZ[26]. It has as its general objectives to:

- Ensure the conservation of marine fisheries resources;
- Strengthen distant water fisheries management;
- Curb IUU fishing; and
- Improve traceability of catches and fisheries product;

so as to promote the sustainable operation of distant water fisheries.

Article 5 of the DWF Act requires that the fisheries agency develop arrangements which have regard to the precautionary principle, ecosystem-based approach and the use of the best available scientific advice. Morgan et al (2018) note, based on onsite meeting discussions with TFA staff, there is an established process by which CMMs are incorporated into domestic legislation, although the documentation provided to the assessment team suggests that the process provides for potential modification to the CMMs in this process, and that legislation can be vetoed by the Legislative Yuan or the Committee of the Whole Yuan.

[26] Generally understood to mean an entity not party to an agreement between two other countries. Even more generally, the term is used to denote a country other than two specific countries referred to, e.g. in the context of trade relations.

In Chinese Taipei, central authority over commercial fisheries is vested in the Council of Agriculture. Under the Council of Agriculture, there are two separate government organizations: the Chinese Taipei Fisheries Agency (TFA) based in Kaohsiung and the Fisheries Research Centre based in Keelung, both of which have complex institutional histories and appear to have no formal overlap in shared responsibilities for fishery management.

The key fisheries management acts are administered by the Fisheries Agency (Council of Agriculture of the Executive Yuan). The Chinese Taipei Fishery Agency, Council of Agriculture has a Deep Sea Fisheries Division which is responsible for managing all aspects of fishing operations as they relate to distant water fishing, including issuing licenses, monitoring VMS, port inspections, recording data, monitoring quota or harvest limits, placement of observers, transshipment, enforcement (with the Coast Guard), prosecutions etc.

TFA's organizational chart below identifies a series of bodies dealing with its operations as a Distant Water Fishing Nation (DWFN). Functions of these are described in more detail below.

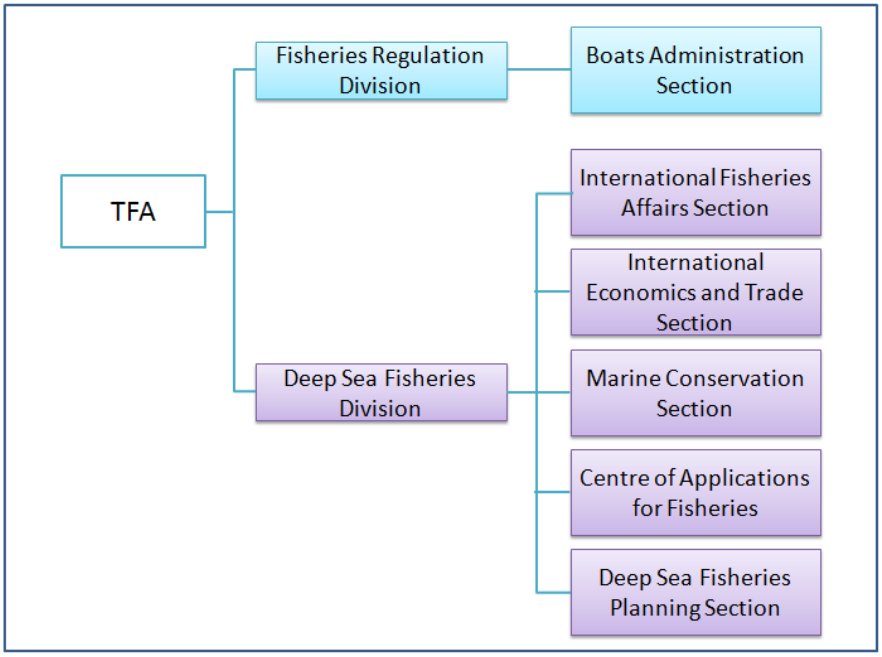


Figure 33. Organizational Chart of TFA. Source: SCS, 2018.

International Fisheries Affairs Section, International Economics and Trade Section, Marine Conservation Section:

- Issuing the authorized operation permit
- Issuing the permit of fisheries cooperation
- VMS
- Monitoring / inspection of unloading at port
- Recording / monitoring the Digital data

- Controlling/ monitoring the harvest quota
- Punishment for the breach of legislation (power shared with the Coast Guard Administration)

International Fisheries Affairs Section: (work with Coast Guard Administration)

- Inspection at sea

Centre of Applications for Fisheries:

- Monitoring of transshipment/ unloading
- Issuing certificates of Origin or other certificate documents

Deep Sea Fisheries Planning Section:

- Planning, employment and administration of fishery observers.
- Position monitoring of deep-sea fishing vessels and their management.
- Monitoring / inspection of unloading at port

Solomon Islands

The Solomon Island's Fisheries Management Act 2015 provides an effective and contemporary legislative framework for both domestic and Solomon Islands licenced foreign fishing vessels operating within the UoA. Fundamentally, the Act requires the Solomon Islands' Government (SIG) to eliminate overfishing and excess fishing capacity, and to ensure that levels of fishing effort do not exceed sustainable limits. The Act includes the following statutory requirements:

- Licensing of local and foreign vessels;
- Access and management arrangements, and provisions on fishing permits (date of validity, revocation and issuance);
- Licensing of processing establishments;
- The powers of authorised officers, and details of prohibited activities;
- Improved powers for licensing domestic foreign fishing vessels and fish processing establishments;
- Requirements for fishing vessels including the activities defined in the MTCs, gear stowage and reporting, access by Solomon Islands vessels in areas beyond national jurisdiction, trans-shipments at sea requirements for fish and fish product processing;
- The Vessel Monitoring System;
- Jurisdictional proceedings and sanctions; including disposition and release of seized items and forfeitures, and details of evidential requirements.

The 2015 Act also provides for higher level stakeholder consultation, engagement and advice via the Fisheries Advisory Council (FAC), with council members advising the minister for fisheries on matters relating to fisheries conservation, management, development and sustainable use. FAC membership is

drawn from key government agencies, industry, and relevant regional fisheries organisations (*Control Union Pesca*. *2019*).

As a party to both the UNFSA and the WCPF Convention, the Solomon Islands has also accepted obligations for key UNFSA principles, such as adoption of a precautionary approach. *Control Union Pesca (2019)* note that the SIG expression and implementation of these obligations under national laws aligns well with the intent of UNFSA and the Convention, also reflecting the history of regional collaboration of parties on sustainable tuna management through PNA, FFA and the WCPFC.

Federated States of Micronesia

Development and management of fisheries for the Federated States of Micronesia (FSM) falls under the jurisdiction of the National Oceanic Resources Management Authority (NORMA), established under Title 24 of the FSM Fisheries Act 2002. A key function of NORMA is to work closely with national fishing industry bodies to promote development of pelagic fisheries and related industries for national benefit. Title 24 contains 11 Chapters that NORMA must follow when developing and implementing fisheries management measures. The chapters and subsections' management measures that are most relevant to the tuna purse seine fishery are described below (**Table 25**).

Table 25: Chapter content for Title 24 of the FSM Fisheries Act 2002

Title 24 Chapter	Specified Fisheries Management and Policy Functions
Chapter 1	General Provisions: commercial and non-commercial fishing permits, access agreements required, fisheries management agreements, multilateral access agreements, application for permits. Chapter 1 Sub-section 101 prohibits the use of explosives, poisons, chemicals etc. to catch any fish or other marine life. Subsection 115 stipulates that no marine mammal shall be taken or killed by a commercial fishing party or for commercial purposes but may be killed for traditional purposes.
Chapter 2	Management Authority: authority, regulations, duties and functions, executive director, Fisheries Management and Surveillance Working Group.
Chapter 3	Permits for Fishing on the High Seas or in an Area Designated by a Fisheries Management Agreement by Flag Vessels: permits for flagged vessels, registration fee for flag fishing vessel and fishing by flag fishing vessels on the high seas or in an area designated by a fisheries management agreement.
Chapter 4	Access Agreements for Foreign Fishing and related activities: negotiation of access agreements, foreign fishing agreements, fees.
Chapter 5	Conservation, Management and Sustainable Use of Fisheries Resources: conservation, management and sustainable use of the fishery resources, allocation of allowable fishing between domestic fishing vessels, allowable fishing between foreign fishing vessels
Chapter 6	Enforcement: enforcement responsibility, appointment of authorized officers, powers of authorized officers, appointment of authorized observers, access granted to authorized observers, duties owed to authorized officers and observers.
Chapter 9	Violations and Penalties for Prohibited Acts: prohibited acts, civil penalties, criminal penalties, liability of operators, fishing without a valid permit, unauthorized fishing in waters under national jurisdiction of a foreign state, fishing on or near submerged reefs or fish aggregating devices, possession, handling and sale of fish unlawfully taken, contamination of the exclusive economic zone

The FSM is also a member country for the FFA, PNA, SPC and WCPFC; and a Party to the Palau Arrangement for the Management of the Western Pacific Tuna Fishery Vessel Day Scheme (VDS). It is also a signatory to contemporary and binding sustainable fisheries treaty arrangements including the United Nations Convention on the Law of the Sea, 1982 (UNCLOS), Food and Agriculture Organization (FAO) Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas 1993 (FAO Compliance Agreement), and the United Nations Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks 1995 (Fish Stocks Agreement).

New Zealand

The New Zealand Fisheries Act (1996) provides the legislative framework for New Zealand domestic and international fisheries management, and is consistent with provisions of UNCLOS, and UNFSA, to which New Zealand is a signatory. For international fisheries, including those for highly migratory tuna species, key provisions guide and manage:

- access to fisheries, including foreign fishing vessels licensed access;
- a high seas fishing regime; covering record keeping, catch and effort data reporting, and catch disposal; and
- a system of prescribed offences and penalties.

Section 5(a) of the New Zealand Fisheries Act implements these obligations by specifying that all functions, duties or powers under the Act must be exercised in a manner consistent with New Zealand's international obligations relating to fishing. This includes obligations under the Fisheries Act 1996 to avoid, remedy or mitigate any adverse effects of fishing on the aquatic environment. Sections 8, 9, and 11 apply to most aquatic environmental issues, along with some additional legislation or specific clauses. For example, the Marine Mammals Protection Act 1978, and the Wildlife Act 1953, apply to protected species.

New Zealand is also signatory to a number of international agreements and has developed domestic legislation to meet these requirements, including the Fisheries (Commercial Fishing) Regulations 2001 and regional commercial fishing regulations; and Fisheries (Western and Central Pacific Ocean Highly Migratory Fish Stocks) Regulations 2003.

Management arrangements for Highly Migratory Species are given effect through the Highly Migratory Species Management Plan (HMSMP) covering its skipjack and yellowfin tuna fisheries, with a subsidiary HMS Annual Operational Plan[27] used as an annual workplan and prioritization framework to achieve the higher level objectives of the HMSMP.

Cook Islands

The Cook Islands Ministry of Marine Resources (MMR) has carriage of operational fisheries management through the Marine Resources Act (MRA) 2005[28]. The MRA is made up of 10 functional areas (parts):

[27] https://www.mpi.govt.nz/dmsdocument/36825-annual-operational-plan-for-highly-migratory-species-201920

[28] See: https://www.ffa.int/system/files/Marine_Resources_Act_2005.pdf

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

The 2005 Cook Islands' MRA is currently undergoing formal review. An updated Draft 2020 Marine Resources Act was initially presented to Parliament in 2017 (Sieben et al. 2020), and carries over many of the central provisions of the previous legislation, and additional measures. For example, the Ministry of marine Resources (MMR) Executive Council can declare a fishery as a designated fishery for the purposes of formalizing management under a Management Plan. This is required where a fishery is deemed important to the national interest; and requires management measures for ensuring sustainability. A designated fishery management plan includes the following measures:

- Identify and address trends in the biological, economic, and social characteristics of the fishery;
- Address how the fishery or category of fishery is to be managed using precautionary and ecosystem approaches to fisheries;
- Identify the target and other fish stocks, fisheries management units, and management objectives for the fishery or category of fisheries;
- Address the proposed conservation, management, and development measures to be applied to the fishery or class of fisheries, having regard to the performance of historical measures;
- Describe the processes and indicators for management and measuring management performance, and;
- Make provision in relation to any other matter necessary for sustainable use of fishery resources.

In addition to the 2005 MRA, the Cook Islands have recently enacted legislation to give effect to an overarching marine resource management and conservation strategy (the Marae Moana Act, 2017). The focus of this is a large scale marine protected area network to protect and conserve the ecological, biodiversity and heritage values of the Cook Islands marine environment.

MMR also has an active fisheries management monitoring and evaluation program, with key legislative and regulatory instruments also including mandated review periods. Overarching guidance is provided by the National Sustainable Development Plan, and the subordinate strategic plan, due for review in 2021. For the tuna fisheries, the Offshore Fisheries Plan is also scheduled for review (MMR, Pers Comm.).

Vanuatu

The Vanuatu Fisheries Department (VFD) is responsible for the implementation and enforcement of fisheries management laws/regulations. The main fisheries legislation in Vanuatu for the conservation,

management and development of fisheries resources is the 2014 Fisheries Act. Title 10 of the Fisheries Act addresses multiple aspects of the fishery, and the key parts relevant to the UoA are summarized below. The Maritime Act (CAP 131) is the primary instrument for the licensing/registration of Vanuatu flagged vessels. Key associated subsidiary legislation includes the Tuna Management Plan (2014), Monitoring Control & Surveillance (MCS) and Inspection Plan and FAD Management Plan. The Tuna Management Plan is currently under review, with the review expected to be finalized early in 2021. Vanuatu has also introduced National Plans of Action (NPOA) to cover fishing interactions and bycatch reduction strategies for seabirds, sharks, and turtles. Any sharks landed are required to have fins naturally attached.

Table 26 Relevant Parts within the 2014 Fisheries Act, Title 10.

Title 10	Specified Fisheries Management and Policy Functions
Part 3	Administration: Functions and Powers of the Minister, Functions and Powers of the Director, Delegation of functions and powers, Fisheries Management Advisory Council
Part 4	Fisheries management, development and conservation
Part 7	Vanuatu fishing vessels and local fishing vessels in Vanuatu waters: Obligations of Vanuatu fishing vessels, Local fishing licences
Part 8	Registration of fishing vessels on the international shipping registry: Requirements for vessel registration, verification of IUU fishing activity, penalties for not complying with registration requirements
Part 9 & 10	Requirements for charter of fishing vessels and for Foreign Fishing Vessels: negotiation of access agreements, foreign fishing agreements, fees.
Part 11	Compliance with international obligations: alignment with international conservation and management measures in Vanuatu waters through publication in Gazette
Part 13	General licensing provisions: terms of licenses, fees etc
Part 17	Other approvals: includes authorization for transhipment
Part 18	Authorised officers, observers and port samplers: observer program, port sampling and monitoring, and duties to authorised officers, observers and port samplers
Part 19	Monitoring, Control, and Surveillance: VMS measures/requirements, Port measures and Catch certification
Part 21	Jurisdiction and evidence: Validity and procedures for certificates, Observer devices, Photographic evidence etc
Part 22	Regulations and penalty notices: general regulation making power, regulations for enforcing fisheries management plans, regulations for promoting the effectiveness of international conservation and management measures, application of regulations and penalty notices.

Vanuatu is a member country of WCPFC and FFA. It is also a signatory to binding fisheries treaty arrangements including the United Nations Convention on the Law of the Sea, 1982 (UNCLOS), Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing, 2009, (PSMA), and the United Nations Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks 1995 (Fish Stocks Agreement).

Vanuatu has developed specific fisheries management measures, such as implementing a limit of 30 purse seine licenses across the vessel groups (i.e. foreign, locally-based foreign, and local) and establishing TACs for the major tuna species (i.e. albacore, yellowfin, skipjack bigeye, and billfish) (NPOA IUU, 2015). Catch volumes and license numbers reported in the CMM Annual Report Part 1 show conformance with these license numbers/TACs (VFD, 2019). The relationship between species TACs/license limits and stock status

are unknown. Vanuatu's national fisheries legislation also explicitly requires adherence to WCPFC's CMM's by any Vanuatu flagged vessels (VFD, Pers Comm.).

7.1.1.5 Recognized Interest Groups

Details about the key international and regional fisheries management entities, and supporting agencies and organizations (e.g. WCPFC, PNA, FFA) are provided in the preceding sections. There are extensive, regular formal and informal stakeholder liaison and consultation processes at the WCPFC, PNA, and FFA and other regional & international fora; as well as bilateral consultations, and ongoing engagement with domestic stakeholders.

At a regional level, FFA plays an important role as a conduit for the relevant Pacific nations. In addition to these fisheries management and governance focused organisations, there are a range of other interest groups and stakeholders supporting and/or engaged with fisheries management processes across the UoA.

The Pacific Islands Tuna Industry Association (PITIA) is a representative body for national fisheries associations of FFA Pacific Island Countries (other than Australia, New Zealand and Tokelau). PITIA's major role is representation of commercial interest to policy making forums. PITIA has observer status at several policy forums and is the recognized industry representative to Forum Fisheries Committee meetings.

The Western Pacific Regional Fishery Management Council (WPRFMC) is one of eight US regional fishery management councils established to prevent overfishing, minimize by catch and protect fish stocks and habitat. The roles and responsibilities of these regional councils are well defined under US legislation. (SCS, 2015).

More broadly, for those countries covered by the UoA, key purse seine fishery stakeholders and interest groups include domestic and foreign purse seine fishers and related companies; as well as pole and line, and longline license holders that also target yellowfin and skipjack tuna. Supply chain related stakeholders include canneries and other fish processing facilities, the Solomon Islands government and a range of local and national government bodies related to fisheries, fishing industry organizations, the regional WCPFC and related fishery management and research entities, local/customary fishers, and environmental NGO's.

The most active and influential of these environment and conservation focused NGO's and Charitable Trusts active on key fisheries issues within the UoA include Birdlife International, Conservation International, Environmental Defense Fund, Fishwise, Greenpeace, International Seafood Sustainability Foundation (ISSF), The Nature Conservancy, PEW Charitable Trusts, the Sustainable Fisheries Partnership, and World Wildlife Fund (WWF)[29].

[29] For example, see https://www.prnewswire.com/news-releases/leading-environmental-ngos-stand-together-to-call-for-100-observer-coverage-on-industrial-tuna-fishing-vessels-300873686.html

Key Stakeholders and interest groups for the FSM tuna fisheries include the Department of Resources and Development, Department of Justice, Department of Transport, Communications and Infrastructure, States Port Authorities (Pohnpei, Kosrae, Chuuk, Yap), National Office of the Public Auditor (NOPA), Department of Foreign Affairs, and smaller Non-Government Organisations (NGO's).

For the Solomon islands, key stakeholder groups include domestic purse seine, pole and line, and longline license holders all fishing predominantly for yellowfin, bigeye and skipjack tuna; foreign purse seine vessels fishing under license within the SB EEZ; supply chain businesses, including large scale fish processing facilities; government agencies, industry organizations, regional organizations, and environmental groups.

There is also a significant local and non-commercial or artisanal based fishing sector, including traditional owners of bait fishing grounds. Customary fishing rights are also explicitly recognised and protected in national fisheries legislation. Commercial fishing is prohibited within 3 nm of the shore, unless specifically approved.

Under Solomon Islands fisheries legislation, a Fisheries Advisory Council (FAC) is constituted to provide higher level management advice and guidance to the Minister for Fisheries. FAC membership includes representatives from key Government agencies, industry, and regional organisations. The Tuna Industry Association of the Solomon Islands (TIASI), the peak industry body representing all tuna fishing and processing companies in the Solomon Islands, is also a FAC member.

For New Zealand, in addition to the Ministry for Primary Industry (MPI), domestic stakeholders with an interest in New Zealand's international fisheries management include related government agencies such as the National Institute of Water and Atmospheric Research (NIWA); environment focussed NGO's including WWF-NZ, the Royal Forest and Bird Protection Society of New Zealand, Greenpeace International, and the umbrella organisation representing Environment and Conservation Organisations of New Zealand (known as ECO).

There are several New Zealand commercial fishing enterprises with active interests in fisheries for skipjack tuna and other tuna species. The largest of these, Talley's Ltd, holds MSC certification for its skipjack tuna operations. New Zealand Maori also have a strong and formalized interest in domestic fisheries management, both at a customary and commercial scale, and hold formal access rights through the Treaty of Waitangi Fisheries Commission (Te Ohu Kaimoana).

For the Cook Islands, key fishery stakeholder groups include the Cook Islands Government, chiefly the MMR, and related government agencies such as the recently established Marine Park Authority, and regional fisheries research and management agencies (e.g. FFA, SPC, NOAA, the Secretariat of the Pacific Regional Environment Programme (SPREP)). The Cook Islands Government agencies also work closely with New Zealand's fisheries and related agencies such as NIWA. Other key stakeholders include:

- A small domestic fishing fleet of commercial vessels, and one local seafood processing company;

- International and regional NGO groups (as described above), and two active locally based environmental NGOs (eNGOs), the Pacific Islands Conservation Initiative Trust (PICI), and the Te Ipukarea Society;
- Smaller scale community and artisanal fishers and their representative organisations, particularly the Cook Islands Fishing Association (CIFA), a national association representing artisanal community fishers from various islands. Sieben et al, (2020) note that the CIFA has been less active in recent years.

For Vanuatu, the primary stakeholder group is VFD, in addition to other related government agencies (e.g. Police Maritime Wing) and broader regional fisheries research/management agencies described for the Cook Islands. Other interested parties include processing plants and small scale/artisanal tuna fishermen, as well as coastal fishermen targeting beche de mer and other near-shore resources. In addition, the Fishery Management Advisory Council (FMAC) provides advice to VFD and evaluates progress toward stated goals. The FMAC is comprised of industry and representatives from associated governmental departments, and have an active role in evaluating proposed fisheries legislation and policy before it is considered for parliamentary and formal regulatory approval (VFD, Pers Comm.).

7.1.1.6 Arrangements for On-going Consultations

The WCPF Convention provides information on the functions, roles and responsibilities of member states and the committees formed under Commission control (SC, NC, and TCC) in relation to consultative processes. The Commission and its committees have well defined operating procedures and terms of reference, and the roles and responsibilities of members and non-members are well defined in the Convention, in the Rules of Procedure and in relevant CMMs. The Commission Secretariat facilitates effective engagement by stakeholders including Non-Government Organisations (NGOs) and other interested parties. Attendance at Commission and related meetings (including SC and TCC) are comprehensive and meaningful involvement and interaction in the cooperative management of the tuna fisheries; noting that some of these meetings are held in closed session (in particular some important aspects relating to compliance with CMMs by CCMs) and thus do not offer transparent and open opportunity for meaningful involvement.

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

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

National Considerations

National government tuna management plans often define consultation roles and responsibilities although the level of detail varies across TMP's. More extensive, and both formal and informal consultation processes, are detailed for the PNA, and FFA and other regional & international for a. This includes consultation with both bilateral and multilateral partners and domestic stakeholders.

At a regional level, the Pacific Islands Tuna Industry Association[30] (PITIA) is a representative body for national fisheries associations of FFA Pacific Island Countries with members from the Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu. PITIA's major role is representation of commercial interest to policy making forums and is the recognized industry representative to Forum Fisheries Committee meetings[31] and is guided by the following objectives:

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

Consultation processes for the flag states relevant to this UoA are described in more detail below.

USA Fleet

The MSA (Section 302(g)) directs Fishery Management Councils to 'establish, maintain, and appoint members to committees and advisory panels', and specifies the roles and responsibilities of the individuals involved in the management process. There is an advisory body comprised of 15-20 "individuals from various groups concerned with the fisheries covered by the WCPFC Convention."

At the national fishery management level, the WPFMC holds three regular meetings per year that are open to the public. Closed meetings may be held upon occasion, but minutes are taken and shared. There are additional conferences and meetings held by the Council Coordination Committee (CCC).

More generally, U.S. Government fisheries management processes provide for a high level of stakeholder engagement including reporting to interested parties. The NMFS provide explanations for management actions through formal and informal meetings and regional management councils provide opportunities for reporting to stakeholders as described above.

Chinese Taipei

[30] See: http://pacifictuna.org/.

[31] For example, see: http://www.tunapacific.org/byline/pacific-islands-tuna-industry-association-pitia/

Documentation regarding formal consultative processes for Chinese Taipei as they pertain to stakeholder involvement in developing a national position for WCPFC is limited however anecdotal explanations and evidence from WCPFC meetings suggests Chinese Taipei has developed consultation arrangements prior to WCPFC meetings that reflect engagement with at least some of the relevant interested and affected parties.

When CMMs are proposed, the Chinese Taipei Fishery Agency (TFA) and the Overseas Fishery Department of Council (OFDC) summarize existing CMMs, any related meeting reports published on WCPFC website about the change of CMMs and new proposed CMMs. This occurs one month before any WCPFC Regular Meeting Commission. In this period before a Commission meeting, the TFA and OFDC gather all related parties, such as Purse-Seiner Association, Tuna Association, and Longline Association to discuss and gather all opinions in order to attempt to achieve a common stances on proposals, that can then become a national position to be addressed by TFA and OFDC in WCPFC on behalf of Chinese Taipei. After the meeting and in order to adopt the CMM into Chinese Taipei domestic regulations, the Deep sea water division of TFA under the Council of Agriculture, Executive Yuan (central government) and overseas Fisheries Development Council of the Republic of China will propose the adoption of CMMs into Chinese Taipei domestic legislation. The Executive Yuan will send the proposal to the Legislative Yuan to carry out examination and revision. After passing the regulation, the Council of Agriculture, under Executive Yuan, will be assigned to establish the policy and procedures associated with the regulation.

When new regulations are proposed, the assessment team was told that domestic law obliges the TFA to provide a pre-notice, for a period of 3-4 weeks, for the public to provide input on changes in legislation, which are then considered by the agency. There is no obligation on the part of the agency to provide explanation of what is, or is not decided, or why (*SCS, 2018*). Proposed changes to key fisheries regulations are also promulgated on the TFA website to provide an opportunity for interested parties to consider them and respond as necessary.

Solomon Islands

The Solomon Islands' Ministry of Fisheries and Marine Resources (MFMR) has over-arching responsibility for the conservation, sustainable management, and development of tuna fishery resources and dependent industries. MFMR's legislative duties and responsibilities are specified in the Solomon Islands Fisheries Management Act 2015[32], including guidance in relation to formal and less formal engagement and consultation with key stakeholders.

The Solomon's fisheries legislation provides for a Fisheries Advisory Council (FAC) with members appointed by the Minister; Council members have an advisory function, making recommendations on fisheries conservation, management, development and sustainable use. FAC membership is drawn from key Government agencies, industry, and regional organisations.

The Tuna Industry Association Solomon Islands (TIASI) is the peak industry body that represents all tuna fishing and processing companies in the Solomon Islands. Its objective is to sustainably develop tuna

[32] Available at: http://macbio-pacific.info/wp-content/uploads/2017/08/Fisheries-Management-Act-2015.pdf.

resources in partnership with the Solomon Islands Government and key stakeholders. Under national fisheries legislation, the Solomon Islands Fisheries Advisory Council is the principal advisory body guiding development of national fisheries policy and practice, including national positions in relation to WCPFC and other regional fisheries processes.

Federated States of Micronesia

For the FSM, the National Oceanic Resource Management Authority (NORMA) has overall responsibility for adopting fisheries regulations, concluding domestic and foreign fishing agreements and issuing fishing permits. As part of these processes, NORMA's Board of Directors consults with a range of stakeholders including fishery representatives from each of the federated states, NGOs, and fishing industry groups. Stakeholder consultation and engagement occurs more formally via FSM's Fisheries Management Surveillance Working Group, and through annual Fisheries Symposium workshops and informal meetings on an as required basis (*Control Union Pesca, 2019*). The FSM's Tuna Management Plan[33] also explicitly recognises the importance of stakeholder consultation and engagement; also recognizing the key role of stakeholders in supporting development of the most recent version of the TMP.

New Zealand

Stakeholder consultation and liaison is an important aspect of New Zealand's fisheries legislative framework, with consultation guidelines established under the 1996 fisheries act. The act requires that stakeholders "with an interest" in each fishery must be consulted in the management decision making process. To this end New Zealand's MPI develops a tailored consultation plan for key legislative and policy initiatives, including the nature of proposed consultation, timeframes; and the expected timeframe for decision making. Stakeholder views are summarised and included as part of the supporting material to aid Ministerial decision making (Akroyd and McLoughlin, 2017).

When management changes are proposed to meet sustainability requirements, MPI prepares a discussion document that provides the Ministry's initial proposals for issues needing decision and a range of management options. The proposals outlined in MPI's discussion document are preliminary and are provided as the basis for consultation with stakeholders. Subsequently, MPI prepares a document to support Ministerial decision making, summarising stakeholder views on the proposals, and making recommendations. The decision document and the Minister's letter setting out his final decisions are made publicly available to stakeholders once finalised. New Zealand's MPI has also developed a comprehensive stakeholder consultation "standard" to facilitate best-practice stakeholder engagement in support of fisheries management decision making[34].

Under its HMSMP and the subordinate Annual Operational Plan, New Zealand has a key work area commitment to stakeholder engagement on tuna fishery management issues; with a structured stakeholder engagement strategy, and deliverables, as part of each HMS AOP. There is also ongoing liaison with e-NGOs to discuss key issues and collaborate on possible solutions, particularly in the leadup

[33] Available at: https://Anon_2015_FSM_Tuna_Management_Plan.pdf

[34] https://fs.fish.govt.nz/Doc/21817/consultation_standard%5B1%5D.pdf.ashx

to key international fisheries meetings and negotiations (e.g. WCPFC annual meetings, and sub committees such as the Ecologically Related Species Working Group).

Cook Islands

The Cook Islands' MMR has oversight of a range of processes to engage stakeholders in fishery decision making, including statutory requirements relating to protection of the interests of local residents in relation to fisheries decisions; and the need to ensure broad participation by Cook Islanders in activities related to the sustainable use of marine resources (MRA, 2005).

Proposed amendments to update the 2005 MRA (the Draft Marine Resources Bill, 2017), include several initiatives to further develop both stakeholder engagement, and their participation in decision making. For example, a Fisheries Advisory Committee (FAC) is proposed, including representatives from the fishing industry and e-NGOs. Like the 2005 Act, the draft contains provisions for establishing a fishery plan for any 'designated fishery' and requires a formal public consultation process as part of this.

The Cook Islands MMR are currently working with key stakeholders to develop a standards-based fisheries management policy framework, due for completion early in 2021. Key elements will include a more defined policy approach to fisheries management objectives, including recognition of the importance of natural marine assets in the region, both for fisheries and for eco-tourism and social and cultural values. Management standards for the tuna fisheries are also being developed (MMR Pers. Comm.).

At an operational level for the purse seine fishery, key decision-making processes are described in the current (2013) Purse Seine Fishery Regulations. These include obligations on the MMR Secretary, or delegate, in relation to taking decisions on fisheries management measures, including consultation with affected parties, the licensing of vessels, and setting sustainable vessel effort and catch limits for Cook Islands purse seine fishing vessels.

Vanuatu

The Vanuatu Fisheries Department (VFD) is the government body charged with the implementation and enforcement of fisheries management laws, policies, regulations and principles under the Ministry of Agriculture, Live stock, Forestry, Fisheries and Biosecurity (MALFFB). There are six departments within VFD (i.e. Administration, Management & Policies, Development & Capture, Research & Aquaculture, Seafood verification and Licensing & Compliance).

Core activities of VFD include:

- processing, issuing or refusing licenses to vessel operators, companies for related fishing activities;
- processing, issuing or refusal of permits for export and import of fisheries products;
- monitoring and surveillance to enforce fisheries laws and regulations;
- collecting data for foreign fishing vessels fishing in Vanuatu waters and beyond and;

- managing and promoting the observer program.

The 2014 Fisheries Act established the Fishery Management Advisory Council (FMAC), which provide recommendations to the Director on policy matters relating to fisheries conservation and management. The council consists of two members nominated by the fishing industry (artisanal and offshore), various members nominated by Vanuatu business/NGO bodies, as well as representatives from government departments. The council is required to '*meet as often as may be necessary';* the assessment team has not yet been provided evidence of council meetings.

Vanuatu's 2014 Tuna Management Development Plan (TMDP) further describes the roles/responsibilities of the FMAC for tuna related matters. The FMAC is responsible for reviewing the TMDP on an annual basis and monitoring progress against stated objectives/goals, which may result in decisions to amend the schedules to the Plan. The TMDP contains criteria for the FMAC to evaluate progress of the measures against the desired target. For example, issues regarding the resolution of EEZ boundaries can be evaluated against the measure of having 'a clear definition of EEZ boundaries resolved with neighboring countries' with the target of having 'definitions included in terms and conditions and a resolution with the Solomon Islands, Fiji, and New Caledonia' (TMDP, 2014). Mid term review processes are also contained within the Tuna Management Plan.

7.1.1.7 Monitoring, Control, Surveillance and Enforcement

Regional

Regional (e.g. WCPFC, FFA and related agencies) Monitoring, Control and Surveillance (MCS) systems include Minimum Harmonized Terms and Conditions of Access (MHTC), a regional VMS system, Regional Register of Foreign Fishing Vessels and a range of regional and international MCS cooperation programmes, including the Niue Treaty and the Agreed Minute of Cooperation in MCS between the USA and FFA member states.

The extent of these regional and collaborative MCS programmes illustrates that, despite significant progress combatting illegal, unreported and unregulated (IUU) fishing, these practices are still occurring with very significant costs across Pacific tuna fisheries[35]. The value of total product either harvested or transhipped involving IUU activity in Pacific tuna fisheries has been estimated recently at USD $616.11m, with a potential economic loss to FFA Members of $152.67m per year (*MRAG Asia Pacific, 2016*).

Between 2015 and 2017, FFA Members have led and completed substantial national and regional work, evaluations and consultations to update the regional MCS framework, now referred to as the *FFA Regional MCS Strategy (RMCSS) 2018 – 2023*[36]. This Strategy targets key regional risk areas and supports the development and consolidation of similarly targeted MCS initiatives, including enhancement of national

[35] See: https:// MRAG Asia Pacific - Towards the Quantification of Illegal, Unreported and Unregulated (IUU) Fishing in the Pacific Islands Region.

[36] Available at: https://www.ffa.int/system/files/RMCSS%20%202%20August%20web%20version.pdf

and regional MCS capabilities to further reduce IUU fishing. The Strategy includes a monitoring and evaluation component to guide and facilitate implementation throughout the life of the framework. Priority objectives for this revised MCS strategy are:

1. Regional standards are in place for effective and efficient MCS systems.
2. Quality information is available and accessible to national and regional officials to assess IUU risks and plan MCS activities.
3. Procedures established and operationalised to conduct effective MCS activities.
4. Effective compliance and enforcement through efficient use of available information, analyses and intelligence, achieved through whole of government engagement.

At the regional level, a range of sanctions exist to deal with situations of non-compliance; notably through black-listing of IUU vessels, and Port State Measures. Port inspection reports provide evidence that they are being applied. Logbook data are supplied as part of licence requirements. An extensive VMS system is in operation, as well as a 100% observer programme for large scale purse seiners. Observers report data from catches in EEZ waters, with special provisions through a MoU to allow observers to operate in the waters of several EEZs.-As described in *Banks et al. (2011*) and via the WCPFC website[37], the Commission has developed and implemented a comprehensive compliance programme, much of which is operationalized via MCS related CMM's. These include:

- Requirements for vessels, including support vessels operating outside their own waters to be on the WCPFC Record of Fishing Vessels and Authorisation to Fish (CMM 2013-10)
- Responsibilities and process for Cooperating Non Members (CMM 2009-11)
- Specifications, Markings and Identification of Vessels (CMM 2004-03)
- High seas Boarding and Inspection Procedures (CMM 2006-08)
- High seas Vessel Monitoring System (CMM2014-02) with the option of "flip the switch[38]" arrangements within EEZs and a blacklist of IUU Vessels (CMM2010-06)
- Regulation of Transshipment, including ban on purse seine vessels transshipping at sea (CMM 2009-06)
- Charter Notification Scheme (CMM 2016-05)
- Monitoring Landings of Purse Seine Vessels (CMM 2009-10)
- Rules for Provision of Scientific Data and Data Dissemination

[37] An overview of the WCPFC compliance and MCS systems is available at: https://www.wcpfc.int/compliance-monitoring

[38] Essentially flipping the switch allows coastal States to have the WCPFC VMS monitor all vessels reporting to the WCPFC within their EEZ

Additional measures have been introduced in recent years[39], including:

- Conservation and Management Measure to establish a List of Vessels presumed to have carried out Illegal, Unreported and Unregulated fishing activities in the WCPO (CMM 2010-06)
- Conservation and Management Measure on daily catch and effort reporting (CMM 2013-05)
- WCPFC Implementation of a Unique Vessel Identifier (UVI) (CMM 2013-04)
- WCPFC Record of Fishing Vessels and Authorization to Fish (CMM 2013-10)
- Conservation and Management Measure for Commission VMS (CMM 2014-02)
- Conservation and Management Measure for Eastern High Seas Pocket Special Management Area (CMM 2016-02)
- Conservation and Management Measure on minimum standards for Port State Measures (CMM 2017-02)
- Conservation and Management Measure for the protection of WCPFC Regional Observer Programme Observers (CMM 2017-03)
- Conservation and Management Measure for the Regional Observer Programme (CMM 2018-05)
- Conservation and Management Measure for WCPFC Record of Fishing Vessels and Authorisation to Fish (CMM 2018-06)
- Conservation and Management Measure for Compliance Monitoring Scheme (CMM 2018-07).

A review on the strengths and weaknesses of regional MCS arrangements in the WCPFC was conducted in were analysed by *MRAG (2009)* and reported on in *Banks et al. (2011)* . MRAG identified the strengths in regional national fisheries licensing systems with good databases and good regional systems, most notably the Pacific VMS, but also others within FFA, WCPFC and SPC. Compliance risks identified with the region were as follows:

- Under-reporting of catches in vessel logs or weekly reports;
- Under-reporting of bycatches;
- CCMs not reporting details on catch and effort to WCFPC;
- Failure to inspect vessels on landing;
- Landings into foreign ports;

[39] Current CMM's are available at the WCPFC website: https://www.wcpfc.int/conservation-and-management-measures

- Failure to implement pre fishing inspections to check licence and other details (e.g. ships master);
- High observer turnover;
- Observer reports of violations not acted upon;
- Weaknesses in implementation of fisheries violations in some countries;
- Weak system of information exchange and data base management.

Banks et al. (2011) concludes that purse seine non-compliance is extremely modest as compared to that for longliners. The PNA implemented a series of changes to respond to the risks identified (including 100% catch retention for bigeye, skipjack and yellowfin; Increasing purse seine observer coverage to 100%; prohibition on transshipping at sea; revision of penalty systems and prosecution laws; and joint initiatives in data exchange between countries, some of which are also covered under various WCPFC CMMS).

The role of FFA

Several of the major elements of this programme, including the observer and VMS programmes, are founded on, and supported by FFA initiatives. Because most of the fishing taking place is in national waters, the broad strategy of the WCPFC compliance programme is to focus on controlling high seas fishing, strengthening the exercise of control by coastal state CCMs, and monitoring compliance with CCM obligations throughout the range of application of Commission measures (*Banks et al. 2011)*.

At the national level, FFA provides policy and services to its members to build national capacity and regional solidarity to control fishing in the Pacific, including illegal, unreported and unregulated fishing. As well as VMS, this includes technical expertise, information sharing and projects related to monitoring activities, regional surveillance operations, the FFA Observer Program, FFA licence information and staff training and support.

FFA maintains a regional vessel register, coordinates the regional observer programme (and USA Treaty vessels), operates the FFA centralised VMS, maintains several other databases on behalf of the FFA parties such as the violations and prosecutions database, and coordinates, through the FFA Regional Fisheries Surveillance Centre, Joint Deployment Actions. The FFA employs a Surveillance Operations Office (SOO) to this end.

The FFA also supports the sub-regional MCS focussed Niue Treaty, an agreement promoting cooperation between FFA members on exchange of information and data (e.g. position and speed of vessels at sea, licence status), and procedures for sub-regional cooperation in monitoring, prosecuting and penalising IUU fishing activity. As a subsidiary to the Niue Treaty, the Te Vaka Moana agreement between FFA members the Cook Islands, New Zealand, Niue, Samoa, Tokelau and Tonga, enables greater sharing of resources, expertise and information; including sub-regional cooperation in the South and Eastern Pacific area; including the use of ports and monitoring of fisheries activities across members' exclusive economic

zones. This Arrangement seeks to optimise MCS efficiency and effectiveness through shared use and coordination of respective national MCS assets and capabilities.

Four annual regional multilateral fisheries surveillance operations support the MCS tools and communications of Pacific Island countries. These are Operation KURU KURU, BIGEYE/ISLAND CHIEF, TUI MOANA and RAI BALANG, and are executed by the QUAD operational Working Group. The QUAD nations comprise the aerial and naval arms of Australia, France, New Zealand and the USA. They provide aerial and surface assets to assist regional surveillance. The FFA SOO has the responsibility for facilitating the coordination of the surveillance assets provided by the QUAD nations, in support of national and multilateral fishing surveillance and response activities. The SOO, and thus the RFSC, is in many cases the conduit between the QUAD nations and FFA members.

For example, Operation Rai Balang 2020[40] took place over 2 weeks in March 2020. The operation achieved maritime surveillance across 14.1 million square kilometres of ocean within the WCPFC convention area; including 108 vessel sighting and 24 boardings. During the operation, FFA coordinated air and surface surveillance assets from eight Pacific Island countries and four regional defence partners.

All FFA members have access to the FFA RFSP covering both their respective EEZ's and the high seas. The three information sources (FFA VMS, WCPFC VMS and AIS) are used to correlate additional sighting reports from QUAD and FFA member assets, potentially highlighting 'dark' vessel contacts not polling on VMS or AIS. These vessels are referred to individual nations for further management/enforcement action.

The RFSP is linked to the extensive FFA secure databases containing a range of fisheries information that are designed to assist national MCS officers to assess the relative level of compliance of all vessels on the FFA VMS. In the RFSP, all vessels are 'traffic-light' colour coded to indicate the level of compliance risk (Compliance Index (CI)) (see next section for further description), which can then be used by member countries to plan MCS activities and operations for their Pacific Patrol Boats (PPB's), with red indicating the possibility of a high-risk/non-compliant vessel, green indicating a greater probability of a low-risk/compliant vessel.

Regional reporting and transparency

The WCPFC TCC is tasked with examining compliance with CMMs adopted by the Commission. Members and CCMs submit a Part 2 Annual Country Report on the implementation of Commission measures. This leads to the development of a Compliance Monitoring Report. There is a lack of transparency with this reporting as much of the material is treated as confidential, including the Part 2 Annual Reports. Discussion of identified compliance issues are held in closed session. However, the Final Compliance Monitoring Review is posted in the WCPFC's Annual Meeting report indicating flag states' non-compliance with specific obligations.

[40] See: http://www.tunapacific.org/category/news/news-news/

CMM 2018-07 provides an update from CMM 2015-07 pertaining to the WCPFC Compliance Monitoring Scheme (CMS). This CMM is relevant to MSC scoring and Performance Indicator 3.2.3.

The stated purpose of the CMS is:

1. assess CCMs' compliance with their WCPFC obligations;
2. identify areas in which technical assistance or capacity building may be needed to assist CCMs to attain compliance;
3. identify aspects of CMMs which may require refinement or amendment for effective implementation;
4. respond to non-compliance by CCMs through remedial and/or preventative options that include a range of possible responses that take account of the reason for and degree, the severity, consequences and frequency of non-compliance, as may be necessary and appropriate to promote compliance with CMMs and other Commission obligations; and
5. monitor and resolve outstanding instances of non-compliance by CCMs with their WCPFC obligations.

The revised CMM's include additional scope provisions in Section 2, which focus on Capacity Assistance and Investigation Status Reports. The 2016 Final Compliance Monitoring Report (Covering 2015) accordingly added two new categories for Capacity Assistance Needed and Flag State Investigation in its Compliance or Implementation Status tables, which classify flag state areas of noncompliance by CMM or data provision article. There has been an increasing level of detail provided in these compliance tables in recent years that demonstrates progress toward greater transparency (*SCS, 2018*).

There is also a new online system that was launched in 2016 called the Compliance Case File online system. This system tracks individual alleged violations relevant to the CMS. There are four lists currently published in this new system that are accessible to relevant flag CCMs and the Secretariat:

- Article 25-2 compliance cases (non-observer prompted flag state investigations),
- FAD set alleged infringements (from observer data),
- observer obstruction alleged infringements (from observer data), and
- shark catch alleged infringements (from observer data).

There is also ongoing discussion in meeting documents regarding allowing participation by observers in closed TCC sessions, including the session which considers the draft Compliance Monitoring Report (CMR) or working group sessions considering the provisional CMR, subject to confidentiality restrictions (*WCPFC 2016a & 2016b*). As part of WCPFC's commitment to ongoing improvement of key MCS programmes, an independent review of the WCPFC CMS was announced in 2017 and recently concluded. The report is

available via the WCPFC website[41]. In the Executive Summary (paragraph 6.), the review panel observe that:

> *"the current system is fundamentally sound, and achieves its overall objectives, as well as stacking up well against other compliance monitoring systems, including those of other RFMOs. It is robust and comprehensive. It appears to be having positive effects upon overall compliance. However due to its comprehensive nature and its (still increasing) size and scope, as well as the demands it places on participants, it is at risk of collapsing under its own weight unless those demands can be reduced".*

Higher priority recommendations from the review focus on:

- making the CMS more manageable, as well as more effective and efficient for those CCM personnel using and/or contributing to the system;
- reducing the burden placed on CCMs, particularly small administrations, with respect to data provision, duplication and repetition;
- reducing the volume of material going to TCC, by introducing pre-screening in a "Friends of the Chair" Group;
- including 'audit points' that reflect critical obligations in each CMM prior to adoption;
- improving the process for development and refinement of CMMs;
- improving capacity building to support effectiveness of the CMS;
- improving the Review Process to better reflect the requirements of procedural fairness;
- in the interim, introducing a Quality Assurance Review (QAR) system to assist CCMs where there is a pattern of serious non-compliance and possibly systemic issues.

Whilst there is progress at WCPFC in examining compliance information and the need for responses to non-compliance, the WCPFC continues to underperform relative to other tuna RFMOs in some regards. In contrast to other tuna RFMOs (ICCAT, IOTC, CCSBT and IATTC), observers are not allowed in the compliance working group meetings and no detailed information on infringements or responses to them are released publicly.

National MCS Programs and Records

While the Regional organizations - predominantly WCPFC and FFA - set up conditions, general policies, capacity building operational support for Monitoring, Control and Surveillance (MCS) activities in the

[41] Available at: https://www.wcpfc.int/doc/final-report-independent-panel-review-compliance-monitoring-scheme-executive-summary.

WCPO tuna fishery, none of these organizations has enforcement capacity *per se* and therefore rely completely on coastal and flag state enforcement actions.

United States

USA legislation to prevent IUU fishing requires that where the U.S is a member of a fishery management organization, including RFMOs such as WCPFC, actions be taken to improve their effectiveness (NOAA 2013, NOAA Pers Comm.), including:

- Incorporate multilateral market-related measures against member or non-member governments whose vessels engage in IUU fishing;
- Seek adoption of lists that identify fishing vessels and vessel owners engaged in IUU fishing;
- Seek adoption of a centralized vessel monitoring system (VMS);
- Increase use of observers and technologies to monitor compliance with conservation and management measures;
- Seek adoption of stronger port State controls in all nations;
- Adopt shark conservation measures, including measures to prohibit removal of any of the fins of a shark (including the tail) and discarding the carcass of the shark at sea; and
- Adopt and expand the use of market-related measures to combat IUU fishing, including import prohibitions, landing restrictions, and catch documentation schemes.
- Maintenance of the NOAA: General Council Enforcement Website providing information for any notice of violation of fisheries regulations that has occurred in the last six months (NOAA also maintains the Summary Settlement Policy describing smaller infringements /citations – not publicly available);

The USA has developed partnerships with Pacific nations in the WCPO to assist with enforcement in that area. Nine "Shiprider" agreements have been signed enabling Pacific nations to place local law enforcement personnel on board USA Coast Guard vessels and give the Coast Guard authority to patrol their territorial waters and conduct vessel boardings. In FY 2012, the USA Coast Guard conducted 121 boardings under bilateral enforcement agreements with seven Pacific Island Nations: Cook Islands, Federated States of Micronesia, Kiribati, Republic of the Marshall Islands, Nauru, Palau, and Tuvalu, with 21 violations documented. Of these, four stemmed from WCPFC measures, while 17 were infractions of national laws applicable within the EEZ of Pacific Island Nations (*NOAA, 2013*).

The USA as a flag state has proven evidence of prosecutions of its vessels for non-compliance with management measures: a search on the NOAA website provides evidence of fisheries enforcement cases in relation to USA vessels under the UoA.

- In 2009, the owners, operators and fishing masters of several fishing vessels (Ocean Encounter, Ocean Conquest, Sea Honor, Sea Quest and Pacific Ranger) were charged with five counts of setting their purse seine net on whales, which is a violation of the Marine Mammal Protection Act, ten counts of setting on or within one nautical mile of a FAD and two counts of deploying FADs during the 2009 FAD closure in violation of the Western and Central Pacific Fisheries Convention Implementation Act WCPFCIA. All seventeen counts were proven and resulted in a civil penalty of USA$953,054.[42]
- In March of 2015, NOAA denied a petition for administrative review for a Notice of Violation and Assessment of Administrative Penalty to the FV Pacific Ranger, with five counts of prohibited take of a marine mammal in violation of the Marine Mammal Protection Act (MMPA), 16 USAC. § 1372(a)(1), and with a single count of setting a purse seine fishing net within one nautical mile of Fish Aggregating Device in violations of the WCPFCIA, 16 V.S.C. § 6906(a)(l)[43]
- In a further case, the FV Ocean Conquest on October 27, 2010 set their purse seine fishing gear on a live whale, thereby taking a marine mammal on the high seas, in violation of16 V.S.C. § 1372(a)(1) and 50 C.F.R. § 216.ll(a) and has been prosecuted.[44]

The US is also proactive in following up information, including observer data, indicating possible infringements. This includes sending NOAA representatives to FFA twice-yearly to review observer data rather than wait for the often delayed provision of such information through routine channels (NOAA Pers Comm.). While these procedures provide evidence of the enforcement abilities of USA fisheries authorities, the repetitive nature of the some minor offences suggest that consequences of non-compliance may need to be increased to improve the deterrence effect from current arrangements.

Chinese Taipei

The new arrangements put in place in response to the EU yellow card tighten regulations and raise the fines for illegal fishing, “fish laundering” and other significant violations. The Act Governing Distant Water Fisheries lists 19 activities as “major violations,” including undertaking distant fishing without registration; failing to install a VMS and a system to report each vessel’s catch; unloading and transshipping fish and fishing in foreign waters without official approval; counterfeiting and hiding identification markers, such as the name and number of a fishing boat; fishing in excess of the authority’s announced quotas; fishing, possessing, transshipping, unloading or selling banned species; avoiding or obstructing inspection and cooperating with boats that have been undertaking illegal, unreported and unregulated (IUU) fishing. Chapter IV of the new Distant Water Fisheries Act provides extensive Penal Provisions in Articles 35 to 45.

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[42] (http://www.nmfs.noaa.gov/ole/newsroom/stories/13/04_090413_purse_seine_fad_case.html)

[43] http://www.gc.noaa.gov/documents/2015/2015_Administrator_Pacific_Ranger_ocr.pdf

[44] http://www.gc.noaa.gov/documents/2015/2015_ALJ_Ocean_Conquest_ocr.pdf

These provisions provide for escalating fines and/or suspension and cancellation of concessions where there are multiple and repeat offenses over a period of time.

The Act stipulates that business operators or employees who perpetrate any of the major violations will be severely fined and their fishing permits will be revoked for up to two years. The enforcement rules impose fines that are categorized in proportion to the size of the boat in question and the number of times in recent years the offence has been detected. If the fines are "less than the value of seized fishery products, the perpetrator would instead be fined up to five times of the value of the seized products." The act also stipulates that repeated violations are subject to more severe punishment.

As this Act is relatively recent, there is limited history available in relation to the consistent imposition of sanctions over time. However since the introduction of this new legislation sanctions have been applied, and are likely to provide effective deterrence. Details of these are made available via TFA's website.

In addition to the revised Distant Water Fisheries Act, amendments to the Ordinance to Govern Investment in the Operation of Foreign Flag Fishing Vessels prohibit Chinese Taipei from investing in or operating boats that are non-Chinese Taipei without official permission. If investments are planned for boats that are known to have undertaken IUU fishing, the permission would not be granted, or, if already granted, would be revoked, according to the amendment. The TFA also adopted a Strategy Plan for Auditing Industry Related to Distant Water Fisheries, however no plans, logistics or timeframes were presented.

As described above, both TFA and the Coast Guard Administration have the power to detect, identify, and issue punishments for infringements. Chinese Taipei's NPOA provides for an annual exchange of information between the Chinese Taipei Coast Guard Administration and the Fisheries Agency regarding international fisheries management. Both the Coast Guard and the Fisheries Agency can conduct boarding and inspection of vessels, but it is unclear what coordination is legally required between the two institutions. The Maritime and Port Bureau in the Ministry of Transportation and Communication also wields legal authority to inspect Chinese Taipei flagged vessels in order to deter IUU fishing and it remains to be clarified how these responsibilities differ from other agencies responsible for aspects of enforcement (*SCS, 2018*).

Information relating to enforcement activities, violations encountered, and sanctions applied is available on the Fishery Agency website, but not in English (as the main language used for official WCPFC documentation), impeding transparency and collaboration with other CCMs. Details of fines imposed by the Chinese Taipei Government for incidents of illegal fishing involving Chinese Taipei deep-sea fishing vessels from January to July 2017 are also available. *SCS (2018)* note this may reflect efforts by Chinese Taipei to improve its performance with respect to non-compliance in light of earlier EU action placing Chinese Taipei on a watch list of countries that have not taken sufficient action to curb IUU fishing. 24 of the fines detailed were based on the new Distant Water Fisheries Act, which came into force on 20 January 2017.

An issue that needs to be resolved is the matter of the Yu Fong 168 being on the WCPFC IUU Vessel list (see 3.2.3a). While the note on the vessel list suggests that Chinese Taipei has sought to take effective action in relation to this matter, the question remains as to why authorities have not removed the Chinese Taipei flag from this vessel. Recent evidence suggests that this vessel cannot be located at this juncture. In this vein, nevertheless, Article 44 of the Distant Water Fisheries Act states:

> *Article 44: .... "In the event that a fishing vessel whose fishing license was withdrawn pursuant to the Fisheries Act before this Act becomes effective and which is listed on the IUU fishing vessel list(s) of the international fisheries organization(s) fails to comply with the order of the competent authority to return to domestic ports within designated timeframe, the competent authority may confiscate such fishing vessel, and apply to the navigation authority for re-registry of its ownership, followed by the revocation of its registration and cancel of its certificate of nationality."*

This would seem to provide a head of power to deal with the vessel and owner.

Chinese Taipei fisheries representatives have also advised that it can be challenging for them to obtain observer data in a timely manner from the WCPFC ROP in cases where there are alleged infringements and the embarked observer is from another WCPFC member country (TFA Pers Comm.).

Solomon Islands

As a party to the FFA, the Solomon Islands' benefit from the suite of MCS related support services provided by WCPFC and the FFA regionally. These include the Regional Surveillance Centre, coordination of regional Vessel Monitoring System services, coordination of Joint MCS Operational Programmes, and observer training (*MRAG Americas, 2016*). Foreign Fishing Vessels such as those operating within the UoA also pay fees related to the cost of Solomon Islands' MCS services.

In addition, the Niue Treaty Subsidiary Agreement (NTSA) functions as a key cooperative MCS agreement between FFA members, including provisions on exchange of fisheries data and information, as well as procedures for cooperation in monitoring, prosecuting and penalising operators of IUU fishing vessels.

Compliance aspects of broader Solomon Islands MCS activities are the responsibility of a specific division within the SI MFMR and include:

- The coordination of Pacific Patrol Boat (PPB) deployment in cooperation with the Police Maritime Division (PMD) of the Royal Solomon Islands Police Force (RSIPF);
- catch log sheet data collection and input, and data monitoring, including data entry for log sheets, transhipping documentation, and recording advanced notice of vessel exit and entry;
- Operating a fisheries monitoring station;
- Licensing and permits for domestic and foreign vessels and collecting licensing fees.

MRAG (2016) also note European Commission (EC) evaluation of SI MFMR MCS capabilities and performance in the context of SI compliance with EU IUU Regulation 1005/2008 (an EU directive intended to deter and eliminate IUU fishing and prevent IUU sourced products from entering EU markets). In December 2014, the EC issued a 'yellow card warning' on the basis that SI action to prevent IUU fishing was not compliant with EU requirements. SI MFMR have subsequently introduced significant improvements across the range of MCS related activities, under the broad umbrella of comprehensive legislative reform including the introduction of comprehensive and contemporary ecosystem based national fisheries legislation in 2015. Improvements include better administration of the EU's catch documentation scheme and more effective monitoring of Solomon Islands flag/chartered vessels if fishing beyond the EEZ.

The SI's Police Maritime Division conduct at sea inspections, with target tasking of around 12 trips per year (between 2000 to 3,500 hours) using two vessels (*MRAG, 2016*). Penalties for non-compliance include a system of potentially compounding administrative penalties and options for pre-court settlement. Additional penalties may include forfeiture of fish, vessels, imprisonment and suspension of the license.

As for other WCPFC members, IUU vessels known to the SI government may also be put on the WCPFC IUU list, or "black-listed" on the FFA's Vessels of Good Standing Register (VOGS) which would deny it the ability to be licensed to fish in any FFA member State EEZ. Fines for serious offences of not less than SB$2.5 million may be imposed and vessels confiscated, or fishing operations stopped. The Solomon Islands National Plan of Action for Illegal, Unreported and Unregulated (NPOA-IUU) fishing classifies NFD purse seine operations as 'low risk' (*MRAG, 2016*).

The WCPFC Compliance Monitoring Scheme (CMS), and its Technical and Compliance Committee (TCC) manage compliance issues based on available information on infringements from observers and other sources. These discussions are held in closed session. Responses to infringements are considered at the TCC and reported to the Commission in the Compliance Monitoring Summary Report. This report provides a reporting matrix describing compliance with CMMs by CCM. Additional detail on the compliance status of each flag State has been added in recent years. The annual compliance summary report still does not provide information on outcomes of investigations into non-compliance, nor specific cases. This makes it difficult to judge whether non-compliance is dealt with consistently (Morgan et al. 2018) or deterred appropriately. Although not a direct sanctioning tool, the CMS provides information on non-compliance, and may provide some deterrence in so far as Flag States would not wish to be rated non-compliant or priority non-compliance over time.

The only other significant tool directly available to the WCPFC is the IUU Vessel list, which is aimed at vessels presumed to have carried out IUU fishing. Where IUU fishing is detected, flag States are notified and asked to take appropriate enforcement action, including ensuring that the vessel leaves the Convention area. At December 2019, there are three vessels on the IUU Vessel list, and this sanction appears to be consistently applied and provide effective deterrence in relation to proven IUU fishing.

At the domestic level, the Solomon Islands Fisheries Management Act provides for a range of sanctions for various infringements. Trumble and Stocker (2016) suggest this framework is generally effective although there is little evidence of formal violations and sanctions being applied. The framework is also supported by a system of administrative penalties, and provisions for pre-court settlements.

The Solomon Islands also reserves the right to prosecute fisheries-related offences through criminal proceedings. Fisheries-related offences can include forfeiture of fish, vessels, imprisonment and suspension of the license. An IUU vessel may also be put on the WCPFC IUU list, or "black-listed" on the FFA VOGS Register which would deny it the ability to be licensed to fish in any FFA member State EEZ.

Table 27: Summary table of fishery infringements within the Solomon Islands EEZ from 2014 – 2018. Source SI MFMR.

Date	Gear Type	Nature of offence	MFMR action	Penalty
March 2016	LL	Breach of Licence Conditions	Vessel detained and released upon payment of fine	SBD $2.5m
23 January 2017	LL	Breaching section 49 (2) (a) and (b) of SI FMA 2015	Vessel detained and released after payment of fine	SBD $ 1.0m
6 February 2017	PS	Breach 2016 License conditions 8 for Purse Seine vessels operating in SI waters which contravene section 49(2) (a) (b) of the FMA 2015	Vessel detained and released after fine payment	SBD $ 1.0m
14 August 2018	LL	Non- compliance with license conditions	Vessel detained for investigation	SBD $ 100,000

The infringement cases in the Table were all handled via administrative proceedings. The Summary Administrative Proceedings provisions are contained in Section 116 and 117 of the Fisheries Management Act 2015. The Administrative processes involves the Ministry of Fisheries and Marine Resources, the Office of the Director of Public Prosecution and the Attorney General's Office. This process can only proceed where the Company or Vessel admit to the offence or infringement and agreed to have the matter dealt with via these provisions.

Federated States of Micronesia

Like the Solomon Islands, FSM also benefits from the MCS framework and capabilities offered by WCPFC, FFA and related agencies and agreements. At the national level, FSM's MCS capability falls within the responsibilities of NORMA's Statistics, Compliance and Technical Projects Division, with key functions including:

- collection and entry of fishing vessel log-sheet data, catch validation, and transshipment reports;
- ensuring fishing vessels are listed on the WCPFC Record of Fishing Vessels and the FFA Regional Register of Good Standing, and that licensed vessels have VMS fitted as required under WCPFC regulations;
- zone notifications and vessel control reports for fishing vessels entering/transiting/leaving FSM waters; and coordination and liaison with FSM's Maritime Police and the Maritime Surveillance Wing operating within the FSM's Department of Justice. These agencies also have responsibility for maritime surveillance of FSM's EEZ and enforcement of fisheries and maritime laws, including in-port fisheries compliance inspection (*Control Union Pesca*. *2019*).

NORMA has also established a Fisheries Management and Surveillance Working Group including representatives from NORMA, the Department of Justice, and staff from the relevant National and State departments/divisions. The working group meets quarterly to monitor and pro-actively manage tuna fishery related MCS issues. FSM's Tuna Management Plan also reflects contemporary MCS priorities as part of their overall strategy to maintain sustainable and profitable tuna fisheries for national benefit. These include:

- Detecting breaches of management policy & implementation system of penalties to deter non-compliance;
- Shifting roles of observers to include scientific monitoring, compliance monitoring and related monitoring;
- Incentives to deter bribery of observers by fishing operators;
- Maintaining reputation and commitment of FSM national observers to ensure continuity of employment opportunities with operators;
- Greater understanding and awareness of WCPFC CMMs by national observers; and
- Recognising that issues related to limited financial and human resources cut through all the above MCS initiatives.

Chapter 9 of FSM's Title 24[45] provides details of violations and penalties for Prohibited Acts that include:

- Violations of any provision, condition or requirement of a fishing permit or license or access agreement, serious misreporting of catch, fishing in a closed area, fishing after attaining quota, directed fishing for a prohibited stock, using prohibited fishing gear or falsifying or concealing markings, identity, or registration of a fishing vessel is subject to a civil penalty of not less than $100,000 and not more than $500,000.
- Fishing without a valid fishing permit is subject to a civil penalty of not less than $100,000 and not more than $1,000,000.
- Unauthorized fishing in waters under the national jurisdiction of a foreign state is subject to a civil penalty of not less than $50,000 and not more than $1,000,000.
- Violation of marine space is subject to a civil penalty of not less than $50,000 and not more than $500,000.
- Fishing on or near submerged reefs or fish aggregating devices is subject to a civil penalty of not less than $50,000 and not more than $250,000.
- Possession, handling and sale of fish unlawfully taken is subject to a civil penalty of not less than $50,000 and not more than $250,000.
- Contamination of the exclusive economic zone is subject to a civil penalty of not less than $50,000 and not more than $500,000.

The FSM also has stringent regulations and policies to reduce the risk of shark finning, or unsustainable take of sharks in its Purse Seine Fishery, including high penalties. These arrangements apply to sharks taken in FSM waters, or taken outside these areas where vessels are accessing FSM ports. Shark finning is banned, and all live sharks taken are to be safely released. Dead sharks must be landed and disposed of (not retained for sale).

In relation to broader bycatch management, WCPFC's CMM 2011-03 and CMM 2012-04 prohibit vessels from setting on tuna associated with cetaceans and whale sharks, if the animal is sighted prior to commencement of a set. Recent SCS assessment team observer data analysis has identified that the majority of whale and whale shark sets were recorded by observers on FSM vessels (96%), with the remainder aboard Vanuatu flagged vessels. The veracity of these observer data appears high, with both SPC and the WCPFC ROP advising that all observer information is subject to rigorous review and evaluation, and observers debriefed after each trip to discuss trip activities and observed "anomalies". Based on this the assessment team concludes that setting on whales and whale sharks is occurring on UoA vessels from FSM. This contravenes CMMs 2011-03, and 2012-04.

[45] Available at: https://www.ffa.int/system/files/Marine_Resources_Act_2002_%5BTitle_24%5D_0.pdf.

FSM's Maritime Police, under the Department of Justice, have primary operational responsibility for enforcement and compliance at the national level. Scope of their activities includes maritime surveillance of FSM's EEZ and in-port and at sea inspections. In 2017, the Maritime Police Enforcement Wing reported that a total of 6 Law Enforcement Patrols (75 days) were conducted in areas of fishing activity that resulted in a total of 80 boardings. Since 2014 FSM's Maritime Police have arrested nine fishing vessels with 135 fishermen for illegal entry and fishing activity in their EEZ (*Control Union Pesca*. *2019*).

In support of regional MCS programmes, FSM has implemented measures to restrict port entry and services for IUU listed vessels. In 2013, FSMA worked with FFA staff to develop an initial National Plan of Action to Prevent, Deter and Eliminate IUU Fishing; detailing actions including fishing vessel licensing restrictions, monitoring, control and surveillance, sanctions, and reporting activities.

NORMA conducts regular compliance workshops with fishing industry representatives and fishing vessel captains to discuss new regulations and fishing vessel licensing and registration requirements. NORMA reported that there has been a decline in non-compliance infractions as the vessel operators and owners has become more aware of the rules and regulations through these workshops (*Control Union Pesca*. *2019*).

New Zealand

New Zealand has an extensive and contemporary regulatory regime under its Fisheries Act 1996 to manage fishing activities by New Zealand vessels or charter vessels operating within its EEZ. They are also an active participant in regional MCS activities and exercises, and a signatory to the Niue Treaty supporting regional cooperation in fisheries legislation, surveillance and law enforcement. Domestically, New Zealand's compliance approach is guided by a framework known as the voluntary, assisted, directed, and enforcement (VADE) model. There are 4 key elements:

- Voluntary Compliance: encouraged through practical and efficient regulatory settings that incorporate fishing industry and other stakeholder input. High levels of voluntary compliance with arrangements are also facilitated by education, engagement and communication of management expectations and obligations;
- Assisted Compliance: established management measures and actions that re-enforce fishers obligations through monitoring, inspection, response, and business intelligence activities.
- Directed Compliance: the range of tools that Compliance Officers use to encourage behavioural change. It includes activity such as infringement notices, official sanctions such as warnings, and lower threshold prosecutions.
- Enforced Compliance: Enforced compliance is where the full extent of the law is applied and would generally apply to more serious offences or where legislation requires an enforcement action. These cases would usually be formally investigated with a view to prosecution.

Sanctions and penalties available the NZ Fisheries Act can be substantial, ranging from prison sentences, fines from $250 to $500,000, and/or forfeiture of quota, vessels, and other property. MPI compliance personnel have reported high levels of voluntary compliance by fishers in the Skipjack purse seine fishery (Akroyd and McLoughlin, 2017).

NZMPI information about compliance activities, and public requests for information about fisheries compliance activities and outcomes are also made publicly available via the ministry's website.[46]

Consistent with both WCPFC and domestic legal and policy requirements, New Zealand uses a range of contemporary fisheries monitoring approaches, including:

- Mandatory satellite-based Vessel Monitoring System (VMS) with an onboard automatic location communicator (ALC);
- An at-sea observer program to characterise and record fishery operations, including monitoring catch and effort, including the collection of biological samples for stock assessment, and monitoring bycatch and broader environmental impacts. Observers are independent of the fishing companies involved;
- A suite of catch monitoring and reporting obligations, including quota management at the vessel level and collectively for species specific catches, and cross checking catch data with landings information.

Cook Islands

As a WCPFC member and a signatory to the Niue Agreement for regional compliance, the Cook Islands national MCS system is linked to both FFA and WCPFC systems. The Cook Islands now operates out of a relatively new national MCS facility, with associated offices opened in 2018 in Rarotonga, known as the Oceans Monitoring Centre (OMC).[47]

The OMC has been developed to support domestic and international MCS activities required under both WCPFC obligations, and to support increasing domestic MCS activities under both fisheries law, and the recently enacted Marae Moana legislation. The centre will host MMR's fisheries programme, including vessel monitoring system (VMS) activities, along with port sampling and observers, catch reporting, and the fisheries and marine conservation database management.

The new centre is a key platform for the Cook Island's regional and domestic MCS activities, enabling:

- Effective electronic monitoring of Cook Islands flagged vessels fishing within the EEZ, and vessels in distant water fisheries beyond national jurisdiction.
- Effective deterrence and management of illegal, unreported and unregulated (IUU) fishing risks, and activity, through routine and targeted information profiling and both domestic and joint regional operations.
- Effective regional and sub-regional fisheries surveillance and enforcement of maritime security; including regional fisheries and defence cooperation;

[46] For example, see: https://www.mpi.govt.nz/news-and-resources/information-releases/fisheries-compliance-reports/

[47] https://www.mmr.gov.ck/2018/03/22/oceans-monitoring-centre-to-enhance-management/

- Improving domestic and regional fisheries data collection, including data from artisanal and smaller scale local commercial fishing, routine ecological monitoring, and the development of baseline data to support sustainable fisheries and broader ecosystem health.

The Cook Islands also operate an ocean-going Police patrol boat for both domestic and regional surveillance and enforcement operations, and works closely with Pacific Island neighbours and regional MCS operations. This vessel was recently involved in the successful multi-agency operation that resulted in the investigation of the Ecuadorian fishing vessel *Nino Maravilla*. The operation involved the Cook Islands Police, MMR, Customs, and Immigration, with international assistance from both New Zealand and Australia.[48]

Most of the tuna catch associated with Cook Islands fishing vessels is landed at Pago Pago in American Samoa, with some landings at Rarotonga, and Papeete in French Polynesia. To support this, the Cook Islands MMR has also established a Fisheries Field Office (FFO) in Pago Pago with permanent staff members, helping to support an expanded programme of port inspections and support for regional fishery observers. The Cook Islands also has a formal MOU arrangement with the US NMFS, and NOAA, to support MCS activities required as part of US tuna fishing access.

The Cook Islands also have an active and contemporary MCS approach to manage the risks of shark finning events in their waters, or by Cook Islands flagged vessels. Current strategies to ensure shark finning does not occur include specific anti-finning regulations since 2002 given effect through legislation and via permit and licence conditions. There is also a no take policy on sharks, and an active at sea and shore-side monitoring and compliance program, including 100% coverage of transhipment events (MMR Pers. Comm).

Vanuatu

Similar to FSM and Solomon Islands, Vanuatu benefits from the MCS framework and capabilities offered by WCPFC, FFA and related agencies and agreements. Compliance activities in Vanuatu are handled by VDF in the Compliance and Licensing Section of Fisheries division, in collaboration with the Police Maritime Wing (TMDP, 2014). The Compliance and Licensing Division, which issues permits and certifies all regulated oceanic fisheries activities, is responsible for ensuring compliance with license conditions.

Responsibilities of VFD for MCS include:

- Cross checking VMS, logsheet, observer, and port records
- Prosecuting all fishing related offenses in Vanuatu waters
- Notification of actions against foreign and Vanuatu-flagged fishing vessels
- Monthly reports on Vanuatu-flagged fishing vessels
- Maintaining a list of vessels in violation of terms and conditions

The Police Maritime Wing is responsible for:

[48] See: https://www.mmr.gov.ck/2018/03/22/oceans-monitoring-centre-to-enhance-management/

- Operating patrol boats and coordinating air and surface surveillance
- Ensuring complete and accurate information on foreign flagged fishing vessels operations in Vanuatu's EEZ
- reducing risks of unauthorized fishing, including monitoring any misreporting of catch positions, and non-compliance with the FAD closure.

In 2015, VFD had seven authorized fisheries inspectors (including senior staff members) and 36 observers. Five inspectors were dedicated solely to compliance (NPOA IUU, 2015). The Police Maritime Wing consists of 20 authorized fisheries officers, with two specialised in the use of Vanuatu's VMS. Vanuatu has two vessels for at-sea inspections, and one vessel is authorized to undertake high seas boarding and inspections (NPOA IUU, 2015); and a risk based approach to compliance is used.

Vanuatu developed the 2014 Vanuatu MCS and Inspection Plan, with the following stated overall goals and objectives:

- Goal 1: Fishing vessels are being inspected prior to licensing and authorizations.
  - Objective: Establish and implement an effective port State scheme
- Goal 2: All foreign, locally-based foreign fishing vessels and Vanuatu flagged fishing vessels are licensed and authorized
  - Objective: Strengthen and implement an effective licensing and authorization regime
- Goal 3: Foreign licensed fishing vessels and Vanuatu flagged fishing vessels do not engage in IUU fishing activities
  - Objective: To implement an effective VMS reporting system
  - Objective: Implement appropriate level of observer coverage on foreign and Vanuatu flagged fishing vessels
  - Objective: Strengthen and implement an effective data collection, submission and reporting mechanism
- Goal 4: Prevent, deter and eliminate IUU fishing activities
  - Objective: Implement measures that will prevent, deter and eliminate IUU fishing activities.

Vanuatu flagged vessels are required to use VMS with 24/7 monitoring of these systems; there are also 5 carrier vessels used for transhipment and these have 100% observer coverage (VFD, Pers Comm.). Vanuatu previously received a yellow card by the European Union in 2013 but this has subsequently been revoked due to progress improving their fisheries governance and combatting IUU. VMS units are required as part of the Fishing License Conditions to be installed, operated, and maintained on all Vanuatu flagged vessels fishing in the EEZ and high seas, and also for foreign flagged fishing vessels licensed to operate inside VU EEZ for the duration of their licensing period (Fisheries Act, 2014, Part 19). The VMS data for vessels (both foreign and Vanuatu flagged) fishing outside of their respective EEZ is reported to FFA (later on-forwarded to WCPFC) or directly to the Vanuatu Vessel Monitoring Center for Vanuatu flagged vessels fishing within the EEZ. The MCS operations for Vanuatu are illustrated in

As outlined previously for the Federated States of Micronesia, SCS assessment team analysis of observer records for Vanuatu flagged vessels has identified a small number of instances where purse seine sets are

occurring on whales and whale sharks. As noted for the FSM, these activities contravene WCPFC's CMM 2011-03, and 2012-04. There are also observer records from 2019 trips indicating a small number of oceanic whitetip shark, and mobula, were retained by the UoA vessel. Retention of mobula occurred in 2016 and 2018, prior to the adoption of CMM 2019-05 specifically aimed at preventing these activities. The retention of two oceanic whitetip sharks was observed in 2019, in contravention of WCPFC CMM 2011-04 prohibiting their retention.

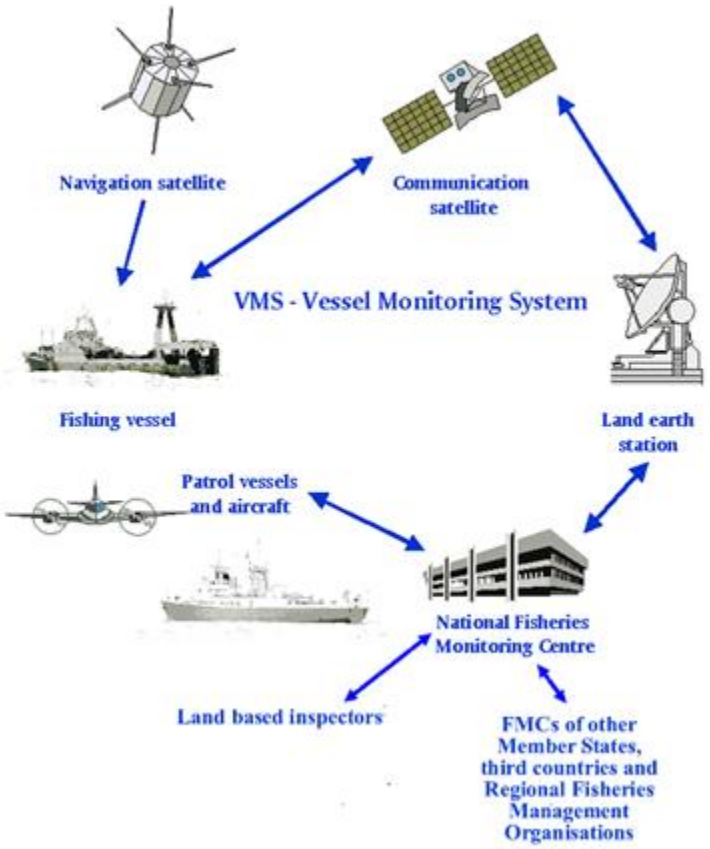

Figure 34 Illustration of MCS operations in Vanuatu. Figure from VFD (https://fisheries.gov.vu/index.php/vessel-monitoring.html).

7.1.1.8 Planned Education and Training for Interest Groups

Planned education and training, and capacity building, for both sustainable fisheries business development across the wild catch fishing supply chain, and to better support regional and national level fisheries management capabilities, is an ongoing priority for both small and larger coastal states throughout the UoA. For example, WCPFC have recently concluded an independent review of the

Compliance Monitoring Scheme, identifying areas requiring capacity building and technical assistance for key internal and external stakeholders in an effort to streamline Commission processes, including development and implementation of a more efficient framework for the Conservation and Management Measures (CMM's).

At this broader regional level, the WCPFC Secretariat and embedded Commission processes generally facilitate effective engagement by stakeholders including Non-Government Organisations (NGOs) and other interested parties. By its nature, this level of engagement incorporates a significant element of less formal knowledge transfer and capacity building for participants. More formal capacity building is an explicit objective of fisheries legislation throughout the UoA at a national level and is also reflected in lower level operational plans and strategies such as the national Tuna Management Plans.

In 2015 the Pacific Islands Regional Oceanscape Program (PROP) of the World Bank reviewed fisheries management systems to assess key aspects of the integrated national fisheries management framework. This included opportunities to build capacity through the training of observers and enforcement officers and update monitoring equipment, and strengthen fisheries management through capacity building of fisheries agency systems, institutions and staff (*Control Union Pesca*. *2019*).

For the FSM, *Control Union Pesca* (2019) also identify a chronology of initiatives and events directed at education and training for fisheries stakeholders in part to increase sustainability performance in advance of a scheduled full MSC assessment. Many of these initiatives formed part of a Fishery Improvement Project (FIP) in 2012. Other tuna fishery focused FIP initiatives across the region in recent years have fulfilled a similar role.

For New Zealand, Akroyd and McLoughlin (2017) note ongoing outreach and education initiatives for vessel masters and crew members aimed at improving understanding of fisheries regulations and enhancing voluntary compliance with management requirements. Both MPI and the NZ fishing industry have a strong track record of using voluntary measures to improve fisheries performance, particularly for bycatch related impacts.

7.1.1.9 Non-fishery Uses or Activities and Arrangements for Liaison and Coordination

Note: There is limited guidance available currently to support completion of this background section. Further advice and supporting information will be sought during future client visits and liaison.

7.1.2 Principle 3 Performance Indicator scores and rationales

Scoring under Principle 3 considers all applicable biological and/or jurisdictional levels that apply to the management system of the UoA. The applicable jurisdictions are determined on a PI, and SI, basis, because the relevant jurisdictions that affect performance relative to the respective scoring guideposts vary based on the aspect of the governance and fishery management system being assessed. For transparency, the scope of scoring is stated explicitly at the beginning of each rationale.

The potentially relevant jurisdictions include the WCPFC, PNA, and the seven licensing flag states of the fleet under assessment (USA, FSM, Solomon Islands (SB), New Zealand (NZ), Cook Islands (CK), Vanuatu (VU) and Chinese Taipei (CT). Each flag state comprises two distinct species-based UoAs and one UoA for Principle 2, with FAD and free school sets scored as elements. For reader-friendliness and to minimize duplicative text in the report, the following scoring tables include consideration of UoAs strictly as they relate to flag states, recognizing that scoring will not differ in P3 on a species-basis. Differences in scores across the four sets of nation state scores (based on flag state performance and other relevant considerations) are noted. For the different set types, we have only noted incidences where scores differ between the two set types; otherwise, a single score has been given.

Although WCPFC performance is considered in each SI, it is not 'scored' as an element as per individual species or guilds in Principle 2, but instead is incorporated with the flag state score to generate an overall UoA score for each nation stage fleet (USA, FSM, SB, NZ, CK, VU, and CT). Where there is no difference in scores between UoAs, the score is followed by "(All)".

PI 3.1.1 – Legal and/or customary framework

PI 3.1.1		The management system exists within an appropriate legal and/or customary framework which ensures that it: - Is capable of delivering sustainability in the UoA(s); - Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and - Incorporates an appropriate dispute resolution framework		
Scoring Issue		SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management			
	Guide post	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Yes, all	Yes, all	No

At a regional level, the WCPFC Convention, the Nauru Agreement, relevant national fisheries laws and national tuna management plans are consistent with the provisions of UNCLOS and UNFSA. All WCPFC Members are legally bound to apply the precautionary approach as parties to the WCPFC Convention (Article 5 & 7). The precautionary approach is also incorporated into national laws and national tuna management plans.

UNCLOS makes specific provisions for straddling stocks and highly migratory fish stock in Articles 63 and 64 and requires that "... States ...cooperate directly or through appropriate international organizations with a view to ensuring conservation and promoting the objective of optimal utilization ..." of the stocks. This is reinforced in Articles 118 and 119 where States are required to cooperate in the conservation and management of high seas stocks. Article 119 further develops the need for catch limits, the use of the best available scientific evidence, the need to rebuild overfished stocks and to manage fishing impacts on non-target stocks.

The UNSFA, operating as an implementing Agreement, seeks to elaborate on roles and responsibilities and requirements of UNCLOS with respect to managing straddling stocks and highly migratory fish stocks. Article 8 reinforces the need for States to cooperate to ensure the objective of the Agreement "to ensure the long-term conservation and sustainable use of straddling fish stocks and highly migratory fish stocks through effective implementation of the relevant provisions of the Convention" is achieved.

As the first RFMO to be established following the entry into force of the UNFSA, the WCPF Convention draws on all the key provisions of the UNFSA. It is also designed to reflect the regional political, socio-economic, geographical and environmental characteristics of the WCPO. The arrangements set out in the WCPF Convention and implemented via CMMs are designed to deliver outcomes consistent with MSC Principles 1 and 2.

Nauru Agreement

The Nauru Agreement is a regional agreement made to facilitate cooperation in the management of fisheries resources of common interest. The Agreement is a binding treaty-level regional fisheries management instrument established in the 1980's to manage tuna stocks within national waters. The Parties to the Nauru Agreement (PNA) are Solomon Islands, Tuvalu, Kiribati, Marshall Islands, Papua New Guinea, Nauru, Federated States of Micronesia and Palau.

The objectives of the Agreement are to enhance regional solidarity and to promote economic control and participatory rights over the tuna resources in PNA waters, with a primary focus to:

- Develop strategic fisheries conservation and management initiatives;
- Develop initiatives to maximise the sustained direct and indirect economic benefits to the Parties; and
- Maximise the profitability of the fishery and ancillary industries within the PNA.

The PNA have consistently sought to develop and implement arrangements designed to improve the sustainability of tuna stocks in their waters and maximise the economic return to them when allowing other entities to fish these stocks. The Parties have effective national legal systems and have demonstrated effective cooperation to deliver management outcomes consistent with MSC Principles 1 and 2.

Federated States of Micronesia

At the national level, the development and management of the marine resources within FSM falls under the jurisdiction of the National Oceanic Resources Management Authority (NORMA). NORMA has been established under Title 24 of the FSM Fisheries Act 2002 and works with national fishing industry bodies to promote development of pelagic fisheries and related industries.

The FSM is also a member country for the FFA, PNA, SPC and WCPFC; and a Party of the Palau Arrangement for the Management of the Western Pacific Tuna Fishery Vessel Day Scheme (VDS). It is also a party to contemporary and binding sustainable fisheries treaty arrangements including the United Nations Convention on the Law of the Sea, 1982 (UNCLOS), Food and Agriculture Organization (FAO) Agreement to Promote Compliance with

International Conservation and Management Measures by Fishing Vessels on the High Seas 1993 (FAO Compliance Agreement, the United Nations Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks 1995 (Fish Stocks Agreement).

Solomon Islands

As a Party to the UNFSA, WCPF Convention and the Nauru Agreement, the Solomon Islands has accepted the obligation to comply with the provisions of these Agreements. The Solomon Islands Fisheries Management Act 2015 is the overarching legislative framework and explicitly recognises customary rights of indigenous people. Arrangements in the Act, supporting Regulations and within subordinate arrangements such as the Tuna Management and Development Plan provide a comprehensive suite of management and enforcement powers designed to deliver management outcomes consistent with MSC Principles 1 and 2.

The Act and Regulations provide for the development and implementation of rules and regulations governing fishing operations and for the application of sanctions where these rules are not followed. They also provide for organized and effective cooperation with other parties via the FFA, PNA and the WCPFC. The Solomon Islands participates in regional MCS arrangements both within WCPFC and with the FFA/PNA. The Tuna Management and Development Plan makes specific reference to the management of international fisheries and working with the WCPFC. The Solomon Islands participates in sub-regional arrangements (FFA and PNA) which feed into WCPFC discussions and decisions, it also contributes scientific data from their tuna fisheries for collective use by SPC on behalf of all WCPFC Parties (GSA 4.3.2.3.).

Chinese Taipei

The management of Chinese Taipei fishing both within its EEZ, on the high seas in the Pacific and in PICT waters is governed by the Fisheries Act (2016) and the Distant Water Fisheries Act (2016). These provide a contemporary framework of sustainable fisheries legislation and are administered by the Fisheries Agency (Council of Agriculture of the Executive Yuan). The Chinese Taipei Fishery Agency, Council of Agriculture has a Deep Sea Fisheries Division which is responsible for managing all aspects of fishing operations, including issuing licenses, monitoring VMS, port inspections, recording data, monitoring quota or harvest limits, placement of observers, transhipment, enforcement (with the Coast Guard), prosecutions etc.

The Fisheries Act deals predominantly with domestic fisheries management, aquaculture and enforcement. It has a range of provisions including who can be granted a license, build a fishing vessel, work on fishing vessels, receive access rights etc. It also has chapters on recreational fishing, fishery development, conservation and management and penalty provisions.

For this assessment, the Distant Water Fisheries (DWF) Act (2016) is most relevant, with a focus on management and enforcement of Chinese Taipei vessels fishing on the high seas or a third country's EEZ to promote the sustainable operation of distant water fisheries. It has objectives to:

- Ensure the conservation of marine fisheries resources;
- Strengthen distant water fisheries management;
- Curb IUU fishing; and
- Improve traceability of catches and fisheries product;

Article 5 of the DWF Act requires that the TFA develop arrangements which have regard to the precautionary principle, ecosystem based approach and the use of the best available scientific advice with the aim to deliver management outcomes consistent with MSC Principles 1 and 2 and specifically requires "Cooperation with other countries and international fisheries organizations" (from pg. 473 of FCRv2.0).

In recent years, the TFA has demonstrated (particularly via its response to the EU yellow card[49] process) that it is open to scrutiny, review and adaptation. However, there is also evidence that Chinese Taipei generally coordinates with other WCPFC parties to contribute scientific data from their purse seine fisheries for collective use by SPC on behalf of all WCPFC Parties. As part of the EU yellow card process TFA has also acknowledged that they haven't historically been able to design/resource systems to fully control their DWF vessels, and that they have therefore recently set up an auditing program that will undertake port inspections in major transshipment hubs used by Chinese Taipei vessels, under the new DWFA.

USA

The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) and the Western and Central Pacific Fisheries (WCPF) Convention Implementation Act, guide management of US fisheries, including vessels fishing on the high seas in the Pacific, in Pacific Island Country or Territory (PICT) waters and in US waters.

The MSFCMA is comprehensive and contemporary and was updated in 2007. Objectives are to:

- Conserve and manage fishery resources found off the coast of the United States;
- Support and encourage the implementation and enforcement of international fishery agreements for the conservation and management of highly migratory species, and to encourage the negotiation and implementation of additional such agreements as necessary;
- Promote domestic commercial and recreational fishing under sound conservation and management principles;
- Provide for the preparation and implementation of fishery management plans;
- Establish Regional Fishery Management Councils to steward fishery resources through the preparation, monitoring, and revising of plans which (A) enable stake holders to participate in the administration of fisheries and (B) consider social and economic needs of the States;
- Developing underutilized fisheries; and
- Protect essential fish habitats.

The National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA/NMFS) is the USA government agency responsible for all aspects of the conservation and management of USA fisheries and marine protected resources. NOAA is an agency of the USA Department of Commerce.

The MSFCMA also requires establishment of Regional Fishery Management Councils, to develop fishery management plans and measures for the USA fisheries operating within their adjacent EEZs and for USA-flagged vessels operating on the high seas outside the EEZ. NOAA/NMFS approves and implements these plans and measures.

The Western Pacific Regional Fishery Management Council (WPRFMC) has developed a Fishery Ecosystem Plan (FEP), consistent with the MSFCMA and the national standards required for fishery conservation and management. The Plan provides information and the rationale for measures set out in the plan; discusses the key components of the Western Pacific Region's pelagic ecosystem, including an overview of the region's pelagic fisheries; and explains how the measures contained here are consistent with the MSFCMA and other applicable laws.

The WPFRMC has authority over the fisheries based in, and seaward of the State of Hawaii, the Territory of American Samoa, the Territory of Guam, the Commonwealth of the Northern Mariana Islands, and the USA Pacific

[49] Refers to the EU's implementation of its IUU regulation as regards third countries. For more information, see https://ec.europa.eu/fisheries/cfp/illegal_fishing/info_en. An up-to-date list of third country status may be found here: https://ec.europa.eu/fisheries/sites/fisheries/files/illegal-fishing-overview-of-existing-procedures-third-countries_en.pdf.

Remote Island Areas (PRIA) of the Western Pacific Region. The Western and Central Pacific Fishery (WCPF) Convention Implementation Act enables the USA to fulfil obligations under the WCPFC.

The arrangements in these Acts provide a comprehensive suite of management and enforcement powers designed to deliver management outcomes consistent with MSC Principles 1 and 2. They also provide for effective and explicit cooperation with other parties (the MSFCCA makes specific reference to the management of international fisheries), with the WCPF Convention Implementation Act providing specific arrangements to participate in the WCPFC. There is also evidence that the USA reliably coordinates with other WCPFC parties to contribute scientific data from their purse seine fisheries for collective use by SPC on behalf of all WCPFC Parties. The USA also undertakes enforcement patrols in WCPFC waters and facilitates patrols for some other nation states.

New Zealand

New Zealand has ratified its membership of key international maritime treaties relevant to sustainable fisheries, including UNCLOS and UNFSA, as well as the WCPF Convention, and the Nauru Agreement. As such, their domestic fisheries law explicitly includes key provisions related to ecologically sustainable development of fisheries both domestically and at a broader regional level. New Zealand also has strong recognition of customary and commercial fishing rights for Maori enshrined in national laws.

Supporting regulations and subordinate arrangements such as the Highly Migratory Species Management Plan and the annual operational plan that gives effect to the HMSMP on an annual basis enshrine these ESD and sustainable fisheries principles, including the Precautionary Approach, as envisaged by MSC Principles 1 and 2.

The New Zealand Fisheries Act and Regulations, including the HMSMP underpinning sustainable tuna fisheries, enable laws and policy that apply both domestically and to international fisheries, including a formal risk based compliance framework. This compliance framework is a staged approach that relies initially on high levels of voluntary compliance based on practical and efficient arrangements that work for both fishers and regulators. More punitive measures are available where higher levels of voluntary compliance are not achieved; appropriate sanctions are also in place.

New Zealand's MPI and Ministry of Foreign Affairs and Trade (MFAT) also work closely together to enable effective bilateral and multilateral cooperation with other key regional fisheries groups such as the FFA, PNA and the WCPFC. They are also an active participant in regional MCS arrangements both within WCPFC and with the FFA. Both MPI and MFAT actively facilitate aid and regional assistance programmes to their pacific neighbours for sustainable fisheries related capacity building programs and projects.

Cook Islands

Similar to New Zealand's legislative framework supporting sustainable fisheries, the Cook Islands also maintain a well considered contemporary legislative framework for fisheries management. They have also ratified their membership of UNCLOS and the UN Fish Stocks Agreement; including the FAO Code of Conduct for Responsible Fisheries (1995), and related Compliance Agreement.

Through their Ministry of Marine Resources (MMR), implementation of the Cook Islands 2005 Fisheries Act, has consistently delivered strong regional and domestic fisheries management outcomes. The Cook Islands have a strong track record of effective regional fisheries management and compliance effectiveness. New draft fisheries

legislation is currently before parliament and expected to be passed later in 2020. This legislation updates the 2005 law, also complementing recently introduced marine conservation legislation protecting large areas of Cook Islands marine ecosystems (Marae Moana Act 2017)

The Cook Islands are active members of WCPFC and related regional fisheries bodies and partnerships; and have an established domestic regulatory process to give effect to WCPFC measures such as the range of CMM's aimed at sustainable target and byproduct species management. They have also recently initiated a comprehensive parliamentary review of the costs and benefits of larger scale purse seine fishing for tuna species in response to domestic stakeholder concerns about the sustainability and local benefits of this type of fishing. This demonstrates strong democratic structures in their approach to and management of new fisheres development and/or capacity expansion.

Vanuatu

The Vanuatu Fisheries Department (VFD) is responsible for the implementation and enforcement of fisheries management laws/regulations. The main fisheries legislation in Vanuatu for the conservation, management and development of fisheries resources is the 2014 Fisheries Act, while the Maritime Act (CAP 131) is the primary instrument for the registration of Vanuatu flagged fishing vessels. Key associated subsidiary legislation includes the Tuna Management Plan (2014), Monitoring Control & Surveillance (MCS) and Inspection Plan and FAD Management Plan.

The Fisheries Act's purpose is to:

- conserve, manage and develop fisheries in Vanuatu in order to ensure its long term sustainable use for the benefit of the people of Vanuatu; and
- effectively discharge obligations under Scheduled Treaties and agreements in which Vanuatu is party to.

Vanuatu is a member country of WCPFC and FFA. It is also a signatory to binding fisheries treaty arrangements including United Nations Convention on the Law of the Sea, 1982 (UNCLOS), Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing, 2009, (PSMA), and the United Nations Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks 1995 (Fish Stocks Agreement). The Fisheries Act and TMDP make specific reference to meeting international obligations including RFMO regulations, and requires ongoing full participation in RFMO meetings, cooperation with neighbouring states on MCS (e.g. Solomon Islands and Fiji) and compliance with reporting requirements specified under WCPFC/other RFMOs to which Vanuatu is a signatory. There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2. A potential issue of concern for Vanuatu is the relatively high number of annual transhipments that occur (Wold 2018). Transhipment in the WCPFC is prohibited for purse seine vessels, however, longline/other vessels are permitted to tranship where **"***it is impracticable for certain vessels . . . to operate without being able to tranship on the high seas***."** (WCPFC CMM 2009-06). Vanuatu ranks 3rd in transhipments in the WCPFC, with four carriers flagged to their state, and has been historically associated with the issuance of flags of convenience (Mendelsohn 2014 in Wold 2018). This issue will be investigated during the site visit to better understand measures in place for transhipment from Vanuatu flagged carriers/vessels, to ensure it is conducted in adherence with WCPFC requirements.

Overall, arrangements in place provide a system for effective cooperation among the parties. WCPFC procedures and U.S. Government systems can apply binding measures consistent with MSC principles 1 and 2. PIPs have varying degrees of strength of legislation; however all are bound by WCPFC requirements. An important issue for the PIPs is their ability to apply their own laws to the U.S. fishing fleet. U.S. legislation requires U.S. flagged vessels to comply with the applicable laws and requirements of other nations when operating in areas under the

jurisdiction of other nations. SG 60 and SG 80 requirements are met by all parties involved in management. SG100 is potentially met at the WCPFC and U.S. Government levels, however, binding arrangements are not in place across all jurisdictions.

b	Resolution of disputes			
	Guide post	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is effective in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective.
	Met?	Yes—All	Yes—All	No—All

Rationale

In relation to the UoA there are two management systems where disputes could arise and may need to be addressed and resolved - the WCPFC and the national flag state management system. Nationally, most disputes would centre on individual fishers or vessels not abiding by the national law and be resolved domestically. Therefore, the regional management system is evaluated for this scoring issue.

The WCPFC dispute mechanism is set out in Article 31 of the Convention. It relies on a consensus-based decision-making process, with provision for a two-chambered voting process requiring a 75% majority in both chambers if all efforts to reach a decision by consensus have been exhausted.

The UNFSA dispute settlement mechanism applies to the Nauru Agreement, the Palau Arrangement and the VDS. The Palau Arrangement sets out a dispute settlement mechanism in Article 8 for issues related to the purse seine fishery and the VDS. Annex 2 of the WCPF Convention allows for the establishment of a Panel to review decisions of the Commission (Art. 20 & 31), but the assessors did not find evidence that this mechanism has been tested (July 2015). The Convention prescribes peaceful settlement of all disputes (Article 31).

In accordance with the Convention, the Commission holds a regular meeting every year. WCPFC members and observers can have representatives at meetings. The Commission can and does, on the basis of scientific evidence and of other relevant information, adopt binding measures and non-binding resolutions. Negotiations on these occur both at technical and political levels. Conservation and Management Measures and Resolutions are proposed by members of the Commission and are presented to the Commission for adoption at the annual meeting (Medley and Powers 2015). Non-parties to the Convention can apply to become Co-operating Non-members and as such are also required to implement the measures and requirements set by WCPFC. This system is transparent in that it makes sure that all members are fully informed of the issues under consideration and can participate in informed discussion. Under Article 21 of the Convention, the Commission is required to promote transparency in its decision-making processes and other activities. Independent observers, including NGO and Inter-Government Organisations, are present at such meetings and would observe any resolutions and justifications that are presented. The Convention states that “Such intergovernmental organizations and non-governmental organizations shall be given timely access to pertinent information subject to the rules and procedures which the Commission may adopt”. Observers can make presentations to members, subject to approval of the chairperson. Disputes resolved in this way would still not necessarily be entirely transparent in the sense that how a resolution is reached may not be fully reported (Medley and Powers 2015).

WCPFC systems meet SG60 and SG80 requirements, however SG100 is not met because the WCPFC dispute and review arrangements have not been tested and proven to be effective.

c	Respect for rights			
	Guide post	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	Yes—All	Yes—All	Yes—All

Rationale

In relation to the UoA, the primary management system where legal rights are created explicitly or established by custom for people dependent on fishing for food or livelihood is the WCPFC. It establishes safeguards and recognizes the rights of communities dependent on fishing for food or their livelihoods.

The WCPF Convention provides for recognition of the interests of small scale and artisanal fishers within its framework for sustainability. The Convention further requires that the needs of SIDs, territories and possessions, and coastal communities dependent on stocks including those taken in the fishery be recognised in the allocation of catch or effort (Art 10 (3) and Resolution 2008-01) and their capacity strengthened (see CMM 2013-06 Conservation and Management Measure on the criteria for the consideration of conservation and management proposals and CMM 2013-07 Conservation and Management Measure on the special requirements of Small Island Developing States and Territories). Article 30 of the Convention further provides for recognition of the interests of small scale and artisanal fishers within the overall management framework in the WCPFC.

To date, the Commission has not formally allocated fishing rights but has sought and received external advice on allocation mechanisms and options. Further, Article 30 of the Convention provides for recognition of the interests of small scale and artisanal fishers within the overall management framework in the WCPFC Convention. The Convention also explicitly recognizes the rights of subsistence, small-scale and artisanal fishers and fish workers, as well as indigenous people in developing States Parties, particularly small island developing States Parties, and territories and possessions.

<u>Federated States of Micronesia</u>
For the FSM, the customary right for people to fish for food and livelihood is explicit in the FSM Bill of Rights Chapter 1. Sub-section 114 which states “due recognition shall be given to local customs in providing a system of law and nothing in this chapter shall be construed to limit or invalidate any part of the existing customary law, except as otherwise provided by law.” The FSM also provides for small-scale fishers and domestic fishers under its national fisheries legislation with powers to promote, support and guide domestic fishing associations and cooperative arrangements. A proportion of sustainable yield for key tuna species’ is also set aside for domestic fishing vessels. The FSM 24nm contiguous zone has also been introduced to safeguard indigenous livelihoods and subsistence fishers (Sieben et al, 2019).

<u>Solomon Islands</u>
As a member of the Pacific Islands Forum Fisheries Agency, the Solomon Islands engage closely with WCPFC processes both via FFA and at a national level. As an expertise based advisory body, FFA works to represent the shared economic and cultural interests of members, and build their capacity, to operate effectively within the WCPFC and other international fisheries fora. For the Solomons, and other FFA members, the need to safeguard their people’s traditional rights to Pacific tuna resources is a primary objective. Medley and Powers (2015) in their WCPFC Performance Review, identified ambiguity in the Convention around consistent management

approaches for oceanic, territorial and archipelagic waters and a lack of criteria for allocating fishing quotas as legal issues to resolve. National tuna management plans for the Solomons, and other PNA members also have strong mechanisms to protect the interests of traditional and small-scale fishers. As part of its domestic management framework, the Solomon Islands also use strategies within their national tuna management plan to protect the interests and rights of traditional and small-scale fishers.

Cook Islands

The current Cook Islands Marine Resources Act (2005) includes a contemporary legal framework for Ecologically Sustainable Development, including recognition of the principle of inter-generational equity for Cook Islanders. This enables fisheries exploitation both domestically and regionally, with the objectives of conserving, using, enhancing and developing marine resources to provide for the social, economic and cultural wellbeing of the community. The MRA explicitly requires:

- Maintaining the potential of marine resources to meet the reasonably foreseeable needs of future generations; and
- Avoiding, remedying or mitigating any adverse effects of fishing on the aquatic environment.

The Cook Islands have also enacted a network of marine areas adjacent to key island communities where larger scale commercial tuna fishing such as purse seine operations, are not permitted. The closures are intended to safeguard opportunities and rights for smaller scale artisanal, and smaller scale local commercial fishing opportunities.

The Act (and its successor currently in Draft form), provide for development of formal Fishery Plans to enable conservation, management and development of fisheries. The MRA and the recently introduced Marae Moana Marine Conservation Act (2017) work in a complementary way to enable these objectives.

Vanuatu

Regulations in Vanuatu provide for a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2. The TMDP specifies that artisanal/small scale vessels are provided maximum opportunity when establishing closed areas. Regulations also provide for exclusive near-shore fishing access for artisanal/small scales vessels, as vessels above 10m must fish outside the 6 NM limit. Total allowable licenses have been set for all fishing sectors (including artisanal), of which 200 vessels/permits can be issued to target tuna/tuna-like species. Subsistence fishing is exempt from licensing requirements. The Vanuatu Constitution specifies that 'Customary law shall continue to have effect as part of the law of the Republic of Vanuatu' (Section 95). In addition, Vanuatu is a member of the Pacific Islands Forum Fisheries Agency, where safeguarding their people's traditional rights to Pacific tuna resources is a primary objective.

The WCPFC management system outlines, and seeks to observe, the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2. This approach is also formalised, through the PNA process.

The coastal nation's law provides an explicit framework to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood consistent with the objectives of MSC Principles 1 and 2. Therefore the management system meets the requirement for SG 60, SG 80 and SG 100.

References

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Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	>80
Information gap indicator	More information sought on the auditing program that will undertake port inspections in major transhipment hubs used by Chinese Taipei vessels, under the new DWFA More information will be sought regarding the mechanisms to control transhipment in Vanuatu. Annex 2 of the WCPF Convention allows for the establishment of a Panel to review decisions of the Commission (Art. 20 & 31). More information as to whether this mechanisms has been tested
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	85
Condition number (if relevant)	

PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue		SG 60	SG 80	SG 100
a	Roles and responsibilities			
	Guide post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
	Met?	Yes—All	Yes—All	Yes for USA, NZ, SI, CI No--FSM, Chinese Taipei, VU

The WCPF Convention provides information on the functions, roles and responsibilities of member states (in particular, Articles 23 – Obligations of members of the Commission and 24 – Flag State duties) and the key committees formed under Commission control (Scientific Committee and Technical and Compliance Committee). WCPFC CMMs also provide clear requirements for such things as sharing information, meeting obligations, conservation measures, and applying appropriate levels of surveillance and enforcement.
There are extensive, regular formal and informal consultation processes at the PNA, and FFA and other regional & international fora and national levels, including consultation with bilateral partners and domestic stakeholders. At the PNA and national levels, organisations and individuals involved in the management process have been identified, with functions, roles and responsibilities explicitly defined and well understood, including consultation with bilateral partners and domestic stakeholders. This also applies for both the FFA and SPC.

At the flag State level, functions, roles and responsibilities are defined by legislation, and via subordinate policy and processes. The level of detail varies depending on the flag, as does their capability, including the scope and level of involvement, as well as the degree of understanding and commitment to these processes at the individual company/vessel level.

<u>FSM</u>
Functions, roles and responsibilities of FSM's NORMA and its staff are well defined under Title 24, Chapter 3 (Management Authority). NORMA's Board of Directors includes representatives of each of the Federated States. In addition to their accountability and reporting obligations as member of various regional fisheries bodies, NORMA also reports annually to the President of FSM, the Speaker of Congress of the FSM and each State governor, maintaining transparency with regard to number of permits and licences issued, fines, forfeitures and estimates on current fishing effort in the EEZ. The NORMA Boards' primary roles are to adopt regulations for the conservation, management and exploitation of fish in the EEZ, conclude fishing agreements, issue fishing permits, and participate in the planning and execution of programs relating to fisheries. (Sieben et al, 2019).
For the FSM, relevant agencies and individuals involved in the management process have been identified. And functions, roles and responsibilities clearly defined and understood across key areas meeting SG80.

Solomon Islands
The Solomon Islands legislation and policy identifies organisations and individuals involved in the management process. It provides explicit information on functions, roles and responsibilities for all key areas of interaction. Part 3 of the Fisheries Management Act 2015 sets out in detail the functions, powers and duties of the Minister; of the Permanent Secretary and of the Director of Fisheries. It also provides details of the delegation of functions, powers and duties. The Act establishes the Fisheries Licensing Committee, the Fisheries Appeals Committee and the Fisheries Advisory Council. Supporting Fisheries Regulations provide more detail on membership, functions and roles and responsibilities where necessary. SG100 met here.

Chinese Taipei
Chinese Taipei has well established arrangements that involve industry associations and individual stakeholders directly. These are built into government processes, and there is recent evidence from surveillance audits that key areas of responsibility and interaction are explicitly defined and well understood, and the range of key stakeholder interests are considered during domestic processes, thus meeting SG80 requirements.

USA
Arrangements for the USA are well developed and formalised with their Advisory Committee set up under the WCPF Convention feeding into management positions as well as the formal role and stakeholder involvement in the WPRFMC.

The Western Pacific Regional Fishery Management Council (WPRFMC) is one of eight US regional fishery management councils established to prevent overfishing, minimize by catch and protect fish stocks and habitat. The roles and responsibilities of these regional councils are well defined under US legislation.

New Zealand
New Zealand's MPI is charged with managing government activities to achieve the objectives of national fisheries legislation, and meeting fisheries responsibilities with respect to New Zealand's obligations under international agreements and treaties (e.g. UNFSA, WCPFC, CCSBT). New Zealand's fisheries legislative framework is comprehensive and contemporary; with roles and responsibilities of key stakeholders involved in fisheries management both recognised and explicit. MPI has developed a comprehensive fisheries consultation *standard* describing roles, responsibilities and expectations for all key aspects of stakeholder consultation and engagement. The relevant Minister has formal responsibilities under the fisheries act in respect of stakeholder engagement and participation in decision making.
New Zealand's tuna management plan (HMSMP) also provides clear and explicit guidance in relation to key stakeholders engagement in the fisheries management processes. Operational implementation of these responsibilities is also made explicit in the subordinate annual operational plan for tuna fisheries.

Cook Islands
The 2005 Marine Resources Act includes recognition of the need to engage stakeholders in fisheries management decision making and related processes, including details of key groups and their roles and responsibilities in relation to management processes. Cook Islands representatives are also actively engaged in regional and bilateral fisheries meetings; including domestic preparation for, and participation at the full range of regional for a (WCPFC and sub committees, FFA, SPC, and bilaterally with New Zealand and Australia). More recent fishery development in the southern regions of Cook Islands EEZ are also actively managed through the WCPFC Southern Committee.
The Cook Islands 2013 Purse Seine Fishery Regulations and the related Fishery Management Plan also provide clear advice about management and decision making roles and responsibilities for tuna purse seine fishing vessels operating under Cook Islands jurisdiction, or within the EEZ.

Vanuatu
The Vanuatu Fisheries Act (2014) Section 10 identifies the Vanuatu Fisheries Department as the key agency responsible for 'principal function of, and authority for, the conservation, management and development of the fisheries resources in accordance with this Act.' (Part 2, Section 3). In addition, the Fisheries Act establishes the

Fishery Management Advisory Council (FMAC), which is tasked with 'providing recommendations to the Director on policy matters relating to fisheries conservation and management.' The member composition of FMAC is explicit in the Fisheries Act, and requires 2 members from industry (1 artisanal, 1 commercial) as well as a representative from various other government agencies. The NPOA IUU document (2015) specifies the six departments in VFD responsible for fisheries management as well as the roles/functions/responsibilities. The TMDP explicitly defines the roles/responsibility/sharing of information regarding MCS between VFD and Police Maritime Wing. While roles/functions are defined for key areas of operation, it is not clear that this has been done for all areas of responsibility and interaction.

Whilst roles and responsibilities are generally well defined, WCPFC has had a number of problems with flag states not applying appropriate controls to all their vessels, and in some cases there appear to be conflicts between requirements for confidentiality and the responsibilities to provide information necessary for management (Medley and Powers 2015). These problems do not prevent WCPFC completing its primary tasks, however, they do undermine overall transparency, effectiveness and efficiency.

At national and international levels, the functions, roles and responsibilities of organisations involved in the management processes are explicitly defined and well understood for key areas of responsibility. SG 60 is met for Vanuatu, Chinese Taipei, and FSM; with the organisations and individuals involved identified and their functions, roles and responsibilities generally understood. SG 80 is also met for these Flag States as functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility. This is helped by their membership and/or participation in the well designed and implemented PNA arrangements and processes.
The USA, New Zealand, Solomon Islands, Cook Islands meet SG 100 level as functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.

b	Consultation processes			
	Guide post	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.
	Met?	Yes—All	Yes—All	No—All

Rationale

The WCPFC formal annual meeting follows annual meetings of the SC, the TCC and the Northern Committee (which deals with management and conservation issues to the north of 20ºN). There are also extensive, regular formal and informal consultation processes through the PNA, FFA and other regional & international fora and at national levels. For example, FFA's fisheries management programme is designed to help members maintain effective policy and legal frameworks that support sustainable use of regional tuna fishery resources. There is a strong consultative and regional capacity building element to this, including member consultations in the leadup to key regional fisheries meetings, including annual WCPFC meetings. Other organisations have access to all the main management bodies as formal observers or informally. These processes seek and accept information and demonstrate consideration of the information. Scientific reports state exactly what information is being used, how it is used, and justification is provided for all information which is rejected. However, information used by management other than the scientific information is not so clearly reported.

USA

The US Treaty is the key arrangement facilitating access by US purse seine vessels to the waters of other Pacific Island Countries. Information on negotiations for the Treaty is not generally available probably due to the commercial nature of such negotiations. More generally, the WPRFMC is supported by several advisory bodies which provide opportunities for consultation and transfer of information.

The USA national management system includes consultation processes that regularly seek and accept relevant information, including local knowledge, demonstrating due consideration of the information obtained. This meets the SG80 requirements.

Chinese Taipei

For WCPFC DWFN members such as Chinese Taipei, Morgan et al, 2018, describe consultation arrangements prior to WCPFC meetings illustrating the opportunity for interested and affected parties to be consulted. For example, "*…when CMMs are proposed, the Chinese Taipei Fishery Agency (TFA) and the Overseas Fishery Department of Council (OFDC) summarize existing CMMs, any related meeting reports published on WCPFC website about the change of CMMs and new proposed CMMs. This occurs one month before any WCPFC Regular Meeting Commission. In this period before a Commission meeting, the TFA and OFDC gather all related parties, such as Purse-Seiner Association, Tuna Association, and Longline Association to discuss and gather all opinions in order to attempt to achieve a common stances on proposals, that can then become a national position to be addressed by TFA and OFDC in WCPFC on behalf of Chinese Taipei. After the WCPFC meeting and in order to adopt the CMM into Chinese Taipei domestic regulations, the Deep Sea Water division of TFA under the Council of Agriculture, Executive Yuan (central government) and overseas Fisheries Development Council of the Republic of China will propose the adoption of CMMs into Chinese Taipeiese domestic legislation. The Executive Yuan will send the proposal to the Legislative Yuan to carry out examination and revision. After passing the regulation, the Council of Agriculture, under Executive Yuan, will be assigned to establish the policy and procedures associated with the regulation.*

When new regulations are proposed, the assessment team was told that domestic law obliges the TFA to provide a pre-notice, for a period of 3-4 weeks, for the public to provide input on changes in legislation, which are then considered by the agency. No evidence was provided demonstrating how nascent legislation arising from CMMs is open to stakeholder consultation: the team did receive evidence that consultation on the new Distant Water Fisheries Act received stakeholder input, which was diverse and included members of industry, academia and eNGOs. There does not appear to be an obligation on the part of the agency to provide explanation of what is, or is not decided (see SIb), based on stakeholder inputs or why".

New Zealand

Section 12 of New Zealand's 1996 Fisheries Act includes a range of specific consultation requirements. For example MPI is required to consult with Maori, environmental, commercial and recreational fishing stakeholders in the development of significant new legislative and policy initiatives and key decisions; including issues with implications for bycatch species sustainability or broader marine conservation. MPI's guidelines (or standard) for fisheries stakeholder engagement sets out best practice processes for fisheries related consultation, including: Guidelines to ensure a consistent and comprehensive approach across the agency with respect to consultation; and minimum performance measures or criteria to guide consultation e.g., a minimum period for stakeholder consultation, and guidance about the nature of feedback to stakeholders with respect to consultation outcomes, and how these are used in decision making. The standard also includes a performance review process.

New Zealand's Department of Conservation (DOC) is the central government organisation charged with conservation and management for marine reserves, seabirds, and for ecologically related species impacted by tuna fishing, including marine mammals such as dolphins, whales, sea lions and fur seals. DOC is actively engaged in the marine conservation aspects of contemporary fisheries management both domestically and as a participant in New Zealand's delegations to annual regional fisheries for a such as WCPFC and CCSBT meetings.

The extent of consultation at the PIP national government level in seeking local knowledge is not fully transparent in all cases. For example, the Cook Islands albacore longline MSC assessment indicates that there is generally a lack of evidence of consultation processes that regularly seek and accept relevant information (Gascoigne et al. 2015). This is likely to be the case more broadly for other PNA members such as the FSM and the Solomon Islands.

SG 60 requirements are met by WCPFC, FFA, and USA and Chinese Taipei because the management system includes consultation that obtains relevant information, including local knowledge, from key parties.

SG 80 is also met for these Flag States because they regularly seek and accept relevant information as outlined for SG 60. Their management system also demonstrates consideration of the information obtained in formulation of management arrangements and processes. SG 100 is not met because the management system under assessment cannot demonstrate consideration of all the information or explain how it uses such information in decisions across all responsible jurisdictions.

c	Participation			
	Guide post		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved and facilitates their effective engagement.
	Met?		Yes—All	No—All

Rationale

This Scoring Issue considers whether appropriate consultation processes are in place to ensure interested parties can participate in decision making. The primary level of decision-making is at the regional level, the WCPFC, however as the Members make decisions, individual flag States need to provide for stakeholder involvement in developing national positions and resulting measures/legislation.

The WCPFC has a comprehensive governance structure that provides for Members, Participating Territories and Cooperating Non-members. It also allows observers (intergovernmental and non-government) to participate in meetings of the Commission and its subsidiary bodies, including the SC, the TCC and the Finance and Administration Committee (although they are restricted from some sections of some of these meetings). All relevant Small Island Developing States are members or participating territories and additional access and support is provided through the participation of the Pacific Islands Forum Fisheries Agency. Attendance at Commission and related meetings is comprehensive, and logistic and financial support is provided to ensure attendance, meaningful involvement and interaction in the cooperative management.
Participation in PNA meetings is open to Nauru agreement parties, to FFA members and observers, including industry partners and NGOs, on application to the PNA Secretariat.

<u>USA</u>
For the USA, the MSA (Section 302(g)) directs the Councils to ”establish, maintain, and appoint members to committees and advisory panels”, and specifies the roles and responsibilities of the individuals involved in the management process. There is an advisory body comprised of 15-20 “individuals from various groups concerned with the fisheries covered by the WCPFC Convention.” Individuals/companies can apply to be part of the USA Government delegation. At the national fishery management level, the WPFMC holds three regular meetings per year that are open to the public. Closed meetings may be held upon occasion, but minutes are taken and shared. There are additional conferences and meetings held by the Council Coordination Committee (CCC). The USA consultation processes meet the SG80 requirements.

Chinese Taipei

For Chinese Taipei, specific fisheries documentation regarding formal and legally required consultative processes to inform their national positions prior to WCPFC meetings, including consideration of new CMMs, or amending existing CMMs, is not readily available. Information on the general provisions within the Administrative Procedure Act relating to administrative planning, administrative guidance and petitions is available, including examples of the consultative arrangements undertaken in developing the new Distant Water Fisheries Act. There do appear to be arrangements in place to consider comments on amendments to laws and regulations implementing WCPFC CMMs. Anecdotal explanations and evidence from WCPFC meetings and other sources suggest Chinese Taipei has developed consultation arrangements prior to WCPFC meetings that provide opportunity for interested and affected parties to be consulted.

This information suggests that when CMMs are proposed, the Chinese Taipei Fishery Agency (TFA) and the Overseas Fishery Department of Council (OFDC) summarize existing CMMs, any related meeting reports published on WCPFC website about the change of CMMs and new proposed CMMs. This occurs one month before any WCPFC Regular Meeting Commission. In this period before a Commission meeting, the TFA and OFDC gather all related parties, such as Purse-Seiner Association, Tuna Association, and Longline Association to discuss and gather all opinions in order to attempt to achieve a common stances on proposals, that can then become a national position to be addressed by TFA and OFDC in WCPFC on behalf of Chinese Taipei. After the WCPFC meeting and in order to adopt the CMM into Chinese Taipei domestic regulations, the Deep Sea Water division of TFA under the Council of Agriculture, Executive Yuan (central government) and overseas Fisheries Development Council of the Republic of China will propose the adoption of CMMs into Chinese Taipei domestic legislation. The Executive Yuan will send the proposal to the Legislative Yuan to carry out examination and revision. After passing the regulation, the Council of Agriculture, under Executive Yuan, will be assigned to establish the policy and procedures associated with the regulation. The team received records of prior notices to members of industry.

When new regulations are proposed, domestic law obliges the TFA to provide a pre-notice, for a period of 3-4 weeks, for the public to provide input on changes in legislation, which are then considered by the agency. No evidence was provided demonstrating how nascent legislation arising from CMMs is open to stakeholder consultation: the team did receive evidence that consultation on the new Distant Water Fisheries Act received stakeholder input which was diverse and included members of industry, academia and eNGOs.
There is sufficient evidence for Chinese Taipei, to conclude that all interested parties have the opportunity and are encouraged to participate in consultation processes thus meeting the SG 80 level.

New Zealand

As outlined above, New Zealand's MPI has a well-developed process and strong track record for effective stakeholder participation in, and support to, tuna management processes. This extends from stakeholder participation in the preparation of the current HMSMP and annual operational plan, through to stakeholder engagement as part of the development of national policy positions on key fisheries issues in advance of regional fisheries management organisation meetings (e.g. WCPFC, CCSBT). For example, MPI will develop position papers with stakeholder input and refine these through fishery specific working groups that involve key stakeholder groups. A departmental position, and/or whole of government agencies position, may be developed on key issues with senior executive and/or parliamentary approval for higher level positions and/or issues. These processes are also evaluated to improve the value and relevance of future consultation.

Federated States of Micronesia & Cook Islands & Vanuatu

For Flag State consultation (e.g. FSM) there appear to be general arrangements in place to consider comments on amendments to laws and regulations needed as a result of WCPFC deliberations and processes, including development of new compliance and management measures. Small Island Developing States participate through Forum Fisheries Agency and full participation in PNA meetings is open to Nauru agreement parties, to FFA members and observers, including industry partners and NGOs, on application to the PNA Secretariat. The development of regional Tuna Management Plans has also included appropriate stakeholder consultation; including advice from relevant fishing companies, fishermen, other national government ministries and NGOs.

Solomon Islands

Solomon Islands fisheries legislation and subordinate policy include arrangements to give effect to management priorities and initiatives needed as a result of WCPFC deliberations and processes, including development of new compliance and management measures. There is also active participation in Forum Fisheries Agency and PNA meetings and other processes. These opportunities are also generally available to other stakeholders including TIASI, and local and international environment NGO's.

Formal consultation and participation in management deliberations at the level of the FAC is provided for in fisheries legislation, however there is no evidence that a primary consultative group, the FAC, has met in recent years. Recent client advice indicates a new FAC is being convened and as part of the SCS MSC assessment process for the Solomon Islands Purse Seine and Pole and Line Fishery, TMI have recently provided evidence (to meet an existing/open Condition), in the form of a recently developed MFMR Plan for Improving National Consultation and Decision Making Processes. The plan is focused on the key consultative processes including the revised FAC, the national Tuna Management and Development Plan, and the principal fishing industry stakeholder advisory group, TIASI. It describes the current status and scope of these groups and processes, the specific stakeholders/parties involved, and the planned frequency of consultations and/or meetings. In addition, MFMR's Tuna Management and Development Plan (currently under review) includes stakeholder engagement and consultation as a key outcome area.

There is sufficient evidence to conclude that all interested parties have the opportunity and are encouraged to participate in consultation processes. Formal arrangements in place facilitate engagement. Therefore the SG 80 level is met for all UoA countries.

SG 100 is not met because the relevant management consultation processes do not yet provide opportunity for all of the interested and affected parties to be involved.

References

WCPFC, SC and TCC meeting records; WCPFC Rules of Procedure; Banks et al. 2011; Medley and Powers 2015;

Gascoigne, J., Kolody, D., Sieben, C. and Cartwright, I. 2015. MSC Public Certification Report. The SZLC, HNSFC & CFA Cook Islands EEZ south Pacific albacore longline fishery.

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Morison, A., and McLoughlin, K. Unassociated Purse Seine Fishery for Skipjack and Yellowfin Tuna from Western and Central Pacific Ocean by Tri Marine International (PTE), MSC Full Assessment: Final Report. SCS Global Services, 2015.

Morgan, S., Morison, A., and Meere, F. Western Pacific Sustainable Tuna Alliance (WPSTA) Western and Central Pacific skipjack and yellowfin free school purse seine MSC Fishery Assessment Report, SCS Global Services, 2018.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	All flag states:>80
Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	85- USA, NZ, SI, CI 80- FSM, Chinese Taipei, VU
Condition number (if relevant)	

PI 3.1.3 – Long term objectives

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Fisheries Standard, and incorporates the precautionary approach		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are implicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are explicit within and required by management policy.
	Met?	Yes—All	Yes—All	Partial—All
Rationale				

The focus of this scoring issue is on the RFMO level, as the subject of PI 3.1.3 should be the wider organization (v2.01 GSA4.5). Information regarding national objectives have been added for coastal states for context.

The WCPF Convention provides clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach. These are explicit at a range of levels, including within applicable CMMs, and management measures set out in the Palau Arrangement, the purse seine VDS and national laws and plans of the US and PNA members.

While the precautionary approach is a stated requirement for WCPFC, in practice it is less clear that the precautionary approach is applied uniformly or consistently across member decisions. Earlier stock assessments in 2010, 2011 and 2014 indicated that bigeye fishing mortality exceeded levels consistent with MSY. While precautionary limit reference points have since been set and CMMs updated, clear precautionary action that has sufficiently reduced exploitation levels was not evident before an updated assessment indicated that the stock was in better condition than previously thought.

Banks et al. (2011), note that the Nauru Agreement (the core PNA instrument) does not explicitly require objectives consistent with the precautionary approach. While not explicit, these are implicit as the PNA rely on healthy and sustainable stocks to underpin domestic management arrangements and economic returns. PNA members have all ratified the UNFSA, which does explicitly require application of the precautionary approach.

<u>Solomon Islands</u>
The Fisheries Management Act 2015 (MFMR 2015) includes a comprehensive suite of conservation, social, and cultural objectives, including application of the precautionary approach. It contains the over-arching objective of ensuring "the long-term management, conservation, development and sustainable use of Solomon Islands fisheries and marine ecosystems for the benefit of the people of Solomon Islands." Section 5(1), of the Act makes application of the Precautionary Approach explicit in subordinate legislation and policy such as the Solomon's National Tuna Fisheries Development Plan.

<u>Federated States of Micronesia</u>
For the FSM, overarching longer term objectives are specified in Title 24. Chapter 1 Sub-section 101. The key objective is "*to ensure the sustainable development, conservation and use of the marine resources in the exclusive*

economic zone by promoting the development of, and investment in, fishing and related activities in the context of effective stewardship". The FSM's Tuna Management Plan (TMP) 2015 gives effect to this objective at the national operational level, integrating ecosystem approaches into the fisheries management system. Under Section 2.2 (Guiding Principles) the FSM TMP explicitly states, "*The precautionary approach to fisheries management is most appropriate*." Hence the ecosystem approach of the TMP is consistent with the MSC Principles 1 and 2 and associated criteria, including application of the precautionary approach.

Cook Islands

At an overarching level, the Cook Islands has ratified both UNCLOS II (1982) and the UN Fish Stocks Agreement, including FAO's Code of Conduct for Responsible Fisheries (1995). As a WCPFC member they are also obliged to pursue WCPFC objectives with respect to target species sustainability and bycatch management, including the need to apply a precautionary approach to fisheries management decision making.

At a domestic level, the Marae Moana Act (2017), also states the "the precautionary principle of the Rio Declaration should be applied where there are threats of serious or irreversible damage, and that a lack of full scientific certainty should not be used as a reason for postponing cost effective measures to prevent environmental degradation in accordance with the Cook Islands' capabilities in the implementation of the marae moana." This Act also requires observance of principles of the ecosystem based approach to fisheries management, including, explicitly, "the principle of ecosystem-based management is that there should be an ecosystem-based approach to the management of natural resources that aims to sustain the health, resilience and diversity of ecosystem of species, while allowing for sustainable use by humans of the goods and services they provide".

Vanuatu

Long term objectives are specified in the Vanuatu Fisheries Act (2014) Section 10 Part 2 under the Purposes and Principles of the Act, with the key objectives to '*conserve, manage and develop fisheries in Vanuatu in order to ensure its long term sustainable use for the benefit of the people of Vanuatu; and*
effectively discharge obligations under Scheduled Treaties and agreements in which Vanuatu is party to.' The Fisheries Act explicitly requires application of the precautionary principle when executing responsibilities, functions, powers, stating that '*a lack of full scientific certainty…is not to be used to prevent or avoid a decision being made to minimise the potential adverse effects or risks of that threat or damage*' (Part 2, Section 5).

Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are implicit within overarching management requirements for the UoA fisheries as outlined in the WCPF Convention; and thus SG 60 is met. These objectives are also made explicit within the relevant WCPFC management framework, thus meeting SG 80 overall and for all jurisdictions. However, there are elements of the management system where it is not yet clear that the precautionary approach is applied in practice across all levels of legislation and policy for all stocks (see comments above in relation to the Nauru agreement). This and the shortcomings in management indicated at 3.1.1a suggest that SG 100 is only partially met.

References

WCPFC, SC and TCC meeting records; WCPFC Rules of Procedure; Banks et al. 2011; Medley and Powers 2015;

Morgan, S., Morison, A., and Meere, F. Western Pacific Sustainable Tuna Alliance (WPSTA) Western and Central Pacific skipjack and yellowfin free school purse seine MSC Fishery Assessment Report, SCS Global Services, 2018.

Morison, A., and McLoughlin, K. Unassociated Purse Seine Fishery for Skipjack and Yellowfin Tuna from Western and Central Pacific Ocean by Tri Marine International (PTE), MSC Full Assessment: Final Report. SCS Global Services, 2015.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	>80
Information gap indicator	Information sufficient to score PI
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	90
Condition number (if relevant)	

PI 3.2.1 – Fishery-specific objectives

PI 3.2.1		The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery-specific management system.	Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.	Well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.
	Met?	Yes	Yes	Partial
Rationale				

Overall, the WCPFC is responsible for the sustainability and management of target stocks and for considering and minimizing the impact of the fishery on ecosystem components. Hence the focus for evaluation against this PI are the WCPFC arrangements, and specifically the relevant CMMs as implemented by PNA arrangements and Flag States.

The principal objective of the WCPFC Convention is to ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stocks in the western and central Pacific Ocean in accordance with the 1982 United Nations Convention on the Law of the Sea and the 1995 UN Fish Stocks Agreement.

Within this overarching framework, there are numerous WCPFC CMMs that relate directly to P1 and P2 outcomes, developed with the support of both the SC and TCC, and aiming to deliver specific conservation and/or management outcomes. For example, CMM 2018-01 (the Conservation and Management Measure for Bigeye, Yellowfin and Skipjack Tuna in the Western and Central Pacific Ocean) includes explicit and measurable operational objectives for all three key tuna species. CMM 2018-01 incorporates high seas purse seine effort limits and requires the establishment of limits for non-PNA Pacific Island Parties.

This CMM also specifies detailed FAD related management measures to limit impacts on sustainability of bigeye and yellowfin tuna, ecologically related species, and to minimise direct environmental impacts from lost and or damaged FADs, including marine debris and pollution effects. Key measures under CMM 2018-01 are:

- A three month (July, August and September) prohibition of deploying, servicing or setting on FADs between 1 July and 30 September each year for all purse seine vessels, tender vessels, and any other vessels operating in support of purse seine vessels fishing in exclusive economic zones and the high seas in the area between 20 degrees North and 20 degrees South.
- In addition to the three month FAD closure (except for Kiribati flagged vessels fishing the high seas adjacent to the Kiribati EEZ, and Philippines' vessels operating in High Seas Pocket 1), a prohibition on deploying, servicing or setting FADs in the high seas for two additional sequential months of the year (e.g. either April – May or November – December) for 2018, 2019 and 2020.
- For each purse seine vessel, a flag CCM shall ensure no more than 350 drifting Fish Aggregating Devices (FADs) with activated 7 instrumented buoys are deployed at any one time.
- To reduce the risk of entanglement of sharks, sea turtles or any other species, from 1 st January 2020, CCMs shall ensure that the design and construction of any FAD to be used in the WCPFC Convention Area

shall be designed to be lesser 'lesser entangling'; the use of natural and/or biodegradeable materials is encouraged (WCPFC CMM 2018-01).

Despite the presence of these FAD related management measures and associated objectives, the recent remote audit process for re-assessment of the UoA by SCS has identified some inconsistencies in WCPFC members' interpretation of the 'lesser entangling' FAD design measure. For example, TFA officials (Chines Taipei) indicated they did not see Paragraph 19 of the Measure as binding; other UoA Flag States acknowledged the measure as binding, but were yet to commence implementation of the measure, and others considered it a priority.

In addition to these FAD specific management arrangements, management objectives are also laid out in national plans, the Palau Arrangement and the VDS implementing purse seine fishing effort limits for parties. WCPFC members also report against a number of indicators, including detailed performance reporting of progress against specific WCPFC CMM's, as part of their obligations through Part 2 Annual Reporting.

The US Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) authorizes fishery management councils to create fishery management plans (FMP). Encompassing US Pacific purse seine fishing, the Western Pacific Regional Fishery Management Council (WPRFMC) developed a Fishery Ecosystem Plan (FEP) as a FMP, consistent with the MSFCMA and the national standards for fishery conservation and management. This FEP is consistent with MSC Principles 1 & 2.

WCPFC Objectives are implicit within the fishery-specific management system and broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, thus SG 60 requirements are met. These objectives are also made explicit within the Convention thus meeting SG 80 requirements. The emphasis of objectives in the WCPF Convention and subordinate CMM's also focus on ecological versus direct social/economic objectives, consistent with guidance in GSA 4.7.

Although aspects of the SG100 requirements may be met, for example with the explicit incorporation of FMSY as a measurable default target reference point in recent CMMs, considering the deficiencies in the harvest strategy and control rules for skipjack and yellowfin (See PIs 1.2.1 and 1.2.2) and bigeye, it cannot be concluded that well defined and measurable objectives are applied throughout the specific fishery management system. A partial score of 90 is therefore awarded.

References

WCPF Convention; WCPFC CMMs; Palau Arrangement; National plans; Banks et al. 2011; Scott and Stokes 2013; PASAI 2013
TFA, Pers Comm, 16 November 2020. NOAA Pers Comm, 17 November 2020.
Morgan, S., Morison, A., and Meere, F. Western Pacific Sustainable Tuna Alliance (WPSTA) Western and Central Pacific skipjack and yellowfin free school purse seine MSC Fishery Assessment Report, SCS Global Services, 2018.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	>80
Information gap indicator	More information sought
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	95
Condition number (if relevant)	

PI 3.2.2 – Decision-making processes

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery		
Scoring Issue		SG 60	SG 80	SG 100
a	Decision-making processes			
	Guide post	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	Yes	Yes	
Rationale				

At the WCPFC level, decision-making processes are open, seek to apply the precautionary approach and use the best available information and are well documented. Consensus is the general rule for decision-making by Commission Members during the annual meetings. If consensus cannot be reached, voting, grounds for appealing decisions, conciliation and review are all part of the established decision-making process, as described in Article 20 of the Convention. The decision-making processes, including development of fishery specific measures and strategies given effect as CMM's, are operationalised through the processes of the Scientific Committee, the Technical and Compliance Committee and the Commission itself.

As an operational level example, WCPFC's 2018 Annual Summary Report for the Technical and Compliance Committee provides an update on working group (FAD IWG) progress to develop Draft Guidelines for Biodegradable and Non-entangling FADs. Draft guidelines from SC14 (2018) were presented to the FAD-IWG along with additional information from SPC. The fourth FAD IWG revised these guidelines in 2020 which will be considered by SC17 and TCC17 in 2021 (WCPFC17 Annual Summary Report 2020). ISSF, working collaboratively with WCPFC and its sub-committees, have released a *Guide to Non-entangling' and Biodegradable FADs*50, providing detailed guidance on constructing biodegradable FAD rafts and tails. The ISSF note that the FAD related research projects associated with these initiatives have initiated large-scale deployments of more than 2,000 biodegradable FADs in the Indian and Eastern Pacific Oceans to test different materials and constructions.

More generally, information used to inform decision making is published via WCPFC and related processes, although some details are not readily available. Conservation and Management Measures are binding, but WCPFC Resolutions are non-binding, with all management measures applying equally inside EEZ's and on the high seas. Flag states enforce management measures on their own vessels on the high seas and coastal states enforce management measures on all vessels fishing within their own EEZs.

PNA also has well-established decision-making processes which have resulted in measures and strategies contributing to, and in important respects, underpinning effective management of the WCPO purse seine fisheries. PASAI (2013) reports that for most PIP jurisdictions examined, decision making is aided through the use of SPC/WCPFC reports.

50 The ISSF guide is available at: https://iss-foundation.org/knowledge-tools/guides-best-practices/non-entangling-fads/download-info/non-entangling-and-biodegradable-fads-guide/

At the WCPFC and subordinate PNA and FFA levels there are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives thus meeting the SG 60 level. The SG 80 level is also met as there are established decision-making processes in place that result in measures and strategies to achieve explicit fishery-specific objectives. Established regional and national decision-making processes are also in place that result in measures and strategies to achieve objectives, also meeting SG 60 and SG 80.

b	Responsiveness of decision-making processes			
	Guide post	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Yes—All	Yes (CT, FSM, USA, NZ, CI) No (SI, VU)	No—All

Rationale

As outlined above, WCPFC decision-making processes allow consideration of serious and important issues through inter-sessional scientific and MCS working groups and committees (e.g. the SC and TCC) and annually at the Commission meeting. A recent example is CMM 2018-01 providing for a transitional management regime (pending development of a formal harvest strategy) that ensures the sustainability of bigeye, skipjack, and yellowfin tuna stocks in the Western and Central Pacific Ocean.

Deliberations and advice/decisions from the working groups and Commission are relatively transparent with the rationales explained in working group reports tabled to the annual meeting. Summary details are generally provided in annual MCS summary reports, and in summary level country reports for members.
Specific details about timeliness of decision-making are less obvious, however the WCPFC decision-making framework has generally delivered targeted CMMs and strategies to address sustainability issues and specific objectives in the purse seine fishery relatively promptly in an RFMO context.

The PNA has established effective decision-making processes which respond to issues identified in relevant research, monitoring, evaluation and consultation. All PNA members have tuna management plans that are applied at the national level. The PNA management system is underpinned by a fishery information system, the Fisheries Information Management System (FIMS) which provides ready access to timely data. PNA members make use of the services provided by both SPC and FFA to identify and respond to important issues.

At a national level, Flag States that are not PNA signatories (e.g. USA, Chinese Taipei, NZ) have a further requirement to respond to serious and other important issues at a domestic level if required.

<u>Federated States of Micronesia</u>
Measures and strategies to sustainably manage the tuna resources of FSM were established through the development and implementation of the Tuna Management Plan 2015. FSM is a participating Party in the Palau Arrangement for the Management of the Western Pacific Tuna Fishery. FSM has also been an active Party in the development and implementation of the Purse Seine and Longline Vessel Day Schemes to control tuna fishing effort in the Parties of the Arrangement waters, aimed at optimizing economic returns from provision of fishing rights, and ensuring sustainable harvesting of the tuna resources in these waters.

For the FSM, NORMA's Board of Directors is the primary decision-making body with responsibilities to oversee and adopt regulations for the conservation, management and exploitation of fish in the EEZ, conclude fishing agreements, issue fishing permits, and participate in the planning and execution of programs relating to fisheries. Under national fisheries legislation, Title 24, the Board must ensure management measures are based on the best scientific evidence available and designed to maintain or restore stocks at levels capable of producing maximum sustainable yield. Decision-making is supported by information and data from various sources including the vessel day scheme (VDS), vessel monitoring system (VMS), components of integrated Fisheries Information Management Systems (iFIMS) and by analysing catch and effort data from the fishery. Increasingly these data are readily available in a timely and transparent manner via e-monitoring initiatives adopted for PNA and WCPFC members and their fleets.

The Control Union Pesca Public Certification Report for the FSM Tuna Longline Fishery (2019) describes an active and adaptive management approach by NORMA under FSM fisheries legislation, including an up to date and actively managed national Tuna Management Plan. In concert with WCPFC and PNA arrangements, FSM decision-making processes actively respond to important issues in a transparent, timely and adaptive manner, including wider implications of decisions, meeting SG80 requirements.

Solomon Islands

The Solomon Islands Fisheries Management Act 2015, in addition to requiring the implementation of WCPFC CMMs, specifically requires under Section 5 (c) that "management measures shall be based on the best scientific evidence available to maintain or restore stocks at levels capable of producing sustainable yield, as qualified by relevant environmental and economic factors including fishing patterns, the interdependence of stocks and relevant international standards; "and in section 5 (h) that, "complete and accurate data and information concerning fishing activities and fisheries resources shall be collected and, as appropriate, shared in a timely manner."

It is less clear how effective these arrangements are at the domestic level independent of scheduled and well-structured PNA and WCPFC arrangements. Specifically, the level of broader stakeholder consultation and the timeliness of input to local and regional serious and other important issues is less clear. For example, the primary higher-level consultative group, the FAC, has not met since October 2014. There have been bilateral meetings between MFMR and the four companies operating in the UoA (they meet annually to discuss management arrangements and their annual MoU's and licence conditions), and also between MFMR and the TIASI. However, no evidence was provided that these meetings deal specifically with relevant research, monitoring, evaluation and consultation in a transparent, timely and adaptive manner.

Most recently, as part of the progress on an SCS imposed MSC Condition imposed for the Solomon Islands Purse Seine and Pole and Line Fishery, Tri Marine have worked with MFMR to develop a Plan for Improving National Consultation and Decision Making Processes. The plan is focused on the key consultative processes including the revised FAC, the national Tuna Management and Development Plan, and the principal fishing industry stakeholder advisory group, TIASI. It describes the current status and scope of these groups and processes, the specific stakeholders/parties involved, and the planned frequency of consultations and/or meetings. In addition, MFMR's Tuna Management and Development Plan (currently under review) includes stakeholder engagement and related decision processes as a key outcome area.

As such, SG 60 is met, however SG 80 and SG100 are not.

Chinese Taipei

The situation for Chinese Taipei in relation to transparent, timely, and adaptive domestic management response and decision-making arrangements for more serious management and/or compliance issues has been less clear (Morgan et al., 2018), however a more recent surveillance audit suggests Chinese Taipei has improved its performance in this regard.

The Chinese Taipei fisheries government response to more serious and important issues can be initiated at any time, rather than just in the lead up to the WCPFC annual meeting (DiNardo and Harte 2019). For example,

correspondence relating to a request by the Tuna Purse Seine Association to TFA to open two additional transshipment ports for purse seine transshipment activities, and subsequent approval by TFA to include Tarawa and Kiritimati following TFA's internal approval process was provided to the surveillance team.

In addition, Chinese Taipei's E-platform for public participation[51] provides an online mechanism for the public and civil society organisations to raise serious and important policy issues that must be responded to by the relevant authority. Agencies are required to respond to issues raised that meet statutory requirements. No fisheries specific examples were available, though TFA (supported by documentation) assured the surveillance team that fisheries related proposals would be addressed under national policy and regulatory requirements.

The domestic fishery management systems of Chinese Taipei have mechanisms to respond to serious and other important issues that are raised by domestic stakeholders outside of the annual WCPFC pre-meeting and that apply to domestic policymaking relevant to the fishery specific management system. Chinese Taipei arrangements are responsive (transparent, timely, adaptive) and apply to serious and other important domestic (flag State) issues taking into account the wider implications of decisions, so SG80 is met for free school and FAD sets.

USA

The USA has processes to respond to serious and other important issues and to allow for consultation and participation in both regional decision-making and at the fleet level, via the WPRFMC and Stakeholder Advisory Committee. These arrangements allow the USA to respond in a transparent, timely and adaptive manner meeting the SG80 requirement. . Relevant information is also generally available via meeting agendas, and meeting outcomes are published on the publicly available websites of the WPRFMC (http://www.wpcouncil.org/meetings-2/) and the Pacific Fisheries Management Council (PFMC) (https://www.pcouncil.org/council-operations/council-meetings/past-meetings/).

New Zealand

New Zealand's Fisheries Act (s 10, 11, and12) [52] includes detailed requirements in relation to fisheries management decision-making, including the need to make use of the best available information. Their decision making framework, including seeking and incorporating stakeholder advice, is well considered and clearly described. For key management issues, the MPI prepares an Initial Position Paper (IPP) that provides the Ministry's initial proposals for issues needing decision. Subsequently, the Ministry will provide a Final Advice Paper (FAP) to the Minister for Primary Industries. This process captures both agency views/advice, as well as key stakeholder advice, providing analysis and a recommended way-forward for Ministerial or parliamentary decision. To communicate outcomes of this process back to the public and/or stakeholders, copies of the FAP, and the Minister's letter setting out his final decisions, are made available via the Department's website (Akroyd and McLoughlin, 2017).

Cook Islands

As a member of WCPFC, the Cook Islands work closely with both Convention members and related regional groups like SPC and FFA. More significant or serious management issues, including target stock depletion, or significant environmental/bycatch issues are normally raised via these annual processes. Typically, most of these are subsequently managed through CCM's recognising the issue and agreeing on a suitable management response via CMM's.

[51] Available at (https://www.ndc.gov.tw/en/Content_List.aspx?n=C3C5AABC54ECEA0D.

[52] Available at: http://www.legislation.govt.nz/act/public/1996/0088/latest/DLM394192.html

Relevant examples include MMR setting a longline vessel cap and stringent catch monitoring requirements to address the issue of regional bigeye tuna overfishing (Sieben et al, 2020); and a proactive response to sustainably manage fishing for south Pacific albacore as required under CMM 2015-02 - with annual review of these measures by the Scientific Committee. The Cook Islands government has also recently introduced the comprehensive Marae Moana legislation implementing extensive marine protected areas, and has actively managed fishing issues impacting shark sustainability, including their establishment of a national Shark Sanctuary, and the banning of wire traces in longline fisheries. (Marine Resources - Shark Conservation Regulations 2012).

The Cook Islands 2013 Purse Seine Fishing Regulations also provide explicit guidance to decision makers about responding to key management issues such as setting fishing effort limits for purse seine vessels, and operational guidance about ensuring low levels of risk in relation to bycatch impacts from purse seine fishing.

Vanuatu

The Vanuatu Fisheries Act (2014) provides the Minister with the functions/powers to give general policy guidance however the main responsibility of decision-making lies with the Director of VFD, including the functions/powers to '*develop, coordinate and facilitate the implementation of national policy and strategies concerning fisheries conservation, management, development and sustainable use; manage MCS in and outside Vanuatu EEZ; promote and facilitate the development of Fisheries Management Plans; and act as the chair for the Fisheries Management Advisory Council established under this Act*' (Part 3, Section 7). The Director must consult with appropriate government ministries/departments and fishermen, and local authorities or other persons likely to be affected by the plan (Part 4, Section 11, 3 a & b). VFD is required to ensure that decisions are based upon the best scientific evidence and are '*designed to maintain/restore… the interdependence of stocks and any generally recommended international minimum standards*' (Part 2, Section 4, b). The TMDP has developed TAC and license numbers for controlling effort toward commercial tuna exploitation, and limits are to be developed with input from FMAC. Currently, the TMDP sets a cap of 30 licenses that can be allocated for purse seine vessels within the EEZ and a TAC of 3,000 t each for Yellowfin and Skipjack (Schedule, Section 2). It is unclear how these TAC/license caps relate to stock status, or whether there is an ongoing review.

Vanuatu previously received a yellow card by the European Union in 2013 but this was revoked in 2014 due to progress in improving their fisheries governance and combatting IUU. This demonstrates that the government does respond to serious and other important identified issues and does so in a transparent and timely manner.

For new management policies, FMAC reviews the policy prior to its consideration by the Ministry of Fisheries, then the development council, and the legislative council for approval. The most recent advice from VFD indicates that FMAC is currently being re-established, although the revised committee has not yet met.

In the absence of any evidence supporting the FMAC and related decision making process, it cannot be concluded that issues identified through consultation/monitoring are dealt with in a transparent, timely and adaptive manner. SG60 is met, but SG80 is not.

At the regional level (WCPFC) and sub-regional level (PNA), and for all jurisdictions under assessment there are decision-making processes that respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner; these also take some account of the wider implications of the decisions thus meeting the SG 60 level.
For the Solomon Islands and Vanuatu, it cannot yet be said that decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner; and also take account of the wider implications of all decisions so SG 60 only is met for these jurisdictions. SG80 is met for the remainder of UOA jurisdictions.

None of the jurisdictions have decision-making process that respond to all issues identified in relevant research, monitoring, evaluation and consultation, so SG100 is not met for any of the flag states.

c	Use of precautionary approach			
	Guide post		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Yes	

Rationale

Assessment of this Scoring Issue is primarily related to the processes and management decisions taken at the fishery specific management level – therefore the focus is WCPFC as the institution responsible for fishery management measures. The role of the PNA and Flag States is essentially to ensure agreed CMMs and management arrangements are implemented.

The WCPFC Convention, in recognition of UNFSA requirements, requires that Members, Participating Territories and Cooperating Non-members of the Commission, directly and through the Commission, apply the precautionary approach. WCPFC decisions are also required to be based on the best scientific information available per the WCPF Convention text, and the Commission through its annual meetings and inter-sessional processes, supports this objective.

For the PNA, Banks et al. (2011) concluded in the initial MSC assessment that the best available information is used for decision- making, albeit with a lack of clarity in the links between decisions on the VDS and WCPFC scientific and stock assessment processes. An MSC assessment condition was then set in relation to this issue. The 2nd surveillance audit for the PNA fishery (Scott & Stokes, 2013) examined progress against this condition and concluded that the Client Action Plan had sufficiently addressed this shortcoming and that SG 80 requirements are met for that fishery (Blyth-Skyrme et al. 2017). Blyth-Skyrme et al. (2017) indicate that the PNA process, both within their own systems as well as the conditions set by the previous MSC certification, has been responsive to these opportunities and has evolved positively.
Timely decisions are made using the integrated fishery information system. While the precautionary approach has not been explicitly adopted by the PNA, member commitments to the WCPFC demonstrate an implicit commitment to the precautionary approach in management of the purse seine fishery.

Based on the above information it is evident that decision-making processes for the WCPFC and PNA are based on precautionary approach and use the best available information, meeting SG 80.

d	Accountability and transparency of management system and decision-making process			
	Guide post	Some information on the fishery's performance and management action is generally available on request to stakeholders.	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.	Formal reporting to all interested stakeholders provides comprehensive information on the fishery's performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.

	Met?	Yes - WCPFC	Yes - WCPFC	No
Rationale				
For the UoA fisheries, the WCPFC is responsible for effective management and acts as the primary fisheries management "decision making" entity on behalf of members and co-operating non-members. Papers and reports from WCPFC plenary sessions, the SC and the TCC are also published formally, and are publicly available on the Commission's website. These papers and reports provide a generally high level of transparency, demonstrating the development of positions on conservation and management issues, and showing how stakeholder contributions including scientific and other information are used to inform management actions. For example, these processes contribute to the development of various Commission CMM's, which are then monitored for effectiveness, with member country progress and issues in relation to these measures, evaluated and reported annually via the Part 1 Annual Country Reports to WCPFC. These Part 1 country reports provide information on fisheries, research and statistics during the preceding calendar year. Part 2 reports are also provided each year summarising management and compliance issues and performance since the previous report; these are not publicly available. Whilst very good practice, it is unclear whether these reports represent all of the relevant information used to inform decision-making. There is also no formal, detailed explanation linking the information provided to any decisions that results. In an international context it is recognized that it is very difficult to give full explanations for all decisions, since this might undermine matters of national interest for members, and/or multi-lateral co-operation. Decisions are very often negotiated outcomes with the trade-offs not always apparent. Therefore, at the regional level (WCPFC) some information on the fishery's performance and management action is generally available on request to stakeholders meeting the SG60 level. SG 80 is also met at this regional level as explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity. Although formal reporting to WCPFC members is available, and generally provides relevant information on the fishery's performance and management actions, including describing to some extent how the management system responded to findings and relevant recommendations, this information is not fully available nor comprehensive in its coverage and detail. SG 100 is therefore not met at the regional level.				
e	Approach to disputes			
	Guide post	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	Yes—All	Yes—All	No—All
Rationale				
The primary management system for assessment under this Scoring Issue is the WCPFC. As the overarching management authority, the Commission process is collaborative, serving to develop and implement management arrangements, and monitor member compliance. WCPFC Members, Participating Territories and Cooperating Non-members are party to all decisions at the WCPFC through ongoing participation in the SC, the TCC, and WCPFC annual meetings. Disputes/disagreements are typically resolved either during the iterative development				

of new management measures, including CMM's, or for more formal matters via negotiation at WCPFC annual meetings.
The Commission has a consensus-based decision-making process, with provision for a two-chambered voting process requiring a 75% majority in both chambers if all efforts to reach a decision by consensus have been exhausted. As established in 3.1.1 b. the WCPFC dispute resolution mechanism is set out in Article 31 of the Convention. Essentially, this Article implements the dispute settlement arrangements established in the UNFSA/UNCLOS and binds all WCPFC Members to those arrangements whether or not they are Parties to the UNFSA.
Recognising that both Chinese Taipei, NZ, and USA are classed as Distant Water Fishing Nations and WCPFC CCM's they are bound by the WCPFC dispute resolution processes outlined above. Whilst there are no ongoing court challenges underway, nonetheless the jurisdictions under assessment are not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery; thereby meeting the SG60 level. Similarly, the WCPFC dispute mechanisms are generally operating efficiently, with the management system likely to comply in a timely fashion with judicial decisions arising from any legal challenges thus meeting SG80. In the absence of examples or major occurrences it cannot be said the management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges. Thus SG100 is not met.

References

Banks et al. 2011, Medley & Powers 2015, Scott & Stokes 2013, Blyth-Skyrme et al. 2017, WCPF Convention Sieben et al

Blythe-Skyrme, R., McLoughlin, K. and Japp, D. MSC Certification PCDR for the PNA Western and Central Pacific skipjack and yellowfin, unassociated / non-FAD set tuna purse seine fishery. Acoura Marine, 2017.

MRAG Americas. 2016. MSC Public Certification Report for Solomon Islands Skipjack and Yellowfin Tuna Purse Seine Anchored FAD, Purse Seine Unassociated, and Pole and Line Fisheries.

National Oceanic Resource Management Authority (NORMA) and Pacific Islands Forum Fisheries Agency (FFA), Management Plan on Tuna Fisheries for the Federated States of Micronesia. December 2015.

Sieben, C. Gascoigne, J. and Watt, P. MSC Public Certification Report for the SZLC CSFC & FZLC FSM EEZ Longline Yellowfin and Bigeye Tuna Fishery (bigeye UoA). Control Union Pesca Ltd, March 2019.

Solomon Islands Tuna Management and Development Plan. Ministry of Fisheries and Marine Resources, Solomon Islands Government.

VFD Pers Comm, 11 November 2020.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	>80
Information gap indicator	More information required regarding the status/meetings of Vanuatu FMAC

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	SI, VU: 75 CT, CI, USA, FSM, NZ: 80
Condition number (if relevant)	3-1, 3-2, 3-3

PI 3.2.3 – Compliance and enforcement

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
a	MCS implementation			
	Guide post	Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	Yes—All	No - all	No—All

Rationale

MCS arrangements considered for this Scoring Issue have been assessed at the regional (WCPFC); sub-regional (PNA/FFA), and Flag State levels. Whilst the WCPFC develop and implement management and MCS measures, it is up to the PNA (at the sub regional level) and Flag States to ensure these are operationalised (often via WCPFC CMM's) and enforced through national and fleet level processes.

At the regional level there is a well-developed MCS system that, when applied appropriately, results in effective compliance with management arrangements. The basis of this system for the WCPFC is its Compliance Monitoring Scheme (CMS). The CMS is a contemporary, integrated framework to ensure that Members, Cooperating Non-Members and Participating Territories (CCMs) implement and comply with obligations arising under the Convention, as well as CMMs adopted by the Commission. The CMS is designed to:

(i) assess CCMs' compliance with their obligations;

(ii) identify areas in which technical assistance or capacity building may be needed to assist CCMs to attain compliance;

(iii) identify aspects of conservation and management measures which may require refinement or amendment for effective implementation;

(iv) respond to non-compliance through remedial options that include a range of possible responses that take account of the reason for and degree of non-compliance, and include cooperative capacity-building initiatives and, in case of serious non-compliance, such penalties and other actions as may be necessary and appropriate to promote compliance with CMMs and other Commission obligations; and

(v) monitor and resolve outstanding instances of non-compliance.

It covers requirements relating to:

(i) catch and effort limits for target species;

(ii) catch and effort reporting for target species;

(iii) reporting including with respect to implementation of measures for non-target species;

(iv) spatial and temporal closures, and restrictions on the use of fish aggregating devices;

(v) authorizations to fish and the Record of Fishing Vessels, observer, VMS coverage, transhipment and the High Seas Boarding and Inspection Scheme;

(vi) provision of scientific data through the Part 1 Annual Report (and its addendum) and the Scientific Data to be provided to the Commission; and;

(vii) submission of the Part 2 Annual Report, including compliance with the obligations in paragraph 36, and compliance with other Commission reporting deadlines.

WCPFC members are required to submit annual TCC reports reflecting the status of fishery compliance in the WCPFC. TCC summary reports publicly identify member compliance (or non- compliance).

The WCPFC also maintains an IUU vessel list which currently lists three vessels, one of which, the Yu Fong 168, is flagged to Chinese Taipei. In a note to the WCPFC IUU Vessel list for 2017, Chinese Taipei confirmed that with respect to Yu Fong 168, the license was revoked in 2009 and the owner of the vessel has been penalized through repeated monetary punishment for violating the rules of not returning to port.

The WCPFC's Regional Observer Program plays an important part in the MCS system with a target of 100% observer coverage on purse seine vessels. Observers provide a suite of important MCS information, including information about the implementation of CMMs relating to both target and by-catch species. There is ongoing uncertainty about actual coverage rates, and the background of this report provides a summary of the available WCPFC information on estimated [actual] coverage rates for the flag states assessed in this fishery.

At the sub-regional/regional level (PNA/FFA), the FFA is the main service organisation providing MCS support for the coastal States in the WCPO. The arrangements are comprehensive and include a regional MCS strategy endorsed by Forum Fisheries Committee Ministers, (covers regional operations and cooperation), a regionally agreed benchmark level of observer coverage and at-sea and in-port inspections. The FFA Surveillance Centre (RFSC) undertakes regional coordination of MCS activity and assesses the risk of non-compliance by vessels. The RFSC monitors fishing vessel activity using a combination of the Vessel Monitoring System (VMS), Automatic Identification System (AIS) and Synthetic Aperture Radar (SAR). MCS arrangements are also supported by the QUAD Operational Working Group. This group comprises the aerial and naval arms of Australia, France, New Zealand and the USA who provide aerial and surface assets to assist regional surveillance.

The Nauru Agreement and Te Vaka Moana Arrangement (a sub-regional arrangement between the Cook Islands, New Zealand, Niue, Samoa, Tokelau and Tonga) also promote regional cooperation between parties on MCS activities.

Regional (WCPFC and FFA) MCS systems includes harmonized Terms and Conditions of Access, a regional VMS system, Regional Register of Foreign Fishing Vessels and a range of regional MCS cooperation programmes, including the Niue Treaty (a multilateral treaty of members of the FFA to enhance their ability to enforce effectively their fisheries laws, and deter breaches). An important part of the overall compliance system at the sub-regional level is the transferable effort management system (VDS) implemented by PNA. While this only applies to about 60% of the fleet (PNA vessels) Blyth-Skyrme et al (2017) suggest it has proven to be effective at this scale.

For this assessment, relevant Flag States are USA, Chinese Taipei, the Solomon Islands, Vanuatu, and Federated States of Micronesia. All of these jurisdictions have fisheries legislation which provide monitoring, control and surveillance systems to complement regional and sub-regional arrangements, including implementation of WCPFC CMMs. The effectiveness of these arrangements varies across jurisdictions.

For example, additional requirements for FAD management in CMM 2018-01 for 'lesser entangling' FADs and limits on FAD numbers per vessel came into force for the WCPFC members in January 2020. Explicit and clear compliance measures and monitoring documentation to show a compliance system with these FAD requirements have not been demonstrated by any of the UoA Flag States. Some Flag State officials (e.g. Taiwan) have questioned whether CMM 2018-01 imposed any current obligations on CCMs to comply with requirements for 'lesser entangling' FADs and limits on FAD numbers. The USA acknowledged a requirement to comply with CMM 2018-01 FAD measures but had yet to promulgate domestic regulations to do so.

The assessment team considered CMM requirements regarding 'lesser entangling' FAD requirements and FAD management plans under scoring issues 2.3.2 (a) and 2.3.2 (d) and when establishing conditions 4, 5 and 6 under Principal 2. We reviewed these scoring issues and conditions for the possibility duplicative assessment and conclude that the scoring of SI 3.2.3a is not duplicative and that the conditions associated with the scoring of SI

3.2.3a are justified as standalone conditions for the relevant Flag States. Further analysis of SI 3.2.3a for each of the jurisdictions under assessment is provided below.

Federated States of Micronesia

As signatories to the PNA, the FSM maintains a comprehensive and contemporary legislative frameworks that complement the objectives and operational level management strategies and measures of the WCPFC. The FSM Tuna Fishery Management Plan includes detailed management strategies, including specific sections to implement MCS initiatives. This includes multi-lateral subsidiary agreements such as the Niue Agreement. The Plan also contains explicit processes and timeframes for management performance monitoring and review, including for MCS focussed activities.

All these individual flag State systems include licensing, vessel identification, the application of catch limits, data requirements, VMS, bans on transhipment at sea, the carriage of observers, and descriptions of permitted fishing gears. There are also defined penalty provisions for breaches of MCS requirements. All WCPFC members are also required to submit annual Part 1 Country Reports to the Scientific Committee of the WCPFC detailing activities related to fisheries management and related obligations and performance against WCPFC CMM's. These reports are publicly available via the WCPFC website. The FSM are one of 14 WCPFC members countries that have authorised inspection vessels listed on the WCPFC High Seas Boarding and Inspection Register, thus enabling high seas inspections under CMM 2006-08.

In relation to broader bycatch management, WCPFC's CMM 2011-03 and CMM 2012-04 prohibit vessels from setting on tuna associated with cetaceans and whale sharks, if the animal is sighted prior to commencement of a set. Recent SCS assessment team observer data analysis has identified that setting on whales and whale sharks is occurring on UoA vessels from the FSM (0.4% of sets based on weight); this is in contravention of WCPFC CMMs 2011-03, and 2012-04.

For the FSM there is a generally effective MCS system, and measures are implemented in the fishery with a reasonable expectation that they are effective. However, based on the evidence of non-compliance for vessels setting on tuna associated with cetaceans and whale sharks outlined above, and in relation to implementation of CMM2018-01 for FAD design, the MCS system has not demonstrated an ability to enforce relevant management measures, strategies and/or rules, thus meeting SG60 only. SG 80 and SG 100 are not yet met because there is not a comprehensive monitoring, control and surveillance system that is demonstrating a consistent ability to enforce relevant management measures, strategies and/or rules.

Solomon Islands

At the national level, the Solomon Islands maintain contemporary legislative frameworks that complement and work to uphold both domestic and regional fisheries objectives. This includes multi-lateral subsidiary agreements such as the Niue Agreement. The Solomons Tuna Management Plan includes explicit objectives and performance indicators to enable implementation of effective and efficient tuna fishery management for both offshore and inshore waters. The TMP includes a suite of MCS focussed objectives and activities that are designed to complement the sub-regional and regional processes and objectives. For example, domestic arrangements include licensing, vessel identification, the application of catch limits, data requirements, VMS, bans on transhipment at sea, the carriage of observers, and descriptions of permitted fishing gears.

The fishery does not deploy drifting FADs but will opportunistically fish on drifting FADs that enter the fishing area. The Solomon Islands purse seine licensing conditions stipulate that 'vessels' shall not be used to: a) fish within five nautical miles of any deployed FAD, except those deployed by the vessel or the company that operates the vessel.' It is unclear to the assessment team whether the fishery is in contravention of Solomon Islands legislation, as the fishery is fishing on drifting FADs that were not deployed by the vessel or the fishing company (i.e. NFD or Tri Marine) that operates the vessel. The client has advised that the prohibition of fishing near other vessel/company FADs was added to the license conditions at the client's request to prevent other companies from setting on one another's AFADs in archipelagic waters, and not for DFAD (Hamilton, pers. comm. 2020). While the assessment team does not consider the setting on derelict DFADs necessarily an issue, it potentially contravenes license conditions depending on how this licencing condition is interpreted.

In addition, there have been a number of occasions in recent years where observer records from SI purse seine UoA vessels have included the bycatch species fate code DFR (discarded, trunk fins removed) for sharks taken across separate trips. These incidents were subsequently investigated by MFMR and the observer records were found by them to be erroneous. Although TMI have provided the assessment team with documentation and company level policies that strongly oppose any shark finning practices amongst the TMI/NFD fleet, there remains some uncertainty about the veracity of observer data, and related MCS practices to counter these risks. This issue is also addressed in more detail under PI 2.2.2d.

For the Solomon Islands, with regard to the apparent practice of SI purse seine vessels setting on DFAD's potentially in contravention of SI permit conditions, the lack of implementation with respect to CMM2018-01 para 19 requiring 'lesser entangling' FADs, and the shark finning incidents outlined above, the assessment team considers, at this stage, that while a MCS system exists, and MSC measures are implemented in the fishery and there is a reasonable expectation that they are effective, it cannot be said that they have demonstrated an ability to enforce relevant management measures, strategies and/or rules. Therefore SG 60 is met; SG80 and SG100 are not yet met because a comprehensive monitoring, control and surveillance system has not been implemented in the fishery that demonstrates a consistent ability to enforce relevant management measures, strategies and/or rules.

<u>Chinese Taipei</u>

Based on the information available, Chinese Taipei's new fisheries law appear comprehensive and contemporary however some aspects are less clearly described or have been tested. Chinese Taipei has a Distant Water Fisheries Sanction Issued List which is available on their Fishery Agency website, but not in English (as the main language used for official WCPFC documentation), compromising accessibility.

Chinese Taipei is also a WCPFC CCM that has authorised inspection vessels listed on the WCPFC High Seas Boarding and Inspection Register, thus enabling high seas inspections under the relevant CMM. TFA has an active port monitoring program with inspection officers present in authorised transhipment ports/hubs. There are no at-sea transhipments for WCPFC based purse seine vessels.

Chinese Taipei prohibits shark finning, as well as the retention of oceanic whitetip, silky shark, whale shark, and other TEP species. For dead sharks that are retained, fins must be naturally attached, and full utilization of sharks is required. In relation to a reported 2017 shark finning incident, TFA is waiting on observer reports and concrete evidence associated with the vessel from the ROP Observer Program to support the investigation; noting that the information provided from the observer database was very brief and not sufficient to enable a credible investigation (TFA Pers comm.).

For Chinese Taipei, noting the challenges and delays inherent in obtaining follow up information on the 2017 shark finning incident from the WCPFC ROP; and the absence of implementing action in relation to CMM2018-01 ('lesser entangling' FADs) the assessment team considers, at this stage, that while a MCS system exists, and MSC measures are implemented in the fishery and there is a reasonable expectation that they are effective, it cannot be said that they have demonstrated an ability to enforce all relevant management measures, strategies and/or rules. Therefore SG 60 is met, and SG80 for 3.2.3 a is not met. SG100 is also not met because a comprehensive monitoring, control and surveillance system has not been implemented in the fishery and has not demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.

<u>USA</u>

The USA system appears the most highly developed based on its national legislation, its relationship with the FFA, the QUAD and through the "Shiprider" scheme, its work with individual FFA members. (The Shiprider scheme enables Pacific Island nations to place local law enforcement personnel on board USA Coast Guard vessels and give the Coast Guard authority to patrol their waters and conduct vessel boardings). The USA also makes enforcement information publicly available. The USA also has its authorised inspection vessels listed on the WCPFC High Seas Boarding and Inspection Register.

For the USA, there is evidence that a comprehensive monitoring, control and surveillance system has been implemented in the fishery. The MCS system has also demonstrated a consistent ability to enforce the relevant management measures, strategies and/or rules. SG 60 is met, however the USA have not yet legislated or

otherwise enforced the requirements of CMM2018-01 with respect to 'lesser entangling' FADs , and thus SG80 is not yet met. SG100 is also not met because a comprehensive monitoring, control and surveillance system has not been implemented in the fishery and has not demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.

New Zealand

Domestically, New Zealand's compliance approach is guided by a framework known as the voluntary, assisted, directed, and enforcement (VADE) model. This approach steps through a range of responses from very low level compliance engagement at the voluntary end of the spectrum, stepping through greater levels of compliance enforcement until the stage of high level enforcement actions for serious offences and wilful non-compliance.

At the national level, New Zealand maintains a comprehensive monitoring control and surveillance system; and engages actively in regional MCS operations, as well as training and capacity building measures regionally. Key national MCS capabilities include:

- Mandatory satellite vessel monitoring system (VMS) with an onboard automatic location communicator (ALC);
- Fishery independent government observers onboard vessels, who also monitor data collection to ensure accurate and traceable catch and effort records;
- Fishing permit requirements, and fishing permit and fishing vessel registers;
- Vessel and gear identification requirements, and vessel inspections and monitoring of landings, and regulations on authorised fish receivers, and to manage transhipment;
- Compliance information management and intelligence analysis;
- Analysis of catch and effort reporting and comparison with VMS, observer, landing and trade data for verification purposes;
- Capabilities for boarding and inspection by fishery officers at sea; and aerial and surface surveillance.

For New Zealand, as for the USA, there is evidence that a comprehensive monitoring, control and surveillance system has been implemented in the fishery. The MCS system has also demonstrated an ability to enforce relevant management measures, strategies and/or rules. The exception to this, at this stage, is evidence that New Zealand has implemented WCPFC CMM2018-01 in relation to FAD designs and management measures. Thus SG 60 is met for New Zealand. SG80 and SG100 are not met because a comprehensive monitoring, control and surveillance system has not been implemented in the fishery and has not demonstrated a consistent ability to enforce all relevant management measures, strategies and/or rules.

Cook Islands

MMR has an established regional and domestic MCS capability and has recently invested in state-of-the-art facilities and a regional MCS hub via its Oceans Monitoring Centre (OMC) located in Rarotonga. As a WCPFC member, and also signatory to the Niue Agreement for regional compliance, the Cook Islands national MCS system is linked to both FFA and WCPFC systems, and they regularly participate in multilateral regional MCS operations.

To work more effectively with USA charter vessels the Cook Islands have also opened a Fisheries Field Office (CIFFO) in Pago Pago, to enable an expanded MCS programme, including port inspections and fishery observer administration. Vessels fishing within the Cook Islands EEZ are monitored in real-time by the Offshore Division at MMR, generating real-time reporting, including operation of the electronic fisheries monitoring system (FMS) e-reporting system. This capability enables reporting of operational data to RFMOs such as WCPFC, and includes monitoring for the large network of marine protected areas within Cook Island waters.

Sieben et al, (2020) note that the Cook Islands have been successfully prosecuting cases of IUU fishing (unlicensed longline and purse seine vessels), as well as shark finning offences, for many years, with an established record of effective compliance in this regard.

For the Cook Islands, there is evidence of an effective monitoring, control and surveillance system; with a demonstrated capacity to enforce relevant management measures, strategies and/or rules. As noted for New Zealand above, at this stage the assessment team has not yet been provided with evidence that the Cook Islands has implemented WCPFC CMM2018-01 in relation to FAD designs and management measures. SG 60 is therefore met, and SG80 and SG100 are not met because a comprehensive monitoring, control and surveillance system has not been implemented in the fishery and has not demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.

Vanuatu

Vanuatu has MCS framework and capabilities offered by WCPFC, FFA and related agencies and agreements (such as the Niue Treaty). They have also developed a TMDP and Monitoring, Control, Surveillance (MCS) and Inspection Plan.

Compliance activities in Vanuatu are handled by the VDF in the Compliance and Licensing Section of Fisheries division, in collaboration with the Police Maritime Wing (TMDP, 2014). The Compliance and Licensing Division, which licences permits and certifies all regulated oceanic fisheries activities and ensures compliance with license conditions. In 2015, VFD had seven authorized fisheries inspectors (including senior staff members) and 36 observers. Five inspectors were dedicated solely to compliance (NPOA IUU, 2015). The Police Maritime Wing consists of 20 authorized fishing officers with two specialised in the use of Vanuatu's VMS. Vanuatu has two vessels for at-sea inspections, and one vessel is authorized to undertake high seas boarding and inspections (NPOA IUU, 2015). VMS units are required as part of the Fishing License Conditions to be installed, operated, and maintained on all Vanuatu flagged vessels fishing in the EEZ and high seas, for foreign flagged fishing vessels licensed to operate inside VU EEZ during their vessels for the duration of their licensing period (Fisheries Act, 2014, Part 19).

As outlined previously for the Federated States of Micronesia, SCS assessment team analysis of observer records for Vanuatu flagged vessels has also identified a small number of instances where purse seine sets are occurring on whales and whale sharks. As noted for the FSM, these activities contravene WCPFC's CMM 2011-03, and 2012-04. There are also observer records from 2019 indicating a small number of oceanic whitetip shark, and mobula, were retained by the UoA vessel. Retention of mobula occurred in 2016 and 2018, prior to the adoption of CMM 2019-05 specifically aimed at preventing these activities. The retention of two oceanic whitetip sharks was observed in 2019, in contravention of WCPFC CMM 2019-04.

As outlined above, and recognising that whilst a MCS system exists, and MCS measures are implemented in the fishery and there is a reasonable expectation that they are effective, it cannot be said that they have demonstrated an ability to enforce relevant management measures, strategies and/or rules. For example, the requirements of CMM2018-01 with respect to 'lesser entangling' FADs have not yet been implemented, and thus SG80 is not yet met across all flag states.

b	Sanctions			
	Guide post	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	Met?	Yes (all)	Yes - All	No – All.
Rationale				

The primary focus for this Scoring Issue is the sub-regional and national level arrangements (PNA and flag states). While the WCPFC develops and implements management and MCS arrangements, it has few if any, sanctions available to it should flag States or vessels/companies fail to abide by CMMs. The WCPFC does provide some reporting on compliance performance that could provide evidence on consistent application of sanctions, however there is limited transparency in non-compliance reporting and responses to non-compliance.

Regional

The WCPFC Compliance Monitoring Scheme (CMS), as part of the TCC processes, is relevant to performance against this scoring issue. The TCC discusses compliance issues based on available information on infringements from observers and other sources. These discussions are held in closed session. Responses to infringements are considered at the TCC and reported to the Commission in the Compliance Monitoring Summary Report. This report is published in the WCPFC's Annual Meeting Summary Report and provides a reporting matrix describing compliance with CMMs by CCM. Additional detail on the compliance status of each flag State has been added in recent years. The annual compliance summary report still does not provide information on outcomes of investigations by flag state agencies into non-compliance, nor specific cases, such that a reader may judge whether non-compliance is dealt with consistently (SCS 2017) or deterred appropriately. The CMS is currently not a sanctioning tool but provides information on non-compliance, along with responding to non-compliance by preventative/remedial options and may provide some deterrence in so far as flag States would not wish to be rated non-compliant or priority non-compliance over time. In 2020-2021, CMS will work toward development of corrective actions to encourage and incentive CCM's compliance with the Commission's obligations in instances of non-compliance (CMM 2019-06).

The only other significant tool directly available to the WCPFC is the IUU Vessel list, which is aimed at vessels presumed to have carried out IUU fishing. Where IUU fishing is detected, flag States are notified and asked to take appropriate enforcement action, including ensuring that the vessel leaves the Convention area. At December 2019 there are three vessels on the IUU Vessel list including one previously flagged to Chinese Taipei. . This sanction appears to be consistently applied and appears to provide effective deterrence in relation to proven IUU fishing.[53] In the case above, Chinese Taipei has reported that the owner of the vessel has been penalized through repeated monetary punishment for violating the rules of not returning to port. On 17 November 2017, WCPFC received a communication from Chinese Taipei informing WCPFC that the vessel has been deregistered by Chinese Taipei (WCPFC, 2019).

PNA

There are some capacity differences between the PNA and other PICTs, but weaknesses are addressed through joint initiatives and support from FFA Regional coordination. However, resource constraints for these smaller island states are substantial in comparison to the larger and wealthier states.

Each of the PNA States has a system of sanctions and some of these are in the process of transition to reflect higher risk offences and implement appropriate minimum and maximum fine schedules. Sanctions are contained in national fishery acts and range from USA$ 50,000 to USA$ 1 million (Blyth-Skyrme et al. 2017). Vessels are usually detained until settlement of a sanction. For PNA members of this UoA, and other jurisdictions under assessment, fishery authorities can and do implement administrative fines. However these processes do not always enable public reporting of the nature of offenses, or the administrative penalty imposed.

Blyth-Skyrme et al. (2017) also report that the frequency of fines of free school purse seiners is very rare. They suggest that this is in part due to the requirement for high rates of observer coverage, and the nature of free school fishing. Whilst FAD related sets are more likely to result in bycatch related impacts and issues, these sets are recorded as such and the requirement for 100% observer coverage remains irrespective of set type. Part 1 annual WCPFC country reports also require reporting on adherence to relevant WCPFC CMM's, including the more recent measures directed at improving FAD management and compliance outcomes. .

[53] https://www.wcpfc.int/system/files/WCPFC-TCC8-2012-10-Analysis-IUU-listing-procedures-tRFMOs.pdf

FSM

Under the FSM's title 24 chapter 9 (violations and penalties for prohibited acts), a person who is found by the Supreme Court of FSM to have committed an offence is subject to a civil penalty. In determining the amount of the penalty, the Supreme Court of FSM takes into account the nature, circumstances, extent and gravity of the prohibited acts committed and, with respect to the violator, the degree of culpability, any history of prior offenses, whether there are multiple violations which together constitute a serious disregard of conservation and management measures. Prescribed penalties range from USD50,000 to USD $1,000,000. The severity of the available penalties appears to be a sufficient deterrent for vessel operators to comply with the regulations.

Sieben et al (2019) note NORMA advice of a decline in infringements as the tuna fleet has become more aware of the rules and regulations, in part through a series of crew briefings and related workshops. As a Party to the Palau Arrangement for the Management of Western Pacific Tuna Fishery (the Purse Seine Vessel Day Scheme), FSM flagged vessels may also be subject to penalties for exceeding their annual effort allocation.

For the FSM, there is evidence of contemporary sanctions to deal with non-compliance, and evidence that they are applied and provide effective deterrence, thus meeting the SG60 and SG 80 level.

Solomon Islands

The Solomon Islands Fisheries Management Act 2015 provides a contemporary legislative framework to facilitate effective MCS activities, including provision for a range of sanctions for various infringements. Trumble and Stocker (2016) suggest this framework is generally effective. It is also supported by a system of administrative penalties and provisions for pre-court settlements. There is also legislative guidance to apply a range of fines available under Solomon Islands legislation. Fines may range from SBD500,000 to 12 million.

The Solomon Islands also reserves the right to prosecute fisheries-related offences through criminal proceedings. Fisheries-related offences can include forfeiture of fish, vessels, imprisonment and suspension of the license. An IUU vessel may also be put on the WCPFC IUU list, or "black-listed" on the FFA VOGS Register which would deny it the ability to be licensed to fish in any FFA member State EEZ.

The Solomon Islands' MFMR provided the following information in relation to recent offences:

Summary table of fishery infringements within the Solomon Islands EEZ from 2014 – 2018.

Date	Gear Type	Nature of offence	MFMR action	Penalty
March 2016	LL	Breach of Licence Conditions	Vessel detained and released upon payment of fine	SBD $2.5m
23 January 2017	LL	Breaching section 49 (2) (a) and (b) of SI FMA 2015	Vessel detained and released after payment of fine	SBD $ 1.0m
6 February 2017	PS	Breach 2016 License conditions 8 for Purse Seine vessels operating in SI waters which contravene section 49(2) (a) (b) of the FMA 2015	Vessel detained and released after fine payment	SBD $ 1.0m

14 August 2018	LL	Non- compliance with license conditions	Vessel detained for investigation	SBD $ 100,000

Source MFMR

The infringement cases in the Table were all handled via administrative proceedings. The Summary Administrative Proceedings provisions are contained in Section 116 and 117 of the Fisheries Management Act 2015. The Administrative processes involves the Ministry of Fisheries and Marine Resources, the Office of the Director of Public Prosecution and the Attorney General's Office. This process can only proceed where the Company or Vessel admit to the offence or infringement and agreed to have the matter dealt with via these provisions.

For the Solomon Islands, there is evidence of contemporary sanctions to deal with non-compliance, and evidence that they are applied, thus meeting the SG60 and SG80 level.

Chinese Taipei

Chapter IV of Chinese Taipei's Distant Water Fisheries Act provides extensive Penal Provisions in Articles 35 to 45. These provisions provide for escalating fines and/or suspension and cancellation of concessions where there are multiple and repeat offenses over a period of time. As this Act has been in operation only since 2017 there is limited evidence to know if the sanctions are being consistently applied and are an effective deterrent.

In relation to Chinese Taipei, Morgan et al (2018) note fines in 109 cases of illegal fishing involving Chinese Taipei deep-sea fishing vessels from January to July 2017. Most of the penalties were under the amended Fisheries Act, however 24 were fines based on the new Distant Water Fisheries Act, which came into force on 20 January 2017.

Sanctions available to Chinese Taipei via Articles 35 to 45 suggest that it is highly likely, if they are applied consistently (similar consequences for similar offences) and at sufficiently punitive level, that they will provide an effective deterrence.

Despite the fact the new Act has operated for a limited time period, there is evidence that contemporary sanctions are being applied under Taiwan's new fisheries act, and are likely to be providing an effective deterrence, thus SG60 and SG80 requirements are met.

USA

The USA has an active surveillance and enforcement regime in the Pacific through its nine "Shiprider" agreements. These agreements enable Pacific nations to place local law enforcement personnel on board USA Coast Guard vessels and give the Coast Guard authority to patrol their waters and conduct vessel boardings. As well as enabling direct surveillance and enforcement action in relation to USA vessels, these arrangements also enable FFA States to undertake additional MCS activity.

There is clear evidence of legal requirements being enforced by USA authorities and transcripts of legal proceedings provide evidence of the sanctions that have been implemented. The NOAA website provides evidence of fisheries enforcement cases in relation to USA vessels (from 2010) including Enforcement Decisions and Orders (see http://www.gc.noaa.gov/enforce-office6.html) and Enforcement Charging Information (see http://www.gc.noaa.gov/enforce-office7.html). It also provides information on prohibitions, landing restrictions, and catch documentation schemes. The USA also independently reviews all its vessels' WCPFC observer records, beyond those flagged for potential non-compliance by the WCPFC. SG60 and SG80 requirements are met in the case of the USA but it is unclear whether the available information demonstrably indicates effective deterrence so SG100 is not met.

New Zealand

Under New Zealand's 1996 Fisheries Act, sanctions available for infringement of regulations depend on the severity of the infringement and can range from that may include prison time, fines from $250 to $500,000, forfeiture of quota, vessels, and other property. Under New Zealand's approach, it is not necessary for the prosecution to prove that the defendant intended to commit the offence; rather, the defendant must show the contravention was due to the act or default of another person, or to an accident or to some other cause beyond the defendant's control; and the defendant took reasonable precautions and exercised due diligence to avoid the contravention (Akroyd and McLoughlin, 2017). They also report, based on discussion with MPI and stakeholders, that there are high levels of voluntary compliance in the New Zealand purse seine fishery for skipjack tuna.

More generally, New Zealand has a relatively open and transparent approach to making the outcomes of domestic fisheries compliance operations available to stakeholders, and to encourage constructive engagement of stakeholders in an effort to improve compliance outcomes. Performance reports detailing compliance outcomes in specific fisheries are available from the MPI website.

For New Zealand, SG60 and SG80 requirements are met, however there is insufficient information to demonstrably indicate effective deterrence, so SG100 is not met.

Cook Islands

Under its Marine Resources Act (2005) the Cook Islands can use a range of sanctions to encourage compliance, or deal with non-compliance, with management regulations. Fines of up to NZD250,000 may be imposed by courts, with similar sanctions also prescribed in the 2013 purse seine fishery regulations.

Under proposed amendments to the 2005 Cook Islands fisheries legislation, the new (Draft) Marine Resources Bill 2020, includes provision for a system of administrative penalties in addition to, or instead of, only legal remedies available previously. Sieben et al, (2020), based on information on a recent Albacore fishery surveillance audit, note that the Cook Islands have successfully prosecuted IUU related infringements, and various breaches to WCPFC Minimum Terms and Conditions of fishing, with total penalties imposed in the order of NZD 10's of millions.

For the Cook islands, SG60 and SG80 requirements are met, however there is insufficient information to demonstrably indicate effective deterrence, so SG100 is not met.

Vanuatu

Sanction values/offenses are specified throughout the Fisheries Act (2014) and the Fishery Act provides the right to prosecute fisheries-related offences through criminal proceedings, which may result in forfeiture of fish, vessels, imprisonment and seizure of licenses. For example, violation of laws/regulations in RFMO's can result in a maximum fine of VT1,000,000,000 or a term of imprisonment of not more than 5 years, or both (Part 7, Section 35, 7). While the sanctions specified appear to suggest that it is highly likely that they will provide an effective deterrence, provided they are applied consistently (similar consequences for similar offences) and at a sufficiently punitive level. Some evidence is available to suggest sanctions are applied (e.g. detention of PNG flagged vessel in 2018) and results of Supreme Court judgements are publicly available (https://courts.gov.vu/court-activity/judgments/supreme-court). For Vanuatu, SG60 and SG80 requirements are met, however there is insufficient information to demonstrably indicate effective deterrence, so SG100 is not met.

Overall, for all Flag States in the UoA, sanctions to deal with non-compliance exist and there is evidence that they are applied and providing an effective deterrent effect, meeting SG 60 and SG80.

c	Compliance

	Guide post	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	Yes—All	Yes—All	No—All

Rationale

In relation to the UoA and for this Scoring Issue, the appropriate management system is that of the WCPFC and the suite of MCS arrangements implemented under the Convention. Individual flag States also play an important role in ensuring arrangements are complied with at the individual fisher level and from an overall flag State performance perspective.

All WCPFC Members and in this case the USA and Chinese Taipei, are bound to implement all WCPFC CMMs. Any detected non-compliance with these arrangements is reported in National Part 2 Country Reports and annually assessed by the TCC. CCMs performance is reported in the Compliance Monitoring Report and available to the Commission. A review of recent WCPFC CMR's indicates that identified non-compliance with CMMs by some flags and vessels remains an issue and an area for improvement. Overall, however these reports suggest fishers comply with the management system including providing necessary information.

Blyth-Skyrme et al. (2017) note good levels of compliance by fishers in the PNA Western and Central Pacific skipjack and yellowfin, un-associated / non-FAD set, tuna purse seine fishery (PNAFTF). Strong evidence to support this observation, without intensive surveillance, is difficult to obtain. It is noted that even in well-managed domestic fisheries, with effective MCS systems in place, some non-compliance will occur. For example, the TCC 15 CMR report to the Commission in December 2019[54] identifies that non-compliance occurs and that the range of offences varies from minor administrative issues (such as late submissions of reports), to more serious operational issues, such as not complying with the conditions of FAD closures or unauthorized fishing.

Nonetheless, the WCPFC has a comprehensive MCS system in place supported by at-sea compliance monitoring and very high levels of coverage by trained scientific observers. This is recognised as contributing to generally strong compliance outcomes and improving the quality of both catch and effort and ecosystem related data collection. The MCS system also requires that logbook and other data be supplied as part of licence requirements.

The TCC reports, observer reports, logbook and other data requirements and regional MCS operations coordinated by FFA, provide reliable evidence that there is compliance with the management system.

For example, in August 2017, Operation Island Chief ran as a ten-day operation involving 10 participating FFA member nations - Fiji, FSM, Kiribati, Palau, PNG, Nauru, the Marshall Islands, the Solomon Islands, Tuvalu, and Vanuatu. 117 at sea and in-port vessel boardings were undertaken with infringements involving four vessels (three flagged to China and one to Chinese Taipei) were detected. The infringements involved non-reporting or misreporting of information.

Logbook data are supplied as part of licence requirements; with VMS and observer reports, and targeted multilateral compliance monitoring exercises providing additional evidence of general compliance with the management system, meeting SG 60. WCPFC reports indicate that the compliance is adequate in the fisheries considered here, and there is evidence of sanctions being implemented where necessary, and in response to relatively low levels of non-compliance usually for minor and administrative level infringements. Thus SG80 is also met.

[54] See: https://www.wcpfc.int/system/files/WCPFC16-2019-TCC15%20TCC15%20Summary%20Report_issued%201%20December.pdf

It cannot be said that there is a high degree of confidence that fishers comply with all aspects of the management system therefore SG100 is not met.				
d	Systematic non-compliance			
	Guide post		There is no evidence of systematic non-compliance.	
	Met?		Yes—All	
Rationale				
The focus for this Scoring Issue is flag states operating within the WCPFC framework. Island states, including all of those represented through the PNA and also FFA arrangements, have a particular interest in protecting their fisheries resources and ensuring long term sustainable benefits from these resources. All WCP states have a strong interest in ensuring that management arrangements are comprehensive, efficient and robust, and non-compliance is minimized. The information presented throughout the analysis for PI 3.2.3 above suggests no evidence of systematic non-compliance. The CMS report tabled at WCPFC 15 identifies breaches by the FSM, USA and Chinese Taipei; with no breaches reported for the Solomon Islands in the UoA. There are relatively more breaches attributed to Chinese Taipei, than to FSM and USA. These are often breaches of reporting deadlines or data not being provided in the required format. The 2017 report on Scientific Data Available to the WCPFC indicated that Chinese Taipei was ranked Tier I for not having provided operational catch and effort data for purse seine vessels to WCPFC, although other forms of data were provided (Williams, 2017). It is noted that even in well-managed domestic fisheries, with effective MCS systems in place, some non-compliance will occur. For example, the TCC 15 CMR report to the Commission in December 2019[55] identifies that non-compliance occurs and that the range of offences varies from minor administrative issues (such as late submissions of reports), to more serious operational issues, such as not complying with the conditions of FAD closures or unauthorized fishing. Overall, there does not appear to be evidence of systematic non-compliance at either the regional or flag level and as such SG 80 is met.				
References				
Banks et al. 2011; Medley and Powers 2015; FFA Strategic MCS Plan (2010); WCPFC 2014a; WCPFC TCC minutes; NOAA 2013 Blythe-Skyrme, R., McLoughlin, K. and Japp, D. MSC Certification PCDR for the PNA Western and Central Pacific skipjack and yellowfin, unassociated / non-FAD set tuna purse seine fishery. Acoura Marine, 2017. Niue Treaty on Cooperation in Fisheries Surveillance and Law Enforcement in the South Pacific Region, available at https://www.ffa.int/system/files/Niue%20Treaty_0.pdf NORMA Pers Comm, 17 November 2020. TFA Pers Comm, 16 November 2020. Trumble, R.J and Stocker, M. MSC Public Certification Report for Solomon Islands Skipjack and Yellowfin Tuna Purse Seine Anchored FAD, Purse Seine Unassociated, and Pole and Line. MRAG America, 2016.				

[55] See: https://www.wcpfc.int/system/files/WCPFC16-2019-TCC15%20TCC15%20Summary%20Report_issued%201%20December.pdf

WCPFC15-2018-Final Compliance Monitoring Report – 11 December 2018.	
Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	60-79—ALL
Information gap indicator	More information sought for monitoring, control, surveillance and compliance with FAD measures will be evaluated at the onsite and evidence that sanctions are consistently applied across all flag state countries (excluding the US)
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	75 - All
Condition	3-3, 3-4, 3-5 and 3-6

PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system		
Scoring Issue		SG 60	SG 80	SG 100
a	Evaluation coverage			
	Guide post	There are mechanisms in place to evaluate some parts of the fishery-specific management system.	There are mechanisms in place to evaluate key parts of the fishery-specific management system.	There are mechanisms in place to evaluate all parts of the fishery-specific management system.
	Met?	Yes—All	Yes—All	No—All
Rationale				

The WCPFC fishery-specific management system is the assessment focus for this Performance Issue, with overall responsibility for the sustainability and management of the target stocks and broader ecological impacts.

The WCPFC has well developed arrangements to provide a range of information to the Secretariat and Commission Members, these include the Scientific Committee, and the Technical and Compliance Committee. Both these committees are established by the Convention, which sets out the functions for each. Both have key roles to play in monitoring and evaluating key parts of the fishery-specific management system, and are comprised of . representatives from CCMs, technical advisors/experts and observers (both IGO and NGO). An Intersessional FAD Management Options Working Group also develops and evaluates FAD management measures for the FAD fishery. he Scientific Committee functions required it to, among other things:

(i) recommend a research plan;

(ii) review the assessments, analyses, other work and recommendations prepared for the Commission by the scientific experts;

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

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

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

(vi) make reports and recommendations on the conservation and management of and research on target stocks or non-target or associated or dependent species in the Convention Area.

The TCC's functions are to:

(i) provide the Commission with information, technical advice and recommendations relating to the implementation of, and compliance with, conservation and management measures;

(ii) monitor and review compliance with conservation and management measures adopted by the Commission and make such recommendations to the Commission as may be necessary; and

(iii) review the implementation of cooperative measures for monitoring, control, surveillance and enforcement adopted by the Commission and make such recommendations to the Commission as may be necessary.

Both Committees are made up of representatives from CCMs, technical advisors/experts and observers (both IGO and NGO).

At the sub-regional level, the PNA VDS is overseen and regularly reviewed internally by a VDS Committee. Further oversight and performance evaluation are provided by the FFA. There have also been a series of internal and a comprehensive external review of other key parts of the PNA processes (Banks et al. 2011, PNA 2015, Hagrannsoknir 2014). Recently developed tuna management plans for several jurisdictions, including FSM and the Solomon Islands, also contain specific objectives and measures to ensure that performance of relevant tuna fishery management arrangements is monitored, and regularly evaluated. The extent to which these evaluation commitments have been fulfilled at this domestic level is unclear.

SG60 requirements are met as there are mechanisms in place to evaluate some parts of the fishery-specific management system. SG80 is met as there are also mechanisms in place to evaluate key parts of the fishery-specific management system. SG100 is not met as it is not clear that these arrangements cover all parts of the fishery-specific management system.

b	Internal and/or external review			
	Guide post	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
	Met?	Yes—All	Yes—All	No—All

Rationale

The focus of this Scoring Issue remains the WCPFC however Flag State capabilities for effective internal and/or external review of their national fisheries management arrangements are also considered. As described previously, the WCPFC has well developed arrangements for the regular internal review of the fishery-specific management system by virtue of the two committees established by the Convention – the Scientific Committee and the Technical and Compliance Committee.

The WCPFC has commissioned one independent review of its performance, delivered in February 2012. This is consistent with the approach adopted by other RFMOs and recommended by the Kobe process. The Review Team comprised four external experts (Dr. Denzil Miller, Dr. Fábio Hazin, Mr. Ichiro Nomura and Dr. Judith Swann), and three Commission members from the European Union (Mr. John Spencer), Nauru (Hon. Min. Rolland Kun), and the Philippines (Mr. Malcolm Sarmiento). The panel composition reflected the Commission decision that the review team should include independent experts and Commission members, including SIDS representation.

An independent review (MRAG, 2009) has been conducted of the Commission's science structure and functions resulting in overhauling of the operation of the SC, the adoption of a peer review process and a number of other changes to the data and science functions. The WCPFC fishery-specific management system is also regularly evaluated via internal SC and TCC deliberations. There has been one external performance review of the WCPFC and a separate review of the science structure and functions. While it is acknowledged that full external performance reviews are resource intensive, it is not clear that there is a commitment to this being a regular undertaking. As such, SG 60 and SG 80 are met but SG100 is not met.

<u>Federated States of Micronesia</u>

For the FSM, NORMA has been subject to periodic audits by the Office of the National Public Auditor (ONPA, 2012). This 2012 review covered operational duties of the Board of Directors, implementation and effectiveness of the current tuna management plan, vessel licence fees, data and reporting and NORMA's internal policy framework. In 2015 The Pacific Islands Regional Oceanscape Program (PROP) of the World Bank conducted a review of the NORMA fisheries management system to assess the need to improve and strengthen enforcement, enhance safety of seafood exports through the establishment of a seafood hygiene competent authority, build

capacity through the training of observers and enforcement officers and update monitoring equipment, strengthen fisheries management through capacity building of NORMA systems, institution and staff, and assess coastal fisheries that may be viable for further development in partnership with local communities. Another audit was conducted in 2017 with a focus on the application of agreed procedures for NORMA's Fisheries Access Agreements. This was more focused on financial aspects rather than the effectiveness of fisheries management arrangements, covering fishing revenue, donate goods and services, sold and non-sold fishing days and traded fishing days of the VDS scheme. With assistance from New Zealand, NORMA has also recently completed a revised fisheries management strategy, including a regular evaluation component (NORMA, Pers Comm.).

Solomon Islands

For the Solomon Islands, the Office of the Auditor General conducted a performance audit of the MFMR in 2012 entitled "Managing Sustainable Fisheries (Tuna Fishery) in Solomon Islands Fisheries Exclusive Economic Zone" (OAG 2012). The objective of the audit was to assess the effectiveness of the management of offshore fisheries (the tuna fishery) by Solomon Islands fisheries authorities in accordance with national fisheries policies and framework. The Audit found some deficiencies in arrangements at that time.

In December 2014 following a review of Solomon Islands management arrangements, the European Commission issued a warning (a yellow card) under the European Union IUU regulations. The objective of the EU IUU Regulation is to prevent, deter and eliminate trade of fisheries products originating from IUU fishing activity and stop their access to the EU markets. Under the Regulations, non-EU countries are 'carded' by the EU when they fail to fight IUU fishing. A yellow card acts as a warning for the country that they need to improve their management and enforcement and compliance.

Since then, the Solomon Islands has embarked on a series of reforms to bring its fisheries legal and administrative frameworks fully into line with international law and is now well equipped to tackle these threats effectively. Working closely with the European Commission, they have strengthened their sanctioning system, and have improved monitoring and control of their fleets. The "yellow card" was lifted in February 2017.

Cook Islands

As a member of the WCPFC, and related regional fisheries management organisations, the Cook Islands is also subject to fisheries management performance reviews processes completed at a regional level. At the country level they also complete the WCPFC annual country report (Part 1 and Part 2), including performance reporting against the implementation of WCPFC CMM's.

Sieben et al, (2020) note that in 2013, the Cook Islands commissioned FFA to undertake a governance review of their Ministry of Marine Resources (MMR), although the results are not publicly available. MMR is also engaged in an active program of review and improvement across key elements of its fisheries management program, including a review of all fisheries and their bycatch. There is also currently a review of the tuna fishing regulations, including management; and a broader initiative to adopt a comprehensive ecosystem based approach to their fisheries management program

The MMR was also reviewed in 2015 to support development of their Strategy for The Development of Statistics 2015 - 2025[56] through the Cook Islands Ministry of Finance and Economic Management (MFEM).

[56] Review report available at: https://paris21.org/sites/default/files/Cook%20Islands%20NSDS%202015-2025_Final.pdf

Cook Islands Office of the Prime Minister also has a National Sustainable Development Plan 2016-2020[57], with one goal stated as "Sustainable management of oceans, lagoons and marine resources." There is a performance evaluation component, including a suite of contemporary performance indicators, embedded within the Plan.

Vanuatu

In 2012, Vanuatu Fisheries Department initiated a review process of the Vanuatu Fisheries Act CAP 315 No. 55 of 2005, which resulted in the revised Fisheries Act 2015 Section 10. The 2009 TMDP was also updated in 2014 and the NPOA IUU report evaluated areas for improvement and actions to be taken to combat IUU fishing was produced in 2015. In addition, the European Commission issued a yellow card to Vanuatu in 2013 but this was revoked in 2014 due to progress made in improving their fisheries governance and combatting IUU. The TMDP specifies improvements to be made across key areas, with annual progress and recommendations to be provided by the FMAC. It is not clear if this is occurring. However, the internal review/updating of the Fisheries Act and TMDP and external review of the European Commission means the fishery-specific management system is subject to regular internal and occasional external review.

Overall, considering regional and national arrangements, including the role of the Tuna Management and Development Plan, there is evidence to suggest that the fishery-specific management system is subject to occasional internal review thus meeting SG60. Overall the management system is also subject to regular internal and occasional external review, thus meeting SG80. However, the management system is not subject to regular internal and external review, thus SG 100 is not met.

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WCPF Convention; WCPFC Performance Review 2012; Independent Review of the Commission's Transitional Science Structure and Functions – MRAG 2009.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	>80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report

[57] Available at: https://www.adb.org/sites/default/files/linked-documents/cobp-coo-2017-2019-ld-01.pdf

Overall Performance Indicator score	80 -- All
Condition number (if relevant)	

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8 Appendices

8.1 Assessment information

8.1.1 Previous assessments

The fishery was first certified in June 2016. The Public Certification Report (PCR) is available on the MSC website.[58] (The existing certificate/UoA only covers US-flagged vessels targeting skipjack/yellowfin with purse seine gear using free school sets only operating in the ELAPS, comprised of the US exclusive economic zones (EEZs) and the highs seas between 20 degrees north and 20 degrees south in the Western and Central Pacific Fisheries Commission (WCPFC) Convention area, as well as the EEZs of PNA member countries; and select management areas within the EEZs of the following non-PNA countries: Cook Islands, Tokelau, Fiji, Vanuatu, and Samoa. USA-flagged vessels operate under the US Multilateral Treaty.

This reassessment includes a significant expansion to include many other flag states and all set types used by the fishery. The previous assessment had conditions on Principle 1 (harmonized), Principle 2 and Principle 3. The Principle 1 conditions and timeline have been harmonized across all other WCPO yellowfin and skipjack tuna fisheries based on the WCPFC 2017 Workplan. The Principle 1 conditions remain open and are described below in

Table 28. Summary of previous assessment conditions

Condition number	Condition	Performance Indicator (PI)	Year Closed	Justification
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	Condition closure dependent on WCPFC following timeline/actions in 2017 Work Plan. Condition to be closed in 2022—based on WCPFC 2021 Annual Meeting
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.	1.2.2 Skipjack	On target	See explanation for 1.2.1 Skipjack

[58] https://fisheries.msc.org/en/fisheries/tri-marine-western-and-central-pacific-skipjack-and-yellowfin-tuna/@@view

	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 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	See explanation for 1.2.1 Skipjack
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	See explanation for 1.2.1 Skipjack

5	By the fourth surveillance audit, demonstrate that it is highly likely that shark finning is not taking place or that if rare cases are reported, that measures are taken to address the issue.	2.1.2	Closed Yr 2 (2018)	The evidence of actions taken by Tri Marine to prevent shark finning and noncompliance within its fleet, ongoing evidence that shark finning is not occurring in a systematic fashion within the UoC[59], and relative strength of the United States legislation and MCS systems in addition to WCPFC CMMs support the assessment team's conclusion that this condition may be closed.
6	By the fourth surveillance audit, demonstrate that sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	3.2.3	Closed Yr 1 (2017)	Harmonization discussions regarding 3.2.3 at the WCPFC level increased the score to SG80. Information is available showing the US government to demonstrate sanctions to deal with non-compliance exist and are thought to be consistently applied, meeting SG80 requirements.

8.1.2 Small-scale fisheries

This fishery is not a small scale fishery.

[59] https://mscportal.force.com/interpret/s/article/Shark-finning-requirements-1527262010507

8.2 Evaluation processes and techniques

8.2.1 Site visits

AUDIT PLAN FOR FISHERY ASSESSMENT

Tri Marine Western and Central Pacific skipjack and yellowfin fishery
Year 4 Surveillance and Re-Assessment
November 10th through November 20th UTC+08:00 Taipei/Singapore
Remote Site Visit Meetings

8.1 Objective

The MSC Fishery Assessment of the Tri Marine Western and Central Pacific skipjack and yellowfin fishery will be conducted by the SCS Global Services Inc. (SCS) Assessment Team to examine fishery performance of the Unit of Certification (Table 1) against the MSC Fishery Standard. Anticipated attendees are listed in Table 2, and Meeting Agenda is shown in Table 1.

Table 1: Unit of Certification/ Unit of Assessment	
Stock: Western Central Pacific Ocean	**Geography:** Western Central Pacific Ocean
Species: Yellowfin (*Thunnus albacares*) and Skipjack tuna (*Katsuwonus pelamis*)	**Management:** Select vessels flagged to USA, Federated States of Micronesia, Solomon Islands, New Zealand, Cook Islands, Vanuatu and Chinese Taipei that are licensed and registered to operate within the Western and Central Pacific Fisheries Commission (WCPFC) Convention area, EEZ's of PNA member countries; and EEZs of the following non-PNA countries: Cook Islands, Tokelau, Fiji, Vanuatu, and Samoa are included.
Method of Capture: purse seine; multiple set types (free school, anchored FAD, drifting FAD, log set)	**Clients:** Tri Marine International Pte. Ltd.

As part of the Re-assessment component of this remote audit, Tri Marine International Pte. Ltd. is expanding the certificate to include vessels flagged to additional nation states other than USA-flagged vessels. In this fishery, the Unit of Certification under examination includes 39 vessels flagged to USA, Federated States of Micronesia, Solomon Islands, New Zealand, Cook Islands, Vanuatu and Chinese Taipei listed in Appendix A. Vessels outside of the 39 vessels listed would only be eligible to share the certificate by virtue of expanding both the Unit of Assessment and Unit of Certification.

8.2 Scope of Audit

During the assessment, the assessment team will examine all aspects of fishery performance as it relates to the MSC Standard, including stock status of target and non-target species, fishery impacts, and fisheries governance and management. Use of the blue eco-label and the licensing agreement will be reviewed. The SCS Assessment Team will conduct the scope extension audit using the Fishery Certification Process

(V2.2). As part of the MSC requirements, the Assessment Team will consist of at least 2 team members (see below). This plan is considered confirmed and will proceed as planned. Any changes to the audit plan requested by the client must be provided to SCS in writing.

Any information considered to justify scoring changes must be publicly available on or before the last day of the site visit as per MSC requirements. If the CAB and any participant at the site visit agree in writing that information will be shared after the site visit, the CAB shall accept this information up to 30 days after the last day of the site visit.

8.3 Follow Up

SCS is responsible for completing all required site visit activities for the MSC Fishery Assessment as per MSC FCP v2.2. All documentation, evidence, and findings will inform updates to the Announcement Comment Draft Report (ACDR), which will be 1) sent to the Client to develop the client action plan and 2) sent to the MSC Peer Review College as required.

8.4 Surveillance Audit Participants

Table 2: Anticipated Meeting Attendees

Name	**Role**	**Affiliation**
Dr. Gerard DiNardo	Team Member, Principle 1 and 2	SCS Global Services
Andy Bodsworth	Team Member, Principle 3	SCS Global Services
Brian Ahlers	Project Manager	SCS Global Services
Amanda Hamilton	Senior Manager – Fisheries Policy & Regulation	Tri Marine International Pte. Ltd.
Angelina Tan	Assistant Manager – Fisheries Policy & Sustainability	Tri Marine International Pte. Ltd.
William (Bill) Naviti	Director of Fisheries	Department of Fisheries, Vanuatu
Tony Taleo	A/Manager - Compliance and Licensing	Department of Fisheries, Vanuatu
Lucy Joy	National Principal Data Officer	Department of Fisheries, Vanuatu
Pamela Maru	Secretary	Ministry of Marine Resources, Cook Islands
Andrew Jones	Acting Dir. - Offshore Fisheries Division	Ministry of Marine Resources, Cook Islands
Latishia Maui	Observer Coordinator	Ministry of Marine Resources, Cook Islands
Eugene Pangelinan	Executive Director	National Oceanic Res. Mgmt Authority (NORMA)
Bradley Phillip	Assistant Director - Science Division	NORMA
Justino Helgen	Acting Assistant – Compliance Division	NORMA
Edward Honiwala	Director	Ministry of Fisheries & Marine Resources, Sol. Isl.
Francis Tofuakalo	Deputy Director - Offshore Fisheries	Ministry of Fisheries & Marine Resources, Sol. Isl.

Mr. Chichao Liu	Senior Specialist	FA – COA, Chinese Taipei
Mr. Wenying Wang (Annie	Section Chief, FA-COA	FA – COA, Chinese Taipei
Ms. Hsiang- Yi Yu (Joy)	Secretary	FA – COA, Chinese Taipei
Ms. Hsiangyin Chen	Associate Researcher	FA-COA
Mr. Weiche Hsu	Assistant	FA-COA
Mr. Weiyang Liu	Overseas Fisheries Development Council of R.O.C	OFDC
Ms. Huishan Ma	Secretary	OFDC
Tom Graham	Chief - International Fisheries Division	NOAA GC, USA
Valerie Post	Fishery Policy Analyst	NOAA NMFS PIRO, USA
Elizabeth O'Sullivan	Legal Counsel	NOAA NMFS PIRO, USA
Arthur Hore	Manager - Offshore Fisheries	Ministry of Primary Industries, New Zealand
Andy Wright	Compliance Advisor	Ministry of Primary Industries, New Zealand

8.5 Agenda

All meetings will take place remotely via Zoom between the assessment team, the client group (Tri Marine International Pte. Ltd.), and relevant government stakeholders and experts in USA, Federated States of Micronesia, Solomon Islands, New Zealand, Cook Islands, Vanuatu and Chinese Taipei. These meetings will occur the weeks of November 6 through November 20th. Team Leader, Gerard DiNardo, will help facilitate meetings remotely with the support of Andy Bodsworth and Brian Ahlers. In addition to the officials listed above, the team will meet remotely with additional experts from Parties to Nauru Agreement (PNA), SPC, and other stakeholders potentially at a later date.

8.6 Logistics Information

Assessment Team Contacts
Dr. Gerard DiNardo, Team Lead and Principle 1 and Principle 2, gdinardo@scsglobalservices.com
Andy Bodsworth, Principle 3 Team Member, andybods@cobaltmrm.com.au
Brian Ahlers, Project Manager, bahlers@scsglobalservices.com

Client Contacts
Amanda Hamilton, ahamilton@trimarinegroup.com
Senior Manager – Fisheries Policy & Regulation, Tri Marine International Pte. Ltd.

Meeting Locations
All meetings will be conducted remotely via zoom.

Meeting Agenda for Day 1, November 10th Singapore Time (November 11th, USA) – Client Opening Meeting				
Time Taipei/Singapore Time Zone (UTC +8)	**Relevant MSC P.I.'s**	**Activities**	**Meeting Participants**	**Orgs**
9:00 AM – 10:30 AM	-	**Client Opening Meeting, Introductions** - Confirmation of Unit of Assessment and Certification - Presentation on the MSC Standard and Fishery Certification Process v2.1	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Angelina Tan	SCS Global Services Tri Marine Group
10:30 - 11:00	-	**Closing Remarks With Client** - Summarize and review evidence provided - Confirmation of evidence still pending - Status Update regarding harmonization under Principle 1 - Timeline - Questions	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Angelina Tan	SCS Global Services Tri Marine Group

Meeting Agenda for Day 2, November 11th Singapore Time (November 10th, USA) PRINCIPLE 1, PRINCIPLE 2, and PRINCIPLE 3 Questions – Vanuatu				
Time Taipei/Singapore Time Zone (UTC +8)	**Relevant MSC P.I.'s**	**Activities**	**Meeting Participants**	**Orgs**
9:00 AM – 9:15 AM	-	**Opening Remarks**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton William (Bill) Naviti Tony Taleo Lucy Joy	SCS Global Services Tri Marine Group Vanuatu Dep. of Fisheries
9:15 – 10:15 AM	Principle 1 Principle 2	**WCPFC Workplan – Harmonization** Observer Program Bycatch Endangered Threatened and Protected Species (ETP) Shark Finning Habitat Impacts	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton William (Bill) Naviti Tony Taleo Lucy Joy	SCS Global Services Tri Marine Group Vanuatu Dep. of Fisheries
10:15 – 10:30		**Break**		
10:30 – 11:00 AM	**Principle 3**	**Compliance and Enforcement** **Consultation**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton William (Bill) Naviti Tony Taleo Lucy Joy	SCS Global Services Tri Marine Group Vanuatu Dep. of Fisheries
11:00 – 11:15 AM	-	**Closing Remarks** Summarize evidence received Summarize evidence still needed	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton William (Bill) Naviti Tony Taleo Lucy Joy	SCS Global Services Tri Marine Group Vanuatu Dep. of Fisheries

Table 5: Meeting Agenda for Day 3, November 14th Singapore Time (November 13th, USA) PRINCIPLE 1, PRINCIPLE 2, and PRINCIPLE 3 Questions – Cook Islands				
Time Taipei/Singapore Time Zone (UTC +8)	**Relevant MSC P.I.'s**	**Activities**	**Meeting Participants**	**Orgs**
9:00 AM – 9:15 AM	-	**Opening Remarks** Introductions	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Pamela Maru Andrew Jones Latishia Maui	SCS Global Services Tri Marine Group Ministry of Marine Resources, Cook Islands
9:15 – 10:15 AM	Principle 1 Principle 2	**WCPFC Workplan – Harmonization** **Observer Program** **Bycatch** **Endangered Threatened and Protected Species (ETP)** **Shark Finning** **Habitat Impacts**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Pamela Maru Andrew Jones Latishia Maui	SCS Global Services Tri Marine Group Ministry of Marine Resources, Cook Islands
10:15 – 10:30		**Break**		
10:30 – 11:00 AM	**Principle 3**	**Compliance and Enforcement** **Consultation**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Pamela Maru Andrew Jones Latishia Maui	SCS Global Services Tri Marine Group Ministry of Marine Resources, Cook Islands

11:00 – 11:15 AM	-	**Closing Remarks** Summarize evidence received Summarize evidence still needed	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Pamela Maru Andrew Jones Latishia Maui	SCS Global Services Tri Marine Group Ministry of Marine Resources, Cook Islands

Table 6: Questions to Solomon Islands Personnel PRINCIPLE 1, PRINCIPLE 2, and PRINCIPLE 3 Questions – Solomon Islands NOTE: Questions to be Submitted Remotely Given Recent Meetings				
Time Taipei/Singapore Time Zone (UTC +8)	**Relevant MSC P.I.'s**	**Activities**	**Meeting Participants**	**Orgs**
9:00 AM – 9:15 AM	-	**Opening Remarks**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton	SCS Global Services Tri Marine Group SI Ministry of Fisheries and Marine Resources
9:15 – 10:15 AM	Principle 1 Principle 2	**WCPFC Workplan – Harmonization** **Observer Program** **Bycatch** **Endangered Threatened and Protected Species (ETP)** **Shark Finning** **Habitat Impacts**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Edward Honiwala Francis Tofuakalo	SCS Global Services Tri Marine Group SI Ministry of Fisheries and Marine Resources
10:15 – 10:30		**Break**		
10:30 – 11:00 AM	**Principle 3**	**Compliance and Enforcement** **Consultation** **Review and evaluation of management performance** **Decision Making Processes**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Edward Honiwala Francis Tofuakalo	SCS Global Services Tri Marine Group SI Ministry of Fisheries and Marine Resources
11:00 – 11:15 AM	-	**Closing Remarks** Summarize evidence received Summarize evidence still needed	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Edward Honiwala Francis Tofuakalo	SCS Global Services Tri Marine Group SI Ministry of Fisheries and Marine Resources

Table 7: Meeting Agenda for Day 4, November 17th Singapore Time (November 16th, USA) PRINCIPLE 1, PRINCIPLE 2, and PRINCIPLE 3 Questions – Chinese Taipei				
Time Taipei/Singapore Time Zone (UTC +8)	**Relevant MSC P.I.'s**	**Activities**	**Meeting Participants**	**Orgs**
9:00 AM – 9:15 AM	-	**Opening Remarks**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Angelina Tan Mr. Chichao Liu Mr. Wenying Wang (Annie) Ms. Hsiang- Yi Yu (Joy) Ms. Hsiangyin Chen Mr. Weiche Hsu Mr. Weiyang Liu Ms. Huishan Ma	SCS Global Services Tri Marine Group FA-COA OFDC
9:15 – 10:15 AM	**Principle 1** **Principle 2**	**WCPFC Workplan – Harmonization** **Observer Program** **Bycatch** **Endangered Threatened and Protected Species (ETP)** **Shark Finning** **Habitat Impacts**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Mr. Chichao Liu Mr. Wenying Wang (Annie) Ms. Hsiang- Yi Yu (Joy) Ms. Hsiangyin Chen Mr. Weiche Hsu Mr. Weiyang Liu Ms. Huishan Ma	SCS Global Services Tri Marine Group FA-COA OFDC
10:15 – 10:30		**Break**		
10:30-11:00 AM	**Principle 3**	**Compliance and Enforcement** **Consultation** **Review and evaluation of management performance**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Mr. Chichao Liu Mr. Wenying Wang (Annie) Ms. Hsiang- Yi Yu (Joy) Ms. Hsiangyin Chen Mr. Weiche Hsu Mr. Weiyang Liu Ms. Huishan Ma	SCS Global Services Tri Marine Group FA-COA OFDC

11:00 – 11:15 AM	-	**Closing Remarks** Summarize evidence received Summarize evidence still needed	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Mr. Chichao Liu Mr. Wenying Wang (Annie) Ms. Hsiang- Yi Yu (Joy) Ms. Hsiangyin Chen Mr. Weiche Hsu Mr. Weiyang Liu Ms. Huishan Ma	SCS Global Services Tri Marine Group FA-COA OFDC

Table 8: Meeting Agenda for Day 5, November 18th Singapore Time (November 17th at 1:00 PM, USA) PRINCIPLE 1, PRINCIPLE 2, and PRINCIPLE 3 Questions – United States				
Time Taipei/Singapore Time Zone (UTC +8)	**Relevant MSC P.I.'s**	**Activities**	**Meeting Participants**	**Orgs**
5:00 AM – 5:15 AM	-	**Opening Remarks** Introductions	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Tom Graham Valerie Post Elizabeth O'Sullivan	SCS Global Services Tri Marine Group NOAA SG NMFS PIRO
5:15 – 7:00 AM	Principle 1 Principle 2	**WCPFC Workplan – Harmonization** **Observer Program** **Bycatch** **Endangered Threatened and Protected Species (ETP)** **Shark Finning** **Habitat Impacts**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Tom Graham Valerie Post Elizabeth O'Sullivan	SCS Global Services Tri Marine Group NOAA SG NMFS PIRO
7:00 – 7:15 AM		**Break**		
7:15 – 8:00 AM	**Principle 3**	**Compliance and Enforcement** **Consultation**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Tom Graham Valerie Post Elizabeth O'Sullivan	SCS Global Services Tri Marine Group NOAA SG NMFS PIRO
8:00 – 8:15 AM	-	**Closing Remarks** Summarize evidence received Summarize evidence still needed	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Tom Graham Valerie Post Elizabeth O'Sullivan	SCS Global Services Tri Marine Group NOAA SG NMFS PIRO

Table 9: Meeting Agenda for Day 5, November 18th Singapore Time (November 17th, USA) PRINCIPLE 1, PRINCIPLE 2, and PRINCIPLE 3 Questions – Federated States of Micronesia (FSM)				
Time Taipei/Singapore Time Zone (UTC +8)	**Relevant MSC P.I.'s**	**Activities**	**Meeting Participants**	**Orgs**
9:00 AM – 9:15 AM	-	**Opening Remarks** Introductions	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Eugene Pangelinan Bradley Phillip Justino Helgen	SCS Global Services Tri Marine Group NORMA
9:15 – 10:15 AM	Principle 1 Principle 2	**WCPFC Workplan – Harmonization** **Observer Program** **Bycatch** **Endangered Threatened and Protected Species (ETP)** **Shark Finning** **Habitat Impacts**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Eugene Pangelinan Bradley Phillip Justino Helgen	SCS Global Services Tri Marine Group NORMA
10:15 – 10:30		**Break**		
10:30 – 11:00 AM	**Principle 3**	**Compliance and Enforcement** **Consultation**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Eugene Pangelinan Bradley Phillip Justino Helgen	SCS Global Services Tri Marine Group NORMA

11:00 – 11:15 AM	-	**Closing Remarks** Summarize evidence received Summarize evidence still needed	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Eugene Pangelinan Bradley Phillip Justino Helgen	SCS Global Services Tri Marine Group NORMA

Table 10: Meeting Agenda for Day 6, November 19th Singapore Time (November 18th, USA) PRINCIPLE 1, PRINCIPLE 2, and PRINCIPLE 3 Questions – New Zealand				
Time Taipei/Singapore Time Zone (UTC +8)	**Relevant MSC P.I.'s**	**Activities**	**Meeting Participants**	**Orgs**
9:00 AM – 9:15 AM	-	**Opening Remarks**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Arthur Hore Andy Wright	SCS Global Services Tri Marine Group FA-COA Ministry of Primary Industries
9:15 – 10:15 AM	**Principle 1** **Principle 2**	**WCPFC Workplan – Harmonization** **Observer Program** **Bycatch** **Endangered Threatened and Protected Species (ETP)** **Shark Finning** **Habitat Impacts**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Arthur Hore Andy Wright	SCS Global Services Tri Marine Group Ministry of Primary Industries
10:15 – 10:30		**Break**		
10:30 – 11:00 AM	**Principle 3**	**Compliance and Enforcement** **Consultation**	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Arthur Hore Andy Wright	SCS Global Services Tri Marine Group Ministry of Primary Industries
11:00 – 11:15 AM	-	**Closing Remarks** Summarize evidence received Summarize evidence still needed	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton Arthur Hore Andy Wright	SCS Global Services Tri Marine Group Ministry of Primary Industries

Meeting Agenda for Day 8, November 20th Singapore Time (November 19th, USA) – Client Closing Meeting				
Time Taipei/Singapore Time Zone (UTC +8)	**Relevant MSC P.I.'s**	**Activities**	**Meeting Participants**	**Orgs**
9:00 AM – 10:30 AM	-	**Client Closing Meeting** - Discuss outstanding documentation - Questions - Next Steps	Dr. Gerard DiNardo Andy Bodsworth Brian Ahlers Amanda Hamilton	SCS Global Services Tri Marine Group

Evaluation techniques

Documentation and Information Gathering

One of the most critical aspects of the MSC certification process is ensuring that the assessment team gets a complete and thorough grounding in all aspects of the fishery under evaluation. In even the smallest fishery, the assessment team typically needs 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.

Information for the assessed was gathered from stakeholder comments prior to the onsite visit (and after), and via phone conversations. Comments were received from ISSF.

The following entities were essential for provide scientific, management, and governance information and documentation for the site visit: WCPFC, Department of Fisheries, Vanuatu, Ministry of Marine Resources, Cook Islands, National Oceanic Res. Mgmt Authority (NORMA), Ministry of Fisheries & Marine Resources, Sol. Isl., FA – COA, Chinese Taipei, OFDC, NOAA GC, USA, NOAA NMFS PIRO, USA, and Ministry of Primary Industries, New Zealand.

Scoring and Report Development Process

ACDR: The Announcement Comment Draft Report was completed in August 2020. The client decided to continue with the full assessment.

Publication of ACDR: Publication of the Announcement Comment Draft Report was published in August 2020.

Onsite Visit: Scoring was initiated during the two week remote site visit and completed iteratively through phone calls, emails and skype teleconferences in November of 2020.

Additional Document Submission: Following the onsite visit, the team compiled a list of requested documents for the client for submission within two weeks.

Client Draft: Rationales and associated background was developed by respectively assigned assessment team members, and then cross read by team members and SCS staff for production of the client draft report. Scoring was completed by consensus through this review process and team meetings by phone and email. The team finalized scoring and submitted the Client Draft in January 2021. Following the initial receipt of the client draft of the report, minor comments from the client were addressed, the report was submitted by the client group in March 2021. No changes in scores were made. From January to March 2021, the client generated an acceptable client action plan.

Peer Review: Based on comments from peer reviewers, the team modified content related to Principles 3 and 2, changes resulted in updating rationales as a result of the peer review comments, but no new conditions raised. Once the Client Action Plan has been determined, the team used the MSC reporting template to formulate the PCDR. In this draft, the team incorporated peer reviewer comments, the team responses to those comments and any modified content. Additionally, the team ensured that the client readdressed the Client Action Plan as needed. The PCDR was prepared on May 18th, 2021 and subject to a 30-day stakeholder comment period.

Scoring Methodology

The assessment team followed guidelines in MSC FCP v2.2 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 is considered at the 60, 80, and 100 scoring guidepost levels. The decision rule described in Table 29 determines the Performance Indicator score, which must always be in an increment of 5. If there are multiple 'elements'[60] 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 29.

[60] MSC FCPV2.2 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.

Table 29. 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 FCPV2.2 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.
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 FCPV2.2 uses the word 'some' instead of half. SCS considers 'half' a clearer description of the methodology utilized.*

When calculating the Principle Indicator scores based on the results of the Scoring Issues (SI), SCS interprets the terms in Table 2 as follows:

- **Few:** Less than half. Ex: if there are a total of three SIs, one SI out of 3 is considered few.
- **Some:** Equal to half. Ex: if there are a total of four SIs, two SIs out of 4 is considered some.
- **Most:** More than half. Ex: if there are a total of three SIs, two SIs out of 3 is considered most.

8.9 Peer Review reports

8.9.1 Peer Reviewer A– PCDR Comments

Question	Yes/No	Peer Reviewer Justification (as given at initial Peer Review stage). Peer Reviewers should provide brief explanations for their 'Yes' or 'No' answers in this table, summarising the detailed comments made in the PI and RBF tables.	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)
Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	Yes	Yes the scorings are consistent with the MSC standard. In the case of P1 those scorings are largely influenced bty the MSC harmonization process. Scores are expected to be similar to those in the harmonization. And the scores here are similar. Differences in opinion arise from 1.2.1 (HS) and especially 1.2.2 (HCR) in that these items have not achieved SG80 for some years even for certified fisheries. Others suggest that this lag in implementation is cause to fail yellowfin (see P.A.H. Medley, J. Gascoigne and G. Scarcella. 2021. An Evaluation of the Sustainability of Global Tuna Stocks Relative to Marine Stewardship Council Criteria (Version 8). ISSF Technical Report 2021-01. International Seafood Sustainability Foundation, Washington, D.C., USA), although they note that their interpretation is meant to warn future clients. The MSC has allowed the delays in implementation in order to achieve harmonization, but that "bill" is coming due. The linkage between vessel days and stock assessment status will have to be an important part of the HS. P2 scores were consistent with MSC standard. Deficiencies largely relate to FAD management and information P3 scores were also, consistent. In both cases of P2 and P3 individual comments were provided (see PI comments) which suggest the possibility of non-material changes.	No response necessary

Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.2, 7.18.1 and sub-clauses]	Yes	Yes the conditions are appropriately written. In the case of P1, a key item is the HCR. I believe this must be achieved to SG80 by surveillance time of 2022. But practically, this means that it must be implemented in the 2021 WCPFC meeting this year (I believe that is how the conditions were written). The condition writeups mention this. In any case, the ramifications of non-achievement might be expanded upon.	No response necessary
Enhanced fisheries only: Does the report clearly evaluate any additional impacts that might arise from enhancement activities?	NA	Not applicable	No response necessary
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary). Add extra rows if needed below, including the codes in Columns A-C.	NA	In several of the P1 scores, the statement "This is the agreed harmonized score" is used. It would be helpful if the date (yr) of that harmonization be reiterated with each statement. In Section 8 the surveillance/re-certification meetings are described giving dates without the year (year is 2020). It should be mentioned. I bring this up because the P1 evaluation of YFT was done on the 2017 stock assessment, whereas I believe now (March 2021) there is a 2020 stock assessment. That assessment is a little more optimistic, so the scores should not materially change. But the surveillance/re-cert timing should be noted.	The years for the harmonized scores are described in the harmonization section.

UoA stock	PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code

Insert extra rows for P1 PIs if separate scores given for different UoA stocks	Perfor-mance Indica-tor (PI)	Has all available relevant information been used to score this PI?	Does the information and/or rationale used to score this PI support the given score?	Will the condition(s) raised improve the fishery's performance to the SG80 level?	Peer reviewers (PRs) should provide support for their answers in the left three columns by referring to specific scoring issues and/or scoring elements, and any relevant documentation as appropriate. Additional rows should be inserted for any PIs where two or more discrete comments are raised, e.g. for different scoring issues, allowing CABs to give a different answer in each case. Paragraph breaks may also be made within cells using the Alt-return key combination. Detailed justifications are only required where answers given are one of the 'No' options. In other (Yes) cases, either confirm 'scoring agreed' or identify any places where weak rationales could be strengthened (without any implications for the scores).	CABs should summarise their response to the Peer Reviewer comments in the CAB Response Code column and provide justification for their response in this column. Where multiple comments are raised by Peer Reviewers with more than one row for a single PI, the CAB response should relate to each of the specific issues raised in each row. CAB responses should include details of where different changes have been made in the report (which section #, table etc).	See codes page for response options
Yellowfin	1.1.1	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Yellowfin	1.1.2	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Yellowfin	1.2.1	Yes	Yes	Yes	1.2.1 b Under the guidelines the report says "no" to the question "is SG80 met", whereas the writeup below that says SG80 is met. I believe the writeup portion is incorrect… but check on it. Otherwise, I agree with scoring	Change made to state SG80 is met	Accepted (no score change, change to rationale)
Yellowfin	1.2.2	Yes	Yes	Yes	Scoring Agreed. See general comments about this condition. It is possible that this fishery could be certified and then shortly afterward decertified if the 2021 WCPFC is not responsive with an HCR. We'll see.		NA (No response needed)

Yellowfin	1.2.3	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Yellowfin	1.2.4	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Skipjack	1.1.1	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Skipjack	1.1.2	Yes	Yes	NA	Not Applicable		NA (No response needed)
Skipjack	1.2.1	Yes	Yes	Yes	Scoring Agreed		NA (No response needed)
Skipjack	1.2.2	Yes	Yes	Yes	Scoring Agreed See general comments and 1.2.2. comments for YFT		NA (No response needed)
Skipjack	1.2.3	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Skipjack	1.2.4	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Yellowfin and Skipjack	2.1.1	Yes	Yes	NA	Scoring Agreed --- Primary Species Outcome		NA (No response needed)
Yellowfin and Skipjack	2.1.2	Yes	Yes	NA	Scoring Agreed --- Primary Species Management Strategy		NA (No response needed)
Yellowfin and Skipjack	2.1.3	Yes	Yes	NA	Scoring Agreed --- Primary Species Information		NA (No response needed)
Yellowfin and Skipjack	2.2.1	Yes	Yes	NA	Scoring Agreed --- Secondary Species Outcome		NA (No response needed)

Yellowfin and Skipjack	2.2.2	Yes	Yes	Yes	Scoring Agreed --- Secondary Species Management Strategy Conditions for 2.2.2.d Cook Islands and Vanuatu shark finning		NA (No response needed)
Yellowfin and Skipjack	2.2.3	Yes	Yes	NA	Scoring Agreed --- Secondary Species Information		NA (No response needed)
Yellowfin and Skipjack	2.3.1	Yes	Yes	Yes	Scoring Agreed --- ETP Species Outcome		NA (No response needed)
Yellowfin and Skipjack	2.3.2	Yes	Yes	Yes	Scoring Agreed --- ETP Species Management Strategy		NA (No response needed)
Yellowfin and Skipjack	2.3.3	Yes	Yes	Yes	Scoring Agreed --- ETP Species Information		NA (No response needed)
Yellowfin and Skipjack	2.4.1	Yes	No (score increase expected)	No	2.4.1.b --- Habitats Outcome VMEs Status I would score this as SG80 being met, in which case a condition would not be needed. The authors scored SG80 not being met with the rationale that lost, derelict, drifting FADs and their buoys can come in contact with corals (VMEs) near shore and perhaps damage them. They note it is extremely unlikely that these FADs would impact coral VMEs in pelagic zones and thus potential impacts would only be coastal. But 5 % of all drifting FADS suggest potential impacts with no real evidence of damage and even less likely that interactions would "reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm".	We agree with the PR, that the the overall impact of the UoA on coral reefs in the region is negligible and unlikely to reduce structure and function of coral reef habitats to a point where there would be serious or irreversible harm. However, the assessment team oncluded that on account of information limitations, a probabliltiy of highly unlikely was not met. The rationale includes an expanded explanations	Accepted (no score change, change to rationale)
Yellowfin and Skipjack	2.4.2	Yes	Yes	Yes	Scoring Agreed ---Habitats Management Strategy		NA (No response needed)

Yellowfin and Skipjack	2.4.3	Yes	Yes	Yes	Scoring Agreed --- Habitats Information		NA (No response needed)
Yellowfin and Skipjack	2.5.1	Yes	Yes	NA	Scoring Agreed --- Ecosystem Outcome		NA (No response needed)
Yellowfin and Skipjack	2.5.2	Yes	Yes	NA	Scoring Agreed --- Ecosystem Management Strategy		NA (No response needed)
Yellowfin and Skipjack	2.5.3	Yes	Yes	NA	Scoring Agreed --- Ecosystem Information		NA (No response needed)
Yellowfin and Skipjack	3.1.1	Yes	Yes	NA	Scoring Agreed		NA (No response needed)
Yellowfin and Skipjack	3.1.2	Yes	Yes		Scoring Agreed		NA (No response needed)
Yellowfin and Skipjack	3.1.3	Yes	Yes		Scoring Agreed		NA (No response needed)
Yellowfin and Skipjack	3.2.1	Yes	Yes		Scoring Agreed		NA (No response needed)
Yellowfin and Skipjack	3.2.2	Yes	No (material score reduction expected to <80)	Yes	3.2.2.c. I would score this as SG80 NOT being met and thus a condition would need to be imposed. The Guideline calls for "Decision-making processes use the precautionary approach…". On the basis of prior performance of the WCPFC, I would say that the decision processes do not use the precautionary approach. Admittedly this performance relates more to the WCPFC actions relative to bigeye and not SKJ or YFT. The authors mentioned this in their scoring of 1.2.2. The action needed to make the SG80 met is that the HCR be implemented at the 2021 meeting (essentially the same as the	It is suggested that implementation of HCR at the 2021 WCPFC meeting is not a prerequisite for meeting SG80 for PI 3.2.2c. Scoring at SG80 recognises the established WCPFC scientific committee and plenary processes that use the best available information to inform decision making. WCP Yellowfin and Skipjack stocks are sustainably fished; although previous management performance with respect to Bigeye stock has been less impressive, however the UoA does not include Bigeye in this	Not accepted (no change)

					1.2.2 conditions). Conditions were already required by the authors for 3.2.2.c for selected UofAs. I agree with the scoring of these and I also agree with the scoring (and conditions where applicable) for 3.2.2.a, 3.2.2.2b, 3.2.2.d and 3.2.2.e	case. The SG80 score is also consistent with/harmonised with similar WCPFC purse seine skipjack and yellowfin tuna assessments. For this assessment, there are no current conditions for 3.2.2c as suggested by the reviewer.	
Yellowfin and Skipjack	3.2.3	Yes	Yes	Yes	Scoring Agreed		NA (No response needed)
Yellowfin and Skipjack	3.2.4	Yes	Yes	NA	Scoring Agreed		NA (No response needed)

8.9.2 Peer Reviewer B – PCDR Comments

Question	Yes/No	Peer Reviewer Justification (as given at initial Peer Review stage). Peer Reviewers should provide brief explanations for their 'Yes' or 'No' answers in this table, summarising the detailed comments made in the PI and RBF tables.	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)

Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	No	The scoring is quite variable throughout the report. **Principle 1** is by and large scored relatively well, though there are some PIs & SIs (particularly connected with management) that require attention. **Principle 2** is by and large not scored in a way that is consistent with the MSC Standard, and there are significant gaps in the evidence presented. The biggest issue of concern in P2 (and this fishery is not the only Western Pacific tuna assessment doing this) is the approach to scoring ETP species as taxonomic groups. There is absolutely no basis for doing this in the MSC Fisheries Standard, FCP, Guidance or Interpretations. There is a systemic issue here which the overlapping fisheries need to collectively address. **Principle 3** is supported by more comprehensive evidence than either P1 or P2, although there some areas where the scoring is not consistent with the MSC Standard.	The assessment team has updated scoring in P2 to score ETP species individually and not by taxonomic groups.
Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.2, 7.18.1 and sub-clauses]	No	Many of the conditions do not conform to MSC requirements. Specific comments are made for each PI & SI, but in brief:- Several conditions do not follow the narrative and metric form of the corresponding SI. One condition has been set which straddles two separate PIs. A condition has not been raised for one PI that scores <80 because the team elected to raise a condition addressing a similar issue elsewhere. Each of these are fundamental issues that must be addressed.	Language in conditions is updated to conform with MSC requirements

Enhanced fisheries only: Does the report clearly evaluate any additional impacts that might arise from enhancement activities?		This is not an enhanced fishery.	
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary). Add extra rows if needed below, including the codes in Columns A-C.	NA	The geographic extent of UoA is not clearly illustrated in the report. It is evident from the description in section 5.1.1 that the USA fleet fish in a different (larger) area than the other UoAs, but this is not taken into account in consideration of impacts of the fishery. Throughout Principle 1 the scoring has not been entered in each PI table for the CPRDR scores - only ACDR scoring ranges are shown. This needs to be updated. The page numbering in the document is not working correctly, which needs fixing. When spell-checking is will be necessary to ensure that the report refers correctly to Principle 1 / 2 / 3 and not Principal 1 / 2 / 3. For many of the PIs the references cited in the rationales are not listed at the end of the PI or in the references, and a proper QA of the report is needed. In section 8.6 the formatting of Table 3 has gone haywire. The surveillance programme (section 8.15) has not been completed as required.	The geographic extent of the UoA is described in Table 1 for the UoC and UoA. The impact of the US fleet is taken into account as observer data for this specific fleet was analyzed. Final scoring for Principle 1 is now entered in each PI Table. Page numbering corrected. The few instanteces mentioning Principal have been corrected to Principle References in the report now included in the references list. Formatting in Table 3 corrected. Surveillance Program is now completed

UoA stock	PI	PI Information	PI Scoring	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code

Skipjack	1.1.1	Yes	No (non-material score reduction expected)	A score of 100 is awarded (but not recorded in the PI table, which needs to be updated). If this MSC assessment was being carried out in 2018 or 2019, the score of 100 would seem to be appropriate, based on the stock assessments that were available at that time. However it is clear from section 7.2.1.2 of the report that the most recent stock assessment is now older than the generation time for this stock (see section 7.2.1.1). It is therefore questionable whether there can still be a "high degree of certainty" that the stock is still above Bmsy given the age of this information (the most recent estimate of B:Bmsy is for the period 2015-2018). Further justification would seem appropriate. This observation would apply in equal measure to the fisheries against which this one has been harmonised; the fact that they pre-date this assessment and hark form a time when 2019 stock assessment was more relevant has to be taken into account for all of these fisheries.	Score of 100 now recorded in PI. The MSC assessment is being carried out using the most recent assessment (Vincent et al. 2019) and that is noted in both the background scoring rationale.	Accepted (no score change, change to rationale)
Skipjack	1.1.2	NA (PI not scored)	NA (PI not scored)	It is not appropriate to score this PI when PI1.1.1 scores more than 80.	No response neccessary	NA (No response needed)
Skipjack	1.2.1	Yes	Yes	SIa - the scoring is appropriate.	No response neccessary	NA (No response needed)

Skipjack	1.2.1	No (material score reduction expected to <80)	No (material score reduction expected to <80)	SIb - the scoring is inappropriate because it is clear that the harvest strategy is not achieving its objectives. The objectives of the harvest strategy for this stock are explained in section 7.2.1.4 of the report and include the TRP set in CMM 2015-06: *"The target reference point for the WCPO Skipjack Tuna stock shall initially be 50 per cent of the estimated recent average spawning biomass in the absence of fishing, (SB F=0, t1-t2)."* It is clear from Figure 7 in the report and the evidence presented for PI1.1.1 that the SB for this stock is presently below this level (according to Table 10 of the report the 2018 estimate was that SBrecent/SBF=0 was 0.440). The key point here is that the wording of the SI is directed at whether the harvest strategy is achieving its own objectives. It is not couched in terms of PRI or MSY. The scoring rationale justifies the SG80 score on the basis that SB is above SBmsy and is exceptionally unlikely to fall below its LRP. These points are both correct, but are not relevant here. The rationale needs to consider whether the harvest strategy is achieving the objective set by CM2015-06 (i.e. SB > TRP). It is not, so SG80 is not met.	As pointed out by the reviewer the skipjack interim Target Reference Point (TRP) is 50% of spawning biomass in the absence of fishing (CMM 2015-06). The trajectory of the median spawning biomass depletion indicates a long-term trend, and has been fluctuating about the interim TRP since 2009 (i.e., for 10 years). Given that the range of estimates clearly spans the interim TRP provides evidence it is acheiving its objective. We also note that the scoring afforded in PI 1.2.1b is consistent with the scoring of PI 1.1.1. Finally, we disagree that noting stock status relative to MSY is not relevant as we consider it to corroborating evidence.	Not accepted (no change)
Skipjack	1.2.2	Yes	Yes	The scoring (especially for SIa) is detailed and well-reasoned, and the overall score of 60 is appropriate.	No response neccessary	NA (No response needed)

Skipjack	1.2.3	No (non-material score reduction expected)	No (non-material score reduction expected)	SIa: the rationale here asserts that there are "comprehensive" data available. However the scoring rationale for SIb points out significant shortcomings in the data that are available, including limited coverage of CPUE monitoring, and that there is limited understanding of the factors that drive abundance trends. A score of 80 would seem more appropriate for this SI given these shortcomings.	We disagree with the reviewers view that comprehennsive data is not available. 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 conduct and advance stock assessments, as well as produce complex models of the ecological system (SEAPODYM) that are beyond what is needed for implementation of the harvest strategy.	Not accepted (no change)
Skipjack	1.2.3	Yes	Yes	SIb: the scoring here acknowledges the age of the stock assessment, and a score of 80 is appropriate.	No response neccessary	NA (No response needed)

Skipjack	1.2.3	No (material score reduction expected to <80)	No (material score reduction expected to <80)	SIc: The notion that there is "good information on all other fishery removals from the stock" is highly questionable. The only information presented to support this assertion is from earlier MSC audits and surveillance reports, the most recent of which was completed 5 years ago. The purpose of this PI is to test whether relevant information is collected to support the harvest strategy. On the basis of the information presented in this report, this is not the case: there are catch data for the UoAs participating in this assessment, but no indication, for instance, of estimates of unrecorded catches or IUU fishing (which given the substantial High Seas extent of the stock is a significant omission). To justify a score of 80 there needs to be information presented in the report showing the overall fishery removals for this skipjack stock by all metiers and all fishers.	We contend there is good information on fishery removals to support the harvest strategy and procedures are in place to estimate the extent of unreported catch and modify the harvest strategy accordingly. First, the extent of IUU fishing in the WCPFC area is reviewed annually by the Commission, and results reported during regular TCC and Commission meetings; investigations are advanced when evidence of IUU is forthcoming (e.g., IUU vessel list). Second, SPC regularly publishes tuna catches in the Pacific Ocean and leading up to the announcement they compile all available data and investigate reports of unrerported catch. Finally, leading up to the completion of a stock assessment the assessment team spends up to 1 year collecting, reviewing, and compiling all reported catch as well as assessing the potential for some level of criptic or unreported catch. Collectively these processes ensure that the majority catch is accounted for and that the data are sufficient to support the harvest strategy.	Not accepted (no change)
Skipjack	1.2.4	Yes	No (scoring implications unknown)	Further to comments on PI1.1.1 above: the stock assessment used in this report is older than the generation time for this species, and indeed is now older than the oldest recorded skipjack tuna. The age of the stock assessment and some of the intrinsic uncertainties in the input data (see PI1.2.3 SIb & c) should be reflected in the scoring of this PI. In particular the scoring at SG100 for SIa, SIc and SId should be considered in the light of the age of the stock assessment and the known shortcomings in some of the input data.	See comment on PI 1.1.1 above.	

Yellowfin	1.1.1	Yes	No (scoring implications unknown)	A score of 100 is awarded (but not recorded in the PI table, which needs to be updated). If this MSC assessment was being carried out in 2017 or 2018, the score of 100 would seem to be appropriate, based on the stock assessments that were available at that time. However it is clear from section 7.2.2.2 of the report that the stock assessment that this report was based on is now several years old. It is therefore questionable whether there can still be a "high degree of certainty" that the stock is still above Bmsy given the age of this information. Further justification would seem appropriate (it is noted that there is a more recent 2020 stock assessment but that it was published in February 2021 and thus fell outside the "information guillotine" for this assessment report - perhaps, however, this assessment was discussed by a working group in 2020 and could be referred to here to bolster the scoring).	Score of 100 now recorded in PI. The MSC assessment is being carried out using the 2017 stock assessment (Tremblay-Boyer et al., 2017), the most recent assessment available when this report was written.	Not accepted (no change)
Yellowfin	1.1.2	NA (PI not scored)	NA (PI not scored)	It is not appropriate to score this PI when PI1.1.1 scores more than 80.	No response neccessary	NA (No response needed)
Yellowfin	1.2.1	Yes	Yes	SIa: The scoring is appropriate; however the rationale does not clearly set out how the SG60 requirements are met. A detailed rationale is set out in the corresponding section of the annual ISSF review of tuna stock status which provides a more appropriate and cogent basis for scoring than that set out here.	We thank the reviewer for pointing out the lack of a clear rationale for the SG 60 score and have modified reworded the rationale accordingly.	Accepted (no score change, additional evidence presented)

Yellowfin	1.2.1	No (material score reduction expected to <80)	No (material score reduction expected to <80)	SIb: the scoring rationale and score awarded for the SI (and PI) do not match up. The rationale states that SG60 and 80 are met, but a "No" is recorded for SG80 for this SI; at the same time the PI score in Table 7 is given as 70. On the basis of the rationale set out in SIa and the paucity of information elsewhere in the report about the existence of management objectives, it does indeed seem to be the case that that SG80 requirements are not adequately met. This shortcoming of the fishery is starkly illustrated by Table 15 of the report which shows the WCPFC work plan for adopting a harvest strategy, which has manifestly not produced the TRP or HCRs that it was intended to produce in 2019. A score of 60 would indeed seem appropriate for this SI based on the information presented in the report.	We thank the reviewer for pointing out this inconsistency and the rationale text should have been consist with the scoring, reaching SG 60 and not SG 80.	Accepted (no score change, change to rationale)
Yellowfin	1.2.2	Yes	Yes	The scoring for all SIs is appropriate.	No response neccessary	NA (No response needed)

Yellowfin	1.2.3	No (material score reduction expected to <80)	No (material score reduction expected to <80)	SIc: The scoring is not appropriate, because the assertion that there is good information about all other fishery removals made here is dependant on the findings of other MSC assessment teams over a period of time ending 5 years ago, and which have themselves been eclipsed by the stock assessment that the rest of the P1 scoring is based upon. In the description of the stock assessment set out in section 7.2.2.2 of the report it is stated that:- "*A significant component of the increase in juvenile fishing mortality was attributable to the Philippines, Indonesian and Vietnamese surface fisheries, which have the most uncertain catch, effort and size data. The work of the WPEA project to assist in enhancing the current fishery monitoring program and improving estimates of historical and current catch from these fisheries remains important given the contribution of these fisheries in the overall fishing impact analyses from this assessment.*" These comments are associated with the modelling carried out by the RFMO in 2017 and thus negate the rationale presented here which is based upon earlier information. SG80 is clearly not met because the team has not presented information to show that the uncertainties in fishery removals highlighted by the RFMO have been addressed.	We do not agree with the reviewers comments and have modified the rationale to support the SG 80 score .WCPFC and SPC have undertaken extensive work (WPEA Project) to quantify all sources of removals and include them in the stock assessment. Small-scale (but extensive) fisheries in Indonesia, the Philippines and Vietnam have in the past been a problem, and there has been ongoing work for quite a few years to quantify the catch (and where possible effort) from these fisheries. There has been gradual improvement in the data from these sources over recent years, and catch data are included in the most recent stock assessment.The rationale has been expanded to include this information.	Not accepted (no change)

Yellowfin	1.2.4	Yes	No (scoring implications unknown)	Further to comments on PI1.1.1 above: the stock assessment used in this report is now over 4 years old. The age of the stock assessment and some of the intrinsic uncertainties in the input data (see PI1.2.3 SIc) should be reflected in the scoring of this PI. In particular the scoring at SG100 for SIa, SIc and SId should be considered in the light of the age of the stock assessment and the known shortcomings in some of the input data.	The most recent assessment was in 2017 and adopted in 2020, which is consistent with the adopted three-year stock assessment schedule for key tuna species in the WCPFC. These schedules are developed based on required prepartory work leading up to an assessment (input data verification and validation, summarizing research findings, stock assessment model development and testing, etc.), as well as staffing workloads. In the interim catch statictics and observer data, as well as CMM reporting requirements, provide insight into potential changes (negative and positive) for key tuna stocks in the WCPFC. The assessment team contends that the original score is appropriate.	Not accepted (no change)
Skipjack & Yellowfin	2.1.1	Yes	Yes	The scoring is appropriate: there are no main primary species and only one minor primary species (bigeye tuna) is above PRI.	No response neccessary	NA (No response needed)
Skipjack & Yellowfin	2.1.2	Yes	Yes	The scoring is appropriate. Note that there is a stray question mark in the overall PI score for the CPRDR.	No response neccessary	NA (No response needed)
Skipjack & Yellowfin	2.1.3	Yes	Yes	The scoring is appropriate.	No response neccessary	NA (No response needed)
Skipjack & Yellowfin	2.2.1	Yes	Yes	SIa: the scoring is appropriate.	No response neccessary	NA (No response needed)

Skipjack & Yellowfin	2.2.1	No (scoring implications unknown)	No (scoring implications unknown)	SIb: the scoring is not appropriate. The team has applied FCPv2.2 PF4.1.4 to justify not scoring the numerous secondary species in the catch. There are several problems with this approach:- 1. Annex PF relates only to fisheries where the RBF is used. 2. The use of the RBF was not mentioned in the announcement of the fishery assessment, nor is there any evidence in the report to show that the team has conducted any of the necessary stakeholder engagement associated with the RBF. 3. According to the information presented about the team in this report and in the announcement, none of the team members appear to have been trained in the use of the RBF, which would prevent it being used. On this basis, the team cannot apply any part of the RBF here. The scoring approach should be reconsidered.	Assessment team members are trained in the use of RBF but that is moot considering there was no RBF conducted in this assessment. MSC FCP v2.2, Annex PF 4.1.4 allows the assessment team limit the use of RBF to only main species and not conduct the an RBF evaluation (a Productivity Susceptibility Analysis (PSA)) on minor species, in which case the outcome PI cannot be scored above 80 (MSC FCP v2.2, Annex PF 5.3.21). The assessment team decided to follow the available guidelines provided under MSC FCP v2.2, Annex PF 4.1.4. As such SG 100 would not be met. The assessment team contends the initial score is appropriate.	Not accepted (no change)
Skipjack & Yellowfin	2.2.2	Yes	Yes	The scoring is appropriate for SIa-c and e.	No response necessary	NA (No response needed)

Skipjack & Yellowfin	2.2.2	No (scoring implications unknown)	No (scoring implications unknown)	SId: - can the team review whether this sentence in the scoring rationale for SId is correct:- "*...meet SG80 there must be no incidents of shark finning for the last 5 years in the observer data sets, and the observer coverage rate (i.e. gap between what SPC estimates as number of trips and observer trip reports submitted to SPC) must be >25%.*" This seems a bit ambiguous: if the gap between the number of trips and the observer trip reports is 25%, that would suggest 75% coverage; but observer coverage of 25% would suggest a gap of 75%. However it is clearly stated elsewhere in the report that there is meant to be 100% observer coverage (see section 7.3.1.2):- *"Observer data from 2015-2019 was used to assess species composition. There has been a requirement of 100% observer coverage in purse seine vessels operating in the WCPFC area since 2010."* This begs the question - is there 100% observer coverage as required by the WCPCFC or not? This issue is visited in the section of the report entitled "Achieved Coverage" (page 107 of the PDF version of the report, given as Page 1 in the footer). Here, the most recent evidence of observer coverage in the fleet is over 5 years old, and clearly needs to be updated. It would seem, however, that if the team was able to determine the gap between the SPC estimated number of trips and the observer trip reports in its evaluation of the shark finning data, then the team must be aware of the level of observer coverage. This begs a further question - where are these data?	We thank the reviewer for pointing out discrepancies in the calculation of observer coverage. A table has been added to section 7.3.1.3 Observer Program/Information Sources of the report indicating the observer coverage rates by flag. Based on information provided by SPC, observer coverage is estimated at 100%. This was confirmed during discusions with SPC and ROP staff. We note not all observer data is submitted and processed in a timely manner, and for this assessment 86% - 100% of observer data was provided to the assessment team. Nonetheless, available data from observed trips appraches 100% and is well above the 20% recommendation noted in the MSC guidelines to meet SG80.	Accepted (no score change, additional evidence presented)

Skipjack & Yellowfin	2.2.2			**Condition 5-1 (PI2.2.2 SId):** The condition is not written in the narrative and metric form of the corresponding SI (as per FCP v2.2 7.18.1.2). In this case, the condition should state: *"By the fourth surveillance audit, provide evidence <u>that it is highly likely</u> that shark finning is not taking place."*	We thank the Reviewer for pointing out the inconsistency in the conditions narrrtive. The text for Condition 5-1 has been modified appropriately.	Accepted (no score change, change to rationale)
Skipjack & Yellowfin	2.2.2			**Condition 5-2 (PI2.2.2 SId):** The condition is not written in the narrative and metric form of the corresponding SI (as per FCP v2.2 7.18.1.2). In this case, the condition should state: *"By the fourth surveillance audit, provide evidence <u>that it is highly likely</u> that shark finning is not taking place."*	We thank the Reviewer for pointing out the inconsistency in the conditions narrrtive. The text for Condition 5-2 has been modified appropriately.	Accepted (no score change, change to rationale)
Skipjack & Yellowfin	2.3.1	No (scoring implications unknown)	No (scoring implications unknown)	SIa & SIb: The scoring at SG100 here is predicated on the assumption of 100% observer coverage. However as noted in the comments for PI2.2.2 SId above and the text presented in the "Achieved Coverage" section of the report there is some doubt about the level of observer coverage (notwithstanding the fact that in order to evaluate the level of shark finning in the fishery the team's stated approach requires knowledge of the level of observer coverage). For this PI it really doesn't matter too much whether there is 100% observer coverage, but given that the team is clearly aware that it doesn't have this level of coverage, the rationale should be revised to match the facts, rather than reciting the obligation to carry observers.	Background text in the observer section (7.3.1.3) has been expanded and provides information pertaining to observer coverage as well as reasons for inconsistencies between estimated and observed trips.There is no evidence to indicate that CCMs are not approaching the requirement for 100% observer coverage on purse seine fleets between 20°N and 20°S. We note that occasionally collected observer data is not submitted for data processing, but this does not amount to a significant number of trips and does not affect all CCMs. Nevertheless, we accept the advice from SPC that the apparent inconsistency in trips for all fleets most probably reflects a recording problem rather than a compliance issue.	Accepted (no score change, change to rationale)

Skipjack & Yellowfin	2.3.1	No (scoring implications unknown)	No (scoring implications unknown)	There are several overarching comments on the assessment approach adopted here:- **1. Incorrect approach to scoring elements.** The assessment team has adopted the wrong assessment approach to scoring cetaceans, mobulid rays, marine turtles and seabirds throughout PI2.3.1. The assessment team has assessed these taxonomic groups as elements. This is not consistent with the MSC requirements for ETP species (it is only permissible to use taxonomic groups when using the RBF for primary and secondary species). The assessment team for this fishery do not seem to be alone in adopting this approach, it seems to be common practice in Pacific tuna fishery MSC assessments. Be that as it may, there is no provision in the MSC Fisheries Standard, FCP, Guidance or Interpretation log that permits this approach. All of the PIs for ETP species should therefore be re-drafted and re-scored correctly, with each species treated as a separate element.	1. Incorrect approach to scoring elements. The assessment team reviewed the scoring of ETP section to score by species and away from taxonomic groups.	Accepted (no score change, additional evidence presented)
Skipjack & Yellowfin	2.3.1	No (scoring implications unknown)	No (scoring implications unknown)	2. MSC scoring requirements not applied The MSC sets out (in Table SA9) how assessment teams are meant to approach scoring outcome PIs. There is no evidence presented anywhere to show how the team has determined that the probability of the UoA impacting ETP species is above the 70th or 80th percentile as required in Table SA9; nor are robust alternative arguments presented to justify a different approach.	Scoring Elements: When population estimates were available, the assement team conducted scoring based on the level of interactions relative to population estimates as well as the mortality resulting from fishery interactions. The argument employed by the assessment team is based on a qualitative interpretation of the likelihood levels through plausible argument and empirical observations of the marginal contribution of the UoA to status or recovery of the ETP species, as outlined in Guidance GSA3.2.3. The assessment team has expanded the rationales to further support the scoring.	Accepted (no score change, change to rationale)

Skipjack & Yellowfin	2.3.1	No (scoring implications unknown)	No (scoring implications unknown)	3. Inconsistent scoring and use of evidence within the assessment Nearly all of the scoring rationales in PI2.3.1 refer to there being "100% observer coverage"; however the team has already acknowledged in its scoring of PI2.2.2 SId that there is not 100% observer coverage, and that there are particular concerns about observer coverage in the Cook Island and Vanuatu UoA. These observations are equally relevant (and perhaps of greater significance) here in PI2.3.1. If there is an argument for different scores being awarded for PI2.2.2 SId, there is an equally valid argument to do the same for PI2.3.1 SIb. This is an inconsistency that needs to be rectified.	3. The team has re-worded this more clearly in the report, A table has been added to section 7.3.1.3 Observer Program/Information Sources of the report indicating the observer coverage rates by flag. Based on information provided by SPC, observer coverage is estimated at 100%. This was confirmed during discusions with SPC and ROP staff. We note not all observer data is submitted and processed in a timely manner, and for this assessment 86% - 100% of observer data was provided to the assessment team. MSC guidance (GSA3.6.3) indicates that there is no specific level of observer coverage required and that for nomal species, 20% is considered sufficient. Given that the available observered trips cover a broad area, and seasons, and follow the WCPFC ROP requirements, the assessment team considers that 75% of available observer data is a representative sample of the UoAs to assess the direct effects of the UoA on ETP species.	Accepted (no score change, additional evidence presented)

Skipjack & Yellowfin	2.3.1	No (scoring implications unknown)	No (scoring implications unknown)	4. Failure to use the RBF Given the comments above, and indeed the uncertain status of the shark and mobulid species that have been known to be caught in the fishery for many years, it is not at all clear why the RBF has not been used here. Table 3 of the MSC FCP v.2.2 asks for ETP species "Can the impact of the fishery in assessment on ETP species be analytically determined?". It is abundantly clear that this is not the case for most of the ETP species considered here, and the RBF should have been used.	4. Failure to Use RBF: We have quantitative information available on the number of interactions of the UoA with ETP species, which the assessment team considered to provide a basis to analytically determine the impact of the fishery on ETP species. Furthermore, for shark species, there are stock assessments for oceanic whitetip shark and for silky shark, and for whale sharks there are also analytical risk assessments. Additional information on population status of mobula sp. has been added to te background. It's on account of the high number of interactions and declining populations of mobulas that the assessment team put a condition on these species for PI 2.3.1	Accepted (no score change, additional evidence presented)
Skipjack & Yellowfin	2.3.1	No (scoring implications unknown)	No (scoring implications unknown)	5. Incorrect or inadequate assignment of ETP species The list of ETP species presented in Table 20 of the report contains a number of errors. The key errors are:- Cetaceans - several species are listed by virtue of being in Appendix 2 of CITES. The MSC stipulate that only species in Appendix 1 should be classified as ETP. It would be more appropriate to refer to WCPFC CMM 2011-03 here, which applies to all cetacean species and is considered (in the Principle 3 text) to be a binding international agreement applying to the UoA. For seabirds - black footed albatross are listed in Annex 1 of ACAP, but this is not mentioned in the table or the text supporting their assignment to the ETP category, so as far as the reader is concerned it is not at all clear why this species has been assigned "ETP" status.	ETP Species Table: The Table 20 has been modified to take care of missing information and updated the table of ETP species consistent with the MSC guidelines. Black footed Albatross is listed as an ETP species, now the justificaiton of why it's considered an ETP species has been included.	Accepted (no score change, additional evidence presented)

Skipjack & Yellowfin	2.3.1	No (scoring implications unknown)	No (scoring implications unknown)	6. Scoring is incomplete Finally, the scoring table for this PI is incomplete. Ignoring the incorrect aggregation of species into taxonomic groups, this table shows a scoring range for both cetaceans and Mobula rays. This is either a relic of the ACDR or it underlines the problems that result from failing to score each species as a separate element.	The scoring table is now updated to include a scoring element table. Current scores for all ETP scoring elements are separete by species level and not in ranges.	Accepted (no score change, additional evidence presented)
Skipjack & Yellowfin	2.3.1	No (material score reduction expected to <60)	No (material score reduction expected to <60)	**SIb: sharks** **Whale sharks** - based on the apparent WCPFC-SC review in 2018, the scoring seems to be justified. It would have been nice to see more evidence from this review in support of the scoring however. **Silky sharks** - it is clear from the scoring rationale that the number of animals caught is known, but the consequences of this catch for the population has not been analytically determined. The team has, with no justification much more than noting that the number of silky shark caught by the UoAs are much lower than the longline fishery, simply asserted that it is likely that the fishery is not hindering recovery, whilst at the same time stating that post capture and entanglement mortality are unknown. This is a subjective and unjustified conclusion. **Oceanic whitetip** - again, there is no evidence of any analytical determination of impact. The team's conclusions on scoring are based on comments (unsupported by any data) of the wide distribution of the species and the low overlap between the UoA and the species range - which amounts to an open admission that it would have been more appropriate to use the RBF to assess impacts on this species.	Scoring rationales for silky and oceanic whitetip sharks have been expanded to address the reviewers comments.	Accepted (no score change, additional evidence presented)

Skipjack & Yellowfin	2.3.1	No (material score reduction expected to <60)	No (material score reduction expected to <60)	**SIb: Cetaceans** The rationale indicates that 5 species of dolphins and 7 species of whales are known to be caught in the fishery. The numbers are not insubstantial: 300 false killer whales; 76 rough-toothed dolphins; 39 Sei whales; the species recorded also include a blue whale and a fin whale. It is self-evident from even a cursory knowledge of these species that they have drastically different life histories, ranges, and population sizes, and that their vulnerability to impacts is also very different. Assessing cetaceans as a single taxonomic group is therefore inappropriate as well as being inconsistent with MSC requirements. The team assert that:- *"The known levels of catch and mortality in the fishery is not considered to be hindering the recovery of any cetacean populations, should such a recovery be required. However, in the absence of better information on post release and entanglement mortality the scant knowledge of the status of cetacean populations, and the large number of interactions, particularly with false killer whales, we could not place a high degree of confidence in this conclusion. This meets the requirements of the SG 60 level but not the SG80 or SG 100 levels."* There are serious flaws in this statement; indeed the paragraph is itself contradictory: it cannot be the case that it is likely that the UoA will not hinder the recovery of ETP populations if there is "scant knowledge" of the populations concerned and the impact of the fishery on them. Key points that require attention to justify an SG60 score would be:- a) Levels of catch are known, but levels of mortality are not, as is evident from the statements in the previous paragraph are not in connection with dolphins. b) There is no evidence presented on the status of 11 of the 12 cetacean species known to be impacted by the fishery. The only information presented about population status is for the false killer whale. The status of the other species is not considered anywhere in the report. If this information is not presented or is not available for each of the 12 species concerned, then a score of 60 cannot be justified.	The ceteceans section isnow updated and scoring is conducted by species A) The team does have information about direct mortality, which is scored at the SG60 level. As the rationale notes, there is limited information on post-release mortality, unknown direct effects are scored at the SG80 level, as nothed in the rationale the SG80 level is not met for false killer whales. B) Information on the status of each cetecean is now included in the rationale.	Accepted (no score change, additional evidence presented)

Skipjack & Yellowfin	2.3.1	No (material score reduction expected to <60)	No (material score reduction expected to <60)	**SIb: Mobula** Earlier comments all apply here concerning the assessment approach: it is not appropriate to assess Mobulid rays as a single taxonomic group; each species should be considered as a separate element. The fishery is known to interact with two identified Mobulid rays (Giant manta & Devil rays) and there are also over 200 recorded interactions with unidentified Mobulids. This should be reflected in the scoring. The team has presented no information whatsoever about the population status of the two known species, their range, whether they are released alive or dead, or the post-capture mortality. There is therefore absolutely no basis for concluding that the SG60 requirements are met.	The scoring table is now updated to include a scoring element table that lists individual mobula species. Also, catches of mobula species (Giant Manta Ray and Devil Rays) are noted in the background section as well as is population status information.	Accepted (no score change, additional evidence presented)
Skipjack & Yellowfin	2.3.1	No (material score reduction expected to <60)	No (material score reduction expected to <60)	**Condition 6 (PI2.3.1 SIb & PI2.3.3 SIb):** This is not consistent with MSC requirements: 1. The condition raised applies to two separate Performance Indicators. The MSC FCP v2.2 specifies at 7.18.1.1 that: "*...every PI that receives a score of less than 80 <u>has its own distinct condition</u> associated with it*." [My emphasis]. This has clearly not been done, so Condition 6 should be revised accordingly. 2. The condition does not follow the narrative and metric form of either PI2.3.1 SIb or 2.3.3 SIb as a result (FCP v2.2 7.18.1.2). The condition needs to be split in two and re-drafted.	The reviewer correctly points out requirements when setting conditions noted in FCP v2.2 7.18.1.1. We have resolved the issue, and created two separate conditions.	Accepted (no score change, additional evidence presented)

Skipjack & Yellowfin	2.3.1	No (material score reduction expected to <80)	No (material score reduction expected to <80)	**SIb: Marine Turtles** Earlier comments all apply here concerning the assessment approach: it is not appropriate to assess Marine turtles as a single taxonomic group; each species should be considered as a separate element. The scoring rationale considers only the low level of interaction between the fishery and marine turtles. It does not present information on the status of the populations concerned to demonstrate that this level of interaction is acceptable in the terms required by this SI. The rationale also states that:- "*There is likely to be an unobserved level of post release mortality, as well mortality from entanglement in FADs. Retention of turtles is prohibited, and all landings are monitored. Based on the very low-level percentage of the total WCPFC Convention Area catch of the target species by UoA vessels, the broad distribution of all turtle species, and the 100% observer coverage it's likely that the known direct effects of fishing by UoA vessels on marine turtles are not hindering their recovery. But in the absence of better data on total mortalities, we have not attached a higher degree of confidence to this conclusion.*" There are several serious flaws in this statement:- a) Post capture mortality and entanglement in FADs are "*known direct effects*" with regard to this SI. The absence of information about either impact means that it cannot be "*highly likely*" that the fishery does not hinder recovery of these species unless other information is presented to contextualise the impact (e.g. population size, range, conservation status for each species). b) The assertion that the fishery meets the SG80 requirements presented here is, in essence, an unstructured version of the "Susceptibility" attributes of the fishery (*sensu* Annex PF of the MSC Fisheries Standard). The rationale demonstrates that the team should use the RBF here. c) The reference to a "*high degree of certainty*" here is extraneous and irrelevant as this is only an issue at SG100. This is in fact a "decoy"	The team has now scored every ETP scoring element individually. Information about population size and conservation status for each species is now included in the rationale. Quantitative information is available: the number of interactions of the UoA with ETP species, and population estimates of sea turtles, which the assessment team considered to provide a basis to analytically determine the impact of the fishery on ETP species, without employing the RBF. The reference to the SG100 are included because the assessment team concluded the SG80 is met.	Accepted (no score change, additional evidence presented)

				argument which distracts from the fact that the SG80 requirements are not met. Reference to the SG100 requirements should be removed.		

Skipjack & Yellowfin	2.3.1	No (non-material score reduction expected)	No (non-material score reduction expected)	**SIb: Seabirds** The same comments apply here as for the other taxonomic groups - the team has not scored by species as it should have done (though in this instance there is only a single individuals of one species). As before, the scoring rationale does not address the issues tested by the scoring guideposts - there is no information about population size, conservation status, post-capture mortality and so on. Indeed, the rationale yet again represents an unstructured and partial review of the RBF "susceptibility" attributes set out in Annex PF of the MSC Fisheries Standard, which yet again shows that the RBF should have been used in this instance. The team assert that there is 100% observer coverage in the fishery, but as they have already stated in the scoring of PI2.2.2 SId, observer coverage is less than 100%. Given the low level of interaction it would seem likely that with a suitably revised and robust rationale a score of 80 could be justified for this species.	The team has now scored every ETP scoring element individually. The scoring rationale now includes information on about population size, conservation status and post-capture mortality. The observer coverage comment has already been addressed in comments above.	Accepted (non-material score reduction)
Skipjack & Yellowfin	2.3.1	No (scoring implications unknown)	No (scoring implications unknown)	SIc: The scoring rationale is brief and inadequate. To fully evaluate this SI, information must be presented to show which indirect effects have been considered, and what that nature of the impact of the fishery is likely to be. This information also clearly needs to be relevant to all of the ETP species concerned. For instance, for the piscivorous ETP species it would seem most likely that disruption of the food chain as a result of fishery removals would be the relevant indirect impact; but for species like marine turtles it could be impacts such as the "ecosystem trap" effect of FADs. No attempt is made in the rationale to identify the different indirect impacts that the fishery could have on different scoring elements (species, not taxonomic groups). The rationale clearly needs an overhaul to align it with MSC scoring requirements and provide an adequate element-by-element assessment of the relevant indirect impacts.	The rationale has been expanded and focused and we agree with the original score.	Accepted (no score change, additional evidence presented)

Skipjack & Yellowfin	2.3.2	No (scoring implications unknown)	No (scoring implications unknown)	Overall comment on this PI:- **1. Inconsistent scoring approach** - given the comments made in PI2.2.2 SId that highlight concerns about observer coverage and quality of data for the Cook Islands and Vanuatu UoAs, it would seem appropriate that a scoring differential should be evident here. It is clear that the team is aware of this from its scoring rationale in SId, but it has neglected to reflect that in the scoring here and has instead asserted (without justification) that it is appropriate to score that issue in Principle 3. **2. Overall score** - an overall score of 75 is assigned to this PI, but the table presented at the end of the PI in which scores are calculated still shows scoring ranges from the ACDR. This needs to be corrected.	The observer coverage comment has already been addressed in comments above. The reasons why 5-years of observer data are not available from Cook Islands and Vanuatu has been explained in the Observer and Information section. Table now contains final scores.	Accepted (no score change, additional evidence presented)
Skipjack & Yellowfin	2.3.2	No (scoring implications unknown)	No (scoring implications unknown)	SIa: here and through the rest of PI2.3.2 it seems reasonable to consider taxonomic groups in situations where the management measures relate to taxonomic groups (such as for WCPFC CMM documents). There are however some significant omissions in the text:- 1. Seabirds were scored as an element in PI2.3.1, but are not even considered here. 2. The scoring rationale for all of the elements is based on an argument that at the WCPFC level there is a strategy but it does not seem to be in place and thus that SG80 is not met, but SG60 is. This is incorrect. Scoring at SG60 requires evidence that there are "*measures in place*" [My emphasis]. There is no reference in the scoring rationale of the existence of any measures. SG60 cannot be met simply by the existence of a strategy that is not in place, it can only be met by evidence that are "*measures in place*". This evidence is not provided. The scoring rationales all require revision to document the measures that are in place and to clearly demonstrate that SG60 is met before the SG80 requirements are considered (see FCP v2.2 at 7.17.7).	We thank the reviewer for pointing out our omission on seabird information; the scoring rationale has been modified accordingly. The measures in place for all ETP elements have been described in detail in the background section. The rationale is now updated to indicate that the measures and the strategy are in place, for most of the ETP species.	Accepted (no score change, additional evidence presented)

Skipjack & Yellowfin	2.3.2	No (scoring implications unknown)	No (scoring implications unknown)	SIb - the team need to think again about the approach to not scoring this SI, and to align it properly with both the comments in the previous SI as well as the MSC Fisheries Standard. In SIa it is repeatedly stated for each scoring element considered that although there is a strategy, it is not in place. For SIb, it is stated that:- "*This scoring issue is not scored, as there are management strategies in place for all ETP species captured in the fishery.*" This is plainly a contradiction of the SIa scoring. Further to this, the team is advised to refer to SA3.11.2 to determine the basis for scoring or not scoring this SI.	- The text in the rationale has been modified accordingly, and the rationale has been moved from SI a to SI b	Accepted (no score change, additional evidence presented)
Skipjack & Yellowfin	2.3.2	No (scoring implications unknown)	No (scoring implications unknown)	SIc - the fundamental obstacle to scoring this SI at SG60 is that neither here nor anywhere else in the report are the "measures" implemented in the fishery listed; hence it is not at all clear how the team has evaluated the likelihood that they will work. A second and equally significant issue here is that the team has already noted (in PI2.2.2 SId) that there are concerns about observer coverage in two of the UoAs. This should also be reflected as a scoring differential for this SI - if there is uncertainty about shark finning for these UoAs, it is hard to be argue that there is an "objective basis for confidence" about the evaluation of ETP management measures for these UoAs, and a score of 80 seems inappropriate for them.	Measures are now described in the rationale, the comment regarding observer coverage has already been addressed.	Accepted (no score change, additional evidence presented)

Skipjack & Yellowfin	2.3.2	No (scoring implications unknown)	No (scoring implications unknown)	SId - The scoring rationale does not match the scoring guideposts nor the scores awarded. the scoring rational concludes that:- "*On this basis requirements at the SG 60 level for all flags are met but not the SG 80 or SG 100 requirements.*" The first problem with this is that there is no SG60 SG for this SI. The second problem is that the team have then indicated in the "Met?" row of the scoring table that SG80 is met for seabirds, but not for any other elements. The fundamental obstacles to scoring this SI at SG80 (even for seabirds alone) are:- 1. The only reference to strategies in the report are that they are not "in place" (in other words, have not been implemented). These cannot, therefore, contribute to scoring at SG80. 2. Neither here nor anywhere else in the report are the "measures" implemented in the fishery listed; hence it is not at all clear how the team has evaluated the likelihood that they are being implemented. 3. Seabirds are not even mentioned in the scoring rationale, so how a score of 80 can be proposed for them is a mystery.	We thank the reviewer for pointing out our oversight on scoreing at the SG 60 level when this level is not available. The text has been modified accordingly.	Accepted (no score change, additional evidence presented)

Skipjack & Yellowfin	2.3.2	No (scoring implications unknown)	No (scoring implications unknown)	SId - A second and equally significant issue here is that the team has already noted (in PI2.2.2 SId) that there are concerns about observer coverage in two of the UoAs. This concern is reiterated here, but instead of reflecting this issue in the scoring the team has stated:- *"Also, observer records from Vanuatu and FSM have identified 'live whale or live whale shark' sets in their reports. As stipulated in CMM 2012-04, it is prohibited for purse seine vessels to intentionally set on Whales or Whale sharks in the WCPFC.* [...] *The noncompliance with CMM 2011-04 will be addressed when scoring P3, including an MCS related condition."* This approach is not appropriate, for two reasons:- 1. The concerns about the inadequacies of evidence available from the Cook Islands and Vanuatu should be reflected as a scoring differential for this SI. 2. The MSC FCP v2.2 (7.18.1.1) requires that a distinct condition of certification is raised for every PI that scores less than 80 - so a condition is required here.	Text addressing why seabirds meet the SG 80 score has been included. A condition has been placed on this PI.	Accepted (no score change, additional evidence presented)

Skipjack & Yellowfin	2.3.2	No (scoring implications unknown)	No (scoring implications unknown)	SIe: The scoring here is compromised by the approach adopted in the rationale, which requires revision. The key issues here are:- **1. Taxonomic groups** - once again the decision to review by taxonomic groups has compromised scoring. In this instance the issue has been compounded by heaping together Cetaceans, marine turtles, mobula rays and seabirds, and it is clear from the rationale that each taxonomic group is subject to separate management arrangements. The rationale needs to be disentangled so that it is clear what review of measures is carried out for which group. **2. Taxonomic groups (part 2)** - it is clear that the grouping of whale, silky and oceanic white-tip shark is inappropriate. It is clear from the rationale that the cycle for reviewing the status of whale sharks is different from that for the other two species, and that the score awarded is a composite which masks the true situation for whale sharks as a scoring element. Here the individual species (scoring elements) clearly need to be considered separately, in accordance with the MSC's own requirements. **3. Evidence of implementation** - given the concerns expressed in PI2.2.2 SId about the quality of observer coverage in two of the UoAs, it is not at all clear how the team has been able to determine that the "*...alternative measures to minimise UoA-related mortality of ETP species* [...] *are implemented as appropriate.*" for these UoAs, or indeed for any of the other UoAs. At the very least it seems that the Cook Islands and Vanuatu UoAs probably do not meet the SG80 requirements here; and in the absence of evidence of implementation for the other UoAs, the proposed scoring is questionable for them as well.	1. Taxonomic groups are now separated in the rationale. 2. Whale sharks are now separate from silky and ocenic white-tip rationale. 3. The concerned raised regarding observer coverage has already been address in earlier comments.	Accepted (no score change, change to rationale)
Skipjack & Yellowfin	2.3.2	No (scoring implications unknown)	No (scoring implications unknown)	**Condition 7 (PI2.3.2 SIa & SId):** The condition is not written in the narrative and metric form of the corresponding SI (as per FCP v2.2 7.18.1.2).	We thank the reviewer for their comment and the Condition narrative has been modified accordingly.	Accepted (no score change, change to rationale)

Skipjack & Yellowfin	2.3.3	No (scoring implications unknown)	No (scoring implications unknown)	**Need for a Condition:** The team has not raised a condition of certification for this PI. It should have raised a condition here to address the scoring at <80 for SIa and SId (FCP v2.2 7.18.1.1).	We thank the Reviewer for pointing out our oversight and the Assessment Team has raised the appropriate condition.	Accepted (no score change, change to rationale)
Skipjack & Yellowfin	2.3.3	No (scoring implications unknown)	No (scoring implications unknown)	Overall comment on this PI:- 1. The team has not calculated an overall PI-level score from the elements scored. 2. The use of taxonomic groups as scoring elements is still problematic and need to be addressed.	The score has been calculated and the use of taxonomic groups has been addressed in an earlier response.	Not accepted (no change)

Skipjack & Yellowfin	2.3.3	No (material score reduction expected to <80)	No (material score reduction expected to <80)	SIa: with the exception of the three shark species, there is absolutely no information presented in the report to document the status of the impacted populations of the ETP species known to be caught in the fishery and whether the UoAs are a threat to their protection and recovery. This deficiency, coupled with the expressions of uncertainty about post-capture mortality, means that for all of the cetaceans, Mobula rays, marine turtles and seabirds, the SG80 requirements are not met. The reason for this is that whilst SG60 can be satisfied by information about UoA-related mortality, SG80 also requires that some quantitative information is adequate "*...to assess UoA related mortality <u>and</u> impact <u>and</u> to determine whether the UoA may be a threat to protection and recovery of the ETP species.*" [My emphasis]. SG80 therefore tests three aspects of the information available, whilst SG60 considers just one. The scoring rationales presented for sharks contrast starkly with those for the other scoring elements in this regard, and show the deficiencies inherent in the information presented for those species very clearly. Indeed, the scoring rationales presented for cetaceans, mobula and marine turtles clearly indicates that the only score that could possibly be awarded for each of this taxonomic groups is less than 80:- *"A quantitative assessment of the level of mortality is available but there is expected to be a level of mortality from entanglement in FADs, and also some unobserved post-release mortality. The consequences for the status of cetaceans cannot therefore be fully evaluated. Information on post-release survival is missing."* *"A quantitative assessment of the level of mortality is available but there is expected to be a level of post-release mortality that has yet to be quantified. Thus, consequences for the status of mobula rays cannot be fully evaluated."* *"A quantitative assessment of the level of mortality is available but there is expected to be a level of mortality from entanglement in FADs that is unobserved. The consequences for the status of any species of marine turtles cannot therefore be fully evaluated. Information on post-release survival is missing as is information on rates of entanglement in FADs."*	Scoring rationales now present additional information For ceteceans and sea turtles there is some quantitiative information presented. The rationale is updated, the team considers that post release mortality is not necessary to meet the SG80, but rather the SG100. Information on entanglement in FADs based on literature is now included in PI 2.3.1	Accepted (no score change, additional evidence presented)

				Either additional information needs to be presented, or the scoring for all elements other than the three shark species should be reduced to 60 (note as well that this information should be presented specie-by-species and not just for taxonomic groups). For seabirds, the scoring at 80 seems appropriate.		

Skipjack & Yellowfin	2.3.3	No (scoring implications unknown)	No (scoring implications unknown)	SIb: the team's approach to the adequacy of information about sharks and in particular whale sharks is becoming haphazard. Prior to this SI, the perception has been from PI2.2.2 SId that information about shark finning in the Cook Islands and Vanuatu may have shortcomings. In PI2.3.2 SId further concerns were raised about the adequacy of information about whale shark interactions in Vanuatu and FSM. How can it be, therefore, that for this SI the team consider that the information available is adequate to measure trends and support a strategy for whale sharks? The rationale presented to support the SG80 score for whale sharks for this SI contains no information at all: it is just a rearranged version of the SG80 and SG100 scoring. No attempt is made to address the SG60 requirements. For seabirds, the assertion that the data from a single seabird capture is adequate to measure trends is risible. No trend can be determined from a single data point. The correct approach to adopt here would have been to look at the overall status and trends in the population of the species concerned, which would provide the information needed to meet the SG80 requirements.	The concerned raised by the Peer Reviewer regarding information and shark finnning has already been addressed in previous comments above. We note that for seabirds, we don't have a single data point, the observer program did not record any interactions with seabirds on other years, the absence of interactions are also considered data points.	

Skipjack & Yellowfin	2.4.1	Yes	Yes	SIb - the scoring rationale correctly identifies that the routine use of purse seines and the very low level of net loss would not impact VMEs; however the loss of FADs constitutes a potential risk to VMEs. Having got this far, the team present no evidence in the rationale (other than the estimate that at least 5% of FADs may become beached) to enable any objective evaluation of the location and extent of FAD impacts on VMEs. However a lot of relevant information is presented earlier in the report, summarising the findings of the Banks and Zaharia 2020 publication. This information should really be presented in the scoring here. The test for VME impacts being "serious or irreversible" is set out in SA3.13.4.1. There is no evidence in the report from a publication or a calculation performed by the team which shows that it is either "unlikely" or "highly unlikely" (i.e. <40th or <30th percentile respectively) that the loss of FADs will impact the habitat structure and function of VMEs in the UoA below 80% of the unimpacted level. The team cite Table GSA7 of the MSC Fisheries Standard to support their scoring. The reason for this is a complete mystery. That table has no direct relevance to the fishing metier under assessment here, nor to the habitats impacted here; indeed table GSA7 sets out an approach that is applicable to commonly encountered habitats (SIa) and not to VMEs (SIb). It seems more likely that the team are referring instead to Box GSA7. The text in this box that relates to habitats is not relevant to PI2.4.1 but to 2.4.2. In any case, the team seems to have taken this guidance and turned it on its head. The guidance actually states that in order to attain a score of 100 for a PI, it is necessary to take account of accidental contact and gear loss impacts. It does not state, as the team seem to suggest, that gear loss only needs to be taken into account at SG100. In any case, there is no rationale presented to justify the SG60 level being attained, nor any evidence in the report to show that the impacts of lost FADs on VMEs is at an appropriate level. In the absence of this information, SG60 is not met.	The scoring rationale has been expanded, pulling in detailed information noted in the Backgroud to support scoring. Additionally, a calculation estimating the potential impact of lost FADs on VMEs in the WCPO has been included. Box GSA7 was noted in the scoring rationale, not Table GSA7.	

Skipjack & Yellowfin	2.4.1	No (material score reduction expected to <80)	No (material score reduction expected to <80)	SIc - the scoring here is appropriate. Non-VME benthic habitats should be regarded as minor, and unless there is evidence about accidental contact and gear loss (see Box GSA7), then the SG100 score cannot be awarded.	Not change necessary	
Skipjack & Yellowfin	2.4.1			**Condition 8 (PI2.4.1 SIb):** This applies to a single SI and follows the narrative and metric form of the SI. Excellent.	No change necessary	
Skipjack & Yellowfin	2.4.2	No (material score reduction expected to <80)	No (material score reduction expected to <80)	SIa: The scoring is flawed in several key respects:- 1. Measures / partial strategy / strategy - the team is advised to look at the definitions set out in Table SA8 and then revise the scoring rationale accordingly. There is no evidence, as asserted, of a "strategy" to manage habitat impacts for this fishery, whether "in place" or not. For this fishery there is clearly no need for a partial strategy to manage seine impacts on habitats; however the management strategy for FADs can be regarded as a "partial strategy" for managing VME impacts. 2. "In place" - the scoring indicates that there is a "partial strategy" in place on the strength of the following rationale:- "*FAD closure periods are in place for the WCPO, there are limitations on the number of FADs deployed at sea at any one time by a vessel, and requirements to report lost FADs. These are measures that collectively <u>are considered to be a partial strategy</u> that is expected to restrict the potential impact of lost FADs on habitats and achieve the SG80 level for Habitat Outcome, <u>even though this is yet to be demonstrated</u>. Nevertheless, <u>we have not seen any evidence that there is an effective strategy in place for managing the numbers of drifting FADs or dealing with any lost FADs.</u>*" [My emphasis] It is abundantly clear from this rationale that the team has not seen any evidence of the implementation of the FAD management strategy. Since this is the "partial strategy" for managing VME impacts; and thus there is clearly no "partial strategy" in place to meet the SG80 requirements. In order to meet the SG80 requirements, the team need to present evidence that the partial strategy is in place and that there is some basis	Based on comment provided by the review the rationale has been modified accordingly.	Accepted (no score change, additional evidence presented)

				for expecting it to attain the SG80 requirements for PI2.4.1 (for instance, are the UoA fleet switching to biodegradable non-entangling FADs?).		
Skipjack & Yellowfin	2.4.2	No (scoring implications unknown)	No (scoring implications unknown)	SIa: There are also some procedural issues with the scoring approach:- 1. Scoring approach - the team has in this instance adopted the "reverse scoring" approach. The SG100 requirements are considered SG100 requirements in the second paragraph; SG80 is considered in the third paragraph; and there is no explicit consideration of the SG60 requirements anywhere. The team needs to turn this around in order to score in accordance with the sequence set out in FCP v2.2 at 7.17.7. 2. Move-on rule - the team has set out a rationale in SIb for not applying the MSC's mandatory move-on rule (which applies at SIa). The absence of that rationale here is a significant omission; perhaps more significant is that the team seemed unaware of the existence and	The reverse scoring approach has been removed. The move on rule iwhich was discussed in detail under Sib will be to SIa.	Accepted (no score change, additional evidence presented)

				significance of the MSC derogation and interpretation for move-on rules issued in November 2020.		

Skipjack & Yellowfin	2.4.2	No (material score reduction expected to <80)	No (material score reduction expected to <80)	SIb: the scoring rationale is muddled, presents no information from the UoAs, and does not support the score awarded. There are several reasons for this:- 1. The MSC requirements at SG60 do indeed include the need for a move-on rule, but for SIa. Not for SIb. The text about move-on rules is irrelevant to this SI and should all be removed. 2. The rationale also includes the statement that:- "*The guidance of the standard itself in GSA3.14.2.2 states that a partial strategy for the UoA may not be required to meet the requirements outline in SA3.14.2.2 if it is a low-impacting bottom gear. As noted above this is a low-impact gear. This meets the requirements of the SG 60 and SG 80 levels but not of the SG 100 level*" Again, this is guidance for SIa and not SIb, so this part of the rationale should also be removed. With this the (incorrect) basis for scoring this SI at 60 or 80 is also removed, so the correct information now needs to be provided. 3. The existing rationale provides no evidence to show why the measures or partial strategy in place for FAD management are "likely to work", let alone any evidence of an "objective basis for confidence" that they "will work". The evidence presented is limited to a brief description of some of the FAD management measures agreed by WCPFC. There is no evidence that measures have been developed with any consideration whatsoever of FAD impacts on VMEs, or indeed that the FAD management strategy itself is being implemented effectively (with the corresponding beneficial impact on VMEs). The sort of evidence that is needed here might include:- How many FADs are lost per year? How has the FAD management strategy reduced FAD loss? How many biodegradable FADs are now being used? Has there been any sign of a reduction in the number of beached FADs in the UoA? And so on.	Additional text has been provided address the reviewers comments. The team has reduced the score for VME scoring element to 60	Accepted (material score reduction to <80)

				On the basis of the information set out in this rationale, SG60 is not met, let alone SG80.		

Skipjack & Yellowfin	2.4.2	No (change to rationale expected, not to scoring)	No (change to rationale expected, not to scoring)	SIc: Whilst it is clear that the routine operation of purse-seines and FADs is monitored and represent "measures" that are being implemented effectively, there is no evidence presented in the report at all to show that the FAD management strategy is being implemented successfully. This is the "partial strategy" which is necessary to address potential VME impacts which are the only reason why PI2.4.1 s scores <80. It is noted that in the rationale for SId the team state that:- "*...we have seen no quantitative evidence of adequate efforts to ensure protection afforded to VMEs associated with potential impacts from derelict FADs.*" This statement points to a lack of evidence to meet the requirements of this SI (SIc) with regard to successful implementation, and indicates that the SG80 score cannot be attained unless and until this new information is provided. A score of <80 here would be consistent with the information that the team has presented elsewhere in the report.	Additional text has been provided address the reviewers comments. The team has reduced the score for VME scoring element to 60	Accepted (material score reduction to <80)
Skipjack & Yellowfin	2.4.2	No (scoring implications unknown)	No (scoring implications unknown)	SId: the scoring rationale once again does not address the issues tested by this SI. Here we are meant to be looking for evidence of compliance with measures / partial strategy / strategy; not with implementation. It would seem likely that there are data available to show that the UoA complies with its own management requirements concerning FADs. If these data are presented here then SG60 can be met. SG80 and SG100 require quantitative evidence of two things: both compliance with management requirements within the UoA <u>and</u> compliance with protection measures afforded to VMEs by other parties. The scoring rationale already acknowledges that there is inadequate knowledge of the VME protection measures that may be implemented by other parties, so it is clear that SG80 cannot be met here.	Additional evidence has been provided in the rationale. The assessment team did not find evidence of protection measures afforded to coral reefs from impacts from DFAD, the team evaluated compliance of the UoA with existing management requirements.	Accepted (no score change, additional evidence presented)

Skipjack & Yellowfin	2.4.3			**Condition 9 (PI2.4.2 SId):** This does not follow the narrative and metric form of the corresponding SI.	This issue has been addressed.	Accepted (no score change, additional evidence presented)
Skipjack & Yellowfin	2.4.3	No (material score reduction expected to <80)	No (material score reduction expected to <80)	SIa & b: the key shortcoming here is that the team has not paid any regard in its presentation of the information to acknowledge the different geographic extent of the UoAs described in section 5.1.1 of the report. The USA have a larger UoA than the others, which must therefore include habitats that are not in the other UoAs. There is not even a map in the report to show this difference, and it is heard to relate the maps showing the extent of habitats and FAD beaching to the description of the UoA. It would be very helpful indeed to include better information in the report showing the extent of each UoA and the habitats within them.	Given the large expanse of the area of operation of the UoA the assessment has focused on the WCPO regional scale. There is not a significant difference in terms of geographic extent of the UoA, the main difference is that the US vessels also operate in the EEZ areas of Fiji and Samoa and A map is now included under section 3 of the WCPFC and EEZs	Accepted (no score change, additional evidence presented)
Skipjack & Yellowfin	2.4.3			**Condition 10 (PI2.4.3 SIb):** This does not follow the narrative and metric form of the corresponding SI.	This issue has been corrected.	Accepted (no score change, additional evidence presented)

Skipjack & Yellowfin	2.4.3	No (scoring implications unknown)	No (scoring implications unknown)	SIc: the scoring here relies on the assertion that there is a FAD tracking program in place. Where is the information to support this assertion? In the absence of this information in the scoring rationale the score cannot be justified. Incidentally, there is a reference to some relevant information earlier in the report, but not in the scoring rationale here, nor is the relevant report cited as a reference.	The rationale has been updated to address the concernes raised by the PR, the FAD tracking program is in place.	Accepted (no score change, change to rationale)

Skipjack & Yellowfin	2.5.1	No (change to rationale expected, not to scoring)	No (change to rationale expected, not to scoring)	SIa: it is clear that the ecosystem has been studied and the impacts of fishing on the ecosystem have been evaluated. What is not clear from the rationale of how or why it is both "unlikely" (≤40th percentile) and "highly unlikely" (≤30th percentile) that the UoA will disrupt the key elements underlying the ecosystem (sensu Table SA8). If quantitative analysis is not possible, the team is required to follow the process set out in SA3.16.5 and has not done so. A key difficulty here is that the team has not defined the "key elements" of the ecosystem *sensu* SA3.16.3. This would help the team to determine the issues of importance for this PI and the extent to which the UoA has an impact on them. The scoring rationale requires revision to explicitly justify the score awarded in the terms required by the MSC. The rationale presented here does not reflect the range of information available or presented earlier in the report. The rationale states that:- "*As described in the background there has been a range of models of the structure and functioning of the pelagic ecosystems developed that support the main tuna fisheries and their responses to fishing and climate change (e.g. Allain et al. 2007, Allain et al. 2015, Kitchell et al. 1999, Lehodey et al. 2013, Leroy et al. 2013, Sibert et al. 2006).* *There have been substantial impacts from the depletion of the main target species, but although the trophic level of the catch had decreased slightly, no such decrease was apparent in the population trophic level (Sibert et al., 2006). Other modelling (Allain et al. 2015) suggests that the structure of the warm pool/cold tongue ecosystem is resistant to considerable perturbation (e.g. large changes in the harvest of the surface fish community).* *Overall, findings indicated that tuna fishery impacts on top-level predators in the Pacific Ocean were substantial but that ecosystem impacts were likely to be minor. These studies suggest it is unlikely that neither the UoA fishery in particular nor the whole WCPFC tuna fishery, are having an irreversible impact on ecosystem structure or functioning to a point where there would be a serious or irreversible harm.*" However the narrative text includes the following information:-	The rationale has been modifed to reflect the identification of two key elements of the ecosystem.	Accepted (no score change, additional evidence presented)

				"*Ecosystem modelling indicated that adult skipjack and yellowfin have critically important ecosystem roles. Their removal evoked substantial and sustained changes in the structure of the system (Kitchell et al., 1999).*" It is very difficult to reconcile these two statements, and it feels as if the rationale is telling a selective part of the story here, rather than providing a balanced, objective and critical appraisal.		

Skipjack & Yellowfin	2.5.2	No (change to rationale expected, not to scoring)	No (change to rationale expected, not to scoring)	SIa: the rationale presented does not follow the MSC's scoring requirements. Having established that various WCPFC CMMs represent elements of a "partial strategy" it is first necessary to show how these meet the SG60 requirements and than the SG80 requirements. This has not been done, and the rationale needs to be revised to show explicitly how SG80 is met. Finally, the scoring could be made much stronger here and for the rest of PI2.5.2 if it took account of the WPRFMC Fishery Ecosystem Plan which sets out objectives that are directly relevant to scoring PI2.5.2. This FEP was published in 2005 and is cited in PI3.1.1 but is not mentioned anywhere in this PI.	The rationale has been modifed to first show how SG60 requirements are met, and then how SG80 requirements are met. The WPRFMC Fishery Ecosystem Plan is applicable to the US, however, we opted to evaluate management at the larger WCPFC level.	Accepted (no score change, additional evidence presented)
Skipjack & Yellowfin	2.5.2	No (non-material score reduction expected)	No (non-material score reduction expected)	SIb: the rationale presented does not follow the MSC's scoring requirements and does not address the issue tested by this SI. Please revise this rationale to first of all show that there is a "*plausible argument*" that the measures are "*likely to work*" (SG60) and then to explain to what extent the information from the UoA and ecosystem provides an "*objective basis for confidence that the measures / partial strategy will work*" (SG80).	The rationale has been modifed to clearly indicate how SG 60 and SG80 are met.	Accepted (no score change, additional evidence presented)

Skipjack & Yellowfin	2.5.2	No (scoring implications unknown)	No (scoring implications unknown)	SIc: There is insufficient evidence presented here to justify a score of 100. That score requires that there is both clear evidence that "*...the partial strategy / strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).*" [My emphasis] To justify the SG100 score, the team must state the objective of the "strategy that consists of a plan" for this ecosystem (SIa) and show that it is being achieved. This cannot be done, because this objective does not exist. Further to this, the "partial strategy" in place in the WCPFC region is composed of various CMMs including those for target and non-target species. As the team has already noted in the scoring of PI2.2.2 and 2.3.2 there are significant issues of concern about the implementation of aspects of this "partial strategy" such that there cannot be "clear evidence" that it is being implemented. The available evidence, therefore, is that there is a partial strategy and that some aspects of it are being implemented successfully. SG80 is met, but no more.	We thank the reviewer for their insight and the rationale has been modified accordingly.	Accepted (non-material score reduction)
Skipjack & Yellowfin	2.5.3	No (scoring implications unknown)	No (scoring implications unknown)	SIa: the rationale details some of the information gathering initiatives in place, but does not state what the key elements of the ecosystem are. SG60 requires simply that "*Information is adequate to identify the key elements of the ecosystem.*". So, what are these elements (sensu SA3.16.3)? If they cannot be listed, SG60 is not met. Some of the things that have been listed are descriptors of the key elements (such as stomach contents) rather than being key elements per se. SG80 requires evidence that these key elements are broadly understood. It is here that things like the stomach contents and isotope studies should be mentioned - and not just listed, but described in a way that demonstrates the level of understanding.	We thank the reviewer for their insight and the rationale has been modified and key elements have been identified.	Accepted (no score change, additional evidence presented)

Skipjack & Yellowfin	2.5.3	No (material score reduction expected to <80)	No (material score reduction expected to <80)	SIb: as for SIa, the scoring here is compromised by the initial failure to define what are considered to be the "key elements" of the ecosystem. The rationale states is that there is are some ecosystem models in existence. But that is pretty much it. There is no evidence in the rationale showing what the model outputs reveal and which would provide evidence that an impact can either be inferred (SG60) or has been investigated in detail (SG80). Without such evidence for this and other "key elements", the scoring is not justified.	We thank the reviewer for their insight and the rationale has been modified and key elements have been identified and additional information on these key elements of the ecoystems is now included in the rationale	Accepted (no score change, additional evidence presented)
Skipjack & Yellowfin	2.5.3	No (non-material score reduction expected)	No (non-material score reduction expected)	SIc: scoring here at SG100 is wholly unjustified, as evidenced by the scoring for PI2.3.3 & 2.4.3. Since these PIs score less than 80, it cannot be the case that impacts of the UoA on "*...ETP species and habitats are identified...*". A score of 80 would be appropriate here, but no more.	We thank the reviewer for their insight and the score has been reduced accordingly.	Accepted (non-material score reduction)
Skipjack & Yellowfin	2.5.3	No (material score reduction expected to <80)	No (material score reduction expected to <80)	SId: The rationale does not clearly show how the SG80 requirements are met. The rationale currently states that:- "*The information gathered is sufficient to identify species impacted and SG 80 requirements are met.*" This is not, however, what SG80 requires. The rationale requires revision to provide the necessary level of detail and to show not only that the information is available but also that it allows "*...some of the main consequences for the ecosystem to be inferred.*"	The reationale has been modified to address the reviewers comments.	Accepted (no score change, additional evidence presented)
Skipjack & Yellowfin	2.5.3	Yes	No (change to rationale expected, not to scoring)	SIe: once again, the failure to identify the "key elements" in SIa makes it hard to evaluate here whether the data being collected are adequate to detect an increase in risk level. As it stands, the rationale only makes reference to monitoring of interactions with non-target tuna and billfish species. This is only part of the data collection programme described earlier in P2. The rationale should therefore be revised to provide a more comprehensive summary of the wide range of monitoring work underway for other species, which together comprise the monitoring arrangements that would detect an increase in risk level.	The reviewer has referred to PI 3.1.1 e however there is no scoring element e in PI 3.1.1.	NA (No response needed)

Skipjack & Yellowfin	3.1.2	Yes	No (scoring implications unknown)	The scoring is well justified, supported by the information relevant to the RFMO and national levels of management and is thoroughly referenced. What is missing is a clear statement of why SG60 is met, followed by SG80 and then SG100. Each SI simply concludes with a statement which condenses and conflates the requirements of each SG. To meet the FCP v2.2 scoring requirements this conclusion needs to be revised and restated SG-by-SG.	Text has been updated to include statements of achievement against each of the SG levels as suggested by the reviewer.	Accepted (No score change, change to rationale)
Skipjack & Yellowfin	3.1.3	No (change to rationale expected, not to scoring)	No (change to rationale expected, not to scoring)	The scoring rationales are again excellent. The team has failed, however, to collate the scoring at the end of the PI and it appears that there is a disparity between the scoring proposed in this PI table and that summarised in section 7.1 of the report. Based on this PI table it would seem that:- USA, NZ, SI, CI - score 85 FSM, Chinese Taipei, VU - score 80 In section 7.1 s score of 80 is indicated for SI. Again, it is necessary for each SI and each SG to specify why SG60 is met, then SG80 and so on.	Text has been updated to include clearer statements of achievement against each of the SG levels as suggested by the reviewer; more emphasis has also been placed on scoring of the overarching management system as outlined in GSA4.5.	Accepted (No score change, change to rationale)
Skipjack & Yellowfin	3.2.1	No (change to rationale expected, not to scoring)	No (change to rationale expected, not to scoring)	The scoring is appropriate - however a major omission is a statement of the RFMO's long-term objectives, given that this is "*the focus of this scoring issue*". Again, the team need to attend to the FCP v2.2 requirement to show exactly how SG60 is met before scoring SG80 and so on.	the RFMO's overarching objective has been added; and text has also been revised to include statements of achievement against each of the SG levels as suggested by the reviewer.	Accepted (No score change, change to rationale)
Skipjack & Yellowfin	3.2.1	No (scoring implications unknown)	No (scoring implications unknown)	The scoring rationale presently lists the measures relevant to the fishery, but not the fishery-specific objectives (these are listed already in section 7.1.1.1 of the report, and just need to be copied across). Finally, the team needs to amend the score awarded for the PI. The text presently states "Score?". The score awarded is 90.	Wording in the rationale added indicating WCPFC objectives are implicit within the fishery-specific management system. Score of 95 awared for PI	Accepted (no score change, change to rationale)

Skipjack & Yellowfin	3.2.2	No (scoring implications unknown)	No (scoring implications unknown)	SIb: although a very good description of the nature of the decision making processes is provided here, none of the text addresses the key issue, which is the responsiveness of the decision making processes. It would seem appropriate here to determine what the team regard as "*serious issues*" and what are "*other important issues*". For each UoA it is then necessary to demonstrate that it is responded in a "*transparent, timely and adaptive manner etc*" to justify first the SG60 and then the SG80 score.	As stated in the rationale, the team considers serious and other important issues identified in relevant research, monitoring, evaluation and consultation, as those issues brought up through the inter-sessional scientific and MCS working groups and committees. The rationale provides examples of responsiveness of the decision making process	Accepted (no score change, change to rationale)
Skipjack & Yellowfin	3.2.2	No (scoring implications unknown)	No (scoring implications unknown)	SIc: the rationale is rather muddled. It starts by stating that the WCPFC is the focus for decision making processes, and that the role of the PNA and flag states is subordinate. It then goes on to state that the PNA has not adopted the precautionary approach before going on to conclude that "*...the decision making processes for the WCPFC and PNA are based on the precautionary approach and use the best available information, meeting SG80.*" There is clearly a need to clarify the rationale here so that there is a clear and logical argument to justify the SG80 score.	Scoring at SG80 recognises the primacy of established WCPFC scientific committee and plenary processes that use the best available information to inform decision making in accordance with the UNFSA and the WCPF Convention. WCP Yellowfin and Skipjack stocks are sustainably fished; although previous management performance with respect to the WCP Bigeye stock, including less adherence to the precautionary approach, has been less impressive. However the UoA does not include Bigeye in this case. The report text notes that PNA has not explicitly adopted the Precautionary Approach however precautionary actions are implicit in PNA decision making. The SG80 score for PI 3.2.2c is also consistent with/harmonised with similar and recent WCPFC purse seine skipjack and yellowfin tuna MSC assessments.	Accepted (No score change, change to rationale)

Skipjack & Yellowfin	3.2.2	No (score increase expected)	No (score increase expected)	SId: if it is indeed the case that the transparency of the management system at the national level that should be tested here and not the WCPFC, then evidence needs to be presented for each and every Flag State to show that the SG80 requirements are met. As the scoring currently stands it appears that only the Solomon Islands' accountability and transparency has been scrutinised. No evidence is presented to show how SG60 is met for each UoA or the WCPFC. For SG80 the rationale provides only an assertion and no supporting information to show how information is made available. Is it, for instance, published on a website, or is their a formal system in place to enable interested parties to obtain information? Are minutes of meetings available? Do they show and explain how relevant information was taken into account and the actions taken in response to this information was determined? Is there a recent example of this happening? As is stands, there seems to be insufficient evidence to support the score awarded.	Text has been revised to reflect that accountability and transparency of management system and decision-making processes has been assessed at the regional (WCPFC) level rather than the national level.	Accepted (No score change, change to rationale)
Skipjack & Yellowfin	3.2.2			Condition 11-1 (PI3.2.2 SIb) Condition 11-2 (PI3.2.2 SIb & d) Both conditions are appropriate and follow the narrative and metric form of the corresponding SIs.	No response neccessary	NA (No response needed)

Skipjack & Yellowfin	3.2.3	Yes	Yes	SIe: again the scoring is not sufficiently clear to meeting FCP v2.2 requirements. The first step in scoring this SI should be to address the SG60 requirements, then SG80, and then SG100 which has not been done. Nonetheless, it is apparent that the fishery is not subject to continuing court challenges (SG60), or is it attempting to comply with judicial decisions (SG80) and that in fact there is a management system in place that acts proactively to avoid disputes arising (SG100). There is probably, therefore, an argument to award a higher score for this SI.	Addressed under PI 3.2.2 e rather than 3.2.3 as suggested here. Text updated to more clearly step through performance against SG60, SG80 and SG 100.	Accepted (No score change, change to rationale)
Skipjack & Yellowfin	3.2.3	No (material score reduction expected to <80)	No (material score reduction expected to <80)	SIa - the scoring is appropriate.	No response neccessary	NA (No response needed)

Skipjack & Yellowfin	3.2.3	No (scoring implications unknown)	No (scoring implications unknown)	SIb - The rationales are not adequate to support scoring at SG80 across all of the UoAs. SG80 requires not just that sanctions exist (this is clearly the case for all UoAs) but they are consistently applied (this evidence is not provided for all UoAs) and that they are thought to provide effective deterrence (again, evidence of this is not provided). It is a matter of some concern that the team state that there is a lack of transparency about non-compliance reporting and responses to non-compliance at the WCPFC level, which prevent scoring at the SG80 level. Further to this comment it is noted that the rationale describing sanctions and deterrents for the PNA relies entirely on information from what appears to be another MSC assessment (Blyth-Skyrme et al 2017). It is hard to be sure about this because the team has neglected to include the report in the references; it could be something different. However given the nature of the comments and the identity of the author it is reasonable to surmise that this is the 2017 PCR for the PNA tuna fishery. If this is the case, there is a significant flaw in the rationale here - the PNA assessment considers different UoAs to those under consideration here. It is plainly inappropriate to transpose conclusions from one set of flag states and apply them to another without any justification. Further to this the 2017 PNA report is now out of date - it refers to a situation 5 or more years ago. On the basis of the information presented, a score of less than 80 for this SI seems to be more appropriate. If information is presented that is clearly and directly relevant to the UoAs under assessment (and is more recent), a higher score would be appropriate.	Use of Blythe Skyrme et al 2017 reflects the inclusion of 2 PNA member countries in the UoA for this assessment. Blythe-Skyrme is supplemented by additional and more recent evidence and information. Text has been updated and additional evidence provided to further substantiate scoring at SG80 level for all jurisdictions in the UoA.	Accepted (no score change, change to rationale)

Skipjack & Yellowfin	3.2.3	No (material score reduction expected to <80)	No (material score reduction expected to <80)	SIc - the evidence presented here does not appear to fully justify the score proposed for several reasons. 1. The first issue, as noted above, is that the scoring relies on evidence set out in a report (Blyth-Skyrme et al 2017) which considers a different set of flag states to those under assessment here. Given that the authors here note that "...individual flag states play an important role in ensuring arrangements are complied with...", it is plainly inappropriate to transpose conclusions from one set of flag states and apply them to another without any justification. 2. The data are out of date. Blyth-Skyrme et al 2017 cite reports for 2015 and 2016 in support of their scoring; however those data are now 5 or more years old and of questionable relevance. 3. The WCPFC has a permanent working group on compliance (TCC), which the team state produces annual reports. If so, where are they? What do they show? (Or is it the case, as reported in SIb above, that there is a "..lack of transparency in non-compliance report and responses to non-compliance..")? For SIb this rationale is presented to indicate that WCPFC measures do not meet SG80 requirements; however in SIc the TCC reports are cited in support of attainment of SG80. This seems to be inconsistent. It is not at all clear why the assessment team for this fishery been unable to provide more recent evidence that is directly relevant to these UoAs. This needs to be rectified to justify a score of 80 here. On the basis of the information presented, a score of less than 80 for this SI seems to be more appropriate. If information is presented that is clearly and directly relevant to the UoAs under assessment (and is more recent), a higher score would be appropriate.	Note above comments in relation to use of Blythe-Skyrme et al for this assessment. Reference is also made to reports of the WCPFC TCC. Text has been updated and additional evidence provided to further substantiate scoring at SG80 level	Accepted (no score change, change to rationale)

Skipjack & Yellowfin	3.2.3	No (material score reduction expected to <80)	No (material score reduction expected to <80)	SId - The scoring rationale states that:- "*The information presented throughout the analysis for PI 3.2.3 above suggests no evidence of systematic noncompliance.*" The only detailed evidence presented earlier in PI3.2.3 is for SIa and SIb, which covers the monitoring, compliance and surveillance activities carried out at the regional and national level (SIa); and the sanctions in place and their effectiveness as deterrents (SIb). The "evidence of compliance" (SIc) relies almost entirely on a report for another MSC certified fishery which has different UoAs and which used data that is now 5 or more years old. The summary presented of the TCC 15 CMR report submitted in 2019 suggests that the level of compliance varies considerably between flag states:- "*...the TCC 15 CMR report to the Commission in December 201949 identifies that non-compliance occurs and that the range of offences varies from minor (such as late submissions of reports), to more serious issues, such as not complying with the conditions of FAD closures or unauthorized fishing.*" Closer inspection of this report shows that the TCC recorded a number of "priority non-compliant" issues for some of the UoA flag states including Chinese Taipei, FSM and Vanuatu over key issues of importance to the MSC Standard and the scoring of the fishery including observer coverage and transhipment. Taking the CMR report and this quote together, it would seem that for at least some of the UoAs there are concerns about non-compliance on some key aspects of the fishery which warrant further scrutiny. It is clear that more information is required to justify scoring this SI at SG80 and also that this should be done UoA-by-UoA rather than as a blanket appraisal.	Note above comments in relation to use of Blythe-Skyrme et al for this assessment. This report has been added to References list for this assessment. Reference is also made to analysis of recent reports of the WCPFC TCC and how these inform judgements about systematic non-compliance. It is suggested that instances of non-compliance, some of which are more serious e.g. infringements of recenty introduced FAD management measures, or observer program infringements, do not amount to examples of systematic non-compliance. Text has been updated and additional evidence provided to further substantiate scoring at SG80 level	Accepted (no score change, change to rationale)
Skipjack & Yellowfin	3.2.3			**Condition 13 (PI3.2.3 SIa):** This does not follow the narrative and metric form of the corresponding SI.	Text updated to reflect the narrative and metric form of the corresponding SI.	Accepted (no score change, change to rationale)

Skipjack & Yellowfin	3.2.4	Yes	Yes	References - given that the scoring of much of this PI relies on the findings in Blyth-Skyrme et al 2017, it really should be cited in the references for this PI. Whilst adding the citation, please add a full reference to this publication in section 8. It is not listed. The scoring is well justified, supported by the information relevant to the RFMO and national levels of management and is thoroughly referenced. What is missing is a clear statement of why SG60 is met, followed by SG80. Each SI simply concludes that "SG60 and SG80 requirements are met...."	Blythe-Skyrme et al added to reference list for PI and to References section. Statements to clarify achievement against each SI have been included as suggested.	Accepted (no score change, change to rationale)

8.10 Stakeholder input

No written or verbal stakeholder submissions were received during consultation opportunities listed in FCP 7.15.4.1.

Organization	Representative	Stage	Medium of submission (verbal/written)	Summary of verbal sub. /Section in report written sub.
ISSF	NA	ACDR	Attachment to email submission	Copy of written submission at ACDR and response is included below.

8.10.1 ISSF Comments ACDR

General comments	Evidence or references	CAB response to stakeholder input	CAB Response Code
<u>Cumulative impacts</u> ISSF is concerned the ACDR does not address cumulative impacts on Principle 2 components. Although some fisheries do not meet the MSC guidance requirements that trigger the evaluation of cumulative impacts, this does not mean that existing cumulative impacts are not significant. This is especially evident in terms of ETP species, as current guidance considers that the combined impact needs to be evaluated “only in cases where either national and/or international requirements set catch limits for ETP species”. However, we consider that cumulative impacts to ETP species mortality should be assessed in reference to the species’ biological limits, stock assessment results, and management advice, regardless of whether catch limits are in place or not (e.g. when management advice requests to reduce catches but catch limits are not agreed). Additionally, there are currently a number of Western and Central Pacific Ocean purse seine and longline tuna fisheries	- https://fisheryprogress.org/directory	Thank you for your suggestions regarding a consideration of a joint assessment for cumulative impacts on ETP species and other issues across MSC certified and prospective fisheries. The MSC standard requires that the 'the combined impacts of MSC UoAs needs to be evaluated, but only in cases where either national and/or international requirements set catch limits for ETP species' (Standard v2.01, GSA3.1.9). In response to this follow-up comment submitted at the PCDR stage, we have expanded the rationale for ETP species, including information on the population status of these species. We've highlighted to MSC the importance of providing a database for CABs that would allow assessors to clearly idenitfy other fisheries that may impact specific ETP species/populations.	Accepted (no score change)

involved in Fishery Improvement Projects (FIPs), some of them with prospects to proceed to a full MSC assessment in the near future. Although the MSC standard only requires cumulative effects to be evaluated and managed for MSC-certified fisheries (including those in evaluation) under overlapping UoAs, we believe these should be carefully assessed (for ETP species, as well as other P2 components such as habitats) and managed for all tuna fisheries with MSC aspirations. All currently certified and prospective MSC tuna fisheries should conduct a joint assessment for cumulative impacts on ETP species in the Western and Central Pacific Ocean and prepare a joint management strategy. The fishery client could coordinate with already certified fisheries, fisheries under assessment, and also seek support on this task from Western and Central Pacific Ocean FIPs.			

Fishery description and FAD management ISSF suggests the client provides complete background information in the assessment report covering the following: GENERAL FISHERY DESCRIPTION A complete dFAD fishery description section must include information on all fishery's operations, including the use of FADs. For example, information required to correctly evaluate impacts would include: number of FADs deployed annually, design and materials of FADs, FAD marking system used (if any), number of FAD tracking buoys purchased annually and/or average number of buoys active. FAD MANAGEMENT STRATEGY ISSF recommends that the PCDR includes a description of the fishery's FAD management strategy. A comprehensive FAD management plan would comprise data collection and analysis to address FAD impacts on habitat and P2 species, including cumulative effects with other tuna fisheries in the Western and Central Pacific Ocean (see comment on cumulative impacts). Such FAD management plan could be informed by, and developed to comply with all best practices identified in, ISSF´s Technical Report 2019-11 on Recommended Best Practices For FAD Management In Tropical Tuna Purse Seine Fisheries. Moreover, the fishery's FAD management plan could be further informed by ISSF Technical Report 2018-19A Workshop for the Reduction of the Impact of Fish Aggregating Devices' Structure on the Ecosystem. Please see below the six elements of FAD management that ISSF considers to be of utmost importance, as well as some practical examples the fishery could adopt to implement them. For further examples and recommendations, please see ISSF Technical reports 2019-11 and 2020-11. Moreover, ISSF recommends that the client fishery develops a public FAD Management Plan in the line of what is required by ISSF Conservation Measure 3.7 Transactions with Vessels or Companies with Vessel-Based FAD Management Policies (effective June 2021).	- ISSF non-entangling and biodegradable FADs guide https://iss-foundation.org/knowledge-tools/guides-best-practices/non-entangling-fads/download-info/non-entangling-and-biodegradable-fads-guide-english/ - ISSF Technical Report 2019-11 https://iss-foundation.org/knowledge-tools/technical-and-meeting-reports/download-info/issf-2019-11-recommended-best-practices-for-fad-management	The assessment team agrees there are opportunity to better characterize the fishery. The more detailed information suggested on FADs was not available to the assessment team, resulting in several conditions on Pis 2.4.x The report includes a description of requirements for FADs as described in CMM 2018-01, however, the fishery itself does not have a FAD management strategy in place, this is one of the reasons a condition was raised in 2.4.2 Regarding the recommendations on the FAD Management Plan, these will be shared directly with the client.	

(1) Comply with flag state and RFMO reporting requirements for fisheries statistics by set type Provision to WCPFC of routine FAD fishery statistics (e.g. activity on FADs, number of active FADs, etc.) as per WCPFC CMMs (e.g. 2018-01, 2013-05) requirements is essential to assess and manage the impacts of FAD fisheries. ISSF suggests that information on FAD fishery statistics as well as information on observer data (100 % coverage) as per WCPFC requirements are provided to flag States, WCPFC and the Science Provider. **(2)** Voluntarily report additional FAD buoy data for use by RFMO science bodies In order to meet ISSF´s best practices on this aspect, ISSF recommends the client fishery provides information on position and acoustic record for the whole track or, alternatively, at least one position and echosounder record per day to scientific research institutes or to WCPFC and the WCPFC Science Provider. **(3)** Support science-based limits on the overall number of FADs used per vessel and/or FAD sets made In order to meet WCPFC's Recommendations and ISSF´s best practices for limiting the number of FADs and to strengthen the effectiveness of these FAD measures, ISSF recommends committing to actions such as (i) deploying only FADs with satellite tracking buoys , (ii) not activating remotely the buoys of inactive FADs in the water (i.e. dormant FADs), (iii) allowing buoys to report at least once per day while they are in the water, and (iv) adopting alternative possible measures such as FAD closures to reduce their impact. **(4)** Use only non-entangling FADs to reduce ghost fishing o A new ISSF non- entangling and biodegradable FADs guide was published on August 2019 and, thus, ISSF encourages fisheries to commit to the new definition of fully non-entangling FAD (without any netting). This will allow following the best practice of Technical Paper 2019-11 to commit to using only non-entangling FADs. o ISSF encourages incorporating in the FAD management plan actions to reduce and remove entangling FADs from the water, including encountered FADs not owned by the fishery client. **(5)** Mitigate other environmental impacts due to FAD loss	-in-tropical-tuna-purse-seine-fisheries/ - ISSF Technical Report 2018-19 https://iss-foundation.org/knowledge-tools/technical-and-meeting-reports/download-info/issf-2018-19a-workshop-for-the-reduction-of-the-impact-of-fish-aggregating-devices-structure-on-the-ecosystem/ - ISSF Technical Report 2020-11 https://iss-foundation.org/knowledge-tools/technical-and-		

including through the use of biodegradable FADs and FAD recovery policies ISSF recommends the FAD management plan incorporates specific actions to address the impact of FAD losses. For example, ISSF suggests the fishery under assessment works towards an early adoption of biodegradable FADs in the Pacific Ocean and the construction and deployment of simpler, smaller biodegradable FADs. Moreover, ISSF encourages FAD fisheries to further develop good practices to reduce the loss and abandonment of FADs as described in Technical Paper 2019-11 and Technical Paper 2018-19. For example, by (i) providing FAD track data till the end of their lifetime to identify areas of high incidence of stranding events, (ii) providing positional data on beached FADs to enable targeted recovery, and (iii) participating in cooperative efforts to recover FAD from the water and remove stranded FADs. The assessment report should include a detailed description of the number of FADs recovered by the fishery and the recovery strategy/plan in place and technology used. **(6)** For silky sharks (the main bycatch issue in FAD sets) implement further mitigation efforts ISSF supports the adoption by the fishery under assessment of measures to reduce shark bycatch (e.g. developing and implementing a Code of Good Practices for bycatch) and suggests the fishery further develops measures to ensure that silky shark mortality is reduced (e.g. directing more effort to school sets and decrease FAD sets, avoiding small sets or with high bycatch/tuna ratio, releasing sharks from the net when safe and practical, implementing live and safe release of sharks (and rays) from the deck). ISSF encourages FAD fisheries to further test and develop shark and rays release techniques from the deck (with a special focus on big individuals) and to identify the tools/tactics used to the safe release of sharks (hoppers, stretchers, release ramps, etc.).	meeting-reports/download-info/issf-2020-11-recommended-best-practices-for-tropical-tuna-purse-seine-fisheries-in-transition-to-msc-certification-with-an-emphasis-on-fads/ - C.M. 3.7. https://iss-foundation.org/what-we-do/verification/conservation-measures-commitments/bycatch-mitigation-3-7-transactions-with-vessels-or-companies-with-vessel-based-fad-management-policies/		

Score alignment ISSF notes some discrepancies in scoring with other similar fisheries currently certified or under assessment. As an example, some Ecosystem related PIs (2.5.X) have not met SG80 in other dFAD Western and Central Pacific ocean fishery assessments (e.g. 2.5.1 for the certified PNG Fishing Industry Association's purse seine Skipjack & Yellowfin Tuna Fishery, or 2.5.2 for the currently under assessment Micronesia Skipjack, Yellowfin and Bigeye Tuna Purse Seine Fishery). ISSF suggests the CAB study these differences and takes them into account when moving from preliminary scores to PCDR scores.	- https://fisheries.msc.org/en/fisheries/png-fishing-industry-associations-purse-seine-skipjack-yellowfin-tuna-fishery/@@assessments - https://fisheries.msc.org/en/fisheries/micronesia-skipjack-yellowfin-and-bigeye-tuna-purse-seine-fishery/		Accepted (no score change)
Traceability ISSF is concerned that given that some vessels from the UoC may fish in non-UoC geographic areas, in cases where there were both UoC-caught and non-UoC-caught fish aboard a vessel, the risk of mixing catches might jeopardize the final product's traceability. In order for the fishery to achieve certification, it must be verified that the Chain of Custody is strong and starts at sea. Alternatively, as in other MSC¬certified tuna fisheries, catch from these trips could be considered to be non-eligible for certification.		The risks of the vessels fishing in areas that are not part of the UoA/UoC are described in Table 6. There are systems in place to segregate and keep records of produc outside the UoC. We've updated the traceability section noting that the Chain of Custody auditor should solicit a list of documents at the point CoC is required [i.e. : Invoices from the sale of whole round tuna from the fishing vessel owner to the trader, unloading report and outturn report and well charts, logbook] to ensure the product is coming from eligible vessels and from the geographic areas within the UoA/UoC.	Not accepted (no score change)

HS advocacy actions According to the ACDR preliminary scores, the CAB will likely set conditions towards the implementation by WCPFC of robust Harvest Strategies and HCR for Western Pacific skipjack and yellowfin. As regards the Client Action Plan to meet these conditions, ISSF would like to suggest specific actions for the Client to consider: **1)** Continue to publicly support the high-level appeals for RFMOs developed by global NGOs that are participants in the NGO Tuna Forum. In 2020 and 2021, apart from publicly supporting NTF's living statement of support by attaching their logo, companies will also have the opportunity to engage in other direct RFMO advocacy tactics to demonstrate market support for specific tuna sustainability asks. NGO participants in the NGO Tuna Forum will be reaching out to market partners with these opportunities in the coming months. **2)** Continue to advocate for accelerated progress on the adoption and implementation of Harvest Strategies and Harvest Control Rules through WCPFC, such as through continued direct engagement with national delegations to WCPFC. ISSF also encourages TriMarine to continue directly engaging in the WCPO MSC Alignment Group and the Group's advocacy initiatives for harvest strategies and other priorities. **3)** Urge the delegations of all parties associated with TriMarine at WCPFC to take a strong public position on advancing harvest strategies as part of the deliberations WCPFC will undertake virtually this year and at future in-person meetings, including by making proposals for the development of harvest strategies including harvest control rules, and to underscore that the MSC has established hard deadlines for P1 conditions for certified tuna fisheries, which for WCPO skipjack HS and for WCPO yellowfin HCR is by June 2022. If these deadlines are not met, the corresponding WCPO skipjack and yellowfin MSC certifications will be suspended. **4)** Have meetings, calls or other direct contact with all other relevant WCPFC delegations where TriMarine has business interests to advocate for the adoption of Harvest Strategies and	- https://ngotunaforum.org/global-tuna-advocacy-appeal/ - https://iss-foundation.org/what-we-do/influence/position-statements	We thank ISSF for these comments, we've shared this feedback with the client. The Client Action Plan does include advocacy elements in their activities.	Accepted (no score change)

HCR. **5)** Publicly support ISSF Position Statements that contain detailed asks on Harvest Strategies and Harvest Control Rules to the virtual sessions of the WCPFC in 2020 as well as WCPFC future in-person meetings, and document that support (e.g. by submitting a letter or some other communication citing the Position Statement). **6)** Support technical work of WCPFC/SPC as well as capacity workshops on Management Strategy Evaluation in the WCPO region so as to increase the leverage of WCPFC members for the discussion and adoption of robust Harvest Strategies.			
Letter(s) of support The ACDR states that the CAB will likely set conditions regarding PI 1.2.1 (Harvest strategy), 1.2.2 (Harvest control rules & tools. Taking into account that national governments will probably have a relevant role in the action plan for these conditions, ISSF is concerned that, without a letter of support from USA, Solomon Islands, FSM, Cook Islands, Chinese Taipei, New Zealand and Vanuatu, there is no clear expectation that the Client Action Plan will achieve its objectives. ISSF notes the Public Certification Report for the fishery's first assessment included a letter of support from NMFS and recommends similar letters of support are added to the Public Comment Draft Report for the fishery's reassessment.	https://fisheries.msc.org/en/fisheries/tri-marine-western-and-central-pacific-skipjack-and-yellowfin-tuna/@@assessments	Letters of Support are included in the PCDR	Accepted (no score change)

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response to stakeholder input	CAB response code
1.2.1 - Harvest strategy **(SKJ)**	The independent report by Medley et al. (2020) indicates that SI 1.2.1.f should be scored and that the fishery would meet SG80.	The independent report by Medley et al. (2020) indicates that SI 1.2.1.f should be scored and that the fishery would meet SG80. met." **1.2.1.f**: "A joint meeting of the tuna Regional Fisheries Management Organisations (tRFMOs) in Brisbane 2010 as part of the Kobe process, specifically focused on bycatch and discarding, although this mainly dealt with non-tuna species. Discards are routinely estimated for all target species where possible, but discarding of target tunas is not generally considered significant compared to other mortality. Monitoring depends upon the presence of at-sea observers, however. The main concern with discards of tuna appears to apply to the purse seine fleet. WCPFC has in place CMM 2009-02 which aims to limit discard mortality and requires reporting of discard events. In addition, recent CMMs on tropical tunas (2018-01, 2017-01) aim to reduce undesirable catch of juvenile bigeye through control of effort on FADs and require purse seine to retain of yellowfin, bigeye and skipjack on board for landing. On this basis, discarding is clearly subject to review and that controls are being implemented, meeting SG80. It is not clear this review is sufficiently frequent to meet SG100."	Medley et al. (2020)	80	Thank you for your comment. The MSC Fisheries Standard SA3.1.6 states that the term 'unwanted catch' shall be interpreted by assessment teams as the part of the catch that a fisher did not intend to catch but could not avoid, and did not want or chose not to use. Furthermore, according to MSC, this scoring issue need not be scored if there are no unwanted catches of primary species. Noting there are no requirements such as minimum or maximum landing sizes or quotas which could lead to any of this catch being unwanted, discarding rates for skipjack are minimal, according to the stock assessment report (Vincent et al., 2016). This was corroborated through examination of UoA observer data from 2015-2019 where reported discards of skipjack for the UoA represented a very small proportion (approximately 1%) of the total catch. Furthermore, CMM 2018-01 requires purse seine vessels fishing in EEZs and on the high seas within the area bounded by 20ºN and 20ºS to retain on board and then land or transship at port all Bigeye, Skipjack, Yellowfin Tuna. While there are exceptions to this requirement discarding of skipjack is considered minor. Based on this information the assessment team concluded there is no 'unwanted catch' of skipjack in this fishery and scoring of PI 1.2.1-f was not necessary.	Not accepted (no score change)

1.2.1 - Harvest strategy **(YFT)**	The independent report by Medley et al. (2020) indicates that SI 1.2.1.f should be scored and that the fishery would meet SG80.	The independent report by Medley et al. (2020) indicates that SI 1.2.1.f should be scored and that the fishery would meet SG80. met." **1.2.1.f**: "A joint meeting of the tuna Regional Fisheries Management Organisations (tRFMOs) in Brisbane 2010 as part of the Kobe process, specifically focused on bycatch and discarding, although this mainly dealt with non-tuna species. Discards are routinely estimated for all target species where possible, but discarding of target tunas is not generally considered significant compared to other mortality. Monitoring depends upon the presence of at-sea observers, however. The main concern with discards of tuna appears to apply to the purse seine fleet. WCPFC has in place CMM 2009-02 which aims to limit discard mortality and requires reporting of discard events. In addition, recent CMMs on tropical tunas (2018-01, 2017-01) aim to reduce undesirable catch of juvenile bigeye through control of effort on FADs and require purse seine to retain of yellowfin, bigeye and skipjack on board for landing. On this basis, discarding is clearly subject to review and that controls are being implemented, meeting SG80. It is not clear this review is sufficiently frequent to meet SG100."	Medley et al. (2020)	80	Thank you for your comment. The MSC Fisheries Standard SA3.1.6 states that the term 'unwanted catch' shall be interpreted by assessment teams as the part of the catch that a fisher did not intend to catch but could not avoid, and did not want or chose not to use. Furthermore, according to MSC, this scoring issue need not be scored if there are no unwanted catches of primary species. Noting there are no requirements such as minimum or maximum landing sizes or quotas which could lead to any of this catch being unwanted, discarding rates for yellowfin are minimal and ignored In the stock assessment. This was corroborated through examination of UoA observer data from 2015-2019 where reported discards of yellowfin for the UoA represented a very small proportion (< 1%) of the total catch. Furthermore, CMM 2018-01 requires purse seine vessels fishing in EEZs and on the high seas within the area bounded by 20ºN and 20ºS to retain on board and then land or transship at port all Bigeye, Skipjack, Yellowfin Tuna. While there are exceptions to this requirement discarding of yellowfin is considered minor. Based on this information the assessment team concluded there is no 'unwanted catch' of yellowfin in this fishery and scoring of PI 1.2.1-f was not necessary.	Not accepted (no score change)

1.2.2 - Harvest control rules and tools **(YFT)**	The independent report by Medley et al. (2020) indicates that the fishery would not meet SG60 for SI 1.2.2.a and 1.2.2.c and that, as a result, the overall PI score would be less than 60 ("Fail").	The independent report by Medley et al. (2020) indicates that the fishery would not meet SG60 for SI 1.2.2.a and 1.2.2.c and that, as a result, the overall PI score would be less than 60 ("Fail"): **1.2.2.a**: "At SG60, MSC allows a harvest control rule to be 'available' rather than 'in place' if the requirements summarised below are met (for full list see SA2.5.2, 2.5.3): • Stock biomass has not previously been reduced below the MSY level, or has been maintained at that level for a recent period of time … and is not predicted to be reduced below BMSY within the next 5 years; • HCRs are effectively used in other stocks by the same management body or an agreement or framework is in place requiring the management body to adopt HCRs before the stock declines below BMSY. MSC's second requirement for an 'available' HCR is met for yellowfin by CMM 2014-06. In terms of the first requirement, for WCPO yellowfin, stock biomass has not previously been reduced below the MSY level, according to the stock assessment. There are no short-term projections available at present based on the new assessment to evaluate likely stock trajectory over the next five years but as noted in 1.1.1 and 1.2.1, the probability of either SB being below or F above the MSY level is quite small, and on that basis, it is not likely that the biomass will decline below the MSY level in the next five years. However, the biomass trajectory is consistently downwards throughout the time series, and there is no particular reason at present to suppose that it will stabilise above BMSY under the current management regime. However, the case of bigeye raises the question as to what actions WCPFC could be relied on to take, should the next stock assessment for yellowfin give a different perception of the stock status (as happened for bigeye in 2017). Despite bigeye being considered overfished from 2011-2017, the management actions put in place by WCPFC have shown no evidence so far of being able to reduce fishing mortality on bigeye, as shown by the most recent stock assessment. Because there is no particular evidence that any 'available' HCR is able to reduce the exploitation rate as the PRI is approached, SG60 is not met. For improvement in this scoring, some demonstrable	Medley et al. (2020)	<60	Thank you again for your comments regarding the design and application of a harvest control rule (PI 1.2.2.a) for yellowfin. First it is important to point out that these are harmonized scores, the rationale of which is based on full consideration of MSC requirements by a range of P1 experts. To achieve a score of SG 60 for PI1.2.2.a, MSC allows a harvest control rule to be either be in place or "available", and to be available it must meet at least one element each of SA2.5.2 and SA2.5.3. As you note, the biomass of yellowfin tuna in the Western Central Pacific Ocean has not previously been reduced below the MSY level based on previous stock assessments; thus SA2.5.2a is met. With the adoption of CMM 2014-06 by WCPFC, SA2.5.3b is met. On this basis the requirements for a harvest control rule to be available at SG 60 are met and the assessment team considers the initial SG 60 score for PI1.2.2.a to be appropriate. We share the concerns regarding slippage of the harvest strategy workplan (CMM 2014-06) and its impact on harvest strategy development. However, as you note a variation request was granted by MSC in 2018 for all tuna fisheries to extend the timeline for developing harvest strategies. The new timeline is now set with an expected harvest control rule completion date. On this basis the assessment team considers the initial SG 60 score for PI1.2.2.a to be appropriate.	Not accepted (no score change)

		progress is required towards a formal harvest strategy and HCR (as per CMM 2014-06) such that a more convincing argument can be made that effective action will be taken if required. The authors are aware that this scoring may not be consistent with the MSC certification of several fisheries targeting this stock. One reason for this difference is that this assessment is a pre-assessment, not a full assessment. A full assessment is based on a strict interpretation of the MSC requirements (scoring issues and guidance) at the time of scoring. A pre-assessment is more focused on risks to an MSC assessment failing and may be more useful to stakeholders to inform decisions about entering certification over a timeframe of a year or more, with the certification process taking a further year or so. A pre-assessment therefore needs to take into account what the situation with the stock is likely to be over this timeframe. We are concerned that although strictly the MSC requirements may be met at time of writing, there has been slow progress with the development of harvest strategies for WCPFC stocks since the commitment was made (CMM 2014-06 was agreed) and strict timelines are not being observed. The workplan for the implementation of CMM 2014-06 has been systematically revised, with CPCs seemingly unwilling to apply the original timetable. Progress is being made at least for some species (WCPFC HS, 2019). Limit reference points have been agreed for bigeye or yellowfin, but not yet target reference points. Interim targets have been agreed for South Pacific albacore, for which HCR are now being developed. In contrast, progress with skipjack has led to the final stage, developing the monitoring strategy. Based on this situation, MSC-certified fisheries with condition milestones for the achievement of a formal harvest strategy for this stock should, based on MSC procedures, be first scored at audit as 'behind target' and subsequently (the following year) have their certificates suspended if progress has not been made. We note however that a variation request was granted in 2018 to extend the timeline for meeting the condition on this performance indicator." (…) 1**.2.2.c**: "Under SA2.5.5, in order to conclude that				

		'available' HCRs are 'effective' (SG60), MSC requires evidence of i) the use of effective HCRs in other stocks or fisheries under the same management body; or ii) a formal agreement or framework with trigger levels which will require the development of a well-defined HCR. It also requires consideration of current exploitation rates in relation to biological reference points and the agreed trigger level (guidance for SA2.5.6: 'evidence that current F is equal to or less than FMSY should usually be taken as evidence that the HCR is effective'). The tools by which CMM 2018-01 is implemented are as follows: (a) temporal / spatial limits on purse seine setting on FADs, (b) restrictions on purse seine effort (days), (c) purse seine required to retain all tuna catch, (d) longline catch limits for bigeye, (e) various limits on increasing fishing capacity. The authors are aware that this is not the same as the scoring applied in various MSC certifications for fisheries targeting this stock. The reasons for this are set out in the rationale for 1.2.2a above, and are primarily due to the different purpose of a pre-assessment and timing for meeting the MSC requirements. In our opinion, in order to meet MSC requirements at this stage, some demonstrable progress is required towards an effective formal harvest strategy (as per CMM 2014-06) such that it is more clear that management tools are likely to be able to maintain stocks at agreed target levels. There are no limits on longline fishing for yellowfin, although catch limits for bigeye may limit effort for some CMMs. The catch time series in the 2017 stock assessment runs to 2015; the harvest strategy has only been in place since 2014, and is incremental, so it is hard to say what impact it has had up till now. Estimated juvenile F has stabilised and perhaps decreased, but the trajectory of adult F does not seem to have been altered. The trajectory of stock biomass is downwards throughout the time series. On this basis, there is no particular evidence that the various tools in place are effective in controlling fishing mortality, and no reason to suppose that the stock trajectory will not continue downwards. On this basis, SG60 is not met. For improvement in this scoring, some demonstrable				

		progress is required towards a formal harvest strategy (as per CMM 2014-06) such that it is clearer that management tools are likely to be effective in maintaining a stable biomass at or above reference levels.				
3.1.1 - Legal and/or customary framework **(WCPFC)**	The independent report by Medley et al. (2020) indicates that the fishery would not meet SG100 for SI 3.1.1.c at the RFMO level (WCPFC) and that, as a result, the overall PI score would be less than 100.	The independent report by Medley et al. (2020) indicates that the fishery would not meet SG100 for SI 3.1.1.c at the RFMO level (WCPFC) and that, as a result, the overall PI score would be less than 100. **3.1.1.c**: "(…) WCPFC has an intention and has a management system that observes the legal rights created explicitly or established by custom for people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2. Therefore the international management system meets the requirement for SG60 and SG80. The WCPFC considers common allocation principles such as historical participation, the rights of Coastal States and the rights of developing States, but are not yet formally part of the allocation process. At the present time, this does not yet meet SG100."	Medley et al. (2020)	80	As stated in the rationale the Convention formally recognizes the needs of small island nations and coastal communities via special requirements for small island developing states: The WCPF Convention provides for recognition of the interests of small scale and artisanal fishers within its framework for sustainability. The Convention further requires that the needs of SIDs, territories and possessions, and coastal communities dependent on stocks including those taken in the fishery be recognized in the allocation of catch or effort (Art 10 (3) and Resolution 2008-01) and their capacity strengthened (see CMM 2013-06 Conservation and Management Measure on the criteria for the consideration of conservation and management proposals and CMM 2013-07 Conservation and Management Measure on the special requirements of Small Island Developing States and Territories). Article 30 of the Convention further provides for recognition of the interests of small scale and artisanal fishers within the overall management framework in the WCPFC	Not accepted (no score change)

3.1.2 - Consultation, roles and responsibilities **(WCPFC)**	The independent report by Medley et al. (2020) indicates that the fishery would not meet SG100 for SI 3.1.2.a at the RFMO level (WCPFC).	The independent report by Medley et al. (2020) indicates that the fishery would not meet SG100 for SI 3.1.2.a at the RFMO level (WCPFC). **WCPFC - 3.1.2.a**: "(…)Roles and responsibilities are not necessarily well understood in all areas, however. WCPFC has had a number of problems with flag States that have not applied appropriate controls to all their vessels, and it appears that not all vessels understand their responsibilities and in some cases there appear to be conflicts between requirements for confidentiality and the responsibilities to provide information necessary for management, which need to be resolved. This includes members not submitting timely data. The Regional Observer Programme (ROP), despite being overall successful, also has allegations of inappropriate behaviour towards observers on vessels, suggesting fishing entities do not fully understand or comply with their responsibilities. Although most data are available to the Pacific Community (Oceanic Fisheries Programme) (SPC-OFP), which is responsible for stock assessment, not all these data have been entered and made available to the Commission. While these problems are not in key areas in the sense that they do not prevent WCPFC completing its primary tasks, they nevertheless undermine its overall effectiveness and increase risks to sustainability. For example, while stock assessments provide estimates of stock status up to the current year, the Scientific Committee noted that the incomplete submission of data increases uncertainty in the assessments and encouraged all members to provide data in accordance with the WCPFC data rules. Hence although the fisheries meet the SG80, they do not meet SG100."	Medley et al. (2020)	80	The assessment team acknowledges some of these issues and challenges faced by the WCPFC in recent years. Upon further review of the WCPFC systems for consultation, the assessment team reaffirms that as per GSA4.4 Consultation, roles and responsibilities in the MSC Standard v 2.01, the WCPFC consultation system is robust and fulfills SG100 requirements for scoring issue (a) for the US fleet. The assessment team found no evidence of non-compliance by the US, New Zealand, Solomon Islands or Cook Islands, regarding data submission to the Commission or of inappropriate behavior towards observers on vessels. The assessment team agrees that functions, roles and responsibilities are not well understood for all areas of responsibility for all flag states, for this reason Taiwan, FSM and Vanuatu do not meet the SG100 for SI a.	Not accepted (no score change)

3.2.2 - Decision-making processes **(WCPFC)**	The independent report by Medley et al. (2020) indicates that the fishery would not meet SG80 for SI 3.2.2.b at the RFMO level (WCPFC).	The independent report by Medley et al. (2020) indicates that the fishery would not meet SG80 for SI 3.2.2.b at the RFMO level (WCPFC). **3.2.2.b**: "(…) However, although overall the decision-making is adequate for most of the stocks being considered and serious issues have been responded to, some important issues have not. The declining SP albacore catch rates comes under 'other important issues' (not yet 'serious' because the stock is above MSY reference points). At a presentation by SPC at the Thirteenth Session of WCPFC in December 2016 concerning the status of the tuna stocks it was stated that the southern albacore stocks were not overfished but that due to the declining CPUE there were concerns over economic viability. WCPFC has not addressed this important issue. It can be shown that regional decision-making processes deal with serious issues identified, in a transparent timely and adaptive manner but not some of the important issues. In particular one of the target species for this assessment, albacore, has shown a steady decline in economic viability over recent years, and WCPFC have not responded in a timely responsive way to halt this decline. Overall the decision-making is adequate for the stocks being considered. It can be shown that it deals with serious but not always important issues for example SP albacore in a transparent, timely and adaptive manner meeting SG60 but does not meet SG80 at this time."	Medley et al. (2020)	75	While Medley et al (2021) does identify one clear example where the WCPFC decision-making process did not adequately respond to one important issue (e.g. albacore economic availability), there are several serious and other important issues that have been identified in tuna research, monitoring, evaluation, and consultation in a transparent, timely, and adaptive manner and take account of the wider implications of decisions. As it relates to albacore, the WCPFC intends to publish a stock assessment of the southern albacore stock later in 2021. This effort to respond on the issue of albacore stocks does demonstrate a level of responsiveness that fulfills the requirements for SG80. Furthermore, as per SA4.8.6, at the SG80 level, in addition to the information provided at the SG60 level, information on decisions, fisheries data supporting decisions, and the reasons for decisions, should be made available to all stakeholders on request. While Medley et al. 2021 does point out an issue with the albacore catch rates in recent years, the assessment team ascertains that the WCPFC component of the management and governance system still fulfills SG80 requirements for the US and Chinese Taipei UoAs.	Not accepted (no score change)

8.11 Conditions

8.11.1 Summary of conditions closed under previous certificate

Condition number	Condition	Performance Indicator (PI)	PI original score	PI revised score
5	By the fourth surveillance audit, demonstrate that it is highly likely that shark finning is not taking place or that if rare cases are reported, that measures are taken to address the issue.	2.1.2	75	80 Closed: Yr 2
6	By the fourth surveillance audit, demonstrate that sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	3.2.3	75	80 Closed: Yr 1

8.11.2 Open Conditions at reassessment announcement

Only US-flagged vessels targeting free school sets are included under the current certificate. All remaining open conditions relate to Principle 1 and timelines/conditions have been harmonized across all fisheries in the WCPO. The fishery was certified under v1.3 and underwent the required P1 upgrade process in the third year surveillance audit, as per the mega variation request submitted by CABs in December 2018. There are no other open conditions, with the exception of new conditions under 8.13.3 below.

Table 30. Open conditions at re-assessment.

Condition number	Condition	Performance Indicator (PI)	Status for Open conditions	PI original score	Overview of condition and expected closure year
1-1	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	Condition closure dependent on WCPFC following timeline/actions in 2017 Work Plan. Condition to be closed in 2022—based on WCPFC 2021 Annual Meeting
1-2	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	1.2.2 Skipjack	On target	60	See explanation for 1.2.1 Skipjack

	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 tools in use for Skipjack Tuna are appropriate and effective in achieving the exploitation levels required under the harvest control rules.				
1-3	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	See explanation for 1.2.1 Skipjack
1-4	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	See explanation for 1.2.1 Skipjack

Table 31 Condition 1-1 Harvest Strategy -Skipjack

Performance Indicator	**PI 1.2.1a (Skipjack). There is a robust and precautionary harvest strategy in place**	
Score	PI score: 70	
Justification	See rationale for PI 1.2.1a (Skipjack): Evaluation Table for PI 1.2.1 Skipjack tuna – Harvest strategy	
Condition	By the first surveillance audit (**Extended to June 2023**) 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 *Via the 2019 MSC-approved Mega Variation CABs agreed to align the condition milestones for the WCPO stocks with the Proposed Revisions to Harvest Strategy Work plan (WCPFC14-2017-DP27_rev2), which indicates the harvest control rule will be adopted in 2021. Consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months to June 2022. Following the second MSC Covid 19 derogation, the condition timeline is extended 12 additional months to June 2023.* *Given the current timeline assessment, the fishery is set to be certified by Q3 2021, to align with the harmonized milestones SCS will aim to either (a) conduct surveillances in June, a few months prior to the anniversary date or (b) conduct an expedited audit outside of the surveillance cycle to assess progress on Principle 1 conditions by June 2023.*	
Milestone Year 1	Surveillance: Milestone Year 1 By the first re-assessment surveillance audit (**Extended to June 2023**), 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 Expected score: 80	
Client Action Plan	**Activities:**	Tri Marine will actively support ongoing work towards the development and adoption of a harvest strategy for WCPO skipjack tuna (as per the WCPFC Harvest Strategy Workplan). Tri Marine's support and advocacy will be through participation in WCPFC (representatives on US, Solomon Islands, American Samoa and China delegations) and industry-level advocacy efforts (e.g. ISSF, IPNLF, WCPO MSC Tuna Alignment Group). UoC vessel flag states will advocate and support this condition being met through active participation in national, sub-regional and WCPFC initiatives/proposals regarding harvest strategies.
	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.
		Responsible Party/ies: TMI and management agencies from USA, Federated States of Micronesia, Solomon Islands, New Zealand, Cook Islands, Vanuatu and Chinese Taipei.

Consultation on condition	Letter of support from flag states attached

Table 32 Condition 1-2 Harvest Control Rules - Skipjack 1.2.2

Performance Indicator	**PI 1.2.2 (Skipjack). Harvest control rules and tools**	
Score	PI score: 60	
Justification	See rationale for PI 1.2.2 (Skipjack): Evaluation Table for PI 1.2.2 Skipjack tuna – Harvest control rules and tools	
Condition	By the first surveillance audit (**Extended to June 2023**): SI a) 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) provide evidence that the selection of the harvest control rules for Skipjack Tuna are robust to the main uncertainties. SI c) 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. *Via the 2019 MSC-approved Mega Variation CABs agreed to align the condition milestones for the WCPO stocks with the Proposed Revisions to Harvest Strategy Work plan (WCPFC14-2017-DP27_rev2), which indicates the harvest control rule will be adopted in 2021. Consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months to June 2022. Following the second MSC Covid 19 derogation, the condition timeline is extended 12 additional months to June 2023.* *Given the current timeline assessment, the fishery is set to be certified by Q3 2021, to align with the harmonized milestones SCS will aim to either (a) conduct surveillances in June, a few months prior to the anniversary date or (b) conduct an expedited audit outside of the surveillance cycle to assess progress on Principle 1 conditions by June 2023.*	
Milestone Year 1	Surveillance: Milestone Year 1 By the first re-assessment surveillance audit (**Extended to June 2023**) Harvest Strategy for Skipjack in place. Expected score: 80	
Client Action Plan	**Activities:**	Tri Marine will actively support ongoing work towards the development and adoption of well-defined and effective harvest control rules for WCPO skipjack tuna (as per the WCPFC Harvest Strategy Workplan). Tri Marine's support and advocacy will be through participation in WCPFC (representatives on US, Solomon Islands, American Samoa and China delegations) and industry-level advocacy efforts (e.g. ISSF, IPNLF, WCPO Tuna Alignment Group). UoCv essel flag states will advocate and support this condition being met through active participation in national, sub-regional and WCPFC initiatives/proposals regarding harvest strategies.
	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.

		Responsible Party/ies: TMI and management agencies from USA, Federated States of Micronesia, Solomon Islands, New Zealand, Cook Islands, Vanuatu and Chinese Taipei.
Consultation on condition	Letter of support from flag states attached	

Table 33 Condition 1-3 Harvest Strategy- Yellowfin PI 1.2.1

Performance Indicator	**PI 1.2.1a (Yellowfin). There is a robust and precautionary harvest strategy in place**	
Score	PI score: 70	
Justification	See rationale for PI 1.2.1a (Yellowfin)	
Condition	By the first surveillance audit (**Extended to June 2023**) 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 *Via the 2019 MSC-approved Mega Variation CABs agreed to align the condition milestones for the WCPO stocks with the Proposed Revisions to Harvest Strategy Work plan (WCPFC14-2017-DP27_rev2), which indicates the harvest control rule will be adopted in 2021. Consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months to June 2022. Following the second MSC Covid 19 derogation, the condition timeline is extended 12 additional months to June 2023.* *Given the current timeline assessment, the fishery is set to be certified by Q3 2021, to align with the harmonized milestones SCS will aim to either (a) conduct surveillances in June, a few months prior to the anniversary date or (b) conduct an expedited audit outside of the surveillance cycle to assess progress on Principle 1 conditions by June 2023.*	
Milestone Year 1	Surveillance: Milestone Year 1 By the first re-assessment surveillance audit (**Extended to June 2023**), 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 Expected score: 80	
Client Action Plan	**Activities:**	Tri Marine will actively support ongoing work towards the development and adoption of a harvest strategy for WCPO yellowfin tuna (as per the WCPFC Harvest Strategy Workplan). Tri Marine's support and advocacy will be through participation in WCPFC (company representatives on US, Solomon Islands, American Samoa and China delegations) and industry-level advocacy efforts (e.g. ISSF, IPNLF, WCPO MSC Tuna Alignment Group). Vessel flag states will advocate and support this condition being met through active participation in national, sub-regional 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.
		Responsible Party/ies: TMI and management agencies from USA, Federated States of Micronesia, Solomon Islands, New Zealand, Cook Islands, Vanuatu and Chinese Taipei.

Consultation on condition	Letter of support from flag states attached

Table 34 Condition 1-4 Harvest Control Rules Yellowfin PI 1.2.2

Performance Indicator	**PI 1.2.2 (Yellowfin). Harvest control rules and tools**	
Score	PI score: 60	
Justification	See rationale for PI 1.2.2 (Yellowfin)	
Condition	By the first surveillance audit (**Extended to June 2023**): SI a) 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) provide evidence that the selection of the harvest control rules for Yellowfin Tuna are robust to the main uncertainties. SI c) 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. *Via the 2019 MSC-approved Mega Variation CABs agreed to align the condition milestones for the WCPO stocks with the Proposed Revisions to Harvest Strategy Work plan (WCPFC14-2017-DP27_rev2), which indicates the harvest control rule will be adopted in 2021. Consistent with MSC COVID 19 derogation, the proposed timeline has been extended by 6 months to June 2022. Following the second MSC Covid 19 derogation, the condition timeline is extended 12 additional months to June 2023.* *Given the current timeline assessment, the fishery is set to be certified by Q3 2021, to align with the harmonized milestones SCS will aim to either (a) conduct surveillances in June, a few months prior to the anniversary date or (b) conduct an expedited audit outside of the surveillance cycle to assess progress on Principle 1 conditions by June 2023.*	
Milestone Year 1	Surveillance: Milestone Year 1 By the first re-assessment surveillance audit (**Extended to June 2023**) Harvest Strategy for Yellowfin in place. Expected score: 80	
Client Action Plan	**Activities:**	Tri Marine will actively support ongoing work towards the development and adoption of well-defined and effective harvest control rules for WCPO yellowfin tuna (as per the WCPFC Harvest Strategy Workplan). Tri Marine's support and advocacy will be through participation in WCPFC (representatives on US, Solomon Islands, American Samoa and China delegations) and industry-level advocacy efforts (e.g. ISSF, IPNLF, WCPO Tuna Alignment Group). UoC vessel flag states will advocate and support this condition being met through active participation in national, sub-regional 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.

		Responsible Party/ies: TMI and management agencies from USA, Federated States of Micronesia, Solomon Islands, New Zealand, Cook Islands, Vanuatu and Chinese Taipei.
Consultation on condition	Letter of support from flag states attached	

8.11.3 New conditions & Client Action Plan

Table 35. Condition 2-1. Secondary Species Management (shark finning)- Cook Islands

Performance Indicator	**PI 2.2.2(d) Performance Indicator Description – Cook Islands**	
Score	75	
Justification	See rationale in PI 2.2.2 SI d.	
Condition	By the 4th annual surveillance audit, provide evidence that it's highly likely that shark finning is not taking place.	
Milestone Year 1	Surveillance: Milestone Year 1 Provide independent verification that observer coverage was > 25% and that shark finning does not take place in the UoA Expected score: 75	
Client Action Plan	**Activities:**	Flag-state authority to provide to CAB: • Regional Observer Program (ROP) verification that onboard observer coverage exceeds 25%; • Verification (i.e. observer reports, port inspections) that shark-finning is not taking place in accordance with national laws/WCPFC CMM 2019-04.
	Expected outcome:	Shark finning is not taking place
		Responsible Party/ies: Cook Islands Ministry of Marine Resources (MMR)
Milestone Year 2	Surveillance: Milestone Year 2 Provide independent verification that observer coverage was > 25% and that shark finning does not take place in the UoA Expected score: 75	
Client Action Plan	**Activities:**	Flag-state authority to provide to CAB: • Regional Observer Program (ROP) verification that onboard observer coverage exceeds 25%; • Verification (i.e. observer reports, port inspections) that shark-finning is not taking place in accordance with national laws/WCPFC CMM 2019-04.
	Expected outcome:	Shark finning is not taking place
		Responsible Party/ies: Cook Islands Ministry of Marine Resources (MMR)
Milestone Year 3	Surveillance: Milestone Year 3 Provide independent verification that observer coverage was > 25% and that shark finning does not take place in the UoA Expected score: 75	
Client Action Plan	**Activities:**	Flag-state authority to provide to CAB: • Reginal Observer Program (ROP) verification that onboard observer coverage exceeds 25%;

		• Verification (i.e. observer reports, port inspections) that shark-finning is not taking place in accordance with national laws/WCPFC CMM 2019-04.
	Expected outcome:	Shark finning is not taking place
		Responsible Party/ies: Cook Islands Ministry of Marine Resources (MMR)
Milestone Year 4	Surveillance: Milestone Year 4 Provide observer data or other independent evidence that ensures shark finning is not taking place in the UoA Expected score: 80	
Client Action Plan	**Activities:**	Flag-state authority to provide to CAB: • Regional Observer Program (ROP) verification that onboard observer coverage exceeds 25%; • Verification (i.e. observer reports, port inspections) that shark-finning is not taking place in accordance with national laws/WCPFC CMM 2019-04.
	Expected outcome:	Shark finning is not taking place
		Responsible Party/ies: Cook Islands Ministry of Marine Resources (MMR)
Consultation on condition	Letter of support from Cook Islands Ministry of Marine Resources	

Table 36. Condition 2-2. Secondary Species Management (shark finning)- Vanuatu

Performance Indicator	**PI 2.2.2(d) Performance Indicator Description – Vanuatu**	
Score	75	
Justification	See rationale in PI 2.2.2 SI d.	
Condition	By the 4th annual surveillance audit, provide evidence that it's highly likely that shark finning is not taking place.	
Milestone Year 1	Surveillance: Milestone Year 1 Provide independent verification that observer coverage was > 25% and that shark finning does not take place in the UoA Expected score: 75	
Client Action Plan	**Activities:**	Flag-state authority to provide to CAB: • Regional Observer Program (ROP) verification that onboard observer coverage exceeds 25%; • Verification (i.e. observer reports, port inspections) that shark-finning is not taking place in accordance with national laws/WCPFC CMM 2019-04.
	Expected outcome:	Shark finning is not taking place
		Responsible Party/ies: Vanuatu Fisheries Department
Milestone Year 2	Surveillance: Milestone Year 2 Provide independent verification that observer coverage was > 25% and that shark finning does not take place in the UoA Expected score: 75	
Client Action Plan	**Activities:**	Flag-state authority to provide to CAB: • Regional Observer Program (ROP) verification that onboard observer coverage exceeds 25%; • Verification (i.e. observer reports, port inspections) that shark-finning is not taking place in accordance with national laws/WCPFC CMM 2019-04.
	Expected outcome:	Shark finning is not taking place
		Responsible Party/ies: Vanuatu Fisheries Department
Milestone Year 3	Surveillance: Milestone Year 3 Provide independent verification that observer coverage was > 25% and that shark finning does not take place in the UoA Expected score: 75	
Client Action Plan	**Activities:**	Flag-state authority to provide to CAB: • Regional Observer Program (ROP) verification that onboard observer coverage exceeds 25%;

		• Verification (i.e. observer reports, port inspections) that shark-finning is not taking place in accordance with national laws/WCPFC CMM 2019-04.
	Expected outcome:	Shark finning is not taking place
		Responsible Party/ies: Vanuatu Fisheries Department
Milestone Year 4	Surveillance: Milestone Year 4 Provide observer data or other independent evidence that ensures shark finning is not taking place in the UoA Expected score: 80	
Client Action Plan	**Activities:**	Flag-state authority to provide to CAB: • Regional Observer Program (ROP) verification that onboard observer coverage exceeds 25%; • Verification (i.e. observer reports, port inspections) that shark-finning is not taking place in accordance with national laws/WCPFC CMM 2019-04.
	Expected outcome:	Shark finning is not taking place
		Responsible Party/ies: Vanuatu Fisheries Department
Consultation on condition	Letter of support from Vanuatu Fisheries Department	

Table 37. Condition 2-3. ETP Species Outcome – All Flags

Performance Indicator	**PI 2.3.1(b) ETP Species Outcome – Direct Effects**	
Score	75	
Justification	See Rationale	
Condition	By the fourth surveillance, provide evidence to demonstrate that direct effects of the UoA are highly likely to not hinder recovery of ETP species (False Killer whale, Sei Whale, Indo-Pacific Bottlenose Dolphin, Rough-toothed dolphin, mobulas and giant manta ray)	
Milestone Year 1	Surveillance: Milestone Year 1 Provide evidence that current measures/strategies to avoid setting on cetaceans (in particular false killer whales) in the fishery are implemented correctly and develop a plan to determine factors influencing cetaceans interactions leading to the effective implementation of measures to avoid interacting with cetaceans in the fishery. In addition, develop and implement a plan to reduce fishery interactions with mobula rays, including protocols for their safe handling and release. Also, develop a plan to ensure the collection of information on the fate of ETP species interacting with UoA purse seine fishing activities. Expected score: 75	
Client Action Plan	**Activities:**	TMI and UoA vessel owners to develop and implement a plan to avoid intentional setting on cetaceans and reduce interactions with mobula rays, including: • Refresher compliance training for UoA vessels on WCPFC/flag-state management measures relating to cetaceans and mobula rays. • Development of guidelines/standard operating procedures for UoA vessels reflecting best-practice handling techniques for safe-release of cetaceans and mobula rays; refresher training of vessels. • Flag state authorities to request WCPFC-ROP/SPC PIRFO to: - Review debriefing/data-entry systems to ensure consistency and accuracy in observer reporting intentional/unintentional sets and fate information for ETP interactions. - Conduct refresher briefings with observers to ensure consistency and accuracy in reporting of intentional vs. unintentional sets resulting in cetacean (and other ETP) interactions and fate information.
	Expected outcome:	Compliance/best management safe handling trainings and guidelines/SOPs delivered to UoA vessels resulting in no intentional setting on cetaceans and reduced interactions with mobula rays and safe release (with evidence of training/guidelines/SOPs provided to CAB); observers/debriefers/data entry officers briefed to ensure accurate set designation and fate reporting.
		Responsible Party/ies: TMI, UoA flag state authorities (all)

Milestone Year 2	Surveillance: Milestone Year 2 Provide information on the factors contributing to the setting of purse seines on cetaceans and interactions with mobula rays in the fishery and options to reduce their frequency. Also, provide fate information for ETP species interacting with all UoA purse seine fishing activities. Expected score: 75	
Client Action Plan	**Activities:**	Flag states to provide CAB with updated and detailed observer data regarding interactions with cetaceans and mobula rays demonstrating: • No intentional setting on cetaceans and safe release of cetaceans caught in unintentional sets. • Reduced interactions with mobula rays. • Fate information for ETP species.
	Expected outcome:	No intentional setting on cetaceans by UoA fishing vessels and safe release; reduced interactions and safe release of mobula rays; accurate set designation by observers and fate reporting for ETP species.
		Responsible Party/ies: TMI, UoA flag state authorities (all)
Milestone Year 3	Surveillance: Milestone Year 3 Provide evidence that one or more options have been tested and proved effective in increasing the efficacy of measures to avoid setting on cetaceans and interactions with mobula rays in the fishery. Provide proposed safe handling and release protocols for mobula rays and evidence of fate information for ETP species interacting with all UoA purse seine fishing activities. Expected score: 75	
Client Action Plan	**Activities:**	UoA flag state authorities to provide CAB with updated and detailed observer data regarding interactions with whales and mobula rays demonstrating: • No intentional setting on cetaceans and safe release of cetaceans caught in unintentional sets. • Reduced interactions with mobula rays. • Fate information for ETP species.
	Expected outcome:	No intentional setting on cetaceans by UoA fishing vessels and safe release; reduced interactions and safe release of mobula rays; accurate set designation by observers and fate reporting for ETP species.
		Responsible Party/ies: TMI, UoA flag state authorities (all)
Milestone Year 4	Surveillance: Milestone Year 4 Provide evidence that the measures/strategies for cetaceans and mobula rays are being implemented successfully and enforced for the whole fishery and that information on the fate of ETP species interactions is adequate to determine whether the UoA may be a threat to the protection and recovery of ETP species. Expected score: 80	
Client Action Plan	**Activities:**	UOA flag states authorities to provide CAB with updated and detailed observer data regarding interactions with whales and mobula rays demonstrating: • No intentional setting on cetaceans and safe release of cetaceans caught in unintentional sets.

		• Reduced interactions with mobula rays. • Fate information for ETP species.
	Expected outcome:	No intentional setting on cetaceans by UoA fishing vessels and safe release; reduced interactions and safe release of mobula rays; accurate set designation by observers and fate reporting for ETP species.
		Responsible Party/ies: TMI, UoA flag state authorities (all)
Consultation on condition	Letters of support from all UoA flag state authorities	

Table 38. Condition 2-4 ETP Species Management Strategy – All Flags

Performance Indicator	**PI 2.3.2 (Scoring issue d) ETP species management strategy: Management strategy implementation** **PI 2.3.2 (Scoring issue d) Review of alternative measures to minimize mortality of ETP species**	
Score	75	
Justification	See Rationale	
Condition	By the fourth surveillance, provide evidence that: a. There is some evidence that the measures/strategy is being implemented successfully for all ETP species b. There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate (ceteceans, mobulas and manta rays)	
Milestone Year 1	Surveillance: Milestone Year 1 - Develop a plan including procedures, protocols, and schedule for implementing CMM 2018-01. An outreach program to inform and educate vessel captains regarding requirements of the CMM should be part of the plan. Develop a plan to ensure the collection of information on the fate of ETP species interacting with UoA purse seine fishing activities. Expected score: 75 Expected score: 70	
Client Action Plan	**Activities:**	• TMI to collaborate with UoA vessel owners to review company/vessel level implementation of CMM 2018-01 (para. 19). • Based on implementation gaps identified from the review (if any), develop a plan for company/vessel level implementation of CMM 2018-01 which includes procedures/protocols, outreach and timeframes. • TMI and UoA vessel owners to consult with UoA flag states on CMM 2018-01 (para. 19) re: implementation and compliance monitoring.
	Expected outcome:	Plan developed for implementing CMM 2018-01 (para. 19) (provided to CAB); UoA flag states consulted.
		Responsible Party/ies: TMI, UoA vessel owners, UoA flag state authorities
Milestone Year 2	Surveillance: Milestone Year 2 Provide evidence to demonstrate that the requirements outlined in CMM 2018-01 are being implemented in the fishery. Expected score: 70	

Client Action Plan	**Activities:**	• Implement plan with UoA companies/vessels for non-entangling FAD design/deployment. • Provision of evidence to CAB of implementation of non-entangling FAD designs (e.g. diagrams of FAD design, photos). • UoA flag states to monitor implementation/compliance with CMM 2018-01 para. 19.
	Expected outcome:	Non-entangling FAD designs implemented by UoA companies/vessels; CMM 2018 para 19 compliance monitoring by UoA flag state authorities.
		Responsible Party/ies: TMI, UoA vessel owners, UoA flag state authorities
Milestone Year 3	Surveillance: Milestone Year 3 Provide evidence to demonstrate that the requirements outlined in CMM 2018-01 are implemented in the fishery and that these requirements are being enforced. Expected score: 80	
Client Action Plan	**Activities:**	• Provision of evidence to CAB of implementation of non-entangling FAD designs (e.g. diagrams of FAD design, photos). • Flag state verification of compliance with CMM 2018-01 para. 19 requirements
	Expected outcome:	Non-entangling FAD design requirements outlined in CMM 2018-01 are implemented by UoA companies/vessels; flag state authorities monitoring compliance.
		Responsible Party/ies: TMI, UoA vessel owners, UoA flag state authorities
Consultation on condition	Letters of support from UoA flag state authorities.	

Table 39. Condition 2-4 and 2-5 - ETP Species Management Strategy and ETP Species Information – All Flags

Performance Indicator(s)	**PI 2.3.2 (Scoring issue d) ETP species management strategy: Management strategy implementation** **PI 2.3.2 (Scoring issue d) Review of alternative measures to minimize mortality of ETP species** **PI 2.3.3(b) ETP Species Information – Information Adequacy**	
Score	PI 2.3.2 – 75 PI 2.3.3. - 75	
Justification	See Rationale PI 2.3.2 and 2.3.3	
Condition 2-4	By the third surveillance provide evidence that: a. There is some evidence that the measures/strategy is being implemented successfully for all ETP species b. There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ceteceans, mobulas and manta rays species and they are implemented as appropriate	
Condition 2-5	By the third surveillance - Provide evidence that some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of Giant Manta Ray and mobulas.	
Milestone Year 1	Surveillance: Milestone Year 1 Develop a plan to ensure the collection of information on the fate of ETP species interacting with UoA purse seine fishing activities And develop a plan to ensure the strategy for ETP species is being implemented successfully. Expected score: 75	
Client Action Plan	**Activities:**	TMI and UoA vessel owners to develop and implement a plan to avoid intentional setting on cetaceans and reduce interactions with mobula rays, including: • Refresher compliance training for UoA vessels on WCPFC/flag-state management measures relating to cetaceans and mobula rays. • Development of guidelines/standard operating procedures for UoA vessels reflecting best-practice handling techniques for safe-release of cetaceans and mobula rays; refresher training of vessels. • Flag state authorities to request WCPFC-ROP/SPC PIRFO to: - Review debriefing/data-entry systems to ensure consistency and accuracy in observer reporting intentional/unintentional sets and fate information for ETP interactions. - Conduct refresher briefings with observers to ensure consistency and accuracy in reporting of intentional vs. unintentional sets resulting in cetacean (and other ETP) interactions and fate information.
		Compliance/best management safe handling trainings and guidelines/SOPS delivered to UoA vessels resulting in no intentional

	Expected outcome:	setting on cetaceans and reduced interactions with mobula rays and safe release (with evidence of training/guidelines/SOPs provided to CAB); observers/debriefers/data entry officers briefed to ensure accurate set designation and fate reporting.
		Responsible Party/ies: TMI, UoA flag state authorities (all)
Milestone Year 2	Surveillance: Milestone Year 2 Provide evidence of implementation of plans to collect information such as fate information for ETP species interacting with all UoA purse seine fishing activities And of progress in successful implementation of management measures for ETP protection. Expected score: 75	
Client Action Plan	**Activities:**	Flag states to provide CAB with updated and detailed observer data regarding interactions with cetaceans and mobula rays demonstrating: • No intentional setting on cetaceans and safe release of cetaceans caught in unintentional sets. • Reduced interactions with mobula rays. • Fate information for ETP species.
	Expected outcome:	No intentional setting on cetaceans by UoA fishing vessels and safe release; reduced interactions and safe release of mobula rays; accurate set designation by observers and fate reporting for ETP species.
		Responsible Party/ies: TMI, UoA flag state authorities (all)
Milestone Year 3	Surveillance: Milestone Year 3 Provide evidence of fate information for ETP species interacting with all UoA purse seine fishing activities and that there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ceteceans, mobulas and manta rays species and they are implemented as appropriate Expected score: 75	
Client Action Plan	**Activities:**	UoA flag state authorities to provide CAB with updated and detailed observer data regarding interactions with whales and mobula rays demonstrating: • No intentional setting on cetaceans and safe release of cetaceans caught in unintentional sets. • Reduced interactions with mobula rays. • Fate information for ETP species.
	Expected outcome:	No intentional setting on cetaceans by UoA fishing vessels and safe release; reduced interactions and safe release of mobula rays; accurate set designation by observers and fate reporting for ETP species.
		Responsible Party/ies: TMI, UoA flag state authorities (all)
Consultation on condition	Letters of support from all UoA flag state authorities	

Table 40. Condition 2-6. Habitat Outcome – All Flags

Performance Indicator	PI 2.4.1 (Scoring issue b) Performance Indicator Description	
Score	75	
Justification	See rationale for PI 2.4.1b for additional information.	
Condition	By the fourth surveillance audit provide evidence that FAD sets by the UoA are highly unlikely to reduce the structure and function of the VME habitats to a point where there would be serious or irreversible harm.	
Milestone Year 1	Surveillance: Milestone Year 1 Develop and provide a plan for investigating the impact of lost FADs on the structure and function of coral reefs. Expected score: 75	
Client Action Plan	**Activities:**	Develop a plan for investigating and mitigating the impact of lost FADs from UoA vessels on the structure of coral reefs which includes: • Data collection including number of FADs deployed and location, number of FADs lost/reason for loss/last position reported, FAD construction material and design. • Collaborating in research initiatives on lost FADs (including FAD design, marking, tracking, recovery) (e.g. WCPFC, SPC, PNA, ISSF, GGGI) • Implementing best practice guidelines/measures on non-entangling and biodegradable FAD materials (i.e. WCPFC, FAO, ISSF, GGGI). • Evaluating the impacts of FADs lost by UoA vessels on coral reefs.
	Expected outcome:	A plan is developed to investigate and mitigate the impact of lost FADs from UoA vessels on coral reefs (plan provided to CAB)
		Responsible Party/ies: TMI, UoA vessel owners, UoA flag state authorities, research partners.
Milestone Year 2	Surveillance: Milestone Year 2 Provide some information on the number of FADs lost by the fishery and the materials used in their construction. Expected score: 75	
Client Action Plan	**Activities:**	Collect and analyze data for UoA vessels on number of FADs deployed and materials used; number of FADs lost, reason and last position reported; data submitted to SPC.
	Expected outcome:	Data analysis quantifying the number of FADs lost and the materials they were constructed from.
		Responsible Party/ies: TMI, UoA vessel owners, UoA flag state authorities, research partners.
Milestone Year 3	Surveillance: Milestone Year 3 Provide an initial evaluation of the potential impacts of FADs lost by vessels in the fishery on coral reefs, and of any additional measures that might be needed if this impact is substantial	

	Expected score: 75	
Client Action Plan	**Activities:**	• Evaluate the potential impacts of lost FADs by UoA vessels on coral reefs using data collected/analyzed (Year 2), plus existing studies. • UoA vessels to develop and trial bioFAD designs in line with WCPFC/national requirements. • Identify additional measures required to mitigate substantial impacts, if necessary. • TMI and UoA vessel owners to support other research initiatives on FAD tracking/lost FADs/bioFADs (e.g. PNA, ISSF, GGGI).
	Expected outcome:	Potential impacts of lost FADs by UoA vessels on coral reefs evaluated; additional mitigation measures identified; progress report provided to CAB.
		Responsible Party/ies: TMI, UoA vessel owners, UoA flag state authorities, research partners.
Milestone Year 4	Surveillance: Milestone Year 4 Provide evidence that the UoA is highly unlikely to reduce structure and function of the coral reefs to a point where there would be serious or irreversible harm. Expected score: 80	
Client Action Plan	**Activities:**	• UoA vessels to implement bioFAD designs in line with WCPFC, national requirements. • UoA vessels to implement additional measures to mitigate impacts on coral reefs, if necessary. • Ongoing data collection and analysis to continue to quantify the number of lost FADs to ensure minimal potential negative impacts on coral reefs.
	Expected outcome:	The impact of lost FADs from UoA vessels on coral reefs is minimized through use of biodegradable materials and engagement in lost FAD management initiatives.
		Responsible Party/ies: TMI, UoA vessel owners, UoA flag state authorities, research partners.
Consultation on condition	Letters of support from UoA flag state authorities.	

Table 41. Condition 2-7 Habitat Management – All Flags

Performance Indicator	PI 2.4.2 (Scoring issue a) Management strategy in place	
Score	75	
Justification	See Rationale SI a and b	
Condition	All Flags (including Solomon Islands) – By the fourth year surveillance audit, provide evidence that: SIa there is a partial strategy in place for VMEs (coral reefs) that is expected to achieve the Habitat Outcome 80 level of performance or above. SI b There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.	
Milestone Year 1	Surveillance: Milestone Year 1 Provide information on the level increased effort to report lost FADs and fulfill FAD management requirements. Expected score: 75	
Client Action Plan	**Activities:**	• TMI and UoA vessel owners to develop a mechanism for UoA vessels to voluntarily report lost FADs, in the absence of mandatory WCPFC requirements (i.e. to flag state/SPC/coastal state of last known FAD position, if applicable) • TMI, UoA vessels owners and UoA flag state authorities to advocate for adoption of binding FAD measures at WCPFC related to FAD design, marking, tracking and recovery. • UoA flag states/vessels to implement WCPFC guidelines for non-entangling and bio-degradable FAD materials. • UoA vessels to comply with PNA FAD tracking requirements. • UoA vessels to comply with ISSF FAD requirements (3.5, 3.7).
	Expected outcome:	UoA vessels voluntarily reporting lost FADs, implementing WCPFC guidelines for non-entangling/bioFADs, complying with PNA FAD tracking requirements and ISSF FAD requirements.
		Responsible Party/ies: TMI, UoA vessel owners, UoA flag state authorities.
Milestone Year 2 and Year 3	Surveillance: Milestone Year 2 and Year 3 Provide evidence that there is an increased effort for vessels in the UoA to report all lost FADs and fulfill FAD management requirements. Expected score: 75	
Client Action Plan	**Activities:**	• Evidence provided to CAB including database containing information on lost FADs; information on FAD design/materials; company-level ISSF FAD policies.
	Expected outcome:	UoA vessels voluntarily reporting lost FADs, implementing WCPFC guidelines for non-entangling/bioFADs, complying with PNA FAD tracking requirements and ISSF FAD requirements; evidence provided to CAB on status of these activities.

		Responsible Party/ies: TMI, UoA vessel owners, UoA flag state authorities.
Milestone Year 4	Provide evidence that there is a partial strategy in place for VMEs (coral reefs) that is expected to achieve the Habitat Outcome 80 level of performance or above Expected score: 80	
Client Action Plan	**Activities:**	Evidence provided to CAB including database containing information on lost FADs; information on FAD design/materials; company-level ISSF FAD policies.
	Expected outcome:	UoA vessels voluntarily reporting lost FADs, implementing WCPFC guidelines for non-entangling/bioFADs, complying with PNA FAD tracking requirements and ISSF FAD requirements; evidence provided to CAB on status of these activities.
		Responsible Party/ies: TMI, UoA vessel owners, UoA flag state authorities.
Consultation on condition	Letters of support from UoA flag state authorities.	

Table 42. Condition 2-8. Habitat Information – All Flags

Performance Indicator	PI 2.4.3 (Scoring issue b) Performance Indicator Description	
Score	75 (FAD sets)	
Justification	See Scoring Rationale	
Condition	By the third surveillance audit, provide evidence that the information available is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the timing and location of use of the fishing gear and, to the degree possible, the spatial extent of interaction.	
Milestone Year 1	Surveillance: Milestone Year 1 Develop and provide a plan for determining the spatial extent, timing and location of FAD interactions with coral reefs. Expected score: 75	
Client Action Plan	**Activities:** **Expected outcome:**	Refer to Conditions 8 & 9 Responsible Party/ies: Refer to Conditions 8 & 9
Milestone Year 2	Surveillance: Milestone Year 2 Provide information on the number of FADs lost by the fishery that might interact with coral reefs. Expected score: 75	
Client Action Plan	**Activities:** **Expected outcome:**	Refer to Conditions 8 & 9 Responsible Party/ies: Refer to Conditions 8 & 9
Milestone Year 3	Surveillance: Milestone Year 3 Provide information on the spatial extent, timing, and location of FAD interactions with coral reefs. Expected score: 80	
Client Action Plan	**Activities:** **Expected outcome:**	Refer to Conditions 8 & 9 Responsible Party/ies: Refer to Conditions 8 & 9
Consultation on condition	Letters of support from UoA flag state authorities.	

Table 43. Condition 3-1. PI 3.2.2 Decision-making – Vanuatu

Performance Indicator	**PI 3.2.2 Management system decision making processes aimed at achieving objectives**	
Score	75 for PI 3.2.2b	
Justification	**Responsiveness of decision-making processes** Whilst settled regional and sub-regional arrangements exist for this SI, it is less clear how effective these arrangements are at the domestic level for both the Solomon Islands and Vanuatu. For Vanuatu, there is a framework for decision-making processes to respond to serious and other important issues through the establishment of FMAC and their annual review of progress. Vanuatu's NPOA IUU Fishing and its national TMDP also address/flag contemporary/relevant issues in a transparent manner. Despite this, the assessment team has not been provided with evidence that the FMAC has been convened in recent years. The process for new management policies requires that FMAC reviews the policy prior to its consideration by the Ministry of Fisheries, the development council, and the legislative council - for final approval. The most recent advice from VFD indicates that FMAC is currently being re-established, although the revised committee has not yet met. In the absence of any evidence supporting the FMAC and related decision-making process, it cannot be concluded that issues identified through consultation/monitoring are dealt with in a transparent, timely and adaptive manner. SG60 is met, but SG80 is not. **As such, for both the Solomon Islands and Vanuatu, SG 60 requirements are met, however, SG 80 and SG 100 requirements are not met.**	
Condition	By the second surveillance audit of the re-assessment, provide evidence that decision-making processes for Vanuatu's VFD, respond to serious and other important issues identified in relevant research, monitoring, evaluation, and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	
Milestone Year 1	**1. Surveillance 1:** By the first surveillance audit, work with VFD to develop a proposal to improve decision making processes such that they respond to important issues in a transparent, timely and adaptive manner and take account of the wider implications of decisions. Ensure the plan improves the flow of information on the fishery's performance and management actions. The plans should identify: who will assess fishery performance, how frequently this will occur, how this information will be transmitted and to whom and what actions will be taken to address deficiencies. Overall, the plan should identify ways to improve input from all sources and how best to assess the wider implications of decisions. **Expected score: 75**	
Client Action Plan	**Activities:**	Tri Marine and Vanuatu-flag UoA vessel owner will advocate and support VFD in the development of a plan to improve national-level decision making processes, including the re-convening of FMAC.
	Expected outcome:	VFD has developed a plan to improve national-level decision making processes.
		Responsible Party/ies: VFD, with support from TMI/UoA vessel owner.
Milestone Year 2	**Surveillance 2:** By the second surveillance audit, demonstrate implementation of revised decision-making processes for VFD, with input from a range of sources and that the wider implications of decisions are being considered. Also, demonstrate the plan has been	

	implemented and information on the fishery's performance and management action is available on request. **Expected score: 75**	
Client Action Plan	**Activities:**	Tri Marine/Vanuatu UoA vessel owner will advocate and support VFD in the ongoing implementation of the plan to improve national-level decision making processes, including the re-convening of FMAC.
	Expected outcome:	VFD has implemented revised decision-making processes with input from a range of sources and wider implications of decisions also being considered, with information on the fishery's performance and management action available on request.
		Responsible Party/ies: VFD, with support from TMI/UoA vessel owner.
Milestone Year 3	**Surveillance 3:** By the third surveillance audit, be able to demonstrate that VFD decision-making processes are responding to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions. Also, provide evidence that information on the fishery's performance and management action are available on request and that explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity. **Expected score: 80**	
Client Action Plan	**Activities:**	Tri Marine/Vanuatu UoA vessel owner will advocate and support VFD in the ongoing implementation of the plan to improve national-level decision making processes, including the re-convening of FMAC.
	Expected outcome:	VFD is implementing decision-making processes that respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions. Information on the fishery's performance and management action are 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.
		Responsible Party/ies: VFD, with support from TMI/UoA vessel owner.
Consultation on condition	Letter of support from Vanuatu Fisheries Department.	

Table 44. Condition 3-2. PI 3.2.2 Decision-making – Solomon Islands

Performance Indicator	PI 3.2.2 Management system decision making processes aimed at achieving objectives
Score	75 for PI 3.2.2b. 75 for PI 3.2.2d.
Justification	**Responsiveness of decision-making processes** Whilst settled regional and sub-regional arrangements exist for this SI, it is less clear how effective these arrangements are at the domestic level for the Solomon Islands. MFMR staff are required to manage the fishery in accordance with the provisions of the SI Fisheries Act, however, the level of broader stakeholder consultation and the timeliness of input to local and regional serious and other important issues is unclear. This is partly due to the fact that a significant consultative mechanism, the FAC has not met since October 2014. There have been bilateral meetings between MFMR and the four companies operating in the UoA (they meet annually to discuss management arrangements and their annual MoUs and license conditions) and also between MFMR and the TIASI. However, no evidence was provided that these meetings deal specifically with relevant research, monitoring, evaluation and consultation in a transparent, timely and adaptive manner. **As such, SG 60 requirements are met, however, SG 80 and SG 100 requirements are not met.** **Accountability and transparency of management and decision-making process.** Overall, SG 60 and SG 80 requirements are met for this PI for the WCPFC however, not all information is publicly available (National Part 2 Reports) and information is not comprehensive for all elements of the management system or available to all interested stakeholders, therefore SG100 is not met. For the Solomon Islands, due to a lack of evidence, it is unclear whether the arrangements set out in the TMDP are in fact being implemented. The Plan states that "Information on fishery performance and management action is available on request, and explanations are provided to the Tuna Industry Association of the Solomon Islands (TIASI) for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring evaluation and review activity". Evidence was not provided to the extent to which this information has either been sought by the TIASI or provided to them.
Condition	SI b) By the second surveillance audit of the re-assessment, provide evidence that decision-making processes for the Solomon Islands' MFMR respond to serious and other important issues identified in relevant research, monitoring, evaluation, and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions. SI d) For the Solomon Islands' MFMR, by the second surveillance audit of the re-assessment, 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.
Milestone Year 1	**1. Surveillance 1:** By the first surveillance audit, work with MFMR to develop a proposal to improve decision making processes such that they respond to important issues in a transparent, timely and adaptive manner and take account of the wider implications of decisions. Ensure the plan improves the flow of information on the fishery's performance

	and management actions. The plans should identify: who will assess fishery performance, how frequently this will occur, how this information will be transmitted and to whom and what actions will be taken to address deficiencies. Overall, the plan should identify ways to improve input from all sources and how best to assess the wider implications of decisions. **Expected score: 75**	
Client Action Plan	**Activities:**	• Tri Marine/NFD will advocate and support MFMR in the initial implementation of the plan to improve national-level decision making processes. • Tri Marine/NFD's support and advocacy will be through direct liaison and cooperation with MFMR, participation as an active member of the Tuna Industry Association of Solomon Islands (TIASI), and in turn, through TIASI's representation on the Fisheries Advisory Council (FAC).
	Expected outcome:	MFMR has commenced the implementation of the plan to improve national-level decision making processes.
Milestone Year 2	**Surveillance 2:** By the second surveillance audit, demonstrate implementation of revised decision-making processes for MFMR, with input from a range of sources and that the wider implications of decisions are being considered. Also, demonstrate the plan has been implemented and information on the fishery's performance and management action is available on request. **Expected score: 75**	
Client Action Plan	**Activities:**	• Tri Marine/NFD will advocate and support MFMR in the ongoing implementation of the plan to improve national-level decision making processes. • Tri Marine/NFD's support and advocacy will be through direct liaison and cooperation with MFMR, participation as an active member of the Tuna Industry Association of Solomon Islands (TIASI), and in turn, through TIASI's representation on the Fisheries Advisory Council (FAC).
	Expected outcome:	MFMR has implemented revised decision-making processes with input from a range of sources and wider implications of decisions also being considered, with information on the fishery's performance and management action available on request.
Milestone Year 3	**Surveillance 3:** By the third surveillance audit, be able to demonstrate that MFMR decision-making processes are responding to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions. Also, provide evidence that information on the fishery's performance and management action are available on request and that explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity. **Expected score: 80**	
Client Action Plan	**Activities:**	• Tri Marine/NFD will advocate and support MFMR in the ongoing implementation of the plan to improve national-level decision making processes. • Tri Marine/NFD's support and advocacy will be through direct liaison and cooperation with MFMR, participation as an active member of the Tuna Industry Association of Solomon Islands (TIASI), and in turn, through TIASI's representation on the Fisheries Advisory Council (FAC).
	Expected outcome:	MFMR is implementing decision-making processes that respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions. Information on the fishery's

		performance and management action are 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.
Consultation on condition	Letter of support from MFMR	

Table 45. Condition 3-3. PI 3.2.3 Compliance and Enforcement – Solomon Islands

Performance Indicator	**PI 3.2.3 (a) A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules**	
Score	**75**	
Justification	See rationale for Scoring Indicator a. for PI 3.2.3 (MCS mechanisms) for the Solomon Islands' for more information.	
Condition	By the third surveillance audit of the re-assessment, the fishery client shall provide evidence that the monitoring, control and surveillance system implemented in the fishery has demonstrated an ability to consistently identify any infringements, and enforce relevant management measures, strategies and/or rules at both a national level (e.g. Flag States TMDP, Vessel License Conditions), and at a regional level (e.g. WCPFC CMM's).	
Milestone Year 1	Surveillance 1: By the first surveillance audit, support MFMR in identifying the degree to which their existing MCS systems provide an effective means to identify any instances of non-compliance with both national and regional (WCPFC, PNA) management measures, including compliance with relevant WCPFC CMM's, and compatible measures adopted on both the high seas, and within areas of national jurisdiction (e.g. EEZ, Archipelagic Waters). Expected score: 75	
Client Action Plan	Activities:	• Support MFMR to conduct a review of Solomon Islands' tuna fishery MCS system, in particular onboard observers and the integration of observer data into compliance monitoring, which includes: - Review of existing MCS processes relating to onboard observers and compliance monitoring against regional best practices (i.e. plans, policies, standard operating procedures etc.). - Review of effectiveness of implementation for the previous two years. - Identification of any gaps in MCS processes and/or implementation relating to onboard observers and/or integration of observer data into compliance monitoring. • TMI/NFD to install surveillance cameras on all NFD fishing vessels to complement human observer monitoring.
	Expected outcome:	MCS system review conducted to identify any gaps in processes and/or implementation relating to observer monitoring and integration of observer data into compliance monitoring.
		Responsible Party/ies: MFMR, with support as required from TMI/NFD.
Milestone Year 2	Surveillance 2: By the second surveillance audit, the relevant management agencies (VFD, NORMA, MFMR), with support from the client, develop an action plan to address the gaps and any shortcomings identified from the review presented in the year 1 surveillance. With emphasis on any systemic weaknesses in their national MCS system, including processes for timely evaluation of observer data to identify and act on any instances of non-compliance. The Action Plan must address any identified occurrences, or significant risks of non-compliant practices, that have been identified. Expected score: 75.	
Client Action Plan	Activities:	Develop an action plan addressing any gaps in processes and/or implementation identified in the MCS review which details the action required, persons/entities responsible, milestones/timeframes and resources required.
	Expected outcome:	MCS Action plan developed; commence implementation.
		Responsible Party/ies: MFMR, with support as required from TMI/NFD.

Milestone Year 3	Surveillance 3: By the third surveillance audit, provide evidence that the fishery's MCS systems consistently demonstrate the ability to identify infringements; and enforce national (e.g. SI TMDP, Vessel Permit/Licence Conditions), and regional (e.g. WCPFC CMM's) management measures, strategies and/or rules. Expected score: 80	
Client Action Plan	Activities:	• Implement the MCS action plan. • Conduct an internal review of completion of the action plan, including the collation of any available evidence of implementation.
	Expected outcome:	MFMR's observer and compliance monitoring is effective, resulting in the MCS system being effective overall in enforcing national and regional management measures.
		Responsible Party/ies: MFMR, with support as required from TMI/NFD.

Table 46. Condition 3-4. PI 3.2.3 Compliance and Enforcement – Federated States of Micronesia

Performance Indicator	**PI 3.2.3 (a) A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules**	
Score	**75**	
Justification	See rationale for Scoring Indicator a. for PI 3.2.3 (MCS mechanisms) for the Federated States of Micronesia for more information.	
Condition	By the third surveillance audit of the re-assessment, the fishery client shall provide evidence that the monitoring, control and surveillance system implemented in the fishery has demonstrated an ability to consistently identify any infringements, and enforce relevant management measures, strategies and/or rules at both a national level (e.g. Flag States TMDP, Vessel License Conditions), and at a regional level (e.g. WCPFC CMM's).	
Milestone Year 1	Surveillance 1: By the first surveillance audit, support NORMA in identifying the degree to which their existing MCS systems provide an effective means to identify any instances of non-compliance with both national and regional (WCPFC, PNA) management measures, including compliance with relevant WCPFC CMM's, and compatible measures adopted on both the high seas, and within areas of national jurisdiction. Expected score: 75	
Client Action Plan	Activities:	Support NORMA to conduct a review of FSM's tuna fishery MCS system, which includes: • Review of existing MCS processes relating to intentional sets on cetaceans/whale sharks and implementation of non-entangling FAD designs/FAD limits (i.e. legislation, plans, policies, standard operating procedures etc.). • Review of effectiveness of implementation/compliance monitoring for the previous two years (or since measures came into effect if less than two years). • Identification of any gaps in MCS processes and/or implementation relating to intentional sets on cetaceans/whale sharks and implementation of non-entangling FAD designs/FAD limits.
	Expected outcome:	MCS system review conducted to identify any gaps in processes and/or implementation relating to intentional sets on cetaceans/whale sharks and implementation of non-entangling FAD designs/FAD limits.
		Responsible Party/ies: NORMA, with support as required from TMI/FSM-flagged UoA vessel companies.
Milestone Year 2	Surveillance 2: By the second surveillance audit, the relevant management agencies (NORMA,), with support from the client, develop an action plan to address the gaps and any shortcomings identified from the review presented in the year 1 surveillance. With emphasis on any systemic weaknesses in their national MCS system, including processes for timely evaluation of observer data to identify and act on any instances of non-compliance. The Action Plan must address any identified occurrences, or significant risks of non-compliant practices, that have been identified. Expected score: 75.	
Client Action Plan	Activities:	Develop an action plan addressing any gaps in processes and/or implementation identified in the MCS review which details the action required, persons/entities responsible, milestones/timeframes and resources required.
	Expected outcome:	MCS Action plan developed; commence implementation.
		Responsible Party/ies: NORMA, with support as required from TMI/FSM-flagged UoA vessel companies.

Milestone Year 3	Surveillance 3: By the third surveillance audit, provide evidence that the fishery's MCS systems consistently demonstrate the ability to identify infringements; and enforce national (e.g. Vessel Permit/Licence Conditions), and regional (e.g. WCPFC CMM's) management measures, strategies and/or rules. Expected score: 80	
Client Action Plan	Activities:	Implement the MCS action plan. • Conduct an internal review of completion of the action plan, including the collation of any available evidence of implementation.
	Expected outcome:	NORMA's MCS system is effective overall in enforcing national and regional management measures.
		Responsible Party/ies: NORMA, with support as required from TMI/FSM-flagged UoA vessel companies.

Table 47. Condition 3-5. PI 3.2.3 Compliance and Enforcement – Vanuatu

Performance Indicator	**PI 3.2.3 (a) A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules**	
Score	**75**	
Justification	See rationale for Scoring Indicator a. for PI 3.2.3 (MCS mechanisms) for Vanuatu for more information.	
Condition	By the third surveillance audit of the re-assessment, the fishery client shall provide evidence that the monitoring, control and surveillance system implemented in the fishery has demonstrated an ability to consistently identify any infringements, and enforce relevant management measures, strategies and/or rules at both a national level (e.g. Flag States TMDP, Vessel License Conditions), and at a regional level (e.g. WCPFC CMM's).	
Milestone Year 1	Surveillance 1: By the first surveillance audit, support VFD in identifying the degree to which their existing MCS systems provide an effective means to identify any instances of non-compliance with both national and regional (WCPFC, PNA) management measures, including compliance with relevant WCPFC CMM's, and compatible measures adopted on both the high seas, and within areas of national jurisdiction. Expected score: 75	
Client Action Plan	Activities:	Support VFD to conduct a review of Vanuatu's tuna fishery MCS system, which includes: • Review of existing MCS processes relating to intentional sets on cetaceans/whale sharks, retention of oceanic white tip sharks/mobulids and implementation of non-entangling FAD designs/FAD limits (i.e. legislation, plans, policies, standard operating procedures etc.). • Review of effectiveness of implementation/compliance monitoring for the previous two years (or since measures came into effect if less than two years). • Identification of any gaps in MCS processes and/or implementation relating to intentional sets on cetaceans/whale sharks, retention of oceanic white tip sharks/mobulids and implementation of non-entangling FAD designs/FAD limits.
	Expected outcome:	MCS system review conducted to identify any gaps in processes and/or implementation relating to intentional sets on cetaceans/whale sharks, retention of oceanic white tip sharks/mobulids and implementation of non-entangling FAD designs/FAD limits.
		Responsible Party/ies: VFD, with support as required from TMI/Vanuatu-flagged UoA vessel owner.
Milestone Year 2	Surveillance 2: By the second surveillance audit, the relevant management agencies (VFD), with support from the client, develop an action plan to address the gaps and any shortcomings identified from the review presented in the year 1 surveillance. With emphasis on any systemic weaknesses in their national MCS system, including processes for timely evaluation of observer data to identify and act on any instances of non-compliance. The Action Plan must address any identified occurrences, or significant risks of non-compliant practices, that have been identified. Expected score: 75.	
Client Action Plan	Activities:	Develop an action plan addressing any gaps in processes and/or implementation identified in the MCS review which details the action required, persons/entities responsible, milestones/timeframes and resources required.
	Expected outcome:	MCS Action plan developed; commence implementation.

		Responsible Party/ies: VFD, with support as required from TMI/Vanuatu-flagged UoA vessel owner.
Milestone Year 3	Surveillance 3: By the third surveillance audit, provide evidence that the fishery's MCS systems consistently demonstrate the ability to identify infringements; and enforce national (e.g. Vessel Permit/Licence Conditions), and regional (e.g. WCPFC CMM's) management measures, strategies and/or rules. Expected score: 80	
Client Action Plan	Activities:	• Implement the MCS action plan. • Conduct an internal review of completion of the action plan, including the collation of any available evidence of implementation.
	Expected outcome:	VFD's MCS system is effective overall in enforcing national and regional management measures.
		Responsible Party/ies: VFD, with support as required from TMI/Vanuatu-flagged UoA vessel owner.

Table 48. Condition 3-6. Compliance and Enforcement – All Flag States

Performance Indicator	**PI 3.2.3 (a) A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules**	
Score	**75**	
Justification	See rationale for Scoring Indicator a. for PI 3.2.3 (MCS mechanisms) for more information. For the Flag States for this assessment (SI, Vanuatu, FSM, Taiwan, USA, Cook Islands and New Zealand) there is little to no supporting evidence of implementation of WCPFC CMM2018-01, in relation to use of non-entangling FAD designs, use of bio-degradeable materials in FAD construction, and compliance with limits to the number of FADs able to be set by each vessel. The assessment team considers, at this stage, that the while a MCS system exist, and MSC measures are implemented in the fishery and there is a reasonable expectation that they are effective. Despite this, with regard to adoption of CMM2018-01, it cannot be said that the management system has demonstrated an ability to enforce relevant management measures, strategies and/or rules. Therefore SG80 for 3.2.3a is not met.	
Condition	By the fourth surveillance audit, the fishery client shall provide evidence that the monitoring, control and surveillance system implemented in the fishery has demonstrated an ability to enforce relevant management measures, strategies and/or rules at both a national level (e.g. compliance with national TMDP, Vessel License Conditions), and at a regional level (e.g. demonstrate compliance with WCPFC CMM's such as 2018-01).	
Milestone Year 1	Surveillance 1 (2022): By the first surveillance audit, support relevant fisheries agencies in conducting a review of the MCS system and report on the degree to which the existing MCS system provides an effective deterrent to non-compliance with both national and regional (WCPFC, PNA) management measures, including compliance with relevant WCPFC CMM's, and compatible measures adopted in internal/archipelagic waters where relevant. Expected score: 75	
Client Action Plan	**Activities:**	Support UoA flag state authorities to conduct a review of their respective tuna fishery MCS systems, in particular the implementation and monitoring of vessel-level compliance with CMM 2018-01 in relation to non-entangling FAD designs and the limit on the number of active FADs deployed per purse seine vessel, which includes: • Review of existing MCS processes relating to non-entangling FADs/FAD limits (i.e. incorporation into legislation, plans, policies, standard operating procedures etc.). • Review effectiveness of implementation since CMM 2018-01 requirements came into effect. • Identification of any gaps in MCS processes and/or implementation relating to non-entangling FAD designs/FAD limits.
	Expected outcome:	MCS system review conducted to identify any gaps in processes and/or implementation relating to non-entangling FAD designs and the limit on the number of active FADs deployed.
		Responsible Party/ies: UoA flag state authorities, with support from TMI/UoA vessel owners.

Milestone Year 2	Surveillance 2 (2023): By the second surveillance audit, all Flag States fisheries agencies, with support from the client, develop an action plan to address the gaps and any shortcomings identified from the review presented in the year 1 surveillance. With emphasis on any systemic weaknesses in the national MCS system, and addressing any specific occurrences (e.g. CMM2018-01) or significant risks of non-compliant practices. Expected score: 75.	
Client Action Plan	**Activities:**	TMI/UoA vessel owners to support UoA flag state authorities to develop action plans addressing any gaps in processes and/or implementation identified in the MCS review relating to non-entangling FADs/FAD limits which details the action required, persons/entities responsible, milestones/timeframes and resources required.
	Expected outcome:	MCS action plans developed; commence implementation.
		Responsible Party/ies: UoA flag state authorities, with support from TMI/UoA vessel owners.
Milestone Year 3	Surveillance 3 (2024): By the third surveillance audit, and guided by the action plan outlined above, provide evidence that the monitoring, control and surveillance system implemented in the fishery is demonstrating the ability to enforce national (e.g. TMDP, Vessel Permit/License Conditions), and regional (e.g. WCPFC CMM's) management measures, strategies and/or rules. Expected score: 75.	
Client Action Plan	**Activities:**	• Implement MCS action plans. • Conduct internal reviews of completion of the action plans, including the collation of any available evidence of implementation.
	Expected outcome:	UoA flag state authorities' implementation of CMM 2018-01 is effective, resulting in the MCS system being effective overall in enforcing national and regional management measures.
		Responsible Party/ies: UoA flag state authorities, with support from TMI/UoA vessel owners.
Milestone Year 4	Surveillance 4 (2025): By the fourth surveillance audit, provide evidence that the fishery's MCS systems demonstrates the ability to enforce national (e.g. TMDP, Vessel Permit/Licence Conditions), and regional (e.g. WCPFC CMM's) management measures, strategies and/or rules. Expected score: 80.	
Client Action Plan	**Activities:**	UoA flag state authorities to provide evidence to CAB of implementation of CMM 2018-01 measures relating to non-entangling FADs/FAD limits and UoA vessel compliance.
	Expected outcome:	UoA flag state authorities' implementation of CMM 2018-01 is effective, resulting in the MCS system being effective overall in enforcing national and regional management measures.
		Responsible Party/ies: UoA flag state authorities, with support from TMI/UoA vessel owners.
Consultation on condition	Letters of support from UoA flag state authorities.	

8.12 Client Action Plan

See Section 8.11.3 above.

8.13 Surveillance

Table 49 Surveillance level rationale

Year	Surveillance activity	Number of auditors	Rationale
1-4	On-site audit	1 or 2 auditors	In accordance with FCRV2.2 7.23.4 and based on the number of conditions and information needed to verify progress. Note, the on-site audit may not necessarily include in person meetings with representatives of *all* management systems relevant to the UoA. The team may visit different locations/UoA's throughout the surveillance audit cycles.

Table 50. Timing of surveillance audit

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
Year 1-4	*Determined at PCR*	*Determined at PCR*	The surveillance audits for this certificate will likely be held concurrent with surveillance audits for the Solomon Islands longline tuna fishery & Solomon Islands purse seine and pole&line fishery to reduce financial burden on the fishery client and time/resources from fishery management/science personnel.

8.14 Harmonised fishery assessments

8.14.1 Principle 1

Principle 1 tuna fisheries in the WCPO have been the subject of several harmonization discussions. In 2016 CAB representative and team members participated in a Harmonization Workshop, which resulted in agreed scores for Principle 1 for the yellowfin tuna, albacore, and skipjack tuna stocks in the western Pacific managed by the Western and Central Pacific Fisheries Commission (WCPFC). The harmonization outcome report was peer-reviewed, the details of which can be provided upon request.

Following the 2016 Harmonization Workshop, CABs have reviewed new information, participated in harmonization discussions and adjusted rationales, and relevant scores. The sections below describe subsequent harmonization discussions in which SCS participated. Currently, all scores are harmonized except for some minor differences in the SG80-100 bracket. These differences do not affect the overall outcome of the Principle 1 assessment.

In 2018, in recognition of different timelines to address Principle 1 conditions across MSC certified tuna fisheries, the MSC required all tuna and tuna-like fisheries (herein, tuna fisheries) certified against MSC Fisheries Standard v1.3 to update to v2.0. Additionally, there are requirements to harmonize timelines for P1 conditions (limited to those concerning harvest strategies and harvest control rules). For the WCPO, timelines are aligned against the WCPFC 2017 work plan.

In 2020 in response to the Covid-19 Derogation issued by MSC, six months was added to all fishery conditions, including harmonized conditions.

Skipjack

This fishery overlaps with several other WCPO skipjack tuna fisheries in the MSC programme (**Table 51**).

Table 51 Fisheries in the MSC System Considered for Harmonization for Principle 1 for skipjack stocks as of June 2020.

Fishery name	CAB	Latest Report Version	1.1.1	1.1.2	1.2.1	1.2.2	1.2.3	1.2.4
Standard v2.0/2.01								
Indonesia pole-and-line and handline, skipjack and yellowfin tuna fishery	SAI Global	ACDR Jan 2020	100	NA	90*	60	90	95
Japanese Pole and Line skipjack and albacore tuna fishery	Lloyds Register	3rd Surv Oct 2019	100	NA	70	60	90	95
PNA Western and Central Pacific skipjack and yellowfin, unassociated / non FAD set, tuna purse seine	Lloyds Register	2nd Surv Anmt Feb 20	100	NA	70	60	90	95
PNG Fishing Industry Association's purse seine Skipjack & Yellowfin Tuna Fishery	SCS	PCR May 2020	100	NA	70	60	90	95

PT Citraraja Ampat, Sorong pole and line Skipjack and Yellowfin Tuna	DNV	1st Surv Apr 2020	100	NA	70	60	95*	95
Solomon Islands skipjack and yellowfin tuna purse seine and pole and line	SCS	ACDR May 2020	100	NA	70	60	90	95
Talleys New Zealand Skipjack Tuna Purse Seine	Lloyds Register	2nd Surv Oct 2019	100	NA	70	60	90	95
Tri Marine Western and Central Pacific Skipjack and Yellowfin Tuna	SCS	ACDR September 2020	100	NA	70	60	90	95
Tropical Pacific yellowfin and skipjack free-school purse seine fishery	Control Union	PCR Oct 2019	100	NA	70	60	90	95
WPSTA Western and Central Pacific skipjack and yellowfin free school purse seine	SCS	2nd Surv May 2020	100	NA	70	60	90	95
Ishihara Marine Products albacore and skipjack pole and line fishery	Control Union	1st Surv Feb 2020	100	NA	70	60	90	95
Standard v1.3								
MSC harmonized scores		2016	100	NA	70	60	90	95
**** Differences in scoring***								

Table 52 Rationale for scoring differences

If applicable, explain and justify any difference in scoring and rationale for the relevant Performance Indicators (FCP v2.1 Annex PB1.3.6)
The differences in scoring noted above under 1.2.1 and 1.2.3 have been discussed and the fisheries have agreed to harmonize with the agreed upon scores at the time of their next audit.

Yellowfin

This fishery overlaps with several other WCPO yellowfin tuna fisheries in the MSC programme (Table 53). See above for more information on recent harmonization discussions for yellowfin in the WCPO.

Table 53 Fisheries in the MSC System Considered for Harmonization for Principle 1 for yellowfin stocks as of June 2020.

Fishery name	CAB	Recent Report Version	1.1.1	1.1.2	1.2.1	1.2.2	1.2.3	1.2.4
American Samoa EEZ albacore and yellowfin longline fishery	Control Union	2nd Surv April 2020	90	NA	70	60	80	95
Australian Eastern Tuna and Billfish Fishery (albacore tuna, yellowfin tuna, bigeye tuna and swordfish)	q.inspecta GmbH	PCDR May 2020	90	NA	70	65	80	100*
Fiji albacore and yellowfin tuna longline	Acoura	January 2018	90	NA	70	60	90*	95
French Polynesia albacore and yellowfin longline fishery	Control Union	1st Surv Nov 2019	90	NA	70	60	80	95

Indonesia pole-and-line and handline, skipjack and yellowfin tuna of Western and Central Pacific archipelagic waters	SAI Global	ACDR Jan 2020	100	NA	90	60	90*	95
Kiribati albacore, bigeye and yellowfin tuna longline fishery	Control Union	NA	TBC	NA	TBC	TBC	TBC	TBC
North Buru and Maluku Fair Trade Fishing Associations, Indonesian Handline Yellowfin Tuna	SCS	PCR May 2020	90	NA	70	60	80	95
Owasebussan Co. Ltd. North Pacific Longline Tuna Fishery for Albacore, Yellowfin Tuna & Bigeye Tuna	SCS	ACDR Jan 2020	90	NA	70	60	80	95
Pan Pacific yellowfin, bigeye and albacore longline fishery	Control Union	PCR May 2020	90	NA	70	60	80	95
PNA Western and Central Pacific skipjack and yellowfin, unassociated / non FAD set, tuna purse seine	Lloyds Register	2nd Surv Anmt Feb 20	90	NA	70	60	90*	95
PNG Fishing Industry Association's purse seine Skipjack & Yellowfin Tuna Fishery	SCS	PCR May 2020	90	NA	70	60	80	95
PT Citraraja Ampat, Sorong pole and line skipjack and yellowfin tuna	DNV	1st Surv Anmt Apr 2020	90	NA	70	60	90*	95
Solomon Islands longline albacore and yellowfin tuna fishery	SCS	PCR Nov 2019	90	NA	70	60	80	95
Solomon Islands skipjack and yellowfin tuna purse seine and pole and line	SCS	ACDR May 2020	90	NA	70	60	80	95
SZLC CSFC & FZLC FSM EEZ Longline Yellowfin and Bigeye Tuna	Control Union	2nd Surv Jan 2020	90	NA	70	60	80	95
SZLC CSFC FZLC & MIFV RMI EEZ Longline yellowfin and bigeye Tuna	Control Union	PCR Oct 2019	90	NA	70	60	80	95
SZLC, CSFC & FZLC Cook Islands EEZ South Pacific albacore & yellowfin longline (certified)	Control Union	PCDR May 2020	90	NA	70	60	80	95
Tri Marine Western and Central Pacific skipjack and yellowfin tuna	SCS	ACDR September 2020	90	NA	70	60	80	95
Tropical Pacific yellowfin and skipjack free- school purse seine fishery	Control Union	PCR Oct 2019	90	NA	70	60	80	95
WPSTA Western and Central Pacific skipjack and yellowfin free school purse seine	SCS	2nd Surv Anmt May 2020	90	NA	70	60	80	95
MSC harmonization scores (v1.3)			90	NA	70	60	80	95

**** Differences in scoring***

Table 54 Rationale for scoring differences

If applicable, explain and justify any difference in scoring and rationale for the relevant Performance Indicators (FCP v2.2 Annex PB1.3.6)
The differences in scoring noted above under 1.2.3 have been discussed and the fisheries have agreed to harmonize with the agreed upon scores at the time of their next audit. The scoring difference in 1.2.4 is due to stock assessment information available for the Australian fishery only. This score will remain.

Table 55 Overlapping fisheries WCPO Yellowfin/Skipjack

Supporting information	
Describe any background or supporting information relevant to the harmonisation activities, processes and outcomes.	
2019 n 2019 triggered harmonization discussions amongst CABs to review the previously agreed-upon scores for these skipjack/yellowfin stocks. The harmonization discussions did not result in a change to scores, however, they led CABs to seek further guidance on interpretation of the standard from MSC. The interpretation remains unanswered, but the MSC The issues reviewed included: • **Higher score for PI 1.2.1a-** The MSC identifies a Harvest Control Rule in place (even if just a generally understood one) as one of the key elements required in a harvest strategy (MSC Standard v2.01 GSA2.4) and so the lack of any form of HCR is relevant to the logic behind whether the harvest strategy elements (as defined by MSC) work together as required by the SG80 level for Scoring Issue a for PI 1.2.1. Applying the MSC definition of a harvest strategy, it is understood that a harvest strategy for a fishery could not be given an unconditional pass for PI 1.2.1 without an HCR being in place. Nevertheless, SCS with other CABs recognize the potential validity of this argument and have in response submitted an interpretation request to MSC on July 2019, to clarify whether the second part of 1.2.1a can meet SG80 if a generally understood or well-defined HCR is not in place. MSC did not provide a response to the interpretation request, and acknowledging that the intent isn't clear in the requirements and guidance, that an interpretation request was not appropriate in this case and that this issue has been incorporated into the policy development cycle for the upcoming FSR. CABs have agreed that for now this condition cannot be closed until the related condition on PI 1.2.2 is closed. • **PI 1.2.2a.** argument that a generally understood HCR is in place and not just available. This does not affect the score for this PI but could affect how PI 1.2.1a is scored and would also allow a different approach for PI 1.2.2c There has previously been agreement among CABs that there is not even a generally understood HCR for skipjack tuna (or other tuna species). A 60 score has been achieved for 1.2.2a on the basis of 'available' HCRs not one that is 'in place'. All measures introduced by WCPFC have been negotiated outcomes that, although important and positive for stock conservation, had not been considered to follow even a generally understood HCR. The MSC Interpretation on HCRs instructs CABs that, when there is uncertainty over whether a HCR meets the requirements of 'generally understood', they should follow the precautionary approach and award a lower score. So, in the absence of new and stronger evidence that the previous decision was incorrect, the status quo should apply, and a condition be maintained.	
Was either FCP v2.2 Annex PB1.3.3.4 or PB1.3.4.5 applied when harmonising?	**Yes**
Date of harmonisation meeting	**July 16 2019**
No agreement was reached and lowest score was adopted (i.e. scores from 2016 harmonization pilot workshop remained in place).	

8.14.2 Principle 2

Table 56 Fisheries in the MSC System Considered for Harmonization for Principle 1 for yellowfin stocks as of June 2020.

Following harmonization requirements outlined in Table GPB1:

PIs		Required to harmonise	Harmonization Comments
PI 2.1.1a	PI 2.1.1a	For stocks that are 'main' in both UoAs, harmonise status relative to PRI (at SG60,80 and 100), and if below PRI, harmonise cumulative impacts at SG80 (not at SG60).	There are no main species
Partially	Partially	For stocks that are 'main' in both UoAs, harmonise status relative to Biologically Based Limits (at SG60, 80, and 100), and if below Biologically Based Limits, harmonise cumulative impacts at SG80 (not at SG60).	There are no main species
PI 2.3.1a	Partially	Harmonise recognition of any limits applicable to both UoAs (at SG60, 80 and 100), and cumulative effects of the UoAs at SG80 and SG100 (not at SG60).	There are no limits applicable to ETP species, cumulative effects are already indirectly taken into account as the team assessed outcome of ETP species weighting impact of the UoA and status of the ETP species.
PI 2.4.1b	Partially	Harmonise recognition of VMEs where both UoAs operate in the same 'managed area(s)' (see Guidance to the MSC Fisheries Standard).	Recognized coral reefs as VMEs
PI 2.4.2 a, c	Partially	Harmonise scoring at SG100 since all fishery impacts are considered (not at SG60 or 80).	With other fisheries employing DFADS, PI 2.4.2 is harmonized with other fisheries *at the SG100 level.*

8.14.3 Principle 3 harmonization requirements

Fishery name	CAB	Latest Report Version	Group #	3.1.1	3.1.2	3.1.3	3.2.1	3.2.2	3.2.3	3.2.4
Standard v2.0/2.01										
WPSTA China	SCS	3rd Surv Oct 2019	1	80	75	90	90	75	75	80

WPSTA Chinese Taipei	SCS	ACDR Jan 2020 (FAD)	2	75	75	90	90	75	75	80
WPSTA USA	SCS	ACDR Jan 2020 (FAD)	3	85	85	90	90	80	75	80
Tri Marine WCPO Fishery (USA)	SCS	ACDR August	3	85	85	90	90	80	75	80
Tri Marine WCPO Fishery (Solomon Islands)	SCS	ACDR August	4	85	75	90	90	75	70	80
Tri Marine WCPO Fishery (Chinese Taipei)	SCS	ACDR August	2	85	80	90	90	80	70	80
Tri Marine WCPO Fishery (FSM)	SCS	ACDR August	5	85	80	90	90	80	70	80
Tri Marine WCPO Fishery (Vanuatu)	SCS	ACDR August		85	80	90	90	75	70	80
Tri Marine WCPO Fishery (New Zealand)	SCS	ACDR August	6	85	85	90	90	80	75	80
Tri Marine WCPO Fishery (Cook Islands)	SCS	ACDR August	7	85	80	90	90	80	70	80
PNA Western and Central Pacific skipjack and yellowfin, unassociated / non FAD set, tuna purse seine	LR	2nd Surv Anmt Feb 20	4	80	95	90	90	90	80	80
Talleys Purse seine fishery (New Zealand, EEZ only)	LR	2nd Surv Oct 2019		90	90	90	90	85	80	80
Solomon Islands purse seine and pole and line fishery *Purse seine UoA	SCS	Reassessment PCDR May 2020	4	85	75	90	90	75	75	80
SZLC, CSFC & FZLC Cook Islands EEZ South Pacific albacore, yellowfin and bigeye longline	CU	Reassessment PCDR May 2020	7	95*	85	80	90	80	80	90
SZLC CSFC & FZLC FSM EEZ Longline Yellowfin and Bigeye Tuna	CU		5	95	95	90	90	95	85	90

Tropical Pacific yellowfin and skipjack free-school purse seine fishery (Cook Islands)	CU	PCR Oct 2019	7	85*	85	90	80	80	80	80
Tropical Pacific yellowfin and skipjack free-school purse seine fishery (PNA)	CU	PCR Oct 2019	4	85	85	90	80	80	80	80
Tropical Pacific yellowfin and skipjack free-school purse seine fishery (High seas)	CU	PCR Oct 2019	All units in this fishery	85	85	90	80	80	80	80

Table 57 Rationale for scoring differences

If applicable, explain and justify any difference in scoring and rationale for the relevant Performance Indicators (FCP v2.2 Annex PB1.3.6)
Scoring differences across Principle 3 are largely a result of a change in the UoA definition between FCP 2.2 and 2.1, where all purse-seine set types are now included (i.e. 3.2.3 condition on FAD MCS and requiring evidence that sanctions are applied to high-seas fleets). This fishery assessment considers fishing activity undertaken both within the high seas and select EEZs, therefore, UoA scores may differ in this fishery than others where high seas activity is not taken into consideration. Scoring differences between the NZ UoA in this fishery and the certified NZ Talley's fleet is because the Talley's fleet operates exclusively within NZ EEZ and not on the high-seas. Because the fleet here operates on the high seas, scores are lower. The deviation between the Cook Islands UoA in this fishery and the Cook Islands certified longline fleet is because the Cook Islands longline rationale score is inconsistent with the scoring table (i.e. 3.1.1, SI c meets SG100 in rationale but scoring in table does not reflect this). Any deviation in scores across the fleets is a result of exceptional circumstances in which the UOAs are demonstrably different (FCP 2.2 PB1.3.6).

8.15 Objection Procedure

To be added at Public Certification Report stage

8.16 Vessel list

Flag state	Vessel name	Beneficial Vessel Owner/Parent Company
FSM	Caroline 1	Caroline Fisheries Corporation
FSM	Melissa	Caroline Fisheries Corporation
FSM	Nanmadol	Caroline Fisheries Corporation
FSM	Marielle	Caroline Fisheries Corporation
FSM	Queen Mary	Caroline Fisheries Corporation
FSM	Trinidad III	Caroline Fisheries Corporation
FSM	Queen Elizabeth 959	CityPro Management Ltd.
FSM	Queen Alexandra 959	CityPro Management Ltd.
FSM	Queen Anne 959	CityPro Management Ltd.
FSM	Queen Isabella 959	CityPro Management Ltd.
FSM	Micronesia 101	Koos Fishing Co.
FSM	Micronesia 102	Koos Fishing Co.
FSM	Micronesia 103	Koos Fishing Co.
FSM	Micronesia 106	Koos Fishing Co.
Cook Islands	Jeannine	Adriatic Sea Fisheries Ltd.
Taiwan	Jih Yu 168	Jih Yu Fishery Co.
Taiwan	Jih Yu 668	Jih Yu Fishery Co.
Taiwan	Jih Yu 768	Jih Yu Fishery Co.
Taiwan	Jih Yu 868	Jih Yu Fishery Co.
Taiwan	Jih Yu 968	Jih Yu Fishery Co.
Taiwan	Fair Bravo No. 707	Fairwell Fishery Co.
Taiwan	Fair Well No. 707	Fairwell Fishery Co.
Taiwan	Viva Fafa No. 707	Fairwell Fishery Co.
Taiwan	New Fair Discovery No. 707	Fairwell Fishery Co.
Taiwan	Win Forever No. 707	Fairwell Fishery Co.
Taiwan	Win Rich No. 707	Fairwell Fishery Co.
New Zealand	Capt. MJ Souza	Talleys
Vanuatu	Win Best 707	Fairwell Fishery Co.
Vanuatu	Win Harvest 707	Fairwell Fishery Co.
Vanuatu	Win Win 707	Fairwell Fishery Co.
Vanuatu	Viva Gogo 707	Fairwell Fishery Co.
USA	Capt Vincent Gann	Jim Sousa
USA	Cape Cod	Cape Fleet Holdings
USA	Cape Ferrat	Cape Fleet Holdings
USA	Cape May	Cape Fleet Holdings
USA	Cape Breton	Cape Fleet Holdings
USA	Cape Elizabeth 3	Cape Fleet Holdings
USA	Cape Finisterre	Cape Fleet Holdings
USA	Pacific Princess	Ricardo Da Rosa

8.17 Catch Table

Table 58. WCPFC ROP observer catch data (mt) for the purse-seine vessels in the UoA from 2015 to 2019 across all set types. Data provided by SPC.

Common Name	Years					Grand Total
	2015	2016	2017	2018	2019	
Skipjack	213715.26	114001.43	117608.94	140307.11	45525.79	631158.53
Yellowfin	24990.62	16038.59	21621.04	21309.80	5474.44	89434.50
Bigeye	5131.83	4607.62	4101.78	5423.25	1232.63	20497.11
Rainbow Runner	317.14	470.08	101.89	175.92	67.85	1132.87
Silky Shark	86.35	133.70	147.27	236.66	69.31	673.28
Mackerel / Scad	113.24	145.63	25.56	42.62	29.20	356.23
Blue Marlin	70.57	27.03	44.14	37.21	7.93	186.87
Whale Shark	28.97	26.45	31.23	51.68	20.81	159.15
Sand Whiting	0	0	0	118.49	0	118.49
Ocean Triggerfish (Spotted)	27.85	48.42	17.53	19.15	5.19	118.14
Mahi Mahi / Dolphinfish / Dorado	30.74	11.91	29.37	12.97	0	84.99
Black Marlin	35.10	10.92	17.81	12.44	1.91	78.17
Wahoo	11.62	7.70	16.13	14.27	1.01	50.73
False Killer Whale	7.87	6.07	1.70	13.00	20.25	48.90
Striped Marlin	13.76	6.58	3.21	4.42	1.05	29.02
Giant Manta	6.73	2.21	5.12	10.92	3.56	28.55
Oceanic Triggerfish (Unidentified)	7.54	14.93	0.30	2.73	0	25.50
Sei Whale	0.00	1.77	1.18	5.59	15.00	23.54
Common Dolphinfish	3.30	3.23	1.65	4.32	9.02	21.52
Fin Whale	0	0	0	20.00	0	20.00
Toothed Whales Nei	0	0	0	11.00	0.38	11.38
Oceanic Whitetip Shark	3.23	1.57	1.39	3.18	1.13	10.50
Bryde's Whale	1.21	0	4.28	0	4.25	9.73
Drummer (Blue Chub)	4.44	4.78	0.29	0.12	0	9.64
Albacore	8.03	0.02	0.69	0.01	0.12	8.86
Devil Manta Ray (Mobula Nei)	7.47	1.28	0	0	0	8.75
Great Barracuda	3.06	1.20	0.97	1.46	0.14	6.82
Rough-Toothed Dolphin	1.87		1.00	1.10	2.71	6.68
Blue Sea Chub / Snubnose Chub / Topsail Drummer	1.22	4.39	0.11	0.29	0.27	6.28
Mobula	2.68	0.33	0.21	2.04	0.93	6.19
Triggerfishes, Durgons Nei	0.20	4.41	0.14	0.82	0.23	5.80
Indo-Pacif. Bottlenose Dolphin	0	0	0	1.42	3.92	5.34
Blacktip Shark	0	5.18	0.00	0	0	5.18

Common Name	Years					Grand Total
	2015	2016	2017	2018	2019	
Mobula (A.K.A. Devil Ray)	0.61	0.68	1.38	2.38	0	5.04
Blue Whale	0	0	0	0	5.00	5.00
Amberjack / Giant Yellowtail	0.64	0.53	0	0.94	2.81	4.92
Manta Rays (Unidentified)	2.68	1.76	0.05	0.29	0	4.77
Kawakawa	1.35	0.28	0.02	0.88	1.41	3.94
Short-Finned Pilot Whale	1.67	1.67	0	0.30	0	3.64
Bigeye Trevally	2.16	0.91	0.10	0.08	0.38	3.62
Golden Trevally	1.33	0.26	0.09	0.94	0.05	2.67
Sailfish (Indo-Pacific)	1.47	0.29	0.10	0.44	0	2.29
Bigeye Scad	0.68	1.41	0.05	0.02	0.05	2.21
Unspecified	1.24	0.08	0.50	0.04	0.03	1.88
Black Triggerfish	0	0.82	0	0.26	0.77	1.84
Slender Sunfish	1.70	0.05	0	0	0	1.75
Longfin Batfish	0.85	0.27	0.29	0.15	0.07	1.63
Frigate Tuna	0.78	0.11	0.15	0.39	0.02	1.46
Spinner Dolphin	0	0	1.00	0.10	0.20	1.30
Blacktip Reef Shark	0	1.05	0	0	0	1.05
Bronze Whaler Shark	0	0		0.02	0.87	0.89
Common Dolphin	0	0	0	0	0.55	0.55
Filefish (Unicorn Leatherjacket)	0.53	0	0.00	0	0	0.53
Unicorn Leatherjacket Filefish	0.42	0.00	0.03	0.05	0.02	0.52
Greater Amberjack / Giant Amberjack / Giant Yellowtail	0.41	0.02	0.01	0	0.07	0.51
Indo-Pacific Sailfish	0	0.15	0	0.25	0.09	0.49
Dogtooth Tuna	0	0	0	0.14	0.30	0.44
Brilliant Pomfret	0.17	0.24	0	0.01	0	0.42
Ocean Sunfish	0.04	0.32	0	0	0	0.36
Bottlenose Dolphin	0	0	0	0.15	0.20	0.35
Indian Scad	0	0	0.30	0	0	0.30
Mantas, Devil Rays Nei	0.20	0.07	0	0	0.00	0.27
Sandbar Shark	0	0	0	0.25	0	0.25
Filefishes	0	0.25	0	0	0	0.25
Batfishes	0	0.24	0	0	0	0.24
Green Turtle	0.09	0.01	0	0.04	0.08	0.21
Minke Whale	0.10	0	0.10	0	0	0.20
Pelagic Sting-Ray	0.10	0.01	0.05	0.02	0	0.18
Scalloped Hammerhead	0	0.08	0	0.10	0	0.18
Bullet Tuna	0	0.04	0.13	0	0	0.17
Great Hammerhead	0.15	0	0	0	0	0.15
Shortfin Mako	0	0	0	0.15	0	0.15

Common Name	Years					Grand Total
	2015	2016	2017	2018	2019	
Anadara Clams Nei	0	0	0	0.11	0	0.11
Olive Ridley Turtle	0.00	0	0.03	0.03	0.05	0.11
Marlins,Sailfishes,Etc. Nei	0	0	0	0	0.10	0.10
Cuvier's Beaked Whale	0.10	0	0	0	0	0.10
Sharptail Mola	0.07	0	0.03	0	0	0.10
Baleen Whales Nei	0.10	0	0	0	0	0.10
Shortfin Mako Shark	0.10	0	0	0	0	0.10
Loggerhead Turtle	0.05	0.03	0	0.01	0.01	0.10
Pelagic Stingray	0.01	0.06	0.00	0.02	0.01	0.10
Pomfrets And Ocean Breams	0.08	0	0	0	0	0.08
Shortbill Spearfish	0.02	0	0	0.02	0.04	0.07
Silvertip Shark	0	0	0	0	0.07	0.07
Longfin Mako Shark	0.07	0	0.00	0	0	0.07
Trevallies	0.06	0.01	0	0	0	0.07
Sickle Pomfret	0	0	0	0.03	0.02	0.05
Tripletail	0.01	0.02	0.00	0.01	0.01	0.05
Galapagos Shark	0	0	0	0.05	0	0.05
Barracudas (Unidentified)	0.01	0	0.04	0	0	0.05
Crestfish/Unicornfish	0.05	0	0	0	0	0.05
Tiger Shark	0	0	0.04	0	0	0.04
Hawksbill Turtle	0.02	0	0	0.01	0	0.03
Leatherback Turtle	0	0	0	0.03	0	0.03
Goldenstriped Soapfish	0	0	0	0.03	0	0.03
Blackfin Barracuda	0.01	0	0	0.02	0	0.03
Pilotfish	0	0.02	0	0	0	0.02
Swordfish	0	0	0	0.02	0	0.02
Basking Shark	0	0	0.02	0	0	0.02
Short-Billed Spearfish	0.02	0	0	0	0	0.02
Triple-Tail	0.00	0	0	0.01	0	0.01
Oilfish	0	0	0.01	0	0	0.01
Needlefishes Nei	0	0	0.01	0	0	0.01
Flathead Chub	0.01	0	0	0	0	0.01
Scomber Mackerels Nei	0.01	0	0	0	0	0.01
Pacific Saury	0	0.01	0	0	0	0.01
Bigeye Thresher Shark	0.01	0	0	0	0	0.01
Opah / Moonfish	0.01	0	0	0	0	0.01
Barracudas Nei	0	0.01	0	0	0	0.01
Pilot Fish	0.00	0	0.00	0.00	0	0.00
Cottonmouth Jack	0	0	0	0	0.00	0.00
Bramid Species	0	0.00	0	0	0	0.00
Batoid Fishes Nei	0	0.00	0	0	0	0.00

Common Name	Years					Grand Total
	2015	2016	2017	2018	2019	
Pompano Dolphinfish	0	0.00	0	0	0	0.00
Cyprus Larva	0	0.00	0	0	0	0.00
Black-Footed Albatross	0.00	0	0	0	0	0.00
Pelagic Puffer	0.00	0	0	0	0	0.00
Various Sharks Nei	0	0	0	0	0.00	0.00
Marine Turtles Nei	0	0	0	0	0.00	0.00
Beaked Whales Nei	0.00	0	0	0	0	0.00
Giant Boarfish	0.00	0	0	0	0	0.00
Sculptured Mitten Lobster	0	0	0.00	0	0	0.00
Capelin	0	0.00	0	0	0	0.00
Grand Total	**244652.04**	**135599.18**	**143789.43**	**167852.73**	**52512.31**	**744405.70**

8.18 Letters of Support

8.18.1 Cook Islands – Ministry of Marine Resources

Ministry *of* Marine Resources
TU'ANGA O TE PAE MOANA
COOK ISLANDS

Po Box 85, Avarua,
Rarotonga, Cook Islands
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E rar@mmr.gov.ck
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29 April 2021

File Ref: 21.04.050

Gabriela Anhalzer
Program Director
SCS Global Services
200 Powell Street, Ste. 600
Emeryville, CA 94608
USA

Dear Ms. Anhalzer,

The Cook Islands Ministry of Marine Resources (MMR) fully supports the efforts by Tri Marine in pursing re-certification of its Western and Central Pacific Purse Seine Skipjack and Yellowfin Fishery under the MSC fisheries standard, with an expanded scope to include Cook Islands flagged purse seiners.

MMR is committed to work with the client group and other stakeholders to implement the client action plan to address conditions of certification.

Regards,

Pamela Maru
Secretary
Ministry of Marine Resources

E: p.maru@mmr.gov.ck
Ph: +682 53044
Skype: pamela.maru

8.18.2 Vanuatu Fisheries Department

GOVERNMENT OF THE REPUBLIC OF VANUATU

FISHERIES DEPARTMENT
SERVICE DES PECHES

Private Mail Bag 9045
Sac Postale Privé No. 9045
Port Vila,
VANUATU

GOUVERNEMENT DE LA REPUBLIQUE DE VANUATU

20 April 2021

Gabriela Anhalzer
SCS Global Services
200 Powell Street, Ste. 600
Emeryville, CA 94608
USA

Dear Ms. Anhalzer,

RE: SUPPORT FOR TRI MARINE'S WCPO PURSE SEINE MSC CERTIFICATION

The Vanuatu Department of Fisheries (VFD) fully supports the efforts of Tri Marine and Fairwell Fishery Co. to pursue MSC certification for Vanuatu-flagged purse seiners which will operate under this fisheries certificate.

VFD is committed to assist the client group, if the fishery passes MSC assessment, in implementing the respective conditions of certification. VFD is therefore committed to implementing the activities in the Client Action Plan to address these conditions.

Sincerely,

VANUATU GOVENMENT ★ MINISTRY OF AGRICULTURE, LIVESTOCK, FORESTRY, FISHERIES, BIOSECURITY ★ FISHERIES DEPARTMENT SERVICE DES PECHES

William NAVITI
Director

8.18.3 New Zealand – Ministry for Primary Industries

Security Classification - None

Fisheries New Zealand
Tini a Tangaroa

16 April 2021

SCS Global Services

200 Powell Street, Ste. 600

Emeryville, CA 94608, USA

Dear Gabriela Anhalzer,

Letter of support for Talley's Marine Stewardship Council certification

Fisheries New Zealand is supportive of Talley's in their pursual of the Marine Stewardship Council certification as part of the Tri Marine Western and Central Pacific Purse Seine Skipjack and Yellowfin fishery, through their vessel the MJ Souza.

Fisheries New Zealand is committed to assist the client group, if the fishery passes the MSC assessment, in implementing their Client Action Plan.

Yours sincerely

Dominic Vallieres
Manager – Highly Migratory & Pacific Fisheries

Ministry for Primary Industries
Charles Fergusson Building
34-38 Bowen Street
PO Box 2526
Wellington 6140, New Zealand

fisheries.govt.nz

8.18.4 FSM – NORMA

National Oceanic Resource Management Authority
FSM NATIONAL GOVERNMENT
P.O. BOX PS122
PALIKIR, POHNPEI, FEDERATED STATES OF MICRONESIA 96941
Tel: (691) 320-5181/2700 Fax: (691) 320-2383 Email: norma@mail.fm Website: www.norma.fm

April 9, 2021

Gabriela Anhalzer
SCS Global Services
200 Powell Street, Ste. 600
Emeryville, CA 94608 USA

Subject: Tri Marine Western Central Pacific Purse Seine Skipjack and Yellowfin fishery

Dear Gabriela,

FSM NORMA noted and agreed to the conditions enumerated in the Client Action Plan (CAP) which seeks advocacy and support from FSM NORMA.

Upholding a sustainable fishing is part of FSM NORMA's mandate and noting the benefits that could for do for Caroline Fisheries Corporation (CFC) and CityPro Management Limited, FSM NORMA supports CFC and CityPro in their efforts to pursue MSC certification.

Thank you!

Eugene Pangelinan
Executive Director

8.18.5 United States – NMFS NOAA

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1845 Wasp Blvd., Bldg 176
Honolulu, Hawaii 96818
(808) 725-5000 · Fax: (808) 725-5215

April 15, 2021

Amanda Hamilton
Senior Manager – Fisheries Policy and Regulation
Tri Marine International
15 Fishery Port Road
Jurong 619735
Singapore

Dear Ms. Hamilton:

This letter responds to your April 7, 2021, inquiry to Tom Graham of our International Fisheries Division. We appreciate the information regarding MSC re-certification of the *Tri Marine Western and Central Pacific Purse Seine Skipjack and Yellowfin Fishery*, including Tri Marine's Client Action Plan.

We note the conditions in the Client Action Plan that relate to activities of the flag States of vessels involved in the fishery. With respect to the work of the Western and Central Pacific Fisheries Commission, NOAA Fisheries continues to support and contribute to the development of harvest strategies for yellowfin tuna and skipjack tuna, including harvest control rules, and we support progressing the outstanding Commission tasks for the tropical tuna stocks identified in WCPFC CMM 2020-01. We also are implementing for U.S. fishing vessels the applicable provisions of CMM 2020-01.

Please let me know if there is any further information that we can provide.

Sincerely,

Michael D. Tosatto
Regional Administrator

8.18.6 Solomon Islands - MFMR

Solomon Islands Government

MINISTRY OF FISHERIES AND MARINE RESOURCES

Tel: (677)39143
Fax: (677)38730
Ext: 209
Email: ehoniwala@fisheries.gov.sb

Kukum Highway
P.O. Box G2, Honiara
Solomon Islands

Date: 16th October 2020

TO WHOM IT MAY CONCERN

ONGOING SUPPORT FOR THE SOLOMON ISLANDS PURSE SEINE AND POLE AND LINE MSC-CERTIFIED TUNA FISHERY

The Ministry of Fisheries and Marine Resources (MFMR) continues to offer full support for the Solomon Islands Purse Seine and Pole and Line Skipjack and Yellowfin MSC fisheries certification.

MFMR is committed to assisting the client group, Tri Marine and National Fisheries Developments Ltd., in implementing the respective existing and new conditions of certification. MFMR is therefore committed to implementing activities in the Client Action Plan.

Yours sincerely,

MINISTRY OF FISHERIES & MARINE RESOURCES

Mr Edwards Honiwala
DIRECTOR OF FISHERIES

8.18.7 China -

行政院農業委員會漁業署
FISHERIES AGENCY
Council of Agriculture, Executive Yuan
No.2, Chao-chow St. TAIPEI, TAIWAN
TEL: 886-7-823-9827 FAX: 886-7-815-8278 http://www.fa.gov.tw

May 12, 2021

Gabriela Anhalzer
Program Director
SCS Global Services
200 Powell Street, Ste. 600
Emeryville, CA 94608
USA

RE: TRI MARINE WCPO PURSE SEINE FISHERY MSC CERTIFICATION

Dear Ms. Anhalzer,

Taiwan Fisheries Agency (TFA) fully supports the efforts by Tri Marine in pursing re-certification of its ***Western and Central Pacific Purse Seine Skipjack and Yellowfin Fishery*** under the MSC fisheries standard, with an expanded scope to include Chinese Taipei-flagged purse seiners.

TFA will support the client group in addressing conditions to the MSC certification relating to the Chinese Taipei flagged vessels.

Sincerely yours,

Chih-Sheng Chang

Chih-Sheng Chang
Director-General

9 Template information and copyright

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Template version control

Version	Date of publication	Description of amendment
1.0	17 December 2018	Date of first release
1.1	29 March 2019	Minor document changes for usability
1.2	25 March 2020	Release alongside Fisheries Certification Process v2.2

A controlled document list of MSC program documents is available on the MSC website (msc.org).

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