Summary of MSC PI Level Scores for WCPO bigeye and yellowfin tuna stocks.

Princi-ple	Compo-nent	Wt	Performance Indicator (PI)		Wt	Bigeye	Yellowfin
One	Outcome	0.33	1.1.1	Stock status	0.5	80	90
			1.1.2	Stock rebuilding	0.5	N/a	N/a
	Manage-ment	0.67	1.2.1	Harvest strategy	0.25	70	70
			1.2.2	Harvest control rules & tools	0.25	60	60
			1.2.3	Information & monitoring	0.25	80	80
			1.2.4	Assessment of stock status	0.25	100	95
Two	Primary species	0.2	2.1.1	Outcome	0.33	90	
			2.1.2	Management strategy	0.33	80	
			2.1.3	Information/Monitoring	0.33	95	
	Second-ary species	0.2	2.2.1	Outcome	0.33	80	
			2.2.2	Management strategy	0.33	80	
			2.2.3	Information/Monitoring	0.33	85	
	ETP species	0.2	2.3.1	Outcome	0.33	75	
			2.3.2	Management strategy	0.33	75	
			2.3.3	Information strategy	0.33	65	
	Habitats	0.2	2.4.1	Outcome	0.33	100	
			2.4.2	Management strategy	0.33	95	
			2.4.3	Information	0.33	85	
	Eco-system	0.2	2.5.1	Outcome	0.33	80	

Princi-ple	Compo-nent	Wt	Performance Indicator (PI)		Wt	Bigeye	Yellowfin
			2.5.2	Management	0.33	80	
			2.5.3	Information	0.33	85	
Three	Govern-ance and policy	0.5	3.1.1	Legal &/or customary framework	0.33	95	
			3.1.2	Consultation, roles & responsibilities	0.33	85	
			3.1.3	Long term objectives	0.33	90	
	Fishery specific manage-ment system	0.5	3.2.1	Fishery specific objectives	0.25	90	
			3.2.2	Decision making processes	0.25	95	
			3.2.3	Compliance & enforcement	0.25	95	
			3.2.4	Monitoring & management performance evaluation	0.25	90	

Appendix 1 Scoring and Rationales

Appendix 1.1 Principle 1 scoring rationales yellowfin

Evaluation Table for PI 1.1.1 – Stock status (Yellowfin)

PI 1.1.1		**The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing**		
Scoring Issue		SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment			
	Guidepost	It is **likely** that the stock is above the point where recruitment would be impaired (PRI).	It is **highly likely** that the stock is above the PRI.	There is a **high degree of certainty** that the stock is above the PRI.

	Met?	Y	Y	Y
	Justification	Changes from Last Assessment The 2017 stock assessment (Tremblay-Boyer, McKechni, et al., 2017) introduced a number of changes from 2014 (Davies et al., 2014) that had a large influence on estimates of stock status. The three additional years of data (tagging, catch, effort, size frequencies) included in the assessment cover a period of strong El Nino conditions and increasing catch levels. Within this period there had also been an increase in several of the standardised CPUE indices. The model attributed this to a period of slightly higher recruitments in some regions before the upturn in the CPUE (which in most cases is an index of the abundance of older fish vulnerable to longline gear). This also resulted in an increase in stock status indicators compared to the 2014 reference case model. Other changes made to the model included implementing minor developments to Multifan-CL since the 2014 assessment. These included developments in the modelling of recruitment (annual SRR, arithmetic rather than geometric mean of other recruitments), a trial of the Dirichlet multinomial likelihood for the size frequency data and estimation of a Lorenzen-type relationship between natural mortality for the size of fish. The values selected for these model settings had notable impacts on the estimates of stock status for the current assessment. Assessment Scenarios WCPO in recent years run a grid of models to explore the interactions among selected axes of uncertainty. The grid contains all combinations of two or more parameter settings or assumptions for each uncertainty axis. The axes are generally selected from those factors explored in 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), tag mixing (2), size data weighting (3) and regional structure (2). Initially the grid consisted of 48 models as only two size weighting had been applied, subsequently a third was added and so the final grid comprised 72 model runs. Reference Points The WCPFC has adopted 20% of the unfished spawning potential ($SB_{F=0}$) i.e. 20%$SB_{F=0}$ as a limit reference point (LRP) for yellowfin, i.e. the point where recruitment would be impaired (PRI). Where $SB_{F=0}$ is calculated from the estimated recruitments and a Beverton-Holt stock recruitment relationship (SRR) and offers a basis for comparing the exploited population relative to population subject to natural mortality only. Stock status was compared by calculating $SB_{recent}/SB_{F=0}$ and $SB_{latest}/SB_{F=0}$, where SB_{latest} and SB_{recent} are the estimated spawning potential in 2015 and the mean over 2011-2014. Conclusions To achieve SG60 it has to be likely (≥ 70th %ile), for SG80 to be highly likely (≥ 80th %ile) and for SG100 there has to be a high degree of certainty (≥ 95th %ile) that current stock status is above 20%$SB_{F=0}$. In the final grid (72 runs) the 25th %ile was 0.27 and 0.25f or SB latest /SB F =0 and SB recent /SB F =0 respectively and so SG60 is satisfied. For the SG80 less than 14 and for SG100 less than		

		3 of the 72 scenarios need to fall below 20%SB F =0 . Looking at figure 40, in the steepness panel for 2 of the three level all scenarios are above the 0.20 level of the spawning potential reference point, while for the steepness of 0.65 the 25% level is above 0.2, this means that only 6 or less scenarios fall below the PRI and so the SG80 is met. Inspecting figure 41, the Majuro plots shows that only 2 of the scenarios fell below the PRI and so the SG100 level is met.		
b	Stock status in relation to achievement of MSY			
	Guidepost		The stock is at or fluctuating around a level consistent with MSY.	There is a **high degree of certainty** that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?		Y	N
	Justification	In Conservation and Management Measure 2016-01 the objective is stated for yellowfin that at a minimum it should be maintained at levels capable of producing the maximum sustainable yield and that fishing mortality rate should not be greater than F_{MSY} , i.e. $F_{MSY} \leq 1$. In the appendix table A6, the 25th %ile of F_{recent}/F_{MSY} is 0.66, and inspection of figure A40 shows that in only two runs is $F_{recent}/F_{MSY} > 1$ and so SG80 is met, especially since the stock is declining in all scenarios and so would have been above SB_{MSY} in the past and the median value of SB_{recent}/SB_{MSY} is 1.43. A high degree of certainty means (≥ 95th %ile), however, 95% confidence intervals are not provided for either SB_{recent}/SB_{MSY} or SB_{latest}/SB_{MSY}. In the 2014 stock assessment the lower 95% confidence intervals for SB/SB_{MSY} was 1 and the upper 95% confidence interval for F/F_{MSY} was 1. In the absence of the necessary evidence in the latest assessment the SG100 is not met.		
References	N. Davies, S. Harley, J. Hampton, and S. McKechnie. Stock assessment of yellowfin tuna in the western and central pacific ocean. WCPFC-SC10-2014/SA-WP-0, 2014. M. S. Tremblay-Boyer, L., G. Pilling, and J. Hampton. Stock assessment of yellowfin tuna in the western and central pacific ocean. WCPFC-SC13-2017/SA-WP-06, 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)	Limit reference point	$SSB_{current}$ has to be greater than 20% of $SB_{F=0}$		
Reference point used in scoring stock relative to MSY (SIb)	MSY target	SSB relative to SSB_{MSY}		
OVERALL PERFORMANCE INDICATOR SCORE:				**90**
CONDITION NUMBER (if relevant):				**N/a**

Evaluation Table for PI 1.1.2 – Stock rebuilding (Yellowfin). Not applicable, not scored.

Evaluation Table for PI 1.2.1 – Harvest strategy (Yellowfin)

PI 1.2.1		**There is a robust and precautionary harvest strategy in place**		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guidepost	The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	Y	N	Not evaluated
	Justification	The management measures applied to yellowfin tuna are the same as those applied to skipjack tuna. MSC defines a harvest strategy as '*the combination of monitoring, stock assessment, harvest control rules and management actions, which may include an MP or an MP (implicit) and be tested by MSE*' (MSC – MSCI Vocabulary v1.1). The stated objective of the WCPFC harvest strategy as defined in CMM 2017-01 is to maintain status quo biomass, pending agreement on a formal target reference point, due in 2019 according to the latest version of the harvest strategy workplan (see Section XX). CMM 2014-06 commits WCPFC to developing a formal harvest strategy for yellowfin and the other key stocks; • Data collection on the stock and fishery (considered in detail in PI 1.2.3 below) • Stock assessment process (considered in detail in PI 1.2.4 below) • Limit reference point (20%$SB_{F=0}$) and management target ($SB_{2012\text{-}15}$; from CMM 2017-01) (see Section XX) • 'Available' HCR (see 1.2.2), with some management tools set out in 2017-01 (described in Section XX); • Monitoring of implementation of CMM 2017-01 via data gathering and Part 1 and 2 reports to the Commission. This management strategy is reviewed annually during the Commission meeting. PNA harvest strategy:		

		PNA operate a purse seine vessel day scheme (VDS) which limits effort by setting an overall 'TAE' (total allowable effort) which is divided up for each of the parties to the agreement. The TAE is set annually based on objectives of 'optimal exploitation' as well as WCPFC provisions (which presumably means MSY). The days are set based on the objective of limiting purse seine effort to 2010 levels (which was a requirement of the previous tropical tuna CMMs, although not 2017-01). The purse seine VDS is relevant for bigeye because most of the F on juveniles comes from the purse seine fishery (see Figure 1 in 1.1.1b). A longline VDS has recently been established, but plays no role in management for the moment (see Section XX). xxxxxx		
b	Harvest strategy evaluation			
	Guidepost	The harvest strategy is **likely** to work based on prior experience or plausible argument.	The harvest strategy may not have been fully **tested** but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been **fully evaluated** and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Y	Y	Not evaluated
	Justification	Yellowfin fishing mortality has always been below F_{MSY}, and the stock has never declined below the default target of SB_{MSY}. From this it can be infered that the harvest strategy is **likely** to work based on prior experience or plausible argument, and while it may not have been fully **tested** but evidence exists that it is achieving its objectives. Therefore the stock is scored at the SG80 level.		
c	Harvest strategy monitoring			
	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	Yes, extensive monitoring is in place at the stock level		

d	Harvest strategy review			
	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Not evaluated
	Justification			
e	Shark finning			
	Guidepost	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	The target species is not a shark; not relevant.		
f	**Review of alternative measures**			
	Guidepost	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a **biannual** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	This fishery targets yellowfin specifically, and 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 bigeye are minimal, according to the stock assessment report. Hence there is no 'unwanted catch'* of yellowfin in this fishery. * SA3.1.6: The term 'unwanted catch' shall be interpreted by the team 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.		
References		(S M(McKechnie, Pilling, et al., 2017a; Scott et al., 2017; WCPFC, 2017a, 2017b)		

	CMMs 2017-01, 2014-06, 2013-01, 2014-01, 2015-01, 2016-01
OVERALL PERFORMANCE INDICATOR SCORE:	**70**
CONDITION NUMBER (if relevant):	**1**

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

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guidepost	**Generally understood** HCRs are in place **or available** that are **expected** to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	**Well defined** HCRs are **in place** that **ensure** that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock **fluctuating around** a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock **fluctuating at or above** a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, **most** of the time.
	Met?	Y	N	Not evaluated
	Justification	Agreed harmonised score: 60 SA2.5.2 In scoring issue (a) at the SG60 level, teams shall accept 'available' HCRs (instead of HCRs that are 'in place') in cases where: a. 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; or b. In UoAs where BMSY estimates are not available, the stock has been maintained to date by the measures in use at levels that have not declined significantly over time, nor shown any evidence of recruitment impairment. SA2.5.3 Teams shall recognise 'available' HCRs as 'expected to reduce the exploitation rate as the point of recruitment impairment is approached' only in cases where: a. 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 b. An agreement or framework is in place that requires the management body to adopt HCRs before the stock declines below BMSY.		

		Stock biomass has been above the estimated MSY level throughout the time series, and since the probabilities that B<BMSY and F>FMSY are low, it is not likely that the stock biomass will fall below this level in the next five years (see PI 1.1.1; Section **Error! Reference source not found.**; **Error! Reference source not found.**). WCPFC have an agreed, legally-binding framework in place to establish place formal harvest strategies and control rules for their main stocks, including WCPO yellowfin (see CMM 2014-06 and associated workplans; Section **Error! Reference source not found.**). The requirements of SA2.5.2-3 are therefore met for a HCR to be 'available'. SG60 is met. Since the harvest strategy is not 'in place', SG80 is not met.		
b	HCRs robustness to uncertainty			
	Guidepost		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties.
	Met?		N	Not evaluated
	Justification	Agreed harmonised score: Not met Since a HCR is 'available' rather than 'in place', it cannot be argued to be robust to the main uncertainties. Not met.		
c	**HCRs evaluation**			
	Guidepost	There is **some evidence** that tools used **or available** to implement HCRs are appropriate and effective in controlling exploitation.	**Available evidence indicates** that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	**Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	Y	N	Not evaluated
	Justification	Agreed harmonised score: 60 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'). Taking this last point first, it is clear that F<FMSY (see 1.1.1). A formal agreement for the development of a well-defined HCR is provided by CMM 2014-06, with a framework provided by the associated workplan (updated after WCPFC13 to reflect the failure to move forward on some of the milestones). A trigger level is provided by the agreed limit reference point (20%SBF=0) and the provisional target reference point (FMSY). The most recent assessment as well as the status quo projections provide some evidence that the tools in use are sufficiently effective at controlling exploitation rates. Overall, therefore, under the MSC requirements and guidance for 'available' HCRs, SG60 is met. SG80 is not met.
References		
OVERALL PERFORMANCE INDICATOR SCORE:		**60**
CONDITION NUMBER (if relevant):		**2**

Evaluation Table for PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guidepost	**Some** relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	**Sufficient** relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Y	Y	N
	Justification	Agreed harmonised score: 80 The following information is available, and is used as part of the harvest strategy – notably to inform the stock assessment model: Fishery-dependent information Catch, effort and CPUE: It is a requirement for all CCM fisheries to provide catch and effort data to WCPFC/SPC. The logsheet data are raised to best estimates of total catch by SPC-OFP, to account for missing data. CPUE data are standardised as described in Davies et al. (2014). Data go back to 1960, although as expected, historical data are sparser and generally less reliable than more recent data. It is often not clear what the relevant factors are for effective catch rate standardization, and they may not be recorded in the logbooks – this is a particular problem for purse seine data. Length-frequency data: Length-frequency data comes from various port sampling programmes and some observer reports, and goes back to 1962. These data are weighted in the stock assessment according to spatial representation, to account for differences in length-frequency by geographic region. Fleet composition: Each CCM provides information to WCPFC annually on their active fleet, in their Part 1 reports. Fishery-independent information		

		Size and age data: Data on age and growth are available to inform the stock assessment, although growth rates remain somewhat uncertain. Natural mortality: Estimating natural mortality is always a big problem; however there are sufficient tagging data available for yellowfin to allow the stock assessment model to estimate natural mortality, although the outcome was somewhat different to the reference case model where natural mortality was fixed (more optimistic). Environmental data: The Ocean Fisheries Programme of SPC has undertaken environmental research as part of their ecosystem monitoring programme, focusing particularly on potential environmental drivers of tuna population dynamics. Information inferred from the stock assessment A significant range of information relating to stock status comes as the output of the stock assessment (Davies et al., 2014), including estimates of stock abundance, fishery impact etc. Data gaps Stock structure - the WCPO yellowfin fishery is assessed and managed as a single stock. However, suggestive evidence for population structure is emerging for the tropical tunas (e.g. Kolody et al., 2013). Observer coverage (providing external verification of logbook data and information about discards) is low, particularly for the longline fishery and particularly on the high seas. Overall, given the size and complexity of the fishery, the range and comprehensiveness of the data available is impressive and improving all the time. Nonetheless, some data gaps do constrain stock assessments – as does bias and lack of precision in some of the datasets, particularly for historical data. Perhaps more importantly, the stock assessment continues to rely on commercial CPUE as an index of stock abundance, and although these data are carefully analysed and standardised as far as possible, there are no fishery-independent datasets with which they can be compared, while issues such as spatial and temporal changes in catchability remain problematic. On this basis, the team concluded that SG80 is met, but SG100 is not met.	
b	Monitoring			
	Guidepost	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	**All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent **uncertainties** in the information [data] and the robustness of assessment and management to this uncertainty.

	Met?	Y	Y	N
	Justification	Agreed harmonised score: 80 Fishery removals are monitored by individual CCMs via logsheets and port sampling, and are required to be submitted to the Commission annually, in the form of estimates of total catch plus catch and effort data broken down by gear and either aggregated (5o squares by month) or (preferably) at operational level (individual logsheets). Despite some gaps in this dataset noted above, coverage is good overall. This catch, effort and CPUE dataset is the key indicator for stock assessment. Other key fisheries data which support management are length-frequency data (collected via port sampling and observer programmes) and tag returns. Port sampling coverage is high, but observer coverage is low, particularly for longline fisheries. Biological data are also collected via research programmes. Formal stock assessments have taken place every few years (2011, 2014). In between formal stock assessments, SPC provide some information on trends in fishery indicators (total catch, nominal CPUE, catch at length and at weight), to guide management (e.g. Pilling et al., 2016c). On this basis, the team felt that SG80 was met. SG100 is not met, for the following reasons: • The characteristics of tuna longline CPUE are often poorly understood and it is unclear how successful most effort standardization analyses are or how to properly represent the uncertainties • Purse seine catch and length-frequency data can be biased by grab-sampling techniques used to estimate species composition • Some data gaps remain in fishery-dependent data (see above) • Some key fleets provide only aggregated data or do not permit operational data to be used in stock assessments (e.g. Japan for the most recent yellowfin assessment) • The requirement to 'raise' logsheet data by estimates of total catch (to account for missing logsheets) results in some loss of precision • Historical data are often lacking in precision Although the frequency of stock assessments is reasonable, they are not carried out with 'high frequency' (i.e. not always updated annually); it is not completely clear how robust the management is to uncertainty – the management system is still a work in progress.		
	Comprehensiveness of information			

c	**Guidepost**		There is good information on all other fishery removals from the stock.	
	Met?		Y	
	Justification	Agreed harmonised score: 80 The stock assessment covers all fishery removals from the stock, and despite some data gaps (notably Vietnam, also Philippines, Indonesia and some smaller coastal fleets), overall the data coverage is quite comprehensive. Where data gaps exist, the WCPFC Secretariat and SPC are working to support and develop data collection systems (see information in Williams, 2013).		
References		(Hoyle and Nichol, 2008; McKechnie et al., 2015b; Pacific, 2016; Farley et al., 2017b; Hampton and Williams, 2017; WCPFC, 2017a; McKechnie, Pilling, et al., 2017a; McKechnie, Tremblay-Boyer, et al., 2017; Pilling and Brouwer, 2017; Scott et al., 2017; Tremblay-Boyer, McKechnie, et al., 2017)(Hoyle and Nichol, 2008; McKechnie et al., 2015b; Pacific, 2016; Farley et al., 2017b; Hampton and Williams, 2017; WCPFC, 2017a; McKechnie, Pilling, et al., 2017a; McKechnie, Tremblay-Boyer, et al., 2017; Pilling and Brouwer, 2017; Scott et al., 2017; Tremblay-Boyer, McKechnie, et al., 2017)(Hoyle and Nichol, 2008; McKechnie et al., 2015b; Pacific, 2016; Farley et al., 2017b; Hampton and Williams, 2017; WCPFC, 2017a; McKechnie, Pilling, et al., 2017a; McKechnie, Tremblay-Boyer, et al., 2017; Pilling and Brouwer, 2017; Scott et al., 2017; Tremblay-Boyer, McKechnie, et al., 2017)(Hoyle and Nichol, 2008; McKechnie et al., 2015b; Pacific, 2016; Farley et al., 2017b; Hampton and Williams, 2017; WCPFC, 2017a; McKechnie, Pilling, et al., 2017a; McKechnie, Tremblay-Boyer, et al., 2017; Pilling and Brouwer, 2017; Scott et al., 2017; Tremblay-Boyer, McKechnie, et al., 2017)(Hoyle and Nichol, 2008; McKechnie et al., 2015b; Pacific, 2016; Farley et al., 2017b; Hampton and Williams, 2017; WCPFC, 2017a; McKechnie, Pilling, et al., 2017a; McKechnie, Tremblay-Boyer, et al., 2017; Pilling and Brouwer, 2017; Scott et al., 2017; Tremblay-Boyer, McKechnie, et al., 2017)(Hoyle and Nichol, 2008; McKechnie et al., 2015b; Pacific, 2016; Farley et al., 2017b; Hampton and Williams, 2017; WCPFC, 2017a; McKechnie, Pilling, et al., 2017a; McKechnie, Tremblay-Boyer, et al., 2017; Pilling and Brouwer, 2017; Scott et al., 2017; Tremblay-Boyer, McKechnie, et al., 2017)(Hoyle and Nichol, 2008; McKechnie et al., 2015b; Pacific, 2016; Farley et al., 2017b; Hampton and Williams, 2017; WCPFC, 2017a; McKechnie, Pilling, et al., 2017a; McKechnie, Tremblay-Boyer, et al., 2017; Pilling and Brouwer, 2017; Scott et al., 2017; Tremblay-Boyer, McKechnie, et al., 2017)		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**N/a**

Evaluation Table for PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guidepost		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		Y	Y
	Justification	The assessment is conducted using an integrated assessment model Multifan-CL (ref) that is able to combine a range of datasets and to model several components, including (i) the dynamics of the fish population; (ii) the fishery dynamics; (iii) the dynamics of tagged fish; (iv) the observation models for the data. The model partitions the population into 9 spatial regions and 28 quarterly age-classes and defines fisheries to consist of relatively homogeneous fishing units that have selectivity and catchability characteristics that do not vary greatly over time and space, although in the case of catchability some allowance can be made for time series variation. SPC have considerable experience in the development and application of Multifan-CL and so the SG 100 level is met.		
b	Assessment approach			
	Guidepost	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	Y	Y	
	Justification	Multifan-CL can estiamate a range of reference points based on yield/spawner per recruit and stock recruitment relationships. As an integrated statistical method in can use the available data in a raw a form as appropriate in a single analysis. This allows for consistency in assumptions and permits the uncertainty associated with both data sources to be propagated to final model outputs such as reference points and projections. Therefore the SG80 level is met.		
	Uncertainty in the assessment			

c	**Guidepost**	The assessment **identifies major sources** of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a **probabilistic** way.
	Met?	Y	Y	Y
	Justification	More than a hundred runs were undertaken in conducting the 2017 yellowfin assessment, then to represent uncertainty the assessment was based on a grid of structural uncertainties, where 72 runs were conducted focusing on a small set of uncertainty axes i.e. was constructed from 5 axes: steepness (3 settings), tagging data overdispersion (2), tag mixing (2), size data weighting (3) and regional structure (2). This allowed statements about probability of achieving management objectives to be made		
d	Evaluation of assessment			
	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			Y
	Justification	Multifan-CL has been extensively used by SPC and other tuna RFMOs (i.e. ICCAT) as a statistical method it has a range of diagnostics ti check goodness of fit and SPC have considerable experience in it sapplication.		
e	Peer review of assessment			
	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.
	Met?		Y	N
	Justification	Although neither the 2017 or the 2014 assessments have been externally peer reviewed the assessment has benefited from developments that addressed the recommendations made by the independent review of the 2011 bigeye assessment (Ianelli et al., 2012). These are detailed in the 2014 assessment report (Davies et al., 2014) and helped inform the recommendations of the 2017 pre-assessment workshop held in Noumea over 24–27 April, 2017 (PAW; Pilling and Brouwer, 2017). The PAW reviewed the main input data sets and provided recommendations regarding the range of assessment model options and sensitivities to be included within the stock assessment. These recommendations provided the main direction for the current assessment. There have also been several reviews of the data inputs (Lawson, 2013 and Powers 2013). Therefore although the current assessment has not been		

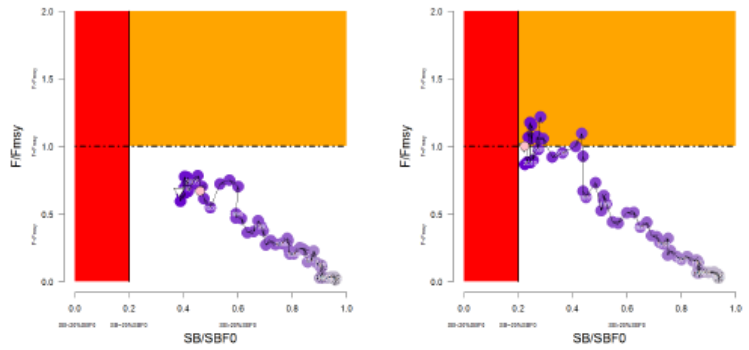
		externally peer reviewed it is regularly subject to internal scrutiny by SPC and the scientific committee of the WCPFC, during which scientists from a number of contracting parties are able to review the assessment. Therefore the SG80 level is met but not the SG 100 level which requires evidence of a formal review and an appropraite response by SPC and WCPFC.
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. Lawson, T. (2013). Update on the estimation of the species composition of the catch by purse seiners in the Western and Central Pacific Ocean, with responses to recent independent reviews. WCPFC-SC9-2013/ST-WP-03, Pohnpei, Federated States of Micronesia, 6–14 August 2013 Powers, J. E. (2013). Review of SPC estimation of species and size composition of the western and central Pacific purse seine fishery from observer-based sampling of the catch. WCPFC-SC9-2013/ST-IP-03, Pohnpei, Federated States of Micronesia, 6–14 August 2013(Ianelli et al., 2012; McKechnie et al., 2015b; Farley et al., 2017b; McKechnie, Pilling, et al., 2017a; McKechnie, Tremblay-Boyer, et al., 2017; Peatman et al., 2017; PNA, 2017; Tremblay-Boyer, McKechnie, et al., 2017; WCPFC, 2017a)(Ianelli et al., 2012; McKechnie et al., 2015b; Farley et al., 2017b; McKechnie, Pilling, et al., 2017a; McKechnie, Tremblay-Boyer, et al., 2017; Peatman et al., 2017; PNA, 2017; Tremblay-Boyer, McKechnie, et al., 2017; WCPFC, 2017a)(Ianelli et al., 2012; McKechnie et al., 2015b; Farley et al., 2017b; McKechnie, Pilling, et al., 2017a; McKechnie, Tremblay-Boyer, et al., 2017; Peatman et al., 2017; PNA, 2017; Tremblay-Boyer, McKechnie, et al., 2017; WCPFC, 2017a)(Ianelli et al., 2012; McKechnie et al., 2015b; Farley et al., 2017b; McKechnie, Pilling, et al., 2017a; McKechnie, Tremblay-Boyer, et al., 2017; Peatman et al., 2017; PNA, 2017; Tremblay-Boyer, McKechnie, et al., 2017; WCPFC, 2017a)(Ianelli et al., 2012; McKechnie et al., 2015b; Farley et al., 2017b; McKechnie, Pilling, et al., 2017a; McKechnie, Tremblay-Boyer, et al., 2017; Peatman et al., 2017; PNA, 2017; Tremblay-Boyer, McKechnie, et al., 2017; WCPFC, 2017a)(Ianelli et al., 2012; McKechnie et al., 2015b; Farley et al., 2017b; McKechnie, Pilling, et al., 2017a; McKechnie, Tremblay-Boyer, et al., 2017; Peatman et al., 2017; PNA, 2017; Tremblay-Boyer, McKechnie, et al., 2017; WCPFC, 2017a)(Ianelli et al., 2012; McKechnie et al., 2015b; Farley et al., 2017b; McKechnie, Pilling, et al., 2017a; McKechnie, Tremblay-Boyer, et al., 2017; Peatman et al., 2017; PNA, 2017; Tremblay-Boyer, McKechnie, et al., 2017; WCPFC, 2017a)
OVERALL PERFORMANCE INDICATOR SCORE:		**95**
CONDITION NUMBER (if relevant):		**N/a**

Appendix 1.2 Principle 1 scoring rationales bigeye

Evaluation Table for PI 1.1.1 – Stock status (Bigeye)

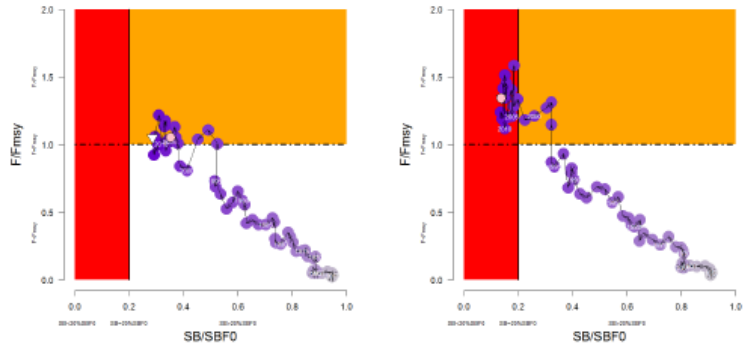
PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment			
	Guide post	It is **likely** that the stock is above the point where recruitment would be impaired (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?	Y	Y	N
	Justification	The stock assessment does not provide a 'reference case' model; McKechnie, Pilling, et al. (2017a) instead submitted all model versions to the Scientific Committee (SC). To evaluate stock status, the assessment team therefore based the scoring largely on the grid constructed by the SC as explained in Section **Error! Reference source not found.**; since this is what the SC considered most appropriate for providing management advice. For the purposes of scoring, the team considered the PRI to correspond to the agreed LRP (20%$SB_{F=0}$), although in practice this is likely to be a conservative estimate of the PRI, noting that it is ~three quarters of the median estimate of SB_{MSY} (26%SB_0 in the SC grid). Based on the SC grid (**Error! Reference source not found.**, WCPFC (2017a)) there is an 84% probability that the SB is above the LRP. (Under SG80, 'highly likely' is defined as 80% or above in this context (SA2.2.1.2).) In practice, it is clear that uncertainty around stock status is higher than this, and unquantifiable; it depends to some extent on the level of confidence that can be placed in the new growth model derived from Farley et al. (2017b), compared to the old model. WCPFC and FSM scientists and managers met with during the site visit (see Section **Error! Reference source not found.**) expressed confidence in the work, but noted that further work on bigeye is a key task for SPC during 2018. Considering the two main sensitivities (i.e. new/old growth and new/old regions), Majuro plots for a representative example run of each are given in Figure 1 below. All the runs except the old/2014 run put the SB above the LRP (to the right of the red zone), but the old/2014 run puts it below.		

		The stock-recruit relationship is plotted in Figure 2 below (stock-recruit pairs from 1964-2014 (Scott et al., 2017)), giving an opportunity to evaluate recruitment in relation to stock biomass directly. As can be seen from the figure, although biomass is reduced in the later part of the time series (crosses), recruitment does not appear to change. On balance, taking the conclusions of the SC grid as well as the sensitivities, and reviewing the stock-recruit information directly, the team concluded that SG80 is met, but SG100 is not met.



(a) Example; new growth/2017 regions (Diagnostic case)

(b) Example; old growth/2017 regions (*L2-184*)



(c) Example; new growth/2014 regions (*2014Reg*)

(d) Example; old growth/2014 regions (*A0B1C0D0E1*)

Figure 1. Representative Majuro plots for the key sensitivities: top left: new growth/2017 regions; top right: old growth/2017 regions; bottom left: new/2014; bottom right: old/2014 (McKechnie, Pilling, et al., 2017a).

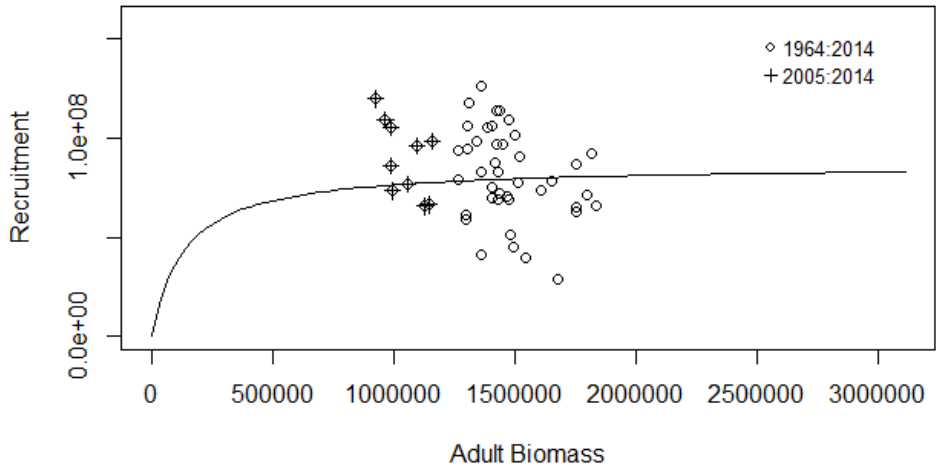


Figure 2. Stock-recruit pairs, 1964-2014 (circles), 2005 onwards marked with crosses (Scott et al., 2017)

b	Stock status in relation to achievement of 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?			
	Justification	SB_{MSY} is estimated (median estimate) at 26%SB_0. MSC provide a default value for B_{MSY} in terms of B_0 of 40%, but the guidance notes that this is only used if B_{MSY} is not analytically determined (GSA 2.2.3.1). Therefore, for the purposes of scoring here the team have used the analytically determined value of SB_{MSY} (i.e. 26%SB_0)		

According to the SC grid, SB_{recent}/SB_{MSY} is estimated as follows: 1.23 (median), 0.63 (10% CI) (**Error! Reference source not found.**). In other words, the stock is estimated to be at a level consistent with SB_{MSY} but with < 90% probability (the probability has not been directly quantified in either of the reports).

To consider F_{MSY}: The SC grid estimates F/F_{MSY} at 0.83 (median), 1.32 (90% CI) (**Error! Reference source not found.**), and it also results in an estimate of a 77% probability that $F<F_{MSY}$ (WCPFC, 2017a). Trends in F from the diagnostic model (new/2017) are given in Figure 3 below; there is little evidence of a significant trend in recent years. According to the diagnostic model, catch is ~MSY, but for the old growth models it remains slightly above, although not as much as in the period 1995-2005 (see Figures 49-50 in McKechnie, Pilling, et al. (2017a)).

Some representative example Kobe plots from the key sensitivities are given in Figure 4. As for the LRP, three of the four runs put SB at or above SB_{MSY}, while one (old/2014) put it below. In relation to F_{MSY}, estimates are very variable, with new/2017 putting F well below, old/2014 putting F well above, and the other two putting F approximately at F_{MSY}.

The conclusion is the same as for SIa; i.e. although the uncertainty in the stock status is likely to be considerably higher than that quantified in the SC grid, on balance it seems likely that the conclusions of the new stock assessment should be preferred (or weighted more heavily) than those of the old version; this is the conclusion of the Scientific Committee. On this basis, SG80 is met. SG100 is not met.

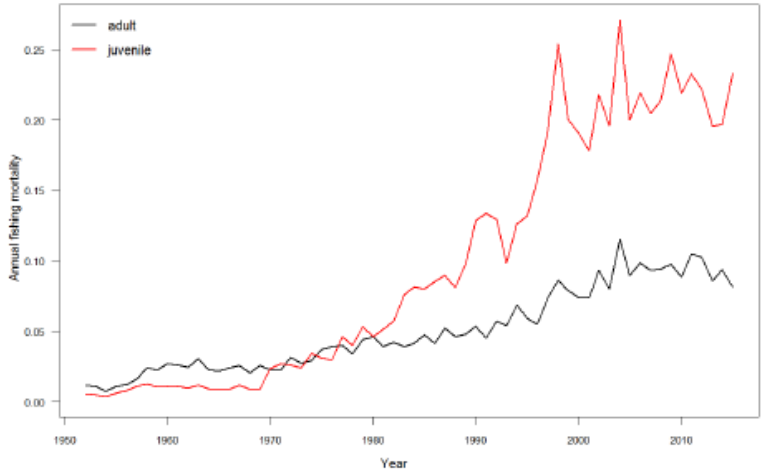


Figure 3: Time series of F (black: adult; red: juvenile) from the diagnostic case model (new/2017) (McKechnie, Pilling, et al., 2017a)

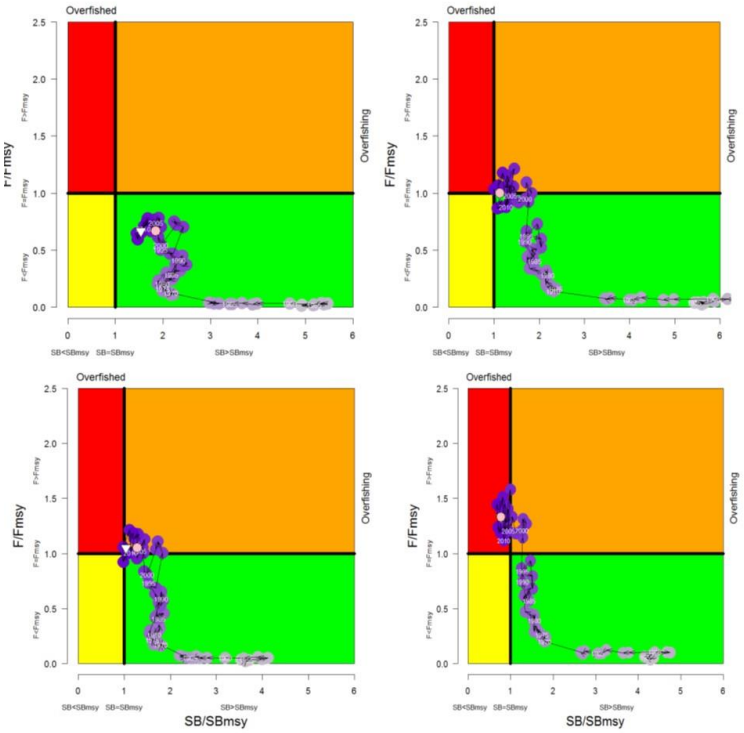


Figure 4. Representative Kobe plots for the key sensitivities: top left: new growth/2017 regions; top right: old growth/2017 regions; bottom left: new/2014; bottom right: old/2014 (McKechnie, Pilling, et al., 2017a).

References	(Farley et al., 2017b; McKechnie, Pilling, et al., 2017a; Scott et al., 2017; WCPFC, 2017a)		
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)	Limit reference point	$20\%SB_{F=0}$	1.6LRP (recent); 1.85LRP (latest) (median of SC uncertainty grid)
Reference point used in scoring stock relative to MSY (SIb)	MSY reference point	SB_{MSY}	$1.23SB_{MSY}$ (recent); 1.45 SB_{MSY} (latest) (median of SC uncertainty grid)
OVERALL PERFORMANCE INDICATOR SCORE:			**80**
CONDITION NUMBER (if relevant):			**N/a**

Evaluation Table for PI 1.1.2 – Stock rebuilding (Bigeye). Not applicable, not scored.

Evaluation Table for PI 1.2.1 – Harvest strategy (Bigeye)

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?	Y	N	N
	Justification	MSC defines a harvest strategy as '*the combination of monitoring, stock assessment, harvest control rules and management actions, which may include an MP or an MP (implicit) and be tested by MSE*' (MSC – MSCI Vocabulary v1.1). The stated objective of the WCPFC harvest strategy as defined in CMM 2017-01 is to maintain status quo biomass, pending agreement on a formal target reference point, due in 2019 according to the latest version of the harvest strategy workplan (see Section **Error! Reference source not found.**). CMM 2014-06 commits WCPFC to developing a formal harvest strategy for yellowfin and the other key stocks; none of the key milestones for bigeye have yet been met however; at WCPFC14 the workplan was refocused from rebuilding to agreeing a long-term HCR, based on the results of the 2017 stock assessment (see harvest strategy workplan; Attachment L in the summary report from WCPFC14). For the moment, the elements of the WCPFC harvest strategy are the following: • Data collection on the stock and fishery (considered in detail in PI 1.2.3 below) • Stock assessment process (considered in detail in PI 1.2.4 below) • Limit reference point (20%$SB_{F=0}$) and management target ($SB_{2012\text{-}15}$; from CMM 2017-01) (see Section **Error! Reference source not found.**) • 'Available' HCR (see 1.2.2), with some management tools set out in 2017-01 (described in Section **Error! Reference source not found.**); • Monitoring of implementation of CMM 2017-01 via data gathering and Part 1 and 2 reports to the Commission.		

		This management strategy is reviewed annually during the Commission meeting. PNA harvest strategy: PNA operate a purse seine vessel day scheme (VDS) which limits effort by setting an overall 'TAE' (total allowable effort) which is divided up for each of the parties to the agreement. The TAE is set annually based on objectives of 'optimal exploitation' as well as WCPFC provisions (which presumably means MSY). The days are set based on the objective of limiting purse seine effort to 2010 levels (which was a requirement of the previous tropical tuna CMMs, although not 2017-01). The purse seine VDS is relevant for bigeye because most of the F on juveniles comes from the purse seine fishery (see Figure 1 in 1.1.1b). A longline VDS has recently been established, but plays no role in management for the moment (see Section **Error! Reference source not found.**). Overall scoring: The objective of the current harvest strategy is to maintain the status quo (WCPFC: average $SB/SB_{F=0}$ for 2012-2015; PNA: purse seine effort at a maximum of 2010 levels). The most recent stock assessment suggests that the status quo is an acceptable biological target for bigeye (see 1.1.1) although this is acknowledged to be uncertain. The new tropical tuna bridging measure (2017-01) has overall somewhat weakened management provisions in relation to bigeye compared to the previous measure (2016-01) (see Section **Error! Reference source not found.**), which was aimed at rebuilding the stock. (It did not particularly seem to be achieving this; see bottom right, Figure 2 in 1.1.1b, but bear in mind that the stock assessment trajectory only runs to 2015.) It does not on this basis comply with the advice of the SC prior to the WCPFC 2017 plenary (SC13 report para. 241): SC13 recommends as a precautionary approach that the fishing mortality on bigeye tuna stock should not be increased from current level to maintain current or increased spawning biomass until the Commission can agree on an appropriate target reference point (TRP). Status quo projections (Scott et al., 2017) provide a basis on which to evaluate the extent to which the harvest strategy is expected to achieve stock management objectives. The projections are summarised in Table 1 below, which gives the estimated probability of SB falling below the LRP in 5, 15 and 30 years (given that the terminal year of the stock assessment is 2015). They are based on status quo catch (longline and small-scale fisheries) or effort (purse seine and pole-and-line) for three model scenarios (i.e. full grid, new growth grid, old growth grid) and two recruitment scenarios (1964-2014 'long term' vs. 2005-2014 'short term'; see Figure 2 in 1.1.1a). Given that the status quo is intended to be replaced with a revised harvest strategy in the short term, the team considered the 5-year projections here. The new growth model suggests a minimal probability of SB falling below the LRP, while the old growth model suggests it is moderately likely (43-47 %) and the full grid is intermediate (~1 in 4 probability). These projections therefore serve to underline the uncertainty in the stock assessment more than to help evaluate the likely short-term future of the stock under the current management framework. Scoring this SI therefore has to rely to some extent on team judgement. It is clear that the move by WCPFC to loosen bigeye management was not particularly precautionary, but given the ongoing work to put in place an improved management target and harvest strategy (2014-06 and workplan; see above and Section **Error! Reference source not found.**), assuming this progresses, the impact on the stock status from changes in the transition from 2016-01 to 2017-01 will

		probably not be significant; or at least will be lost in the much larger uncertainty about stock status derived from the choice of growth model and regional structure. On this basis, SG60 can be considered to be met. SG80 is however not met. Table 1. Probability that SB<LRP based on status quo projections (Scott et al., 2017)		
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?	Y	Y	N
	Justification	As noted above, the status quo projections do not help a great deal in evaluating the likely impact of current management in the short term. The new growth model suggests that the biomass will remain above the LRP with high probability, while the overall model grid gives a ~25% probability of biomass declining below the LRP. The combined weighted grid proposed by SC13 to provide management advice is not included, but logically would give a result somewhere between these two (i.e. in the range 5-20%). Management measures over the past few years (2013-01 – 2017-01) have been adjusted (strengthened from 2013-01 through 2016-01 and then weakened in 2017-01) but probably not in a way that has a significant impact on the stock (although stock status is only estimated to 2015; i.e. in the terminal year of the assessment, 2014-01 was in force). The team considered that the estimated probability of SB<LRP in the range 5-20% constitutes 'evidence' that the harvest strategy is working. Furhermore, 5-20% is the range of probabilities that WCPFC have agreed to consider in evaluating what should be the acceptable risk of a stock falling below Blim; in that sense the status quo is consistent with WCPFC stated aims. SG80 is therefore met.		

	Long-term Rctmnt			Short-term Rctmnt		
Model Group	2020	2030	2045	2020	2030	2045
All	0.23	0.33	0.39	0.23	0.18	0.21
New Growth	0.00	0.14	0.22	0.00	0.00	0.01
Old Growth	0.47	0.53	0.56	0.43	0.34	0.38

c	Harvest strategy monitoring			
	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	Monitoring of the fishery for the purposes of stock assessment is considered in PI 1.2.3 below, and the analysis of data is considered under PI 1.2.4. Monitoring of the implementation of the harvest strategy (notably CMM 2017-01) is carried out via self-assessment by CCMs, included in their Part 1 and 2 reports submitted to WCPFC annually. For FSM, NORMA monitors the fishery via logsheets, port inspections and VMS. Met.		
d	Harvest strategy review			
	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Not evaluated
	Justification	Since SG80a is not met, this has no impact on the scoring.		
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?	Not relevant	Not relevant	Not relevant
	Justification	The target species is not a shark.		
f	**Review of alternative measures**			
	Guide post	There has been a review of the potential effectiveness and practicality of alternative measures to	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of	There is a **biannual** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality

		minimise UoA-related mortality of unwanted catch of the target stock.	unwanted catch of the target stock and they are implemented as appropriate.	of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	This fishery targets bigeye specifically, and 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 bigeye are minimal, according to the stock assessment report. Hence there is no 'unwanted catch'* of bigeye in this fishery. * SA3.1.6: The term 'unwanted catch' shall be interpreted by the team 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.		
References		(McKechnie, Pilling, et al., 2017a; Scott et al., 2017; WCPFC, 2017a, 2017b) CMMs 2017-01, 2014-06, 2013-01, 2014-01, 2015-01, 2016-01		
OVERALL PERFORMANCE INDICATOR SCORE:				**70**
CONDITION NUMBER (if relevant):				**Aggregate 80 scored not reached – no condition raised.**

Evaluation Table for PI 1.2.2 – Harvest control rules and tools (Bigeye)

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?	Y	N	N
	Justification	SA2.5.2 In scoring issue (a) at the SG60 level, teams shall accept 'available' HCRs (instead of HCRs that are 'in place') in cases where: **!!** a. 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; or b. In UoAs where BMSY estimates are not available, the stock has been maintained to date by the measures in use at levels that have not declined significantly over time, nor shown any evidence of recruitment impairment. SA2.5.3 Teams shall recognise 'available' HCRs as 'expected to reduce the exploitation rate as the point of recruitment impairment is approached' only in cases where: **!!** a. 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 b. An agreement or framework is in place that requires the management body to adopt HCRs before the stock declines below BMSY.		

		According to the new stock assessment model (diagnostic model) and the SC combined grid, stock biomass has been above the estimated MSY level throughout the time series; only the old/2014 trajectory puts the stock biomass below SB_{MSY} at any point (see 1.1.1b). Based on the SC grid, the probability that $F>F_{MSY}$ is estimated to be 13%. $p(SB<SB_{MSY})$ is not quoted in the SC13 report, but from **Error! Reference source not found.** can be seen to be <50% but >10%; p(SB<LRP) is estimated to be 16%. The biomass trajectory is stable or (possibly) increasing and F is ~stable (see 1.1.1). On this basis, SA2.5.2a is met. WCPFC have an agreed, legally-binding framework in place to establish formal harvest strategies and control rules for their main stocks, including WCPO bigeye (see CMM 2014-06 and associated workplans; Section XX). SA2.5.3b is therefore met. On this basis, a HCR can be considered to be 'available' for this stock. SG60 is met. Since the harvest strategy is not 'in place', SG80 is not met.		
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?		N	N
	Justification	Since a HCR is 'available' rather than 'in place', it cannot be argued to be robust to the main uncertainties. Not 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?	Y	N	N
	Justification	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 F_{MSY} should usually be taken as evidence that the HCR is effective').		

		A formal framework is in place for the development of a harvest strategy for the stock (CMM 2014-06 and workplans; see above). F is estimated by the SC to be below F_{MSY} with 77% probability. The criteria for 'available' tools at SG60 are therefore met. SG80 is not met because the HCR does not include well-defined target exploitation levels.
References		(McKechnie, Pilling, et al., 2017a; WCPFC, 2017a, 2017b) CMM 2014-06
OVERALL PERFORMANCE INDICATOR SCORE:		**60**
CONDITION NUMBER (if relevant):		**Aggregate 80 scored not reached – no condition raised.**

Commented [CS1]: reference to workplan to be added

Evaluation Table for PI 1.2.3 – Information and monitoring (Bigeye)

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 is available to support the harvest strategy.	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Y	Y	N
	Justification	The following information is available, and is used as part of the harvest strategy – notably to inform the stock assessment model: 1. Fishery-dependent information Catch, effort and CPUE: It is a requirement for all CCM fisheries to provide catch and effort data to WCPFC/SPC, and unlike in the past, most key fleets now provide operational (logbook) rather than just aggregate data (Williams, 2017). Catch and effort data go back to 1950, although as expected, historical data are sparser and generally less reliable than more recent data. The logsheet data are raised to best estimates of total catch by SPC-OFP, to account for missing data. Purse seine catch is allocated to species via an agreed methodology ('method 3') (Hampton and Williams, 2017). Longline CPUE data are analysed and standardised as described in (McKechnie, Tremblay-Boyer, et al., 2017) and provide the key stock assessment input; purse seine CPUE is not used because of difficulty in measuring effort meaningfully. Length/weight-frequency data: Size-frequency data come from various port sampling programmes and some observer reports, and go back to the 1960s. These data are weighted in the stock assessment according to spatial representation, to account for differences in length-frequency by geographic region. NB recent deterioration from longline fleets? this fleet? to check Fleet composition: Each CCM provides information to WCPFC annually on their active fleet, in their Part 1 reports. 2. Fishery-independent information		

		Size and age data: Age and growth is a big issue for this assessment, as is clear above. The work done by Farley et al. (2017b) is considered to be very detailed compared to what is available for most stocks, but conflicts with the growth model previously used in terms of its impact on the conclusions of the stock assessment (see Section **Error! Reference source not found.**). One concern is that it did not include enough very large fish; reportedly the Japanese are providing additional samples which can be added to the analysis (WCPFC, 2017a). Natural mortality: Estimating natural mortality is always a big problem. For bigeye (and other WCPO stocks), the methodology set out in Hoyle and Nichol (2008) is used to estimate M-at-length by sex, based on the levels of M which give the observed divergence in sex ratio after maturity. This M-at-length vector is then used to calculate a M-at-age vector using the growth curve, which is the input to the stock assessment model. M as stock assessment sensitivity Environmental data: The Ocean Fisheries Programme of SPC undertaken environmental research as part of their ecosystem monitoring programme, focusing particularly on potential environmental drivers of tuna population dynamics. 3. Stock structure Stock structure - the WCPO bigeye fishery is assessed and managed as a single stock in the WCPFC Convention Area, although there is strong evidence for mixing across the WCPFC/IATTC boundary (Section **Error! Reference source not found.**). Some work has been done to evaluate the usefulness of a combined management approach (McKechnie et al., 2015a), which concluded that the approach of separate assessments in the WCPO and the EPO was appropriate. 4. Information inferred from the stock assessment A significant range of information relating to stock status comes as the output of the stock assessment (McKechnie, Pilling, et al., 2017a; WCPFC, 2017a), including estimates of spawner potential, recruitment, fishery impact etc. 5. Data gaps Observer coverage (providing external verification of logbook data and information about discards) is low for the longline fishery. There is no external fishery-independent biomass indicator (such as a survey). Overall, given the size and complexity of the fishery, the range and comprehensiveness of the data available is impressive and improving all the time. Nonetheless, some data gaps do constrain stock assessments – as does bias and lack of precision in some of the datasets, particularly historical data; as well as uncertainty in others, particularly age/growth. Perhaps most importantly, the stock assessment continues to rely on commercial CPUE as an index of stock abundance, and although these data are carefully analysed and standardised as far as possible, there are no fishery-independent datasets with which they can be compared, while issues such as spatial and temporal changes in catchability remain problematic. On this basis, the team concluded that SG80 is met, but SG100 is not met.
	Monitoring	

b	**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?	Y	Y	N
	Justification	Fishery removals are monitored by individual CCMs via logsheets and port sampling, and are required to be submitted to the Commission annually, in the form of estimates of total catch plus catch and effort data broken down by gear and either aggregated (5º squares by month) or (preferably) at operational level (individual logsheets). Despite some gaps in this dataset, coverage is good overall. This catch, effort and CPUE dataset is the key indicator for stock assessment. Other key fisheries data which support management are size-frequency data (collected via port sampling and observer programmes) and tag returns. say more about this. Biological data are also collected via research programmes (e.g. Farley et al. (2017b)). Formal stock assessments have taken place every few years (2011, 2014, 2017). In between formal stock assessments, SPC provide some information on trends in fishery indicators (total catch, nominal CPUE, catch at length and at weight), to guide management (e.g. (Pilling et al., 2016)). On this basis, the team felt that SG80 was met. SG100 is not met, for the following reasons: • The characteristics of tuna longline CPUE are often poorly understood and it is unclear how successful most effort standardization analyses are or how to properly represent the uncertainties • Purse seine catch and length-frequency data can be biased by grab-sampling techniques used to estimate species composition (although there is an agreed methodology used to avoid bias as far as possible; see Hampton and Williams (2017)). • Some data gaps remain in fishery-dependent data (see Figure XX) • The requirement to 'raise' logsheet data by estimates of total catch (to account for missing logsheets) results in some loss of precision • Historical data are often lacking in precision • Although the frequency of stock assessments is reasonable, they are not carried out with 'high frequency' (i.e. not annually) The uncertainty in the most recent stock assessment is high and difficult to quantify; and it is not completely clear how robust the management is to uncertainty – the management system is still a work in progress.		
	Comprehensiveness of information			

c	**Guide post**		There is good information on all other fishery removals from the stock.	
	Met?		Y	
	Justification	WCPFC and SPC work hard 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 particular problem, and there has been ongoing work for quite a few years to quantify the catch (and where possible effort) from these fisheries (described in McKechnie, Pilling, et al. (2017a) Section 4.5.4). According to the stock assessment report, there has been gradual improvement in the data from Indonesia and the Philippines over the last decade or so; since the last assessment, catch data from Vietnam has also been available and is included in the 2017 assessment. At the pre-assessment workshop, it was noted that there is some potential for under-reporting of bigeye catch, and the pre-assessment workshop (Pilling and Brouwer, 2017) requested SPC to include a one-off sensitivity with this potential IUU fish added to the catch history (details of how this was done are given in McKechnie, Tremblay-Boyer, et al. (2017). It did not have a significant effect on the conclusions of the assessment, which were a little more positive (see McKechnie, Pilling, et al. (2017a); Appendix, Table 11).		
References		(Hoyle and Nichol, 2008; McKechnie et al., 2015b; Pacific, 2016; Farley et al., 2017b; Hampton and Williams, 2017; WCPFC, 2017a; McKechnie, Pilling, et al., 2017a; McKechnie, Tremblay-Boyer, et al., 2017; Pilling and Brouwer, 2017; Scott et al., 2017; Tremblay-Boyer, McKechnie, et al., 2017)		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**N/a**

Evaluation Table for PI 1.2.4 – Assessment of stock status (Bigeye)

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?		Y	Y
	Justification	The assessment takes into consideration the structure of the fishery; this is done by defining 'fisheries' based on characteristics of gear, method (e.g. purse seine set type), region and flag. It also includes a detailed biological model for bigeye, including sex-specific growth and natural mortality curves, and a maturity curve. See Section **Error! Reference source not found.** for more details. SG100 is met.		
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?	Y	Y	
	Justification	The stock assessment estimates stock status relative to a range of reference points, including SB and F reference points and depletion and MSY-based reference points; see **Error! Reference source not found.** and PI 1.1.1. SG80 is met.		
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?	Y	Y	Y
	Justification	The assessment is a sophisticated statistical assessment which allows input parameters to vary stochastically within parameters defined by the assessors. The key means by which uncertainty in terms of the input values themselves is taken into account is via defining sensitivity runs (described in Section **Error! Reference source not found.**). SG80 is met. The probability of the stock being above or below a given reference level, as quoted in PI 1.1.1, is evaluated based on a model grid which is defined across an agreed set of these sensitivities (e.g. as per **Error! Reference source not found.** which summarises three possible grids). The probabilities quoted in 1.1.1 are based on the SC grid, as explained in the rationale. In practice, the uncertainty around these estimates is greater than these probabilities suggest, because they do not incorporate the uncertainty about which grid to choose (which is basically unquantifiable) – this is emphasised in the stock assessment report. It should be noted that this is no different to any other stock assessment; it is just brought into relief here by the fact that two of the sensitivities have a significant impact on the stock assessment conclusions. Probability is quantified to the extent possible; on this basis, SG100 is met.		
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?			Y
	Justification	Alternative hypotheses in terms of model input parameter values or estimation methods, or model structure, are explored based on sensitivities, as described above (see **Error! Reference source not found.**). The transition from the 2014 reference case to the 2017 diagnostic case model is explained in Section **Error! Reference source not found.**, and shows the new or changed inputs and how they have been carefully evaluated at each stage. Alternative hypotheses are also explored externally; for example, an alternative Pacific-wide stock structure is considered in McKechnie et al. (2015b). Tremblay-Boyer, McKechnie, et al. (2017) considers the use of geo-statistics as an new method of standardising CPUE; opportunities for improving the input data (e.g. Peatman et al. (2017)) or developing new sources of input data (e.g. PNA (2017)) are considered by the SC each year. Although the conclusions of the stock assessment are not particularly robust in terms of providing a definitive conclusion about the stock status (see 1.1.1) this is not the fault of the assessment, and in fact the uncertainty associated with the assessment outcome is in some ways a consequence of how effective the assessment has been in considering all possible hypotheses. Met.		
	Peer review of assessment			

e	**Guide post**		The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.
	Met?		Y	Y
	Justification	The initial proposed approach from SPC is reviewed by external scientists in a pre-assessment workshop (Pilling and Brouwer, 2017). The final assessment is then evaluated by the Scientific Committee, who in this case asked SPC to prepare an alternative grid, as described in Section XX. A previous bigeye assessment (2011) had a formal external review (Ianelli et al., 2012). SG100 is met.		
References		(Ianelli et al., 2012; McKechnie et al., 2015b; Farley et al., 2017b; McKechnie, Pilling, et al., 2017a; McKechnie, Tremblay-Boyer, et al., 2017; Peatman et al., 2017; PNA, 2017; Tremblay-Boyer, McKechnie, et al., 2017; WCPFC, 2017a)		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				**N/a**

Appendix 1.3 Principle 2 scoring rationales

Evaluation Table for PI 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the 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?	WCPO bigeye – Y WCPO yellowfin – Y Blue marlin – Y NP albacore - Y	WCPO bigeye – Y WCPO yellowfin – Y Blue marlin – Y NP albacore - Y	WCPO bigeye – N WCPO yellowfin – Y Blue marlin – Y NP albacore - Y
	Justification	Based on the observer and logbook data, WCPO bigeye, WCPO yellowfin and blue marlin are the only species meeting the requirements for 'main' primary species. North Pacific albacore was included as 'main' on a precautionary basis (see Section XX). The main primary species for each UoA are as follows: UoA 1 (WCPO yellowfin): WCPO bigeye, blue marlin, North Pacific albacore UoA 2 (WCPO bigeye): WCPO yellowfin, blue marlin, North Pacific albacore WCPO yellowfin: see commentary under Principle 1 scoring (Section XX). SG100 is met. WCPO bigeye: see commentary under Principle 1 scoring (Section XXX). Based on the SC grid (Table 3) there is an 84% probability that the SB is above the LRP. SG60 and SG80 are met. Note that for 2.1.1, SG100 (high degree of certainty) requires 90% probability that the stock is above the PRI (see Table SA9 in the FCR v2.0). SG100 is therefore not met. Blue marlin (also see Section XX): the most recent stock assessment for this stock dates from 2016 (ISC, 2016a). The assessment found that although estimates of total stock biomass show a long-term decline from the start of the assessment timeframe (1971) to 2014, female spawning biomass was estimated to be 24,809 mt in 2014, or about 25% above SSB_{MSY}. Fishing mortality was about 12% below F_{MSY}. The 95% confidence intervals shown on the Kobe plot (Figure XX) indicate there is a high degree of certainty that this stock is above the PRI and is fluctuating around a level consistent with MSY. SG100 is met. North Pacific albacore (also see Section XX): the most recent stock assessment by the Albacore Working Group of ISC was in 2017 (ISC, 2017a). The assessment estimated SSB (in terms of female spawner biomass) to be ~2.5 times above the LRP. Projections at constant fishing intensity suggest a high degree of certainty (>99%) that the SSB will not fall below the LRP in 2020 and 2025. Current fishing intensity ($F_{2012-2014}$) is below F_{MSY} and all F_{MSY} proxy reference points except $F_{50\%}$. There is therefore a high degree of certainty that this stock is above the PRI and is fluctuating around a level consistent with MSY. SG100 is met.		
	Minor primary species stock status			

<table>
<tr><td rowspan="3">b</td><td>Guide post</td><td colspan="2"></td><td>For minor species that are below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species</td></tr>
<tr><td>Met?</td><td colspan="2"></td><td>N</td></tr>
<tr><td>Justification</td><td colspan="4">Minor primary species and stocks are WCNPO swordfish, WCPO skipjack, Pacific bluefin tuna and WCNPO striped marlin. The status for each stock is summarized in the table below. Bluefin and striped marlin are not likely to be above the PRI and rebuilding trends are not apparent. The team adopted an all or nothing approach for minor species; SG100 is therefore not met.
<table>
<tr><th>Stock</th><th>Below PRI?</th><th>Reference</th></tr>
<tr><td>Western and Central North Pacific swordfish</td><td>No. Exploitable biomass of WCNPO swordfish fluctuated at or above B_{MSY} throughout the assessment time horizon and has remained high in recent years. Results indicated it was very unlikely that the WCNPO swordfish population biomass was below B_{MSY} in 2012.</td><td>ISC (2014)</td></tr>
<tr><td>Western Central North Pacific striped marlin</td><td>Overfishing is occurring relative to MSY-based reference points and the WCNPO striped marlin stock is overfished. No LRP estimated however team made assumption that this stock is not likely (70th percentile) to be above PRI. No rebuilding trend apparent.</td><td>ISC (2015)</td></tr>
<tr><td>WCPO skipjack</td><td>No. Recent levels of spawning biomass are well above the level that will support the MSY, and are well above the limit reference point, 20%$SB_{F=0}$.</td><td>McKechnie et al. (2016)</td></tr>
<tr><td>Pacific bluefin</td><td>Overfishing is occurring and the stock is overfished. Team made assumption that this stock is not likely (70th percentile) to be above PRI. No rebuilding trend apparent.</td><td>ISC (2016b)</td></tr>
</table></td></tr>
<tr><td colspan="2">References</td><td colspan="3">ISC (2014); ISC (2015); McKechnie et al. (2016); ISC (2016b); ISC (2016a); ISC (2017a)
UoA logbook data (Table XX)
UoA observer data (Table XX)</td></tr>
</table>

Species/stock	UoA	Score
WCPO yellowfin	**2**	**100**
WCPO bigeye	**1**	**80**
Blue marlin	**1, 2**	**100**
NP albacore	**1, 2**	**100**
Minor	**1, 2**	**80**
OVERALL PERFORMANCE INDICATOR SCORE:		**UoA1: 90** **UoA2: 90**
CONDITION NUMBER (if relevant):		**N/a**

Evaluation Table for 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 above the point where recruitment would be impaired.	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 point where recruitment would be impaired.	There is a **strategy** in place for the UoA for managing main and minor primary species.
	Met?	WCPO bigeye – Y WCPO yellowfin – Y Blue marlin – Y NP albacore – Y Minor - Y	WCPO bigeye – Y WCPO yellowfin – Y Blue marlin – Y NP albacore – Y Minor - Y	WCPO bigeye – N WCPO yellowfin – N Blue marlin – N NP albacore – N Minor - N
	Justification	The main primary species for each UoA are as follows: UoA 1 (WCPO yellowfin): WCPO bigeye, blue marlin, North Pacific albacore UoA 2 (WCPO bigeye): WCPO yellowfin, blue marlin, North Pacific albacore MSC definition of a strategy (Table SA8): A "**strategy**" represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and which should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery and should contain mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts. A "**partial strategy**" represents a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically. WCPO bigeye and yellowfin (see Section XX): CMM 2014-06 commits WCPFC to putting in place a formal harvest strategy for its key stocks (WCPO skipjack, yellowfin and bigeye, and South Pacific albacore), with an associated workplan, although the workplan has been revised twice (at WCPFC13 and WCPFC14). In the meantime, yellowfin and bigeye are managed through CMM 2017-01 which is intended to be a 'bridging measure' while work continues towards a formal harvest strategy. The objectives of the CMM are as follows: Bigeye: *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/$SB_{F=0}$ for 2012-2015*. Yellowfin: *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.* The measures outlined in the CMM are for both stocks further explained in Sections XXXX and are not repeated here. It is worth noting however that FSM are a SIDS (Small Island Developing State) and are therefore exempt from certain measures included in the CMM, particularly the bigeye catch limits for longline fishing. Being a PNA member, FSM has in place a vessel day scheme for its longline fleet which operates in a similar fashion as the purse seine VDS. The scheme allows a total of 123,000 longline days, which is significantly more than currently takes place and should therefore be regarded as aspirational without limiting the longline fishery for either yellowfin or bigeye. The team therefore did not consider the VDS in the management of either stock. In the absence of a formal harvest strategy, the team considered the measures in CMM 2017-01 to be part of a partial strategy rather than a full strategy. As such, SG80 is met but not SG100.		

		Blue marlin: this species received a score of 100 in PI 2.1.1(a) – as such, the term 'if necessary' applies here and management as described under SG60 and SG80 is not required. SG80 is therefore met by default for blue marlin. There is no specific strategy in place to manage bycatch of blue marlin in either this fishery or at regional WCPFC level; bycatch is instead covered under the more generic WCPFC Resolution 2005-03 on Non-Target Fish Species. On that basis, SG100 is not met. NP albacore: as for blue marlin, SG60 and SG80 is met by default as this stock scored 100 under 2.1.1(a). In 2017, the WCPFC Northern Committee passed an 'interim harvest strategy' for North Pacific albacore which incorporates the WCPFC LRP of 20%$SB_{F=0}$ and puts in place a decision rule relating to the LRP, as follows: *In the event that, based on information from ISC, the spawning stock size decreases below the LRP at any time, NC will, at its next regular session or intersessionally if warranted, adopt a reasonable timeline, but no longer than 10 years, for rebuilding the spawning stock to at least the LRP and recommend a CMM that can be expected to achieve such rebuilding within that timeline*. Aside from this interim harvest strategy, WCPFC and IATTC still have harmonised management measures in place, which have applied since 2005: i.e. CMM 2005-03 (WCPFC) and Resolution C-05-02 (IATTC) which have the same requirements. However, until a more formal harvest strategy has been adopted for the stock, the team did not consider SG100 to be met. Minor species: SG60 and SG80 are met by default. Management of minor primary species is covered under the generic WCPFC Resolution 2005-03 on Non-Target Fish Species. On that basis, SG100 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 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?	WCPO bigeye – Y WCPO yellowfin – Y Blue marlin – Y NP albacore – Y Minor - Y	WCPO bigeye – Y WCPO yellowfin – Y Blue marlin – Y NP albacore – Y Minor - Y	WCPO bigeye – N WCPO yellowfin – N Blue marlin – N NP albacore – N Minor - N
	Justification	As stated in scoring issue a above, blue marlin and NP albacore received a score of 100 in PI 2.1.1 and management as described under SG60 and SG80 is not required in this PI. SG80 is therefore met by default for these stocks. Note that management for neither of these stocks has been tested and SG100 is therefore not met. Bigeye: Status quo projections (discussed in detail in PI 1.2.1(a)) suggest a minimal probability of SB falling below the LRP in the next 5 years although this outcome is dependent on the model scenarios in McKechnie, Pilling, et al. (2017a), with the old growth model suggesting it is moderately likely (43-47 %). Whilst the projections are to a degree undermined by the uncertainties in the stock assessment model, the team took into account the fact that WCPFC have committed to a workplan to put in place a formal harvest control rule for bigeye by 2021, which provides some objective basis for confidence that the partial strategy will work. On that basis SG80 is met. In the absence of any testing, SG100 is not met. Yellowfin: wait for P1 analysis – SG80 probably met. Minor species: in the absence of any testing, SG100 is not met. SG60 and SG80 are met by default.		
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?		Y	N

	Justification	Evidence for implementation of the partial strategies for all species includes VMS and observer data, landings data (port sampling), logbooks and the MCS system as described under Principle 3. In the absence of systematic non-compliance by the UoA the team considered that SG80 should be met. However, considering the low observer coverage in this and other longline fisheries (see Section XX) and taking into account the fact that much of CMM 2017-01 relies on factors that our outside the control of the UoA (e.g. other longline fisheries, the purse seine fishery), the team felt that clear evidence of its successful implementation is lacking. SG100 is not 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?	Not relevant	Not relevant	Not relevant
	Justification	No primary species are sharks: sharks are all protected in FSM and are therefore considered under ETP species below. Not relevant.		
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 unwanted catch of main primary 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 primary 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 primary species, and they are implemented, as appropriate.
	Met?	Y	Y	N
	Justification	All main primary species are retained for sale, as evidenced by the observer data. There is no unwanted catch of main primary species. SG60 and SG80 are met by default. In the absence of a biennial review, SG100 is not met.		
References		CMM 2017-01; WCPFC Resolution 2005-03 UoA logbook data (Table XX) UoA observer data (Table XX)		

Species/stock	**UoA**	**Score**
WCPO yellowfin	**2**	**80**
WCPO bigeye	**1**	**80**
Blue marlin	**1, 2**	**80**
NP albacore	**1, 2**	**80**
Minor	**1, 2**	**80**
OVERALL PERFORMANCE INDICATOR SCORE:		**UoA1: 80** **UoA2: 80**
CONDITION NUMBER (if relevant):		**N/a**

Evaluation Table for 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 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 adeqaute 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 susceptiblity 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?	Y	Y	Y
	Justification	There is quantitative information on the catch of main and minor primary species (landings and discards) from logbooks, port sampling and observers. Each of the main primary stocks has a stock assessment (see 2.1.1a), providing quantitative information on total landings and stock biomass. As most if not all primary species are retained for sale, logbooks (which provide 100% coverage) enable the impact of the UoA on these stocks to be evaluated with a high degree of certainty; SG100 is met.		
b	Information adequacy for assessment of impact on minor species			
	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			Y
	Justification	See above – met.		
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?	Y	Y	N
	Justification	A partial strategy is in place for main primary species where necessary (see 2.1.2) and the information required to support it (fishing effort via logbooks and VMS, landings, discards) is available as set out above. In the absence of a full strategy, SG100 is not met.		
References		UoA logbook data (Table XX) UoA observer data (Table XX) See also PIs 2.1.1, 2.1.2 and references therein		
OVERALL PERFORMANCE INDICATOR SCORE:				**UoA1: 95** **UoA2: 95**

CONDITION NUMBER (if relevant):	N/a

Evaluation Table for PI 2.2.1 – Secondary species outcome

PI 2.2.1		The UoA aims to maintain secondary species above a biological 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 within 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 also 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 within biologically based limits.
	Met?	Y	Y	N
	Justification	With the exception of bait, there are no 'main' secondary species (see Section XXX). Bait (see Section XXX): The fishery only uses Indian oil sardine (*Sardinella longiceps*), which [Commented [CS2]: Eric? Same comment as in main report] average total catch (including landings, discards and bait). Population size for *S. longiceps* is highly erratic and susceptible to environmental fluctuations, with FAO catch statistics indicating large-scale annual fluctuations in the landings of this species. Fishery output and population parameters are being monitored by the Central Marine Fisheries Research Institute (CMFRI) and used as a proxy for stock survey (Andrews et al., 2008). According to these statistics the fishery thrived in the 1920s, with landings of over 57,000 tonnes in the 1923-24 season, followed by a decline over the following 22 years to a minimum of less than 500 tonnes in the mid-1940s. The fishery revived in the 1950s, with landings of around 10,000 tonnes per annum, and has grown considerably since, to a fishery landing over 400,000 tonnes in 2003 (Andrews et al., 2008). Recent landings, according to CMFRI are: 2015 – 265,667 t, 2014 – 544,684 t, 2013 – 595,392 t. MSY is estimated to be ~226,000 t (2007 estimate given in Andrews et al. (2008), but is no doubt highly variable. The stock is managed by comparing the 'average long-term yield' (rolling five-year mean) to the 'potential long-term yield' (some kind of estimate of the highest sustainable landings). Analysis of catch data indicates that the average length at capture exceeded the size at maturity and optimum size for exploitation for the species (CMFRI, 2012). Whilst there are no indications that this stock is below biologically based limits, the team considered it more precautionary to also evaluate the second part of this scoring guidepost. This fishery uses approximately 2,500 t of bait per year, or less than 1% of the Indian landings on the stock (which is the most likely source of bait for this fishery). This negligible impact constitutes a 'partial strategy', which ensures that this fishery is having no impact on the stock. SG80 is met. There is not, however, a high degree of certainty in relation to the stock status of Indian oil sardine, so SG100 is not met. Note that MSC Guidance GSA3.4.6 states that even if the total catch of a species is clearly hindering recovery, UoA catches of less than 30% of the total catch of a species may not normally be influential in hindering a recovery in a marginal sense. Although *S. longiceps* is a popular choice for bait in longline fisheries, the longline fisheries in the MSC programme		

		combined that make use of this species are highly unlikely to exceed this 30% threshold. This further supported the team's view that SG80 should be met.		
b	**Minor secondary species stock status**			
	Guide post			For minor species that are below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?			N
	Justification	There is a long list of minor secondary species (see Table X and Table X) and they have not been evaluated individually. Using an all or nothing approach, this scoring issue is therefore not met.		
References		UoA logbook and observer data CMFRI (2012) and Andrews et al. (2008)		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**N/a**

Evaluation Table for 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 within 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 within 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?	Y	Y	N
	Justification	With the exception of bait, there are no 'main' secondary species (see Section XXX). Minor species were not evaluated in detail and were not considered to meet SG100. As set out in PI 2.2.1(a), the amount of bait used by this fishery is trivial in comparison to the total landings and biomass for the stock. This negligible impact, together with the fact that the volume of bait use is monitored constitutes a partial strategy to ensure that the fishery has no impact on the stock. It does not, however, meet MSC's definition of a strategy as given above, so SG100 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?	Y	Y	N
	Justification	For the bait species, the small percentage of the total catch used by this fishery (<1%) provides an objective basis for confidence that it is not having any impact on the stock. SG80 is met. Although the team had high confidence of a lack of impact, there is nothing in place that would constitute testing; either for the bait or for the minor species. 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?		Y	N
	Justification	The quantity of bait used is known, as are total landings from the stock, which are monitored by the CMFRI. SG80 is met. In the absence of a strategy or a partial strategy which also covers minor species, the team did not consider SG100 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?	Not relevant	Not relevant	Not relevant

	Justification	No secondary species are sharks: sharks are all protected in FSM and are therefore considered under ETP species below. Not relevant.		
e	Review of alternative measures to minimise mortality of unwanted catch			
	Justification	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?	Y	Y	N
	Guide post	For the bait species, there is no unwanted catch as all of it is purchased and used. This scoring issue is therefore not relevant. Since there are no other main secondary species, SG60 and SG80 are met by default. Not all minor secondary species are desirable, and as far as the team is aware there is no biennial review of alternative measures to minimise these catches. SG100 is not met.		
References	UoA logbook and observer data Site visit interviews			
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**N/a**

Evaluation Table for 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?	Y	Y	Y
	Justification	Other than the bait *S. longiceps*, there are no main secondary species. Bait species: There is quantitative information on the purchase of bait (based on client purchase data). The quantity of bait used is therefore known, as are total landings from the stock, which are monitored by the CMFRI. Quantitative information is thus available and adequate to assess with a high degree of certainty the impact of the UoA on the species. SG100 is 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?			N
	Justification	There is a long list of minor secondary species (see Table XX and Table XX). The impact of the UoA on these stocks in terms of catch (landings, discards, mortality to point of discard) can be evaluated via the observer reports, but in some cases little is known about the stock structure and status, so SG100 is not met in full.		
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?	Y	Y	N
	Justification	For the bait species, the team concluded that there is a 'partial strategy' in place for bait rather than a strategy (see 2.2.2). The information available (purchase data, landings data) is sufficient to support this partial strategy and SG80 is met. In the absence of a formal strategy for all secondary species however SG100 is not met.		
References		UoA logbook and observer data Site visit interviews		
OVERALL PERFORMANCE INDICATOR SCORE:				**85**
CONDITION NUMBER (if relevant):				**N/a**

Evaluation Table for 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 scored – no limits	Not scored – no limits	Not scored – no limits
	Justification	ETP species are discussed in Section XXX, Table XX and include the following: - Elasmobranchs (sharks and rays) - Sea turtles - Seabirds - Cetaceans Formal 'limits' (national or international) which trigger management action are not in place for any of these species groups. This scoring issue was therefore not scored.		
b	Direct effects			
	Guide post	Known direct effects of the UoA are likely to not **hinder recovery** of ETP species.	Known 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?	Y	Y – Elasmobranchs N – Sea turtles Y – Seabirds Y - Cetaceans	N – Elasmobranchs N – Sea turtles N – Seabirds N - Cetaceans
	Justification	Elasmobranchs: For the purposes of scoring, the assessment team focused on the most frequently caught elasmobranchs according to the observer data (Table XX); this concerns silky shark, blue shark and pelagic stingray. The total direct effects of the fishery on elasmobranchs, including scaled up estimates of total fleet bycatch are estimated in Table XX. As explained in Section XX, the team assumed 50% mortality for all sharks concerned. On this basis, the following mortality estimates were derived for the three key species: - Blue shark: 129 ind./year - Silky shark: 834 ind./year - Pelagic stingray: 447 ind./year Note that these estimates should be considered at an order of magnitude rather than as absolute values. Blue shark: The most recent stock assessment for the North Pacific stock carried out by ISC (2017b) (see Section elasmobranchs for details) considers this stock not overfished with overfishing not occurring. The reference case model estimates current spawning biomass (SB_{2015}) at 308,286 tonnes. The scaled up observer data estimates the average annual UoA catch of blue shark at 258 ind. or 5.43 tonnes (Table XX). Assuming 50% mortality, this corresponds to less than 0.01% of the estimated SB. On that basis, known direct effects of the UoA are highly likely to not hinder recovery of blue shark and SG80 is met.		

		Silky shark: The most recent stock assessment (Rice and Harley, 2013) (see Section elasmobranchs for details) estimates 'current' catch (2005-8) at 5,331 t (although this estimate is highly uncertain). This fishery catches ~12.5 t/year, resulting in a mortality of ~6.25 t/year, or ~0.1 % of the total catch. On this basis, SG80 is met. Pelagic stingrays: the estimated average annual catch by the UoA is 894 ind. or 60 tonnes. Although there is some debate as to consistency of reporting of pelagic stingrays in fisheries statistics and data are lacking from several areas of the species' range, there are no data to suggest that significant declines have occurred in this species (Baum et al., 2009). Given increasing trends observed in some regions, this species' widespread distribution, and in the absence of evidence to suggest significant declines, it is currently assessed as of Least Concern globally (Baum et al., 2009). For this reason, the team considered that known direct effects of the UoA are highly likely to not hinder recovery of this species. SG80 is met. Overall, considering the levels of uncertainty in population estimates and the low level of observer coverage in this fishery, the team considered that SG100 was not met for elasmobranchs. Sea turtles: Only two interactions with sea turtles were recorded in the observer data (Table XX), both of which were loggerheads and were dead at point of discard. Considering the low level of observer coverage and low number of interactions, the team made no attempt to scale up these data. The FSM EEZ overlaps with 4 sea turtle Regional Management Units (RMUs), none of which concern the loggerhead but four other species: green turtle, hawksbill, leatherback and olive ridley (see Section seaturtles). The olive ridley RMU is considered at high risk from bycatch in longlines (Wallace et al., 2013). The distribution of sea turtles in FSM waters is not well known, although the green turtle is thought to be the most abundant with moderate nesting colonies on some of the outer islands (Ahser, 2002). An overview of known nesting sites is also available here: http://seamap.env.duke.edu/swot. This suggests that interactions with adult nesting females may occur which would have a more severe impact at population level than interactions with only juveniles. Although observer coverage is limited and recorded interactions rates are low, a study on the bycatch profile of the pelagic tuna longline fishery in neighboring Palau (Gilman et al., 2015), indicates a higher interaction rate is likely, with 106 sea turtles caught during 232 observed sets (or 60 trips) between 1999 and 2011 (excluding 2000 to 2003 and 2006). Although the known direct effects of the UoA are likely to not hinder recovery of ETP species, more information would be required to determine that this is highly likely to be the case. SG80 is not met. Seabirds: Although none of the observer reports cite interactions with seabirds, the observer coverage in this fishery is low (Section data availability). As such, the team considered potential impacts of this fishery on vulnerable seabird species on a precautionary basis. Watling (2002), based on interviews with WCPO industry stakeholders and observer data, indicates that although seabird interactions with longline vessels operating in tropical and subtropical areas of the WCPO are very rare (except in the Hawaii-based longline fisheries) this does not preclude the possibility of highly threatened seabird populations being impacted. Gilman (2006) equally concluded that existing observer data are currently insufficient to support a conclusion with any high level of certainty that no pelagic longline fisheries operating in the tropical Pacific Islands region could be contributing to existing or cause future seabird population declines. According to Filippi et al. (2010), the FSM EEZ is located in a low-risk area for seabird interactions (see Figure XX in Section seabirds) and none of the mitigation measures listed in the recently updated CMM 2017-06 have to be applied by longline fisheries in FSM. Furthermore, the study by Gilman et al. (2015) found only 2 interactions with seabirds in a similar fishery in neighboring Palau. On this basis, the team considered it highly likely that the fishery is not hindering recovery of seabird species and SG80 is met. Without a more robust observer dataset, however, this cannot be said with a high degree of certainty and SG100 is not met. Cetaceans: As for seabirds, no interactions with cetaceans were cited in the UoA observer data; however this group was considered on a precautionary basis (Section cetaceans). There are two main types of interaction between cetaceans and longlines: depredation and entanglement, the latter often following on from the former (Anderson, 2014). The study by Gilman et al. (2015) found only one interaction with a toothed whale in the Palau longline fishery. On this basis, the team considered it highly likely that the UoA is not hindering recovery of cetacean species and SG80 is met. Here also, however, without a more robust observer dataset, this cannot be said with a high degree of certainty and SG100 is not met.
	Indirect effects	

c	**Guide post**		Indirect effects have been considered 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 fishery on ETP species.
	Met?		Y – Elasmobranchs Y – Sea turtles Y – Seabirds Y - Cetaceans	Y – Elasmobranchs Y – Sea turtles Y – Seabirds Y - Cetaceans
	Justification	Note: Discard and post-release mortality is accounted for in the data cited above and is therefore not an indirect effect. The team considered possible indirect effects to be as follows: Elasmobranchs: None Sea turtles: Disturbance around nesting areas / inter-nesting foraging areas Seabirds: Disturbance around nesting / roosting areas Cetaceans: Noise disturbance, change in foraging behaviour For sea turtles and seabirds, disturbance around inshore nesting, foraging or roosting areas is highly unlikely as vessels are not permitted to operate within 24nm from any landmass with the EEZ (Section fishing areas). As compliance with this measure is high according to NORMA, the team considered that SG100 should be met. Mammals: Noise disturbance is likely to be minimal because the number of vessels is limited relative to the size of the EEZ. It is known that marine mammals have changed their foraging behaviour in response to the availability of fish on longlines – individual fishers will try to mitigate this by avoiding setting or hauling in the presence of mammals if possible. Aside from the risk of bycatch (considered above), it has been shown in other fisheries (e.g. orcas in toothfish fisheries) that the impact on the mammals themselves is positive, as one would expect. Overall, the team concluded that SG100 is met.		
References		(Ahser, 2002; Watling, 2002; Gilman, 2006; Filippi et al., 2010; Rice and Harley, 2013; Wallace et al., 2013; Anderson, 2014; Gilman et al., 2015; ISC, 2017b)		

Element	**Score**
Elasmobranchs	**90**
Sea turtles	**70**
Seabirds	**90**
Cetaceans	**90**
OVERALL PERFORMANCE INDICATOR SCORE:	**75 (sea turtles)**
CONDITION NUMBER (if relevant):	**XXX**

Evaluation Table for 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?	Y – Elasmobranchs Y – Sea turtles Y – Seabirds Y - Cetaceans	Y – Elasmobranchs Y – Sea turtles Y – Seabirds Y - Cetaceans	N – Elasmobranchs N – Sea turtles N – Seabirds N - Cetaceans
	Justification	MSC definitions: A "**strategy**" represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and which should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery and should contain mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts. A "**comprehensive strategy**" (applicable only for ETP component) is a complete and tested strategy made up of linked monitoring, analyses, and management measures and responses. All ETP species: FSM participates in the Regional Observer Programme (ROP) which at a regional level aims to collect verified catch data, other scientific data, and additional information related to the fishery, including on the implementation of CMMs. CMM 2007-01 entered into force on 15 February 2008, and provides the basis of the rules and development of the WCPFC ROP and sets a minimum required national observer coverage of 5% for longline fisheries (see Section data availability). Elasmobranchs: There are various CMMs in place at regional level which relate to shark bycatch. CMM 2010-07 is the overarching measure on sharks which stipulates *inter alia* that fins on board vessels should total no more than 5% of the weight of sharks on board up to the first point of landing (see Section elasmos for further details) and that CCMs should develop a national NPOA in line with the FAO's IPOA. Species-specific CMMs are further in place for silky sharks (CMM 2013-08) and oceanic whitetip sharks (CMM 2011-04), both of which prohibit CCMs from retaining on board, transshipping, storing on a fishing vessel, or landing any oceanic whitetip or silky shark, in whole or in part, in the fisheries covered by the Convention. CCMs are further required to release any individuals as soon as possible after being brought alongside the vessel, and to do so in a manner that results in as little harm to the shark as possible. At national FSM level, all elasmobranchs (sharks and rays) are protected under Section 913 of its FSM Code Title 24. The regulation does not ban the landing of sharks, but stipulates that all sharks caught alive must be released and that any shark dead upon hauling may be landed with its fins naturally attached. At state level (Chuuk, Pohnpei, Kosrei and Yaap), shark sanctuaries are in place and sharks are only allowed to be targeted for traditional use. This does not affect the UoA however as this fishery takes place outside the 24nm limit. Since the regulations were adopted in 2015, NORMA reports a good level of compliance by all longline fleets, including the UoA. Although the regulations do not prohibit the landing of sharks, the ban on shark finning is crucial in that it acts as a disincentive for retention (volume taken up by the carcass of a shark is disproportionate to its value). One side-effect, however, has been that sharks		

		that were previously retained and therefore reported in logbook data, are now more frequently cut off at the line which has likely resulted in under-reporting. The team considered that the above measures constitute a strategy, designed to minimise mortality on elasmobranchs and sharks specifically and that SG80 is met. Although the strategy goes above and beyond regional requirement (i.e. the ban on shark finning) the issues around underreporting of shark bycatch combined with the low observer coverage, prevent SG100 from being met. Sea turtles: At regional level, CMM-2008-03 on the conservation and management of sea turtles is in force, requiring the implementation of the FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations, which include the use of wide circle hooks; using fish rather than squid for bait; and setting hooks deeper than turtle abundant depths (40–100 m). The CMM also details reporting requirements for CCMs and best practice guidelines to ensure the survival of captured sea turtles. For longline vessels, the CMM specifically requires that operators carry and use line cutters and de-hookers to handle and promptly release sea turtles caught or entangled and, where appropriate, carry and use dip-nets. At national FSM level, there is no NPOA on sea turtles as of yet. As far as the team is aware, this is also not yet in the drafting phase. Legislation is however in place under the Marine Preservation Act which sets limitations on the taking of sea turtles for traditional consumption and which does not apply to this fishery. At national level, management of sea turtle bycatch in longline fisheries therefore defaults to CMM-2008-03. The team considered that the above measures constitute a strategy, designed to minimise mortality on sea turtles specifically and that SG80 is met. However, due to the issues around observer coverage, SG100 should not be met. Seabirds: In December 2017 (WCPFC14), CMM 2017-06 was agreed on mitigating the impact of fishing for highly migratory fish stocks on seabirds. The CMM sets out requirements for CCMs to develop NPOAs, as well as a series of mitigation measures for tuna longline fisheries operating south of 30°S and north of 23°N. The FSM EEZ being located between 13°26'N and 1°10'S is, however, exempt from these mitigation measures. As for the other species groups, the team considered that the above measures constitute a strategy, designed to minimise mortality on seabirds specifically and that SG80 is met. However, due to the issues around observer coverage, SG100 is not met Cetaceans: For cetaceans, interactions are generally caused by depredation and are rare for the fishery under assessment. While cetaceans are not specifically addressed in any CMMs for WCPO longline fisheries, their protection is ensured through the Pacific Islands MoU which FSM is a signatory to (see Section cetaceans). On the basis that cetaceans are unlikely to be a problem for the fishery under assessment, the team considered this requirement to constitute a strategy and sufficient for SG80 to be met. As for the other ETP groups, the low observer coverage precludes SG100 from being met.		
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?	Not scored	Not scored	Not scored
	Justification	Only scored where there are no requirements for protection and rebuilding provided through national ETP legislation or international agreements.		
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?	Y – Elasmobranchs Y – Sea turtles	Y – Elasmobranchs Y – Sea turtles	N – Elasmobranchs N – Sea turtles

		Y – Seabirds Y - Cetaceans	Y – Seabirds Y - Cetaceans	N – Seabirds N - Cetaceans
	Justification	Elasmobranchs: Since the FSM regulations were adopted in 2015, NORMA reports a good level of compliance by all longline fleets, as well as a decline in the number of sharks being landed. Although the regulations do not prohibit the landing of sharks, the ban on shark finning is crucial in that it acts as a disincentive for retention (volume taken up by the carcass of a shark is disproportionate to its value). One side-effect, however, has been that sharks that were previously retained and therefore reported in logbook data, are now more frequently cut off at the line which has likely resulted in under-reporting. This means that the observer data are now the only reliable source on interactions with sharks in this fishery. While the team agreed that the available observer data provides some objective basis for confidence that the strategy will work (SG80 is met), the evidence base was lacking to provide high confidence. SG100 is not met. Sea turtles: In the Hawaii longline fishery, combined turtle species capture rates declined by ~ 90% from the period before the CMM came into effect to the period after the regulations came into effect (Dalzell and Gilman, 2006). While changes in the timing of setting and gear retrieval between the two time periods (as a result of the seabird CMM) may be another cause of the observed changes in turtle catch rates, this provides an objective basis for confidence that strategy is working. In the absence of more robust observer data, SG100 is not met. Seabirds: Based on the analysis by Filippi et al. (2010), described in Section seabirds, the team agreed that SG80 is met. Considering the low observer coverage however, SG100 is not met. Cetaceans: the fact that cetaceans are unlikely to be a problem for pelagic longline fisheries and the low level of reported interactions with this fishery provides an objective basis for confidence that the strategy will work. SG80 is therefore met. In the absence of more robust observer data, SG100 is not met.		
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?		N	N
	Justification	All ETP species: during site visit interviews non-compliance by the UoA fleet was not a cause for concern in this fishery (Section on MCS) and observations during the site visit indicated that some measures (e.g. turtle dehookers) were being implemented. Whilst there is no evidence that the measures described in SIa are not being implemented successfully, the observer coverage in this fishery is currently too low to provide evidence that this is indeed the case. The team therefore concluded that the current non-compliance with 5% observer rates required by CMM 2007-01 precludes SG80 from being 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?	Y	Y	Y
	Justification	At the annual meeting of the WCPFC Scientific Committee, the Ecosystem and Bycatch Mitigation Theme exists to do precisely this. Working and information papers presented to SC12 (2016) include the following: • EB-WP-05: Technical details on the development of shark management plans • EB-WP-06: Implications of the choice of mitigation measure on mortality of silky and oceanic white-tips		

		• EB-WP-07: The outcome of different shark handling practices for post-release mortality • EB-WP-08: Review of available information on non-key sharks [including mantas and mobulids] and fisheries interactions • EB-WP-10: Improving tori line performance in small vessel longline fisheries • EB-WP-11: Report of a WCPFC workshop on the effectiveness of turtle bycatch mitigation measures • EB-WP-13: Effectiveness of seabird mitigation measures on small vessels north of 23° S • EB-IP-04: Cross-taxa comparison of the effectiveness of mitigation measures for elasmobranchs • EB-IP-05: Advice from ACAP on reducing longline impacts on birds • EB-IP-06: Development and testing of the 'hook pod' to reduce seabird impacts in New Zealand longline fisheries • EB-IP-11: Use of biodegradable twine Likewise at SC11: • EB-WP-02: Monte Carlo simulation modelling of measures to reduce impacts on silky and oceanic white-tip sharks • EB-WP-05: Analysis of the effectiveness of turtle mitigation measures in longline fisheries • EB-WP-10: At-sea experiments to develop mitigation measures for seabird bycatch in small boat longline fisheries in the North Pacific Furthermore, as part of the ABNJ Tuna project, there have been a number of workshops on bycatch in longlines with particular emphasis on sharks, sea turtles and seabirds with several studies (shark post-release tagging studies, seabird mortality analysis) being carried out as a result. SG100 is met.
References		(Dalzell and Gilman, 2006; Filippi et al., 2010) References given in scoring issue e are not listed again individually here, but can be located by going to the meeting page (https://www.wcpfc.int/meetings/sc12) and selecting the tab 'Ecosystem and Bycatch Mitigation Theme' (and likewise for SC11). CMM 2007-01 CMM 2010-07 CMM 2013-08 CMM 2011-04 CMM-2008-03 CMM 2017-06

Elasmobranchs	**75**
Sea turtles	**75**
Seabirds	**75**
Cetaceans	**75**
OVERALL PERFORMANCE INDICATOR SCORE:	**75**
CONDITION NUMBER (if relevant):	**XXX**

Evaluation Table for 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?	Y – Elasmobranchs Y – Sea turtles Y – Seabirds Y - Cetaceans	Y – Elasmobranchs N – Sea turtles Y – Seabirds Y - Cetaceans	N – Elasmobranchs N – Sea turtles N – Seabirds N - Cetaceans
	Justification	Elasmobranchs: Some quantitative information is available from observer reports, enabling UoA related mortality and the impact on the relevant populations to be estimated (see PI2.3.1). SG80 is met. Considering the low level of observer coverage, SG100 is not met. Sea turtles: as rare-event species, the observer coverage is currently too low to enable a quantitative estimation of mortality rates. SG80 is not met. Seabirds and cetaceans: considering the low likelihood of interactions (explained in PI 2.3.1), the observer data are sufficient for the UoA impact to be estimated. SG80 is met. The observer coverage is too low for SG100 to be 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?	Y	N	N
	Justification	All ETP species: much of the information used in the scoring of the ETP species component stems from studies on similar fisheries (e.g. Gilman et al. (2015)) or risk assessments (e.g. Filippi et al. (2010)), with the only fishery-specific information provided by a limited observer dataset. While the strategies in place are considered appropriate to manage the UoA's impact on ETP species (PI 2.3.2), the evidence base is lacking to detect increases in risk level and adapt management strategies on an ongoing basis. For this reason, SG80 is not met.		
References		(Filippi et al., 2010; Gilman et al., 2015)		
Elasmobranchs				**70**
Sea turtles				**60**

Seabirds	**70**
Cetaceans	**70**
OVERALL PERFORMANCE INDICATOR SCORE:	**65**
CONDITION NUMBER (if relevant):	**XXX**

Evaluation Table for 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(s) covered by the governance body(s) responsible for fisheries management.**		
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?	Y	Y	Y
	Justification	The longline fishery takes place in deep water and is highly unlikely to interact with benthic features. Lost gear may consist of monofilament and/or hooks and is only likely to continue to fish as long as bait remains on the hooks. Bait is stripped relatively quickly off the hooks and as such, the mortality rate associated to lost longlines is low (Macfadyen et al., 2009). SG100 is therefore met.		
b	VME habitat status			
	Guide post	The UoA is **unlikely** to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is **highly unlikely** to reduce structure and function of the VME 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 VME habitats to a point where there would be serious or irreversible harm.
	Met?	Y	Y	Y
	Justification	See above. SG100 is met.		
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?			Y
	Justification	As above. Met.		
References		Site visit interviews		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				**N/a**

Evaluation Table for 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			
	Guide post	There are **measures** in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a **partial strategy** in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a **strategy** in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	Y	Y	N
	Justification	Considering that this fishery is extremely unlikely to impact benthic habitats, the term 'if necessary' applies here and management measures should not be required. SG 60 and 80 are therefore met by default. There is, however, no strategy in place which specifically aims to manage the impacts of the fishery on habitat types (either directly or through ghost fishing), as required by MSC for a score of 100. SG100 is therefore 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/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?	Y	Y	Y
	Justification	The 'partial strategy' is the nature of the fishery (pelagic only); there is therefore high confidence that it works, based on information directly about the gear type and deployment. SG100 is met.		
c	Management strategy implementation			
	Guide post		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?		Y	Y
	Justification	Quantitative evidence such as VMS tracks will clearly demonstrate no impact on benthic habitats. SG100 is met.		
	Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs			

d	**Guide post**	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?	Y	Y	Y
	Justification	In the absence of interactions with VMEs (see 2.4.1), this issue is met by default. SG100 is met.		
References		Site visit interviews		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				**N/a**

Evaluation Table for 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 Consequence Spatial Analysis (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?	Y	Y	N
	Justification	Knowledge of demersal habitats is not relevant to this fishery, so SG80 is met by default. SG100 is not met because it does not include a statement about 'relevant to the scale and intensity of the UoA'.		
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?	Y	Y	Y
	Justification	Since the gear does not interact with habitats, the (lack of) physical impacts are clear. SG100 is met.		
	Monitoring			

c	**Guide post**		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in habitat distributions over time are measured.
	Met?		Y	N
	Justification	No information is required, so SG80 is met by default. SG100 is not met because such measurements are not necessary in this fishery.		
References		Site visit interviews		
OVERALL PERFORMANCE INDICATOR SCORE:				**85**
CONDITION NUMBER (if relevant):				**N/a**

Evaluation Table for 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?	Y	Y	N
	Justification	Based on the analysis presented in Section XX, it is likely that the tuna longline fishery is having some degree of impact on ecosystem structure and functioning. It is therefore important to determine how much predator abundance can be altered before cascading effects occur, and whether there are clear thresholds for large-scale ecosystem transformation (Baum and Worm, 2009). The size-based model developed by Polovina and Woodworth-Jefcoats (2013) did not suggest any obvious threshold in changes to an ecosystem size structure that could serve as a management target. The team therefore considered biomass at MSY to be a suitable trigger, below which irreversible ecosystem impacts might be expected. At the scale of the UoA, it is therefore highly unlikely that the fishery under assessment would lead to irreversible ecosystem impacts (see Sections YFT and BET under Principle 1). On this basis, it is considered highly unlikely that the UoA fishery will disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. There is however limited formal evidence supporting this conclusion, in terms of direct information about the FSM EEZ pelagic ecosystem and the impact of longlining upon it. SG100 is thus not met.		
References		(Baum and Worm, 2009; Polovina and Woodworth-Jefcoats, 2013)		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**N/a**

Commented [C3]: Add bigeye and yft refs

Evaluation Table for 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 fishery 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?	Y	Y	N
	Justification	The FAO code states that fisheries management should ensure the conservation not only of target species, but also sympatric non-target species (Allain et al., 2011). This resolution is now explicit in WCPFC measures, although tuna fisheries remain managed on a single-species basis. The WCPFC's application of the FAO code extends to the highly migratory fish species including tuna through CMM-2017-01 and the updated workplan for the adoption of Harvest strategies under CMM 2014-06 on the management of bigeye, yellowfin and skipjack (the harvest strategies for yellowfin and bigeye in particular have been discussed in detail under Principles 1, see Section XXX), as well as to the management of non-target species (see rationales presented in PIs 2.1.2, 2.2.2 and 2.3.2). The team considered that all the CMMs in conjunction with the national legislation at FSM level (in particular in relation to sharks) constituted at least a partial strategy and that SG80 was therefore met. Management measures remain, however, species-specific with little consideration for an ecosystem-based approach that consists of a plan. Furthermore, at national level, work is ongoing on the drafting of various NPOAs on sharks, sea turtles and seabirds but these have yet to be put in place. SG100 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 fisheries/ 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?	Y	Y	N
	Justification	The WCPFC and national measures which form the partial strategy all take into account the available information with the expectation that impacts on the ecosystem are restrained (see discussions under Principle 1 and Principle 2). Furthermore, there is confidence that the partial strategy will work, based on the small footprint of the fishery in the ecosystem. SG80 is therefore met. Testing at UoA level has not been carried out however so 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).

Commented [C4]: may raise recommendation that these should be drafted

	Met?		Y	N
	Justification	At regional level, the partial strategy has so far succeeded in maintaining target species above B_{MSY} level (see Section XX stock status), considered here as the main trigger point beyond which ecosystem structure and functioning may be affected (PI 2.5.1). There is therefore some evidence that the partial strategy is being implemented successfully. There is however insufficient evidence on key ecosystem indicators to inform on all measures with a high degree of certainty. SG80 is met but not SG100.		
References		(Allain et al., 2011)		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**N/a**

Evaluation Table for 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?	Y	Y	
	Justification	There is ongoing work to collect detailed data on the structure of the Pacific Ocean pelagic ecosystem, e.g. through observer programmes (e.g. bycatch composition and quantities), trophic analyses (e.g. stomach contents, stable isotopes), mid-trophic level sampling (e.g. acoustics and net sampling of micronekton and zooplankton), behavioural analyses (tagging of a range of species), tagging studies (e.g. through the ABNJ Tuna Project). This information is thought to be adequate to broadly understand the key elements of the ecosystem. SG80 is met.		
b	Investigation of UoA impacts			
	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but **have not been investigated** in detail.	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**.
	Met?	Y	Y	Y
	Justification	Trophic structure of pelagic ecosystems in the Pacific, including the WCPO, has been characterised using Ecopath and Ecosim models based on diet data. The dynamic system model SEAPODYM, is a model developed for investigating spatial tuna population dynamics, under the influence of both fishing and environmental effects (Lehodey et al., 2013). The continued development and application of the SEAPODYM model to the work of the WCPFC Scientific Committee, is facilitated through Project 62 which affiliates the independently funded work on SEAPODYM into the SC's work programme (Lehodey et al., 2013). A list of current projects is given in Lehodey et al. (2013). Main interactions between the fishery and the ecosystem have been and are being investigated in detail. SG100 is met.		
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?		Y	N
	Justification	Information on target and non-target species (bycatch and ETP species) is gathered by the SPC through logbook data and its regional observer programme. The available information is managed by the Bycatch mitigation information system (BMIS) which acts as a reference and educational tool that supports the WCPFC's responsibilities with regard to the sustainable management of non-target, or bycatch, species in WCPO fisheries targeting highly migratory species, including tuna and billfish (Fitzsimmons, 2011). Furthermore, the Kobe By-catch Technical Working Group (KBTWG) was established in 2009 with the aim of supporting, streamlining, and seeking to		

		harmonize the by-catch related activities of Ecosystems/By-catch working groups across RFMOs and feeding its findings through to those RFMOs (in this framework, a Joint t-RFMOs FADs Working Group took place in April 2017). Furthermore, the ABNJ Tuna Project aims to achieve responsible, efficient and sustainable tuna production and biodiversity conservation through: (i) supporting the use of sustainable and efficient fishing practices by the stakeholders of the tuna resources; (ii) reducing illegal, unreported and unregulated fishing; and (iii) mitigating adverse impacts of bycatch on biodiversity. The project is partly funded by the Global Environment Facility (GEF) and has a total budget of about US$178 million. In the WCPFC work on this project has focused on *inter alia* collecting integrated bycatch data on sharks from the WCPFC and IATTC regions, carrying out a t-RFMO shark data inventory and data improvement field studies, including tagging; preparing an assessment methods catalogue for sharks for one ocean basin with results made available globally, four additional species assessments (including species risk assessments) and promoting the use of results for priority setting and development of robust pan-Pacific Conservation and Management Measures; and collating and disseminate new information on mitigation of impacts to bycatch species, thereby reducing technical uncertainties across a range of stakeholders allowing t-RFMO discussions to focus on management issues such as cost and feasibility (REF TO ABNJ). The team considered that sufficient information is being gathered to understand the main functions of the ecosystem components. SG80 is therefore met. There remains, however, uncertainty as to the fishery's impacts on those components due to issues with low observer coverage. SG100 is thus 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?		Y	N
	Justification	For the same reasons given is SIc, SG80 is met but not SG100.		
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?		Y	N
	Justification	Logbook and observer data is sufficient to detect any changes which might have ecosystem impacts; e.g. changes in rates of by catch. SG80 is met. Since there is not something that could be formally defined as an ecosystem management strategy (as yet), SG100 is not met.		
References		Lehodey et al., 2013; Fitzsimmons, 2011; for the status of individual stocks see references in 1.1.1, 2.1.1 and 2.3.1.		
OVERALL PERFORMANCE INDICATOR SCORE:				**85**
CONDITION NUMBER (if relevant):				**N/a**

Appendix 1.4 Principle 3 scoring rationales

Evaluation Table for 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); and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**		
Scoring Issue		SG 60	SG 80	SG 100
a	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?	Y	Y	Y
	Justification	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 works under Title 24. Marine Resources of the Code of FSM, - Fisheries Act 2002, which establishes a comprehensive framework for fisheries management. Title 18 of the FSM Code establishes the jurisdiction of NORMA as the territorial sea from 12nm from the island baselines and FSM 200nm EEZ, the outer limit of which is measured from the same baselines. The Marine Resources Department in each state, Chuuk, Pohnpei, Kosrae, and Yap, has jurisdiction over the territorial sea from the high water mark to 12nm. A 24nm zone from the islands and atolls of FSM is recognized as a contiguous zone. NORMA rights and authority regarding fish and fishery resources in Title 24 relevant to the pelagic longline fishery are outlined in Sections 101-124, 201-211, 301-303, 401-407, 501-504, 601-611 and 901-920. The National Fisheries Corporation works with NORMA in promoting the development of pelagic fisheries and related industries. The Board of Directors of NORMA, comprised of five members (one representative from each state appointed by the President and one at-large member appointed by the President of FSM), established under Title 24 is responsible for adopting fisheries regulations, concluding domestic and foreign fishing agreements and issuing domestic, domestic-based and foreign fishing permits. FSM is a Party of the Palau Arrangement for the Management of the Western Pacific Tuna Fishery – Longline Fishery Vessel Day Scheme (VDS). It is also a member of the FFA, PNA, SPC and WCPFC and must therefore adopt WCPFC CMMs. FSM has agreed to abide by a range of international legally binding and non-binding treaties concerning fisheries, which influence the domestic management framework. These include the binding *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)* and the signed but not ratified *FAO Agreement of Port State Measures to Prevent, Deter, and Eliminate Illegal, Unreported and Unregulated Fishing 2009.* Other non-binding treaties include the FAO Code of Conduct for Responsible Fisheries and International Plans of Action to: prevent, deter and eliminate illegal, unreported and unregulated fishing; reduce fishing over capacity; reduce the incidental catch of seabirds, and conserve and manage sharks.		

		Consistent with its obligations under Article 118 of the UNCLOS and Part III of the Fish Stocks Agreement, FSM cooperates in the management of highly migratory species through regional fisheries management organizations (RFMOs) which have allowed the development and implementation of sustainable management arrangements for some species as required under the obligations of UNCLOS Article 63(2), 64, 118, 119 and the Fish Stock Agreement Article 5. On the basis of the above, SG100 is met.		
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 **considered to be 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?	Y	Y	N
	Justification	At the national level, there is a mechanism in place in the FSM Code to resolve disputes concerning infractions and penalties awarded for non-compliance to regulations concerning the tuna fishery. Title 6. Judicial Procedure Chapter 9. Section 902 stipulates that "*any appeal authorized by law may be taken by filing a notice of appeal with the presiding judge of the Supreme Court of FSM from which the appeal is taken, or with the clerk of the court for the District in which the court was held, within 30 days after the imposition of the sentence or entry of the judgment, order, or decree appealed from, or within such longer time as may be prescribed by rules of procedure adopted by the Chief Justice."* Any infractions beyond administrative penalties are the responsibility of the Department of Justice. Most fisheries infractions are settled out of court for efficiency reasons as court cases tend to be lengthy. At the regional level, the WCPFC dispute settlement mechanism is set out under Article 31 of the Convention. Annex II of the Convention establishes the authority to form a panel to review decisions made by the Commission and to settle disputes among members of the Commission. The dispute settlement mechanism outlined in the Convention allows for a transparent process to occur. To date there have not been any sanctions imposed by WCPFC, therefore there has not been a need for a panel to be convened to resolve disputes. While the mechanisms for dispute resolution are transparent and considered to be effective in dealing with most issues at both the national and regional level, they have only been tested and proven to be effective at a national level, so only SG 80 is considered met. SG 100 is not met in full.		
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?	Y	Y	Y
	Justification	At the national level, 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 Code also		

		provides for small-scale fishers and domestic fishers. Title 24 specifically states that the State Government has powers "*to establish and support programmes to promote, support and guide fishing cooperative associations".* To support the livelihoods of local fishers NORMA allocates a portion of the optimum sustainable yield to domestic fishing vessels. Also, the 24nm contiguous zone was implemented to safeguard indigenous livelihoods and subsistence fishers. At the regional level, the WCPFC Convention provides for the recognition of the interests of small-scale and artisanal fishers with the overall framework for sustainability in the WCPFC Convention. For example, under Article 5 the Convention states that "in order to conserve and manage highly migratory fish stocks in the Convention area…. the members of the Commission shall… (h) take into account the interests of artisanal and subsistence fishers". Under Article 10, paragraph 3, the Convention States that "in developing criteria for allocation of the total allowable catch or total allowable effort the Commission shall take into account…. (d) the needs of small island developing States and territories and possessions, in the Convention area whose economies, food supplies and livelihoods are overwhelmingly, dependent on the exploitation of marine living resources and (g) the needs of coastal communities which are dependent on the fishing stock". Furthermore, under Article 30, the Convention specifies that the Commission shall give all recognition to the special requirements of the developing State parties to this Convention, in particular small island developing States, territories and possessions, in particular (b) the need to avoid adverse impacts on and ensure access to fisheries by subsistence, small-scale and artisanal fishers and fish workers as well as indigenous people. On the basis of the above, SG 100 is met
References		Federated States of Micronesia Code Title 18, Title 24 Sections 103-120, 301-306, and 502-510 Federated States of Micronesia Bill of Rights Chapter 1 Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (1995) Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (1993) Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPFC Convention) WCPFC CMM 2015-01 Conservation and Management Measure for big eye, yellowfin and skipjack tuna in the Western and Central Pacific Ocean.
OVERALL PERFORMANCE INDICATOR SCORE:		**95**
CONDITION NUMBER (if relevant):		**N/a**

Evaluation Table for 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?	Y	Y	Y
	Justification	At the national level, the development and management of the marine resources within the FSM falls under the jurisdiction of the National Oceanic Resources Management Authority (NORMA). NORMA works under Title 24. Marine Resources of the Code of FSM, - Fisheries Act 2002, which establishes a comprehensive framework for fisheries management. The functions, roles and responsibilities of NORMA and its staff are well defined under Title 24, Chapter 3 (Management Authority). The National Fisheries Corporation works with NORMA in promoting the development of pelagic fisheries and related industries. NORMA remains representative of the FSM as a whole, with members of each State, appointed by the President of the Federated States of Micronesia, holding a position on the Board of Directors. Duties and functions of NORMA are explicitly described in Chapter 3 of Title 24 and include providing technical assistance in the delimitation of the EEZ and to negotiate domestic-based and foreign fishing agreements. Activities undertaken by NORMA are reported on an annual basis 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 Board of Directors of NORMA is the management system's decision-making body and its 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. At the sub-regional level, the PNA coordinates the implementation of management measures for member countries to ensure the tuna resources are maintained at sustainale levels and to enhance the economic benefits from the tuna fisheries. The FSM tuna longline fishery is managed under the PNA vessel day scheme (VDS) and administered by NORMA in conjuction with the PNA office. The VDS provides FSM with an annual PAE that changes every year. The PAE is subject to future changes as a result of discussions for the selling and determining of the TAE by PNA. The Oceanic Programme (OFP) of SPC provides FSM and other Pcific Island members with scientific information and advice to manage the region's tuna, billfish and other related species. SPC is the scientific service provider for WCPFC and is mainly responsible for the compilation of catch and effort data, statistical analysis, analysis of biological parameters and environmental processes that influence the productivity of tuna and billfish populations, regional stock assessments and bio-economic modelling. The FFA is an advisory body that provides expertise and technical assistance to FSM and Pacific Island members in the development of fisheries management policy and legal frameworks for the sustainable management of tuna resources and supports the monitoring, control and surveillance of fisheries as well as treaty administration, information technology and vessel registration and monitoring. At the regional level, the WCPF Convention in Articles 9-16 and 23-24 provide information on the functions, roles and responsibilities of member states and the committees formed under Commission control (e.g. Scientific Committee and Technical Compliance Committee). The Commission and its associated committees have clear operating procedures and terms of reference and the roles and responsibilities		

		of members and non-members are clearly defined in the Convention, Rules of Procedure and relevant CMMs. The FSM is an active member of the WCPFC and its committees. The level of collaboration and cooperation and the roles and responsibilities of NORMA and WCPFC are well understood. On the basis of the above, SG 100 is met.		
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?	Y	Y	N
	Justification	At the national level, NORMA attends annual regional meetings held by the WCPFC and Scientific Committee and sub-regional meetings held by PNA. Non-Governmental Organisations (NGOs), International-Governmental Organisations (IGOs) and industry are integral to these consultative discussions and provide contracting parties with information on coastal and distant water fishing states as well as scientific information. Both NORMA and the national fisheries section of the Department of External Affairs (DEA) maintain direct contact on technical issues with regional and international bodies relating to fisheries (FAO, 2002). The Board of Directors and NORMA consult with relevant stakeholders such as Congress, Department of Justice, Department of Resources and Development, and State representatives (as required) when adopting regulations for the conservation, management and exploitation of fish in the EEZ and when negotiating foreign and domestic-based fishing agreements (E. Pangelinan, pers. comm. 16th February, 2018). NORMA also consults with the States and NGOs at annual Fisheries Symposium workshops about fisheries management regulations and agreements. The FSM Tuna Management Plan (TMP) developed in early 2011 was followed by stakeholder consultations in Pohnpei in October 2011. The objective of the consultations, following earlier workshops on the EAFM framework, was to update the FSM TMP adopted in 2000 and consider its associated amendments to the Marine Resources Act 2002. Further consultations were held with stakeholders the development of the amended TMP 2015. NORMA established a Fisheries Management and Surveillance Working Group to formulate and implement national fisheries management and surveillance strategies. The working group consists of appropriate representatives from NORMA and the Department of Justice as well as representatives from relevant National and State departments and divisions. The working group meets every quarter to discuss the management of the tuna fishery resources and Monitoring, Control and Surveillance (MCS) issues and provide recommendations to the Boad of Directors for consideration. The Palau Arrangement for the Management of the Western Pacific Tuna Fishery – Longline Vessel Day Scheme requires the Parties (of which FSM is a Party) to consult with distant water fishing nations, fishing parties, fishing organisations, and other relevant organizations at annual meetings. As there is no formal consultation processes in place, SG80 is met but not SG 100 At the regional level, there are extensive formal and informal consultation processes at the WCPFC that regularly seek and accept information from members and cooperating non-members. The Commission is active in assisting and facilitating the regular and timely provision of fisheries data and information for assessment by the Commission secretariat and scientific providers, such as SPC. The Commission actively uses information from the fishery and its member states to inform fisheries management decisions and assist in the the formulation of CMMs. This is demonstrated through reports and outcomes of WCPFC meetings, which detail the decision-making process and are readily accessible online. At a regional level, SG100 is met As only the regional management system includes consultation processes that regularly seek and accept relevant information, including local knowledge and demonstrates consideration of the information and explains how it is used or not used, SG80 is met but not SG100.		

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?		Y	N
	Justification	At the national level, the consultation process provides opportunity for all interested and affected parties to be involved through the Fisheries Management and Surveillance Working Group and in the development of tuna fisheries management plans.(refer to 3.1.2b. The Palau Arrangement for the Management of the Western Pacific Tuna Fishery – Longline Vessel Day Scheme requires the Parties (of which FSM is a Party) to consult with distant water fishing nations, fishing parties, fishing organisations, and other relevant organizations at annual meetings to determine fishing effort controls within the Parties waters and on the high seas. At the regional level, the WCPFC Secretariat facilitates effective engagement by stakeholders. Attendance at Commission and related meetings is comprehensive and logistic and financial support is provided to cooperating non-members to ensure attendance and meaningful involvement and interaction in the cooperative management of fisheries in the Western and Central Pacific Ocean (WCPO). Additional services are provided through the FFA and SPC. NGOs can attend meetings as observers and may make statements which are included in the official record.		
References	Federated States of Micronesia Code Title 24 Chapters 1, 3 and 5 Federated States of Micronesia Tuna Management Plan 2015 Office of the National Public Auditor NORMA report 2012 WCPFC, SC and TCC meeting records WCPFC Rules of Procedure WCPFC website http://www.wcpfc.int			
OVERALL PERFORMANCE INDICATOR SCORE:				**85**
CONDITION NUMBER (if relevant):				**N/a**

Commented [C5]: Peter to expand on why SG100 not met.

Evaluation Table for 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?	Y	Y	P
	Justification	The long-term objectives at the national level, consistent with the MSC fisheries standard, are clearly 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*. NORMA has developed and implemented Tuna Management Plan (TMP) 2015 to meet the key objective outlined in Title 24. The TMP provides a framework under which NORMA manages tuna fishery resources within its EEZ and specifies the integration and implementation of ecosystem approaches into the management system. The ecosystem approach of the TMP is consistent with the MSC Principles and Criteria and application of the precautionary approach. Since the FSM framework requires clear management plans to be developed with explicit objectives constituent with the legislation, SG 100 is met. The WCPFC is responsible for decision-making for key management measures which affect the bigeye and yellowfin stocks, the bycatch species and ecosystem (P2). Long-term objectives are explicit within the WCPFC Convention. For example, Article 2 specifies that the Commission has the objective to "ensure through effective management, the long-term conservation and sustainable use of highly migratory fish stocks in the WCPO in accordance with the 1982 Convention and Agreement [UNCLOS and FSA respectively". Article 5 of the Convention then provides principles and measures for achieving this conservation and management objective. More specifically Article 5(c) requires the Commission to apply the precautionary approach in decision-making 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 the FSA. Article 10 of the Convention is consistent with MSC principles and objectives in specifying long term objectives of "maintaining or restoring populations…above levels at which their reproduction may become seriously threatened". Evidence that these objectives are guiding, or are starting to guide decision-making is provided in various Commission reports and in CMMs. Commission reports also indicate that explicit action is being undertaken through CMMs to support achievement of objectives, however this is yet to result in target reference points being formulated for all managed stocks. While there is a requirement for the WCPFC to apply the precautionary principle during decision-making it has historically struggled to do so for some stocks. Additionally, the guidelines set out in Annex II of the SFA provide additional objectives to guide decision-making that include the use of target reference points to meet the management objectives and the adoption of fisheries management strategies to ensure that target reference points are not exceeded. Evidence that the objectives are guiding decision-making is provided in various reports of the Commission and indicate that explicate action is being undertaken to develop and implement management arrangements that support achievement of the objectives. However, the long term objectives have yet to be explicitly defined. Based on the above, SG 80 is met for both the national and regional systems. SG 100 is met for the FSM system but not the regional (WCPFC) system. Based on partial scoring at the SG 100 level, the overall score is 90.		
References		Federated States of Micronesia Code Title 24 Chapter 1 Federated States of Micronesia Tuna Management Plan 2015 United Nations Convention on the Law of the Sea, 1982		

	Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPFC Convention) Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (1995) Western and Central Pacific Fisheries Commission website
OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**N/a**

Evaluation Table for 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?	Y	Y	P
	Justification	National Principle 1 Objectives: NORMA has adopted a number of short and long-term objectives to improve its abilities to realize the goals of Title 24 and the TMP 2015 through the incorporation of ecosystem science and principles. The TMP 2015 objectives: FSM contribution to: (i) keeping biomass levels above limit reference points throughout range of stocks; (ii) continue to promote sustainable fishing in FSM EEZ; (iii) collect accurate/ timely data from all tuna fisheries in FSM (incl. bycatch); and, (iv) fewer fish species/ stocks are assessed as being subject to overfishing and to avoid extinction for a species (i.e. $B_{CURRENT} < B_{MSY} > B_{EXTINCT}$) are consistent with MSC's Principle 1. Under Title 24 and the TMP 2015 NORMA has taken a series of management actions to conserve pelagic species caught in the Western Pacific region. Evidence of management measures taken to meet these objectives include the purse seine and longline VDS schemes and closure of waters within 24 nm of FSM islands and atolls to commercial fishing by vessels. FSM has also adopted conservation and management measures agreed at the WCPF Commission for yellowfin and bigeye, specifically Conservation and Management Measure for bigeye, yellowfin and skipjack (CMM 2017-01). The Longline Vessel Day Scheme made pursuant to the Palau Arrangement for the Management of the Western Pacific Tuna Fishery's relevant objectives are to promote optimal utilization, conservation and management of tuna resources and maximize economic returns, employment generation and export earnings from sustainable harvesting of tuna resources. These long-term and short term objectives are explicit and are considered to be clearly defined and measurable, and thus meet the requirements of SG 100. Regional Principle 1 Objectives: Regional fishery-specific objectives are set out in the CMMs of WCPFC. For Principle 1. The CMM 2017-01 for bigeye, yellowfin and skipjack has the objective to ensure that the fishing mortality rate is no greater than F_{MSY}. To meet this objective the Commission's members, cooperating non-members and participating territories (CCMs) have agreed to take measures to not increase catches by their longline vessels of yellowfin and bigeye. Long-term objectives are given in the WCPF Convention (Article 2) … *to ensure, through effective management the long-term conservation and sustainable use of highly migratory fish stocks in the WPFO in accordance with UNCLOS and the Fish Stocks Agreement.* These regional level objectives and the requirements of the CMMS are incorporated into the Federated States of Micronesia fishery management system. Based on the above SG100 is met. National Principle 2 Objectives NORMA adopted an ecosystem approach in the development of the Tuna Management Plan 2015. The objectives of the TMP relevant to Principle 2: ecosystem & biodiversity maintenance; waste minimisation; reduction in the quantity of bycatch; collect accurate data from all tuna fisheries in FSM (incl. bycatch, etc.) are consistent with MSC's Principle 2. The measures contained in FSM Code 2002 are		

		consistent with the MSA's National Standards and other applicable laws. Measures that address issues concerning marine species preservation and protection of endangered species are outlined Title 23. Resource Conservation. Chapter 1 Marine-Species Preservation prohibits the use of explosives, poisons, chemicals etc., limitations are outlined on the taking of turtles, limitations are outlined on the taking of marine mammals and penalties are given for persons violating any of the Chapter provisions. Chapter 3. Endangered Species Act prohibits any person to take, engage in commercial activity with, hold, have possession of, or export any threatened or endangered species of plant or animal and penalties are given for persons violating any of the provisions of this Chapter. As the objectives are well defined but not measurable due to a lack of observer data the score of the SG is 80 but not 100. Regional Principle 2 Objectives: The regional long term objectives citied above for Principle 1 also apply for Principle 2 for this fishery. Regional short-term objectives for Principle 2 are set up in the CMMs of WCPFC, the CMM for Mitigating Impacts of Fishing on Seabirds (CMM 2017-06), CMM of Sea Turtles (2008-03), CMM for Sharks (CMM 2014-05), and CMM for Silky Sharks (CMM 2013-10). WCPFC also provides supplementary information on CMMs that include Guidelines for Handling Sea Turtles and Guidelines for the Safe Release of Encircled Animals including whale sharks. In most cases the objectives in these CMMs are not well defined or measurable. Based on the above SG 80 is met but not SG100. On the basis of the above this PI received a partial score of 90.
References		Federated States of Micronesia Code Title 23 and 24 Federated States of Micronesia Tuna Management Plan 2015 Palau Arrangement for the Management of the Western Pacific Tuna Fishery – Longline Vessel Day Scheme WCPFC Convention WCPFC website http://www.wcpfc.int
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		**N/a**

Evaluation Table for 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?	Y	Y	
	Justification	The Board of Directors of NORMA, comprised of five members, established under FSM Code Title 24. Chapter 3, is the national management system's decision-making body and its 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. Under Title 24. Chapter 5 Sub-section 502 the Board of Directors is required to ensure that 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 by the Board of Directors with support from NORMA is made through the gathering of information 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. 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 was 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 and ensure the sustainable harvesting of the tuna resources in these waters. The decision-making processes at the international level are well established and documented. Decision-making at the Commission is by consensus and 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 WCPFC Convention. On the basis of the above SG 80 is met.		
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?	Y	Y	N
	Justification	NORMA and its Board of Directors' primary roles are to prepare, monitor and amend regulations and management plans for the offshore fishery within FSM's EEZ. There is an adaptive management approach, which monitors and addresses changing conditions based on the best available information. This approach is reflected Paragraph 7 of the Fishing Access Agreement for a Domestic Based Foreign Fishing Fleets that provides powers to NORMA in the event it determines, through consultations with competent regional scientific		

		authorities, that if there is a serious threat to a stock, it can take precautionary measures to preserve the stocks by limiting or closing access to the FSM EEZ or portions thereof. In developing management plans, NORMA consults with its stakeholders and provides a public forum for decision-making. The Tuna Management Plan originally developed in 2000 was reviewed by a stakeholder consultation in Pohnpei in October 2011. The objective of the consultation, following earlier workshops on the EAFM framework, was to update the TMP adopted in 2000 and consider its associated amendments to the Marine Resources Act 2002. Further consultations were held with stakeholders in the development of the TMP 2015 which provided guidelines for the management of the tuna resources to ensure sustainability. To enhance the management of tuna resources in the Western Pacific, FSM and the Parties to the Palau Arrangement developed and implemented a Vessel Day Scheme for the longline fisheries in the waters of the Parties in early 2017. Through the Management Scheme, the Parties limit the level of longline fishing effort to the levels of total allowable effort (TAE) agreed by the Parties. The TAE is set using the best scientific, economic, management and other relevant advice and information. The TAE is allocated amongst the Parties as their Party Allowable Effort (PAE) in the manner agreed to by the Parties. Each Party is required to ensure the number of fishing days by longline vessels in its waters does not exceed the Parties' PAE or adjusted PAE in any Management Year. Based on the above, SG 100 is met. Commission decision-making processes are based heavily on Scientific Committee reports on the status of target and non-target species and respond to serious issues, such as overfishing, and suspected overfished. (i.e. bigeye). Based on recent stock status assessments for bigeye and yellowfin (2017), the main target species of the FSM longline fishery, the Scientific Committee (SC) concluded that: the bigeye stock appears to not be experiencing overfishing (77% probability) and it appears the stock is not in an overfished condition (84% probability). It recommended as a precautionary approach the fishing mortality on the bigeye stock should not be increased from the current level to maintain current or increased spawning biomass until the Commission can agree on an appropriate target reference point (TRP) and that future work is required to improve the assessment and reduce uncertainty. For the yellowfin stock the Scientific Committee concluded that it appears to not to be experiencing overfishing (96% probability) and it appears that the stock is not in an overfished condition (92% probability). It recommended that WCPFC could consider measures to reduce fishing mortality from fisheries that take juveniles and measures should be implemented to maintain current spawning biomass levels until the Commission can agree on an appropriate target reference point (TRP). Due to the recommendations of the Scientific Committee and based on the results of the assessments for bigeye, yellowfin and skipjack, CMM 2017-01 was adopted. However, WCPFC, has not responded effectively to all issues, including fishing effort issues concerning other tuna species (i.e. southern albacore) and implemented alternative management measures. Therefore, for the regional level decision-making processes, SG 80 is met, but SG 100 is not met. On the basis of the above SG 80 is met but not SG100.

c	Use of precautionary approach			
	Guide post		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Y	
	Justification	Title 24. Chapter 5 Sub-section 502 stipulates that NORMA is required to apply the precautionary approach in the adoption of management measures that are consistent with and no less stringent than the criteria set forth in the United Nations Agreement or any other relevant agreement or fisheries management agreement to which FSM is a party. This approach is reflected in Paragraph 7 of the Fishing Access Agreement for a Domestic Based Foreign Fishing Fleets that provides powers to NORMA in the event it determines, through consultations with competent regional scientific authorities, that if there is a serious threat to a stock, it can take precautionary measures to preserve the stocks by limiting or closing access to the FSM EEZ or portions thereof. Under Title 24. Chapter 5 Sub-section 502 NORMA is also required to ensure that 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 by the Board of Directors with the support of NORMA is made through the gathering of information 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. On the basis of the above, SG80 is met. WCPFC Convention Article 5(c) requires the Commission to apply the precautionary approach in decision-making and Article 6 requires the application of the precautionary approach and use of a Scientific Committee to ensure that the Commission obtains the best scientific information available for its consideration and decision-making. On the basis of the above, SG 80 is met.		
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?	Y	Y	Y
	Justification	Information concerning FSM fishery licensing, key documents and projects is publically available on the NORMA website: www.norma.fm. New regulations and amendments to regulations are gazetted in local newspapers and public notices. NORMA's Youth Ambassador visits the States regularly to promote fisheries issues and the World Tuna Day and Fisheries Symposium provide information to raise public awareness of the tuna fishery. FSM is required to submit annual reports to WCPFC concerning research, statistics and the status of their fisheries. Information submitted in these reports includes fleet composition, effort, interactions with ETP species and independent data from observer coverage or port sampling programmes. This information is publically available on the WCPFC website. Also, the Office of the National Public Auditor provides information concerning FSM fishery performance on its publically available website: www.fsmopa.fm. WCPFC also maintains a publically accessible website where meeting minutes, reports and scientific reports from the Commission and subsidiary bodies are posted and are freely available for download. The national and regional websites provide a high level of public access and transparency, showing how scientific information is used to inform management actions, which are then monitored for effectiveness and discussed. On the basis of the above, SG 100 is met.		
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?	Y	Y	Y

	Justification	At the national level, there is no evidence available to suggest that NORMA or its Board of Directors are disrespectful to, or defiant of national laws, or legally binding agreements reached at the international level. As outlined in 3.1.1 NORMA and the Department of Justice have well-established mechanisms and frameworks for addressing legal disputes concerning the fishery. NORMA attempts to curtail disputes by consulting with the industry through stakeholder meetings and workshops to raise public awareness and provide input into amendments of management measures and/or policy. These consultative processes enable NORMA to minimize disputes and respond to judicial decisions in a timely fashion. At the regional level, WCPFC decision-making is based on consensus and therefore to a degree is proactive in avoiding legal disputes through this process. The Federated States of Micronesia has acted proactively at the regional level by incorporating WCPFC CMMS into national legislation. On the basis of the above, SG 100 is met.
References		Federated States of Micronesia Code Title 24 Chapter 3 Federated States of Micronesia Tuna Management Plan Fishing Access Agreement for a Domestic Based Fishing Fleet Paragraph 7 Plau Arrangement for the Management of the Western Pacific Tuna Fishery – Longline Vessel Day Scheme NORMA website: www.norma.fm Office of the National Public Auditor website: www.fsmopa.fm CMM 2010-05 WCPF Convention
OVERALL PERFORMANCE INDICATOR SCORE:		**95**
CONDITION NUMBER (if relevant):		**N/a**

Evaluation Table for 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?	Y	Y	Y
	Justification	A monitoring control and surveillance (MCS) mechanism is in place in the FSM. As a Member State of the WCPFC Convention, it is required to comply with regulations set by the WCPFC. The MSC Division of NORMA, comprised of 5 officers, is responsible for the collection and entry of fishing vessel logsheet data as required the FSM Code Title 24 that sets out the conditions and terms of the fishing permits and foreign fishing agreements. The reporting requirements of fishing licenses include daily vessel positions, details on sets and gear specifications, information on species retained and discarded. The MSC Division is also responsible for ensuring that licensed fishing vessels are listed on the WCPFC Record of Fishing Vessels and the FFA Regional Register of Good Standing and that licensed vessels have been fitted with Vessel Monitoring System (VMS) as required by the Commission. A summary of this information is presented to the WCPFC on an annual basis in a two-part report. A Fisheries Management and Surveillance Working Group was established by NORMA to formulate and implement national fisheries management and surveillance strategies. The working group consists of appropriate representatives from NORMA and the Department of Justice as well as representatives from relevant National and State departments and divisions. The working group meets every quarter to discuss the management of the tuna fishery resources and Monitoring, Control and Surveillance (MCS) issues and provide recommendations to the Board of Directors. Enforcement responsibilities sit primarily with the Maritime Police under the Department of Justice and Office of the Attorney General, which are given power to penalise parties in breach of compliance regulations stipulated in Title 24 of the FSM Code. The Maritime Police responsibilities include maritime surveillance of FSM EEZ and enforcement of fisheries and maritime laws. Regular dockside inspections are conducted on commercial fishing vessels entering into ports to determine whether the vessels are compliant with the regulations. Four patrol boats conduct surveillance activities in areas of fishing operations. In 2017 the Maritime Police Enforcement Wing reported that a total of 6 Law Enforcement Patrols (75 days) were conducted in areas of fishing activitiy concentration that resulted in a total of 80 boardings. A total of 15 minor infractions were identified during onboard inspections during fisheries surveiilance operations from 2014-2016. Vessel operators were fined for the infractions and most were settled out of court. Since 2014 the Maritime Police has arrested nine fishing vessels with 135 fishermen for illegal entry and fishing activity in FSM waters. FSM has implemented measures to restrict port entry and access to port services of vessels included in IUU lists and worked with other nations to strengthen enforcement and data programs aimed at curtailing IUU fishing. In December 2017 FSM with other CCMs at the Fourteenth Session of WCPFC adopted the Conservation and Management Measure on Minimum Standards for Port State Measures (CMM 2017-02) to establish processes and procedures for port inspections of fishing vessels suspected of engaging in IUU fishing or fishing related activities in support of IUU fishing. A National Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing was developed with assistance from FFA and approved in 2013. The Plan outlines actions that can be taken to enhance the objective of eradicating IUU fishing through fishing vessel licensing restriction, monitoring, control and surveillance, sanctions, and reporting activates. 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 fleet has become more aware of the rules and regulations through these workshops (J. Helgen per comm. 15 February 2018). At the international level, WCPFC aims to ensure compliance through VMS, IUU vessel listing, port state controls, observers, logbooks and transshipment monitoring. A wide range of CMMs have been agreed and implemented at the national level that include: • Specifications for the Marking and Identification of Fishing Vessels (CMM 2004-03) • Centralized Vessel Monitoring System (Commission VMS) (CMM 2011-02) • Regional Observer Program (ROP) CMM (2007-01) • WCPFC IUU List (CMM 2010-06) • Compliance Monitoring Scheme (CMM 2013-02 • Standards, Specifications and Procedures for the Record of Fishing Vessels (CMM 2013-03) and • CMM for WVPFC implementation of a Unique Vessel Identifier (CMM 2013-04) The combination of monitoring, control and surveillance at WCPFC create a system that has demonstrated to be comprehensive and effective in the WCPO fisheries. Being that the MCS system in place for this fishery has been shown to be effective, SG 100 is met.		
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?	Y	Y	Y
	Justification	A person who is found by the Supreme Court of FSM to have committed an act prohibited in Title 24 Chapter 9 Violations and Penalties for Prohibited Acts 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. Prohibited acts under Chapter 9 of Title 24 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 severity of the penalties has proven to be a sufficient deterrent for vessel operators to comply with the regulations. The majority of infractions committed by tuna longliners are minor. NORMA reported that there has been a decline in non-compliance infractions as the fleet has become more aware of the rules and regulations through these workshops (J. Helgen per comm. 15 February 2018). As FSM is a Party to the Palau Arrangement for the Management of Western Pacific Tuna Fishery – Longline Vessel Day Scheme it is required to ensure that every longline vessel that is licensed to fish in its waters, and every longline vessel that is entitled to fly its flag, comply with the requirements of the Management Scheme and that if a Party exceeds its PAE for a Management Year, the Party's PAE for the following Management Year will be adjusted by deducting: • If the excess is less than 10% of the PAE – the amount of the excess: • If the excess is 10% of the PAE or more – 120% of the access. As the Longline Vessel Day Scheme commenced in January 2018 it is too early to determine whether the above penalties are an effective deterrence. At the regional level, the WCPFC relies largely on the IUU vessel listing process (CMM 2010-06) as an incentive for compliance along with port state controls, observers, logbooks and transshipment monitoring. The current IUU vessel listing highlights the success of this form of sanctioning in deterring non-compliance as only three fishing vessels remain on the 2015 vessel list and none have been added in the last year or more. On the basis of the above, SG 100 is met.		
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?	Y	Y	N
	Justification	At the national level, there is evidence that the FSM pelagic longline fishers comply with the management system. Vessel operators provide information of importance to ensure the effective management of the fishery through vessel operator daily logbooks and catch unloading records. The Marine Police Enforcement Unit patrols indicate that non-compliance of the vessel operators is low, with only minor violations evident for failure to monitor international distress and call frequencies and failure to display permit or permit number in the wheelhouse. Compliance with catch regulations is verified at vessel unloading, where a member of NORMA is always present as a witness. Pohnpei is also the transshipment port for the FSM, and this is only permitted under strict Commission regulations (see CMM 2009-06). However, the low level of observer coverage (2.6% in 2014), which is below the 5% WCPFC regional target, does not provide a **high** degree of certainty of compliance. At the regional level, WCPFC aims to ensure compliance through VMS, IUU vessel listing, port state controls, observers, logbooks and transshipment monitoring. The lack of any significant breaches of regulation provides a reasonable level of confidence that the operators are complying with the management system, SG80 is met.		
d	Systematic non-compliance			
	Guide post		There is no evidence of systematic non-compliance.	

	Met?		Y	
	Justification	Records from the Marine Police patrols indicate that there is a low incidence of minor infractions committed by the tuna longline fleet. Also, the severity of the penalities for vioations listed in Title 24 Chapter 9 is a major deterrent to non-compliance. There is no evidence of systematic non-compliance. SG80 is therefore met.		
References		Federated States of Micronesia Code Title 24 Chapter 5 Palau Arrangement for the Management of the Western Pacific Tuna Fishery – Longline Vessel Day Scheme Specifications for the Marking and Identification of Fishing Vessels (CMM 2004-03) Centralized Vessel Monitoring System (Commission VMS) (CMM 2011-02) Regional Observer Program (ROP) CMM (2007-01) WCPFC IUU List (CMM 2010-06) Compliance Monitoring Scheme (CMM 2013-02) Standards, Specifications and Procedures for the Record of Fishing Vessels (CMM 2013-03) and CMM for WVPFC implementation of a Unique Vessel Identifier (CMM 2013-04)		
OVERALL PERFORMANCE INDICATOR SCORE:				**95**
CONDITION NUMBER (if relevant):				**N/a**

Evaluation Table for 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?	Y	Y	Y
	Justification	At the national level, there are mechanisms in place to evaluate key parts of the management system. The FSM Code Title 24. Marine Resources is the main document for managing fisheries resources. Many of the provisions of Title 24 have been repealed and re enacted since it was published in 1982 and currently there are amendments and inclusions being considered by NORMA to submit to Congress for approval. The National Tuna Management Plan 2015 states that *"the plan will be reviewed at least every two years, if necessary, to factor in priority policy changes on tuna fisheries in consideration of new information and decisions taken by the Board of Directors, including decisions emerging from sub-regional and international agreements where FSM is a signatory."* A review of the original TMP 2000 was conducted in 2011 that identified downfalls in the management system that included the lack of guidelines for NORMA to manage the tuna resources. A revised TMP was published in 2015 that addressed issues raised in the 2011 review. As of 2012, NORMA has been subject to periodic audits by the Office of the National Public Auditor (ONPA, 2012). The audit in 2012 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 (ONPA, 2012). The ONPA conducted an independent audit in 2017 on applying agreed upon procedures of NORMA's Fisheries Access Agreements. The audit covered several matters that include fishing revenue, donate goods and services, sold and non-sold fishing days and traded fishing days of the VDS scheme. At the regional level, there is a regional annual report developed by the WCPFC Secretariat, which details compliance of members with the reporting provisions of the Commission. An internal review is also conducted by the WCPFC through assessing the implementation and performance of the CMMs through reports of member countries to the Commission and stock assessments. This allows Commission meetings to provide an overall review of key processes and outcomes. Stock assessments undertaken by SPC are also subject to peer-review and external review to ensure that the scientific processes remain robust. On the basis of the above, SG 100 is met		
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?	Y	Y	N
	Justification	As of 2012, NORMA has been subject to periodic audits by the Office of the National Public Auditor (ONPA, 2012). Although a governmental body completed the audit, the auditors were external to the fishery specific management system and so the audit acts as an external review of the performance and effectiveness of many aspects of the management system. The audit in 2012 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 (ONPA, 2012). The ONPA recently conducted an independent audit on applying agreed upon procedures of NORMA's Fisheries Access Agreements in 2017. The audit covered several matters that include fishing revenue, donate goods and services, sold and non-sold fishing days and traded fishing days of the VDS scheme. The Pacific Islands Regional Oceanscape Program (PROP) of the World Bank in 2015 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. Currently a review of the FSM fisheries legislation and seafood safety management system is being conducted by the European Union to identify gaps in the sanitary controls for seafood products to be exported to the European Union countries. At the regional level, WCPFC does not have a regular program of external reviews. However, an independent performance review was undertaken in 2011 resulting in the development of a schedule of responses and actions in response to recommendations of the review. Also, an Independent Review of the Commission's Transitional Science Structure and Functions was conducted and there was a recommendation for periodic external reviews of the stock assessments, which has been adopted by WCPFC. As specified in scoring element (a) an annual report is provided to the Commission by the Secretariat on compliance of members with the reporting provisions of the Commission. In 2017, there was an Independent Review of the Compliance Monitoring Scheme which assessed CCM's compliance with their obligations; identified areas that required capacity building and technical assistance; identified aspects of CMMs that need to be amended or refined and responded to non-compliance through remedial options. Also, stock assessments undertaken by SPC are subject to peer-review and occasional external review. As both the national and regional management systems have regular internal reviews but only occasional external reviews, only SG 80 is met.
References		Federated States of Micronesia Title 24 Office of the National Public Auditor NORMA reports 2012 and 2017 Pacific Islands Regional Oceanscape Program (PROP) NORMA review 2015 MSC pre-assessment of the Federated States of Micronesia Yellowfin and Bigeye Longline Fishery 2015 Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPFC Convention).
OVERALL PERFORMANCE INDICATOR SCORE:		**90**
CONDITION NUMBER (if relevant):		**N/a**