Pacific Ocean Tuna Longline (Liancheng) Three-Year Audit Report

Version 1.2, September 2021

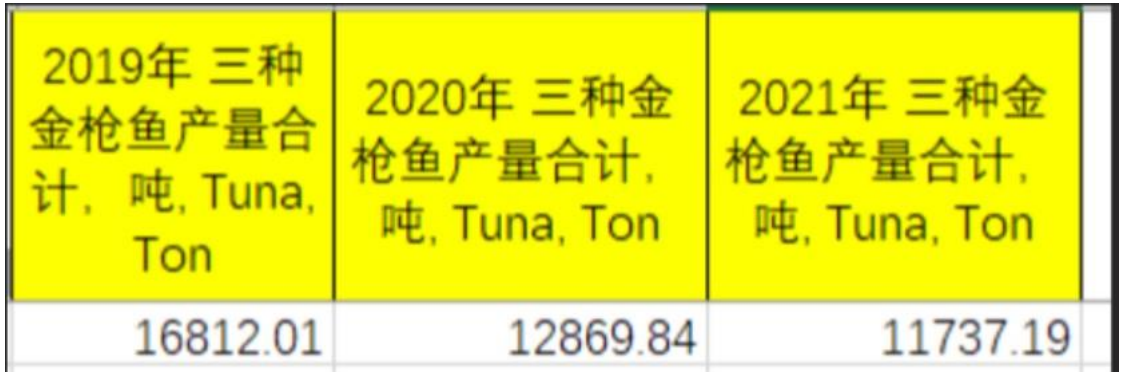
FIP Information

Target species scientific name(s) and common name(s) [state target stock(s), if relevant]	North Pacific albacore (*Thunnus alalunga*) Yellowfin (*Thunnus albacares*) Bigeye (*Thunnus obesus*)
Fishery location	Western and Central Pacific Ocean
Gear type(s)	Pelagic longline
Estimated FIP Landings (weight in tons)	11,737.19 tons (2021)
Vessel type(s) and size(s)	Industrial longliners (crew between 13 and 20 members, vessel size is not indicated in the pre-assessment report (67 GRT to 742 GRT)
Number of vessels	Approximately eighty vessels
Management authority	Western and Central Pacific Fisheries Commission (WCPFC) (tuna stocks)[1] National fishery authorities in China (Chinese Bureau of Fisheries), Taiwan (Taiwan Fisheries Authority) and the Federated States of Micronesia (National Oceanic Resource Management Authority).
Auditor name(s)	Jose Peiro Crespo
Auditor Organization/Affiliation	Naunet Fisheries Consultants
Date of report completion	26/09/2022

[1] The Eastern Pacific stocks of yellowfin and bigeye tuna were also included in the pre-assessment but removed from the FIP during the first-year review review.

FIP Background (Optional)

The fishery targets three species of tuna: North Pacific albacore (*Thunnus alalunga*), yellowfin (*Thunnus albacares*) and bigeye (*Thunnus obesus*). The fishery is currently carried out by 80 longline vessels carrying out between 13 and 20 crew members. The total catch of tuna species in 2021 was 11,737 tons. The number of vessels has remained more or less constant since the FIP started. The total catch has decreased by 30% since 2019, but the reason is unclear.



2019年 三种金枪鱼产量合计，吨, Tuna, Ton	2020年 三种金枪鱼产量合计，吨, Tuna, Ton	2021年 三种金枪鱼产量合计，吨, Tuna, Ton
16812.01	12869.84	11737.19

Stakeholder Consultation & Meetings

Name	Affiliation	Date and Subjects Discussed
Kat Collinson (Key Traceability)	FIP manager	12th July February 2022 Introductory call • Scope of the FIP (are of operation of the fleet, number of vessels, target species, baitfish species, catch volume, etc.) • Main stakeholders involved in the fishery and their roles • Scope of the audit, preparation of the stakeholder meetings, deadlines, etc. • Main issues identified in the Fishery • Other relevant topics.
Francisco Leotte	Thai Union Sustainability manager	
Kat Collinson (Key Traceability)	FIP manager/s	25th August 2022 Stakeholder meeting. A short presentation was prepared by the consultant and some specific issues clarified with the relevant stakeholders (manager, TFA, etc). • Scope of the FIP (are of operation of the fleet, number of vessels, target species, baitfish species, catch volume, etc.) • Status of target stocks
Daniel Yang (Key Traceability)		
Francisco Leotte	Thai Union	

Wenying Wang	Taiwanese Fisheries Agency	• ETP management strategy (observer coverage/Observer and skipper training/ETP species handling) • Work developed with the national management authorities • On-coming WCPFC meetings
Joseph Fu	Taiwanese Fisheries Agency	
No meetings were conducted with other management agencies (Chinese Bureau of Fisheries, NORMA (FSM)).		

Summary of Findings and Recommendations

In regard to Principle 1, none of the species targeted by the fishery (North Pacific albacore (NP ALB), yellowfin tuna (YFT) and bigeye tuna (BET) has a Harvest strategy (HS) or Harvest control rules (HCR) in place yet. A number of engagement activities have been developed by the FIP coordinators (such as sending supporting letters to national authorities and the WCPFC) but progress has been limited[2]. The most recent stock assessments for NP ALB, YFT and BET, conducted in 2020, indicated that the biomass of the three species in 2018 was above the SSB_{MSY} (SSB_{2018} NP ALB = 135%SSB_{MSY}, SSB_{2018} YFT = 2.28 SSB_{MSY} and SSB_{2018} BET =1.67 SSB_{MSY}).

In regard to Principle 2, the most recent data on bycatch provided has been for the period 2016-2019. The main primary species affected by the fishery are the species already covered by Principle 1 plus South Pacific Albacore (SP ALB). All these species are over the MSY. Although during the pre-assessment of the fishery a number of secondary main species were identified in the catch (such as blue and striped marlin, swordfish, short fin mako or blue shark), the FIP coordinators undertook an update assessment of primary/secondary/ETP species with the new data available and no secondary main species were identified. However, information about the bait used in the fishery is scarce (including species used and volumes) which makes difficult to understand the impact of the fishery on them (and depending on the species/volume some of them could be considered main[3]). It is therefore suggested by the auditor to include a new activity/task/sub-task to try to clarify this issue. In regard to ETP species, the fishery interacts with silky sharks, oceanic whitetip sharks, mobulids, sea turtles, seabirds and cetaceans. Although the impact on sharks and sea turtles may be limited, the exact number of individuals caught may be underestimated for shark species and the existence of other impacts (plastics) on sea turtles makes that these two groups score below 80 for 2.3.1 ETP outcome (despite some progress made in recent years with observer and logbook data, 2.3.3. Information on ETP species is still scored below 80 due to the lack of adequate data for some of these species). The fishery occurs in pelagic waters. Therefore, no impact on the habitat/seabed (VMEs, MPAs) is expected. In regard to the impact on the ecosystem, the impacts of tuna fishing on the ecosystem are complex and not fully understood (the removal of these top predators could lead to trophic cascades, negatively impacting the ecosystem) but overall, findings from a range of models indicate that although tuna fishery impacts on top-level predators in the Pacific Ocean were substantial, ecosystem impacts were likely to be minor. A number of activities have been undertaken by the FIP for this principle since it started, such as engaging with the client and managers to improve data collection (promoting the implementation of electronic monitoring, etc.), undertaking the review of P2 scores based on new bycatch data, etc. Overall, three Principle 2 P.I.s (2.2.1, 2.3.1 and 2.3.3) have improved their scores since the beginning of the FIP.

[2] CMM 2014-06 sets out the principles and elements for harvest strategies to be developed and implemented, including requirements for target and limit reference points and decision rules or ("harvest control rules"), with a clear intention that harvest control rules, tested using simulation approaches, will be part of the implemented harvest strategies. The CMM also included a requirement to adopt a workplan with an indicative timeframe no later than 2015 (However, the WCPFC workplan for the implementation of CMM 2014-06 has been systematically revised, with deadlines pushed back (in 2020 and 2021 due to the COVID-19 pandemic) and co-operating and member states seemingly unwilling or unable to apply the timetable as originally agreed).

[3] In the Zhejiang Ocean Family CO., LTD Pacific and Indian Ocean Longline Tuna and Swordfish fishery (a similar longline fisheries operating in the same area) currently being assessed under the MSC standard, some bait species have been considered and assessed as "main".

In regard to Principle 3, if only the management of the target tuna stocks at the regional level (WCPFC) is considered, it seems to be broadly adequate, reaching >80 score for the majority of P.I.s under that Principle (except for P.3.2.2 Decision-making processes and 3.2.3 Compliance and enforcement). However, at the national level, scores differ, the best and worst performances corresponding to the FSM and Chinese management respectively. In the case of China, a similar fishery (the Zhejiang Ocean Family CO., LTD Pacific and Indian Ocean Longline Tuna and Swordfish) is currently being assessed under the MSC standard. The CPRDR assessment report has been reviewed by the auditor and it is considered that the Chinese element is not adequately covered for many of the management P.I. and a precautionary approach has been taken by the auditor during the scoring of this FIP. Some activities have been undertaken by the FIP in regard to Principle 3, including reviews and updates of the Chinese and Taiwanese management systems and resulting MSC scores. It has resulted in three P.I.s (3.1.1 Legal and customary framework, 3.1.3 Long term objectives and 3.2.1Fishery specific objectives) scoring >80 for all the management authorities (all P3 P.I.s were scored as 60-79 during the pre-assessment). In general, engagement of the FIP coordinators with national authorities has been difficult, especially for the Chinese Bureau of Fisheries (the Taiwanese and FMS fishing authorities seem to be more cooperative). It is important to keep in mind that approximately 85% of the vessels included in this FIP are flagged in China and this issue needs to be considered as a serious weakness. It is unclear how engagement can be improved, as it seems the FIP coordinator/responsible have tried to contact the Chinese national authorities several times (through introduction letters, emails, etc) with little success. It is expected that the Chinese authorities will be more cooperative in coming years as more Chinese fisheries are currently interested in entering the MSC program, but it is fundamental to try to find alternative ways to reach them in order to improve P3 scores.

Summary of MSC Performance Indicator Scores

Note: scores for all target species (NP ALB, YFT and BET) and all management regimes (WCPFC, China, Taiwan, FMS) have been provided in the table below. It is considered this information will facilitate to track progress for specific species/countries.

Principle	Component	Performance Indicator		Previous Score 2019	Current Score 2022	Rationale or Key Points
1 (UoA1: NP ALB)	Outcome	1.1.1	Stock status	60-79	>80	The most recent stock assessment for the NP ALB stock was conducted in 2020. The stock status relative to the unexploited state was estimated $SSB_{2015\text{-}17}$ = 50% (95%CI 36%–64%). The default PRI is taken here to be the LRP agreed by WCPFC, i.e. 20%SSB_0. The assessment estimated female spawner biomass (B) is thought to be ~2.3 times the LRP. Projections at constant fishing intensity suggested that there will be a low probability that the SSB will fall below the LRP by 2028. There is an analytical estimate of SSB_{MSY}=14%B_0. It is lower than the WCPFC limit reference point and has not been accepted as the target reference point. To capture uncertainty, the Working Group set out three different model scenarios in the assessment report: the base case, an alternative with an important sensitivity model due to uncertainty in growth parameters and a model representing an update of the 2017 base case model to 2020 data. For the base case SSB_{2018}=115%SSB_{MSY} (95%CI 90%-160%) and for the 2017 update SSB_{2018}=132%SSB_{MSY}. The growth parameters sensitivity model is more pessimistic, with

						SSB_{2018}=82%SSB_{MSY}. However, it can be considered that the stock is fluctuating around MSY. **SG80 is met.**
		1.1.2	Stock rebuilding	NA	NA	NA
	Management	1.2.1	Harvest Strategy	60-79	60-79	The current harvest strategy for North Pacific albacore is set out in WCPFC CMM 2019-03 which states: CCMs should take measures to ensure that fishing effort on NP ALB does not increase above "current levels". In 2017, the WCPFC Northern Committee passed an 'interim harvest strategy' for North Pacific albacore which supplements the above harvest strategy; although it will not come into force unless endorsed by the WCPFC plenary. This puts in place the WCPFC LRP of 20%BF=0. And it indicates that a TRP should be determined as part of an MSE included under the Committee's future work. A decision rule relating to the LRP was also put in place, 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*". The 2020 stock assessment estimates that F is below all (F_{MSY}, $F_{0.1}$, $F_{10\%}$) but one ($F_{50\%}$) the proxy targets evaluated. Fishing intensity is estimated to have fluctuated at a constant level since the 2002-4 reference period. Projections at constant F (consistent with the harvest strategy) suggest a low probability (<1%) that biomass will decline below the 20%BF=0 by 2028 (these projections imply a reduction in catch over this period, because of patterns of recent recruitment). Projections at constant catch suggest >2.5% probability that female SSB will drop below 20%BF=0 LRP by 2022, but this probability decreases, dependent on future recruitment. On this basis, the HS (no increase in fishing effort) can be expected to achieve stock management objectives in the short term. However, in the longer term, the current management measures to implement the HS would not necessarily achieve stock management objectives (maintain biomass above the LRP), since there is currently no means of

						controlling catches directly and no means of enforcing the requirements on fishing effort at regional level. **SG80 is NOT met.**
		1.2.2	Harvest control rules and tools	60-79	60-79	MSC CRv2.0 lays out two conditions for acceptance of HCR being available sufficient to justify scoring at the SG60 level (MSC 2014). First, CR v2.0 SA2.5.2a provides for HCR being recognised as available, "…*if stock biomass has not previously been reduced below BMSY or has been maintained at that level for a recent period of tim*e". The most recent stock assessment for the NP ALB stock was conducted in 2020. For the base case SSB2018=115%SSBMSY (95%CI 90%-160%) and for the 2017 update SSB2018=132%SSBMSY. The growth parameters sensitivity model is more pessimistic, with SSB2018=82%SSBMSY. The stock status relative to the unexploited state was estimated SSB2015-17 = 50% (95%CI 36%–64%), well above the LRP of 20%SBF=0 agreed by WCPFC. The CRv2.0 SA2.5.2a condition is therefore met and HCRs are considered to be 'available'. Second, CR v2.0 SA2.5.3b provides for HCR being recognised as available if, "…*there is an agreement or framework in place that requires the management body to adopt HCRs before the stock declines below BMSY*". CMM 2014-06 sets out the principles and elements for harvest strategies to be developed and implemented, including requirements for target and limit reference points and decision rules or ("harvest control rules"), with a clear intention that harvest control rules, tested using simulation approaches, will be part of the implemented harvest strategies. The CMM also included a requirement to adopt a workplan with an indicative timeframe no later than 2015 (*Note: The WCPFC workplan for the implementation of CMM 2014-06 has been systematically revised, with deadlines pushed back (in 2020 and 2021 due to the COVID-19 pandemic) and co-operating and member states seemingly unwilling or unable to apply the timetable as originally agreed*). The current harvest strategy for North Pacific albacore is set out in WCPFC CMM 2019-03 which states: CCMs should take measures to ensure that fishing effort on NP ALB does not increase above "current levels".

						CMM 2014-06 established a process for the adoption of harvest control rules, however, well-defined harvest control rules are not currently in place. **SG80 is not met.**
		1.2.3	Information and monitoring	>80	>80	The stock assessment uses fishery-specific catch data, size data and various abundance indices; the assessment had a choice of various indices of relative abundance with good contrast. Biological data including tagging, age and growth and sex composition data are also available, although some uncertainties remain, e.g., in relation to growth. Historical data may also be uncertain; the most recent assessment used a relatively short time series from 1994-2018, due to poor data in the earlier part of the time series (Medley et al., 2022). Overall, however, data are comprehensive for the most recent period, and data not used directly in the stock assessment, such as environmental studies, is also available. **SG80 is met.**
		1.2.4	Assessment of stock status	>80	>80	The NP stock was assessed in 2020 using the Stock Synthesis 3 modelling framework. This is a modern well-tested statistical catch-at-age modelling approach that has wide application across a large number of fisheries. 35 fisheries were defined on the basis of gear, location, season, and the unit of catch (numbers or weight). These data have been sufficient to conduct assessments and to evaluate the harvest strategy. Stock structure data are limited, but are consistent with North Pacific Ocean-wide stock. Species biology is incorporated (e.g., size structure, age and growth, estimates of natural mortality) (Medley et al., 2020). Overall, the sock assessment is adequate. **SG80 is met.**
1 (UoA2: YFT)	Outcome	1.1.1	Stock status	>80	>80	The 2020 stock assessment conducted for the stock provided median estimates and associated 10% and 90% percentiles of $SSB_{2015\text{-}2018}$ = $2.43SSB_{MSY}$ (1.77-3.57) and SSB_{2018} = $2.28SSB_{MSY}$ (1.67-3.29). In both cases, it seems that $SSB>SB_{MSY}$ (even if the 10% percentiles are used) Based on this information, and that there is 0% probability that F > FMSY, there is a high degree of certainty that the stock is above MSY. **SG80 is met.**
		1.1.2	Stock rebuilding	>80	NA	NA
	Management	1.2.1	Harvest Strategy	60-79	60-79	There is no formal harvest control rule within WCPFC for YFT. An explicit LRP for the stock has been adopted ($20\%SSB_0$), and a formal target reference point is currently being developed as part of the

						workplan established under CMM 2014-06. In the absence of a formal target reference point, the default target point for the stock is SSB_{MSY}. The current WCPFC harvest strategy is contained in CMM 2020-01 (due to expire on 15 February 2022) which is a continuation of the measures set out in 2018-01 (the objective for YFT set in that CMM was to maintain the spawning depletion ratio (SSB/SSB_0) at or above the average for 2012-2015, and also includes several purse seine FAD and fishing day limits). As noted above, CMM 2014-06 established a workplan to implement the required elements of a harvest strategy in 2015, but this workplan has undergone several modifications since it was first developed, and the YFT HS is scheduled for completion in 2022 and implemented in 2023. **SG80 is NOT met.**
		1.2.2	Harvest control rules and tools	60-79	60-79	MSC Fisheries Standard v2.01 stipulates two conditions for acceptance of HCR being 'available' instead of being in place to justify scoring at the SG60 level. The first is through SA2.5.2a where the guidance indicates that teams shall accept 'available' HCRs in cases where, "*…Stock biomass has not previously been reduced below the MSY level or has been maintained at that level for a recent period of time that is at least longer than 2 generation times of the species and is not predicted to be reduced below BMSY within the next 5 years*" As noted at PI 1.1.1 scoring issue, the 2020 assessment provides probabilistic estimates of parameters of interest and has been extensively explored using a crosswise grid of sensitivity tests (Vincent et al., 2020). The stock assessment estimates recent (2015-2018) spawning biomass of yellowfin tuna at 58% of unfished levels (SBF=0) and 2.43 times SSB_{MSY} and the latest (2018) spawning biomass at 54% of unfished levels ($SSB_{F=0}$) and 2.28 times SSB_{MSY}. The stock is estimated to have never been reduced to SSB_{MSY} and has been above SSB_{MSY} in all years. Potential stock consequences of fishing at 'status quo' conditions (i.e. at recent average fishing levels) were evaluated through stochastic 30-year projections within the uncertainty grid developed for the 2020 assessment. Future recruitment in the projection period was based upon the long-term recruitment patterns (sampled from the period 1962 to 2017). The outputs of the projections (median SB2025/SBF=0, SB2035/SBF=0, SB2048/SBF=0, and Frecent/FMSY, and risk SB2048/SBF=0 < LRP) were calculated across the 72-model grid.

						Projections indicate that median SB2025/SBF=0 = 0.58; median SB2035/SBF=0 = 0.59 and median SB2045/SBF=0 = 0.58. The risk that SB2048/SBF=0 is less than the Limit Reference Point and yellowfin tuna considered to be overfished is unlikely (0%) as is spawning biomass to fall below SBMSY or to be experiencing overfishing (F>FMSY) (Vincent et al., 2020). The second condition is through SA2.5.3b where the guidance indicates that teams shall recognize HCRs as being available if "*an agreement or framework is in place that requires the management body to adopt HCRs before the stock declines below BMSY*". CMM 2014-06 sets out definitions of harvest strategies to be developed and implemented. The definitions include target and limit reference points and decision rules or ("harvest control rules"), with a clear intention that harvest control rules, tested using simulation approaches, will be part of the implemented harvest strategies. The Commission adopted a work plan at its 2015 annual meeting, which has been revised multiple times. While progress on the CMM 2014-06 workplan has been slow the current stock assessment and projections of future stock size indicate that the stock will remain above SSBMSY over the period agreed in the CMM 2014-06 workplan. On this basis requirements outlined in Standard SA2.5.3b are met. Butas well-defined HCR are not in place, **SG80 is not met.**
		1.2.3	Information and monitoring	>80	>80	Detailed data is available since the 1950's, including a comprehensive range of relevant information on catch (fishery removals) and effort data, length/weight frequency data for the stock, tag release-recapture data, stock abundance, and environmental information. Although observer coverage in the longline fishery is low, the information available seems to be adequate and it is used to assess the stock and it is considered sufficient to support the future harvest strategy. **SG80 is met.**
		1.2.4	Assessment of stock status	>80	>80	The most recent full assessment of YFT was carried out in 2020. It is an integrated, model-based assessment that integrates a suite of datasets to model several components, including growth, natural mortality, maturity and fecundity, recruitment, fishery dynamics, and dynamics of tagged fish. The model partitions the population into 9 spatial regions and quarterly age-classes and defines fisheries to consist of relatively homogeneous fishing units with similar operational characteristics.

						Estimates of the 2020 stock assessment were based on a structural uncertainty grid of 72 alternative model formulations and was generally more optimistic than the 2017 assessment (Vincent et al., 2020). **SG80 is met.**
1 (UoA3: BET)	Outcome	1.1.1	Stock status	>80	>80	The 2020 stock assessment conducted for the stock provided median estimates and associated 10% and 90% percentiles of $SSB_{2015-2018}$ = $1.83SSB_{MSY}$ (1.18-2.32) and SSB_{2018} = $1.67SSB_{MSY}$ (1.23-2.15). In both cases, it seems that $SSB>SB_{MSY}$ (even if the 10% percentiles are used). **SG80 is met.**
		1.1.2	Stock rebuilding	NA	NA	NA
	Management	1.2.1	Harvest Strategy	60-79	60-79	The current WCPFC harvest strategy is contained in CMM 2020-01 (due to expire on 15 February 2022) which is a continuation of the measures set out in 2018-01 (the objective for YFT set in that CMM was to maintain the spawning depletion ratio (SSB/SSB_0) at or above the average for 2012-2015, and also includes several purse seine FAD and fishing day limits). As noted above, CMM 2014-06 established a workplan to implement the required elements of a harvest strategy in 2015, but this workplan has undergone several modifications since it was first developed, and it is scheduled for completion in 2022 and implemented in 2023. Additional bigeye tuna measures specific to longline fisheries are in place including: • Restrictions on the levels of bigeye caught by the main CCMs fishing for bigeye (China, Indonesia, Japan, Korea, Taiwan and the USA). The CMM requires. • The Commission to regularly review bigeye catches, including monthly reporting of the amount of bigeye catch by CCM flagged vessels to the Commission Secretariat by the end of the following month. • The Secretariat to notify CCMs when 90% of the catch limit for a CCM is exceeded. • CCMs that caught less than 2000t in 2004 shall ensure that its bigeye catch does not exceed 2000t annually. • Commission to agree on hard limits for bigeye and a framework to allocate those limits amongst all Members and Participating Territories by 2020.

						However, there is no formal harvest control rule within WCPFC for BET. **SG80 is NOT met.**
		1.2.2	Harvest control rules and tools	60-79	60-79	As indicated previously, MSC Fisheries Standard v2.01 stipulates two conditions for acceptance of HCR being 'available' instead of being in place to justify scoring at the SG60 level. The 2020 assessment for the stock provides probabilistic estimates of parameters of interest and has been extensively explored using a crosswise grid of sensitivity tests (Ducharme-Barth et al., 2020). The stock assessment estimates recent (2015-2018) spawning biomass of bigeye tuna at 41% of unfished levels (SBF=0) and 1.83 times SBMSY and the latest (2018) spawning biomass at 38% of unfished levels (SBF=0) and 1.67 times SBMSY. Potential stock consequences of fishing at 'status quo' conditions (i.e. at recent average fishing levels) were evaluated through stochastic 30-year projections within the uncertainty grid developed for the 2020 assessment. Future recruitment in the projection period was based upon the long-term recruitment patterns (sampled from the period 1962 to 2017) and short-term recruitment patterns (sampled from the period 2008 to 2017). The outputs of the projections (median SB2025/SBF=0, SB2035/SBF=0, SB2048/SBF=0, and Frecent/FMSY, and risk SB2048/SBF=0 < LRP) were calculated across the 24-model grid. Under the short-term recruitment scenario, projections indicate that median SB2025/SBF=0 = 0.47; median SB2035/SBF=0 = 0.49 and median SB2048/SBF=0 = 0.49. The risk that SB2048/SBF=0 is less than the Limit Reference Point and bigeye tuna considered to be overfished is unlikely (0%) as is spawning biomass to fall below SBMSY or to be experiencing overfishing (F>FMSY) (Ducharme-Barth et al., 2020). Under the long-term recruitment scenario, projections indicate that median SB2025/SBF=0 = 0.42; median SB2035/SBF=0 = 0.44 and median SB2048/SBF=0 = 0.45. The risk that SB2048/SBF=0 is less than the Limit Reference Point and bigeye tuna considered to be overfished is 5%. Spawning biomass has been estimated to be above the MSY level with a high probability (Ducharme-Barth et al., 2020). As for the YFT stock, CMM 2014-06 sets out definitions of harvest strategies to be developed and implemented. The definitions include target and limit reference points and decision rules or ("harvest control

						rules"), with a clear intention that harvest control rules, tested using simulation approaches, will be part of the implemented harvest strategies. Therefore, the two requirements are met. However, as not well-established HCR are in place. **SG80 is not met.**
		1.2.3	Information and monitoring	>80	>80	Detailed data is available since the 1950's, including a comprehensive range of relevant information on catch (fishery removals) and effort data, length/weight frequency data for the stock, tag release-recapture data, stock abundance, and environmental information. Although observer coverage in the longline fishery is low, the information available seems to be adequate and it is used to assess the stock and it is considered sufficient to support the future harvest strategy. **SG80 is met.**
		1.2.4	Assessment of stock status	>80	>80	The most recent assessment for the stock (Ducharme-Barth et al., 2020) was conducted using an integrated assessment model Multifan-CL (MFCL) that is able to combine a range of datasets and to model several components, including biological parameters (growth, natural mortality, maturity, fecundity, and recruitment), fishery dynamics, and tagging data. The model partitions the population into 9 spatial regions and 40 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. The WCPO BET 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. While work has been done to evaluate the usefulness of a combined management approach, separate assessments in the WCPO and the EPO was considered appropriate for now (Ducharme-Barth et al. 2020). **SG80 is met.**
2 (all the UoAs)	Primary species	2.1.1	Outcome	>80	>80	Observer data for the period 2016-2019 was analysed by Key Traceability in 2022 (Collinson 2022). Main primary species identified in the catch were NP and SP albacore, WCPO BET and WCPO YFT. The only species not covered in P1 was SB albacore (all the other species covered under target species are fluctuating around the MSY level). The 2021 assessment provides a median estimate of SBMSY of 18%B0 and there is no estimate of PRI. While the WCPFC and IATTC adopted a limit reference point (LRP) for albacore tuna at 20%SBF=0, GSA2.2.3.1 states that "*in the case where BMSY is analytically*

						determined to be lower than 40%B0 and there is no analytical determination of PRI, the default PRI should be 20%B0 unless BMSY < 27%B0, in which case the default PRI should be 75%BMSY". Recalling the 2021 stock assessment provides a median estimate of SBMSY of 16%SBF=0 and noting that the default PRI value equals 75%BMSY, PRI is estimated as 12%SBF=0 (0.75(16%B0). Results from the 2021 assessment indicate that SB2016-2019 is 52%SBF=0 (80% CI: 41%-57%) and SB2019 is 40%SBF=0 (80% CI: 27%-45%) are both well above the default PRI value and the adopted LRP (20%SBF=0). In fact, none of the 72 models exceeded the LRP of 20%SBF=0. The 2021 South Pacific-wide assessment also indicated that median SB2016-2019 is 3.22%SBMSY (80% CI: 2.24% - 5.18%) and SB2019 is 2.33%SBMSY (80% CI: 1.69% - 3.92%). Therefore, all the main primary species are highly likely to be above the PRI and fluctuating around the MSY level. **SG80 is met**.
		2.1.2	Management strategy	>80	>80	Conservation and Management Measure for bigeye, yellowfin and skipjack tuna in the Western and Central Pacific Ocean are included in CMM 2021-01. They include interim objectives for the species, FAD management measures, effort control for purse seines, and specific measures for bigeye tuna in longline fisheries. CMM 2015-02 also set measure sfor SP ALB. **SG80 is met.**
		2.1.3	Information	>80	>80	At the time of the pre-assessment, the catch data used to identify the P2 main and minor secondary species was obtained from all regional PLL fisheries and therefore did not likely provide as robust a characterization of the catch composition of the longline fisheries targeting albacore tuna. However, observer data for all flags was collected by the fishery and supplied to the FIP coordinators in March 2022. The data covers fishing activities in both the EEZs of FSM and RMI and also the WCPO high seas. Given the scale of the data (2016-2019) and its geographical coverage, it was considered representative of the fishery's operations. **SG80 is met.**
	Secondary species	2.2.1	Outcome	<60	>80	During the pre-assessment of the fishery several main secondary species were identified in the catch, including blue and striped marlin, swordfish, short fin mako and blue shark and the fishery scored as <60 for some of those elements (striped marlin). However, observer data for the period 2016-2019 was analyzed by KT in January 2022 (Collison 2022), indicating that no main secondary

						species are identified in the catch of the fishery and the score given was 80 by default. In that last report, bait species used in the fishery were not considered. Information is scarce but Pacific Saury (*Cololabis saira*), Indian oil sardine (*Sardinella longiceps*) and Pacific chub mackerel (*Scomber japonicus*) have been suggested as bait species used in the fishery. Management measures seem to be in place for Pacific saury, Indian oil sardine and Pacific chub mackerel but no formal reference points have not been set. Therefore, they are considered secondary and they could be considered as main if the volume used in the fishery is >5% of the total but information about this particular is not available. The most recent estimates found (see Anhalzer et al., 2022 for chub mackerel, Prathibha Rohit et al., 2018 for Indian oil sardine, and Kulik et al., 2017 for Pacific saury) for these species indicate that they are likely to be within biologically based limits and given the relatively low volume of those species used by the fishery, it is concluded that even if there is a risk that those species are experiencing overfishing in some areas, the UoA does not hinder recovery and rebuilding. Therefore, **w**ith precaution, it is considered that the main secondary species are highly likely to be above biologically based limits. **SG80 is met.**
		2.2.2	Management strategy	60-79	60-79	No main species were identified in the catch in the most recent review of the bycatch in the fishery (Collison 2022). Although the bait species identified seem to be managed and within biologically limits, with no more specific information (about species and volumes used[4] and from which fisheries those species are purchased) a precautionary score is given for management strategy. **SG80 is not met.**
		2.2.3	Information	60-79	60-79	At the time of the pre-assessment, the catch data used to identify the P2 main and minor secondary species was obtained from all regional PLL fisheries and therefore did not likely provide as robust a characterization of the catch composition of the longline fisheries targeting albacore tuna. However, observer data for all flags was collected by the fishery and supplied to the FIP coordinators in March 2022. The data covers fishing activities in both the EEZs of FSM and RMI and also the WCPO high seas. Given the scale of the data (2016-2019) and its geographical coverage, it was considered representative of

[4] In the Zhejiang Ocean Family CO., LTD Pacific and Indian Ocean Longline Tuna and Swordfish currently being assessed under the MSC standard, the bait species indicated differ from the ones use in this fishery, which seems to be interesting.

						the fishery's operations. Information on bait species used in the fishery does not seem to be adequate. **SG80 is not met.**
	ETP species	2.3.1	Outcome	<60	>80	ETP species identified from the observer reports are as follows (Collinson 2022): • Sharks (silky and oceanic whitetip). • Mobulid rays (manta and mobula, spinetail). • Turtles (green, hawksbill, loggerhead, olive ridley). • Although seabirds and cetaceans are not identified in the observer reports collected, they appear as bycaught in other assessments in the area. The status of the affected species is summarized below (Collinson 2022): *Silky shark:* The most recent stock assessment (WCPFC, 2018) estimates the most recent (2016) catches in the WCPO to be 725,400 sharks and 570,000 in the longline fishery. The 2018 model for the WCPO-only stock estimated that current biomass is likely to be above MSY P(SB2016 > SBMSY) = 72 %) but that overfishing is occurring (F/FMSY = 1.6). The most recent silky shark catch estimate (Clarke et al. 2018) is just over 700,000 sharks but it is considered it is an underestimation of the real catch. 389 silky sharks were reported by the fishery, 61% of them were released alive. Therefore, although SG60 is met, as the observer data is yet to be scaled up to represent 100%, SG80 is not met. *Oceanic whitetip shark*: The most recent stock assessment (Tremblay-Boyer et al., 2019) assesses the stock as overfished and predicts population extinction in the long-term under current rates of fishing mortality. The stock is estimated to be overfished and undergoing overfishing (where SB2013-2015/SBMSY = 0.1 and F2013-2015/FMSY = 4.24. 386 individuals were reported in the observer reports, 85% of them released alive. As in the previous species, as the observer data is yet to be scaled up to represent 100%, SG80 is not met. *Mobulids*: Interactions with mobulid rays occur in this fishery. Peatman et al., 2019 indicate that 10 – 35% of manta rays are released alive/healthy or injured. Only 20 individuals were recorded by the fishery across all four years of reports. SG80 is met. *Turtles*: Incidental catch of marine turtles in longline fisheries is one of the most serious threats to marine turtle populations (Gilman and

						Huang, 2017) and six out of the seven marine sea turtle species are threatened with extinction. 33 individuals were recorded across the data period, of which 24 were olive ridley turtles. All were discarded by the fishery, (three green and 15 olive ridley dead), so the majority were released alive. Turtle populations in some areas are small and localised and even minimal mortalities can have an impact either directly or indirectly (Gascoigne et al., 2015). Additionally, plastic disposal and waste management issues are increasing problems in fisheries. Clukey et al., 2017 noted 100% olive ridley, 90% green and 80% of loggerhead turtles captured as bycatch in longline operations in the Pacific had ingested plastic, which may have resulted from fisheries. Although the known direct effects of the UoAs 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 some species can be caught in the fishery, interactions with the most endangered species (albatrosses and large petrels) which are main at-risk species susceptible to capture in pelagic longline fisheries do not seem to be a problem as those species are distributed outside of the area of operation of the fishery (Collinson 2022). SG80 is met. *Cetaceans*: Gilman et al. (2006a) found only one interaction with a toothed whale in the Palau longline fishery. On this basis, it is considered that interactions of the fishery with cetaceans may be low. SG80 is met. **SG80 is not met for sharks and turtles.**
		2.3.2	Management strategy	60-79	60-79	CMM 2019-04 is in place for shark species in WCPO waters. It requires the prohibition of retaining the shark or its products on-board. Numbers must be recorded by the fishery itself and if accidentally captured, best efforts made for their safe release. There are therefore measures in place to ensure the UoAs do not hinder the recovery of the stock. CMM 2019-05 is also in place (active since January 2021). It requires fishing vessels to release mobulids alive and unharmed as soon as practicable. It further prohibits the retention, transshipment, or landing of mobulids either wholly or in part. CMM 2018-04 deals with the conservation of sea turtles, requiring commission members, cooperating non-members and participating territories (CCMs) to implement, as appropriate the FAO Guidelines to

						Reduce Sea Turtle Mortality in Fishing Operations and ensure the safe handling of all captured sea turtles, in order to improve their survival. The WCPFC has also recognised the need to implement measures to reduce levels of seabird bycatch in its fisheries and Resolution CMM 2018-03 (superseding CMM 2017-06) mandates that all pelagic longline vessels fishing in the Convention Area adopt mitigation measures in areas overlapping with seabirds, depending on the area being fished. For cetaceans, CMM 2011-03 addresses the impact of purse seine fishing activity on cetaceans. Bycatch provisions are also included in other CMMs. For example, CMM 2012-01 requires to the members the use of non-entangling FADs from 1st January 2024 to reduce the risk of entanglement of sharks, sea turtles or any other species, as from 1st January 2024. However, the impact of the fishery on sharks and turtles is considered moderate and therefore the management measures implemented for these two groups are not considered fully effective. **SG80 is not met.**
		2.3.3	Information	<60	60-79	At the time of the pre-assessment, the catch data used to identify the P2 main and minor secondary species was obtained from all regional PLL fisheries and therefore did not likely provide as robust a characterization of the catch composition of the longline fisheries targeting albacore tuna. However, observer data for all flags was collected by the fishery and supplied to the FIP coordinators in March 2022. The data covers fishing activities in both the EEZs of FSM and RMI and also the WCPO high seas. Given the scale of the data (2016-2019) and its geographical coverage, it was considered representative of the fishery's operations. However, some species such as seabirds and cetaceans, appear as bycaught in other assessments in the area nut where not identified in the observer reports collected by the client. Furthermore, the FIP is in process of implementing Electronic Monitoring across all vessels in the fishery, which would be needed to confirm the magnitude of UoA and associated enhancement related impacts, mortalities and injuries and the consequences for the status of ETP species. **SG80 is not met.**
	Habitats	2.4.1	Outcome	>80	>80	The fishery uses pelagic longline fishing gear. The line is suspended in the water column by floats at the surface. Therefore, habitat interactions

						are not likely. This P.I. was score as >80 at the time of the pre-assessment. **SG80 is met.**
		2.4.2	Management strategy	>80	>80	This gear has no physical impact with the seabed, so no management strategy is necessary, and a default **SG 80 score** was given at the time of the pre-assessment.
		2.4.3	Information	>80	>80	Fishing takes place in the epipelagic habitat. The distribution of the pelagic habitat is known over the spatial range within which the fishery operates from widely available sea charts and bathymetric maps of the Western Pacific Ocean. Derelict longlines could potentially impact some seabed features (such as coral reefs) and the information about this impact is scarce. However, in line with other similar fisheries in the area (Anhalzer et al., 2022), **SG80 is met.**
	Ecosystem	2.5.1	Outcome	>80	>80	The impacts of tuna fishing on the ecosystem are complex and not fully understood. Tuna are high trophic level predators so there is some concern their removal could lead to trophic cascades, negatively impacting the ecosystem. There has been a range of models of the structure and functioning of the pelagic ecosystems developed that support the main tuna fisheries and their responses to fishing and climate change (e.g. Allain et al. 2007, Allain et al. 2015, Kitchell et al. 1999, Lehodey et al. 2013, Leroy et al. 2013, Sibert et al. 2006, ee references in Anhalzer et al., 2022). Overall, findings indicated that tuna fishery impacts on top-level predators in the Pacific Ocean were substantial but that ecosystem impacts were likely to be minor. **SG80 is met.**
		2.5.2	Management strategy	>80	>80	At the regional level, the 1995 FAO Code of Conduct for Responsible Fisheries is used as the framework for an "Ecosystem Approach to Fisheries Management". The WCPFC's application of the FAO code extends to the highly migratory fish species including tuna through Conservation and Management Measures such as CMM 2014-01 on the management of bigeye, yellowfin and skipjack, as well as to the management of non-target species, in particular through Resolution 2005-03 on Non-Target Fish Species and CMMs to improve the protection of sharks. Although not specifically designed to manage impacts on the ecosystem, the range of measures in place is considered to represent a partial strategy that works to achieve the intended outcome. **SG80 is met.**

		2.5.3	Information	>80	>80	Several organizations are collecting data regarding the structure of the Pacific Ocean pelagic ecosystem. This occurs through observer programmes (e.g. bycatch composition and quantities), trophic analyses (e.g. stomach contents, stable isotopes), and mid-trophic level sampling (e.g. acoustics and net sampling of microplankton and zooplankton) Therefore, it is considered that information is adequate to broadly understand the ecosystem elements, **meeting SG 80.**
3	Governance and Policy	3.1.1	Legal and customary framework	60-79[5]	WCPFC >80 All countries >80	Fishing for tuna and tuna like species in the area of the assessment, both on the high seas and in zones of national jurisdiction, is governed by the Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPF Convention). The Commission was established under the Convention and is tasked to co-ordinate scientific research and make recommendations designed to maintain populations of tuna and tuna like species sharing the same ecosystem at levels which will prevent recruitment failure and permit maximum sustainable yield. The WCPF Convention draws on key provisions of the UN Fish Stocks Agreement; also reflecting regional political, socio-economic, geographical and environmental characteristics of the WCPO area. All WCPFC Members are legally bound to implement all their obligations under the Convention in domestic law. The Bureau of Fisheries and Fisheries Management, under Ministry of Agriculture P. R. China, is the highest level of fisheries administration in China. The Bureau is designated to set up strategies and policies for fisheries development, implement laws and enforcements, build up regulations and agreements and enhance fisheries management. China's principal fisheries legislation is the Fisheries Law of the People's Republic of China (China Fisheries Law) 2000. This provides a range of general provisions including covering all fishing activity including fishing on the high seas and in other State's EEZs and provides guidance on domestic jurisdictional arrangements. The law vests all key functions relating to controlling fishing operations on the high seas and other EEZs and contains specific enforcement and prosecution provisions. The law is supplemented by several other regulations and policies that deal with management and compliance of China's DWFN vessels.

[5] The scores given in this column refer to the scores given during the pre-assessment (all management authorities included)

						China has also recently introduced a national DWFV performance evaluation framework that includes performance indicators and objectives relating to organised and effective cooperation with other parties, including RFMO members and internally, to promote DWF fisheries sustainability objectives. In Taiwan, there is an effective national legal system, with an organised cooperation with other parties. The management of Taiwanese fishing vessels operated in Taiwan's EEZ and on the high seas is governed by the Taiwan Fisheries Agency under Council of Agriculture Executive Yuan. Two main Acts are applied to manage fishing vessels, namely the Fisheries Act (Laws and Regulations Database of The Republic of China and Taiwan, 2018) and the Distant Water Fisheries Act (Laws and Regulations Database of the Republic of China and Taiwan, 2016). In 2015, IUU fishing was recognised as a major issue in Taiwanese fisheries, and it was granted a "Yellow Card" by the EU. In response, the Taiwanese fishing authority created The Act for Distant Water Fisheries, which regulates the high seas fisheries in Taiwan to "*ensure the conservation of marine fisheries resources, strengthen distant water fisheries management, curb illegal, unregulated and unreported (IUU) fishing, and improve traceability of catches and fisheries products*". The European Commission lifted the yellow card in June 2019, acknowledging the progress made by the country. The National Oceanic Resource Management Authority (NORMA) is the main governmental body managing fisheries in the Federated States of Micronesia (FSM). The Management Plan on Tuna Fisheries 2015 is the FSM's high-level fisheries policy. It regulates fishing activities in FSM'S EEZ and FSM-flagged vessels fishing in high seas. In the Plan, it is stated that the FSM will comply both with the WCPFC regulations and the international law. Therefore, it is considered that there is an effective regional and national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2. Mechanisms for the resolutions of legal disputes and to observer legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood are also in place in all the countries, **and SG80 is met.**

		3.1.2	Consultation, roles and responsibilities	60-79	WCPFC >80 China 60-79 Other countries >80	The WCPFC is itself an organization set up to define roles and responsibilities for its parties and co-operating non- parties. Functions, roles and responsibilities are explicitly defined at the international level. The Parties may vary in their ability to perform their role, but the roles and responsibilities are nevertheless explicitly defined at least at the national level for key areas, which include providing catch and monitoring data to the Secretariat, taking part in various meetings sharing information and making decisions, meeting the requirements for conservation and other recommendations for WCPFC and applying appropriate levels of control and surveillance. WCPFC also co-operates with all relevant organizations in the region. In China, the Bureau of Fisheries and Fisheries Management, has a clearly defined roles and responsibilities, with procedures that align with the WCPFC. China have established arrangements that involve industry associations and individual stakeholders. These are built into government processes, but it is unclear if all areas of responsibility and interaction are explicitly defined and well understood. China has developed consultation arrangements prior to WCPFC meetings that provide opportunity for interested and affected parties to be consulted. These provide for discussion and input from stakeholders via the China Overseas Fisheries Association (COFA). However, there is not clear how particular stakeholders are contacted or why by the competent authority, or for what matters or how often (regularity), nor are generalised minutes or transparent records of consulted participants available. In Taiwan, the fisheries management systems and policies operate under collaboration from stakeholders, external organisations, and governing bodies. Roles and responsibilities for the flag state fall under these main entities. There are several significant organisations responsible for the Taiwanese fisheries management and developments including: • Taiwan Tuna Association (TTA) which aims to promote public business related to members, develop and coordinate international tuna fisheries and conduct market research on technological improvements for distant water tuna fleets. • Fisheries agency, Council of Agriculture (FA-COA), which is the major representative to Taiwan’s fisheries management,

						responsible for planning and implementing fishery policies and outreach. The FA-COA works on a number of conservation management policies across coastal fisheries, distant water fisheries and aquaculture. Within this organisation, the FA-COA also partners with a number of different universities in Taiwan that conduct fisheries research. • The Coastguard Administration, which is charged with maintaining law and order and protecting the resources of the territorial waters of Taiwan, among other tasks. • The Overseas Fishery Development Council (OFDC), which is a local foundation assisting the government and fishing industry in their aim of fisheries cooperation and reducing the detention of fishing vessels by foreign authorities. As indicated previously, the development and management of the marine resources within the FSM falls under the jurisdiction of the National Oceanic Resources Management Authority, which works under Title 24 of the Fisheries Act 2002. The functions, roles and responsibilities of the management authority, which include providing technical assistance in the delimitation of the EEZ, adopt regulations for the conservation, management and exploitation of fish in the EEZ, negotiate domestic-based and foreign fishing agreements (among others), are well defined in the Act. Activities undertaken by NORMA are reported on an annual basis to the authorities. The National Fisheries Corporation works with NORMA in promoting the development of pelagic fisheries and related industries. 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. Based on the information provided, **this P.I. does not reach SG80 for China.**
		3.1.3	Long term objectives	>80	WCPFC >80	The long-term objectives that guide decision-making consistent with MSC fisheries standards and the precautionary approach are those established by the WCPFC. The WCPF Convention provides clear long-term objectives that guide decision-making. The Convention

					All national authorities >80	requires that Commission be more cautious when information is uncertain, unreliable or inadequate and does not use the absence of adequate scientific information as a reason for postponing or failing to take conservation and management measures (Medley and Powers 2015). This approach is explicit within applicable WCPFC CMMs. Although China has ratified UNCLOS but not yet ratified the UNFSA, as a WCPFC Member, they are legally bound to implement obligations under the Convention. For Taiwan, the Distant Water Fisheries Act (2016) explicitly states that the FA-COA will develop and work towards national plans with the precautionary approach for the following actions: • Conservation, management, utilisation, and maintenance of maximum sustainable yield (MSY) of marine fisheries resources. • Measures in response to the change of marine fisheries resources and marine ecosystem. • Goals for sustainable operation, development strategies and implementing steps for distant water fisheries; among others (for more information please see KT 2022). In the FSM, the long-term objectives are clearly specified in Title 24 of the Fisheries Act. 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 developed and implemented Tuna Management Plan (TMP) in 2015 to meet that objective. 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. This **P.I. meets SG80 for all the management authorities.**
	Fishery specific management system	3.2.1	Fishery specific objectives	60-79	WCPFC >80 All national authorities >80	This PI seeks information about specific management objectives designed to achieve outcomes expressed in MSC's Principles 1 and 2; and whether these objectives are implicit, explicit and/or well defined and measurable. At the international level, there are a large number of WCPFC CMMs that relate directly to P1 and P2 outcomes, developed with the support of both the SC and TCC, and aiming to deliver specific conservation and/or management outcomes. For example, CMM 2018-

						01 (the Conservation and Management Measure for Bigeye, Yellowfin and Skipjack Tuna in the Western and Central Pacific Ocean), recently revised, includes explicit and measurable operational objectives for all three key tuna species. It provides the operational fishing reference points guiding management of bigeye, yellowfin, and skipjack tuna in the WCPO and includes a number of explicit objectives: "*Measures shall ensure, at a minimum, that stocks are maintained at levels capable of producing maximum sustainable yield, pending agreement on target reference points as part of the harvest strategy approach, as qualified by relevant environmental and economic factors including the special requirements of developing States in the Convention Area as expressed by Article 5 of the Convention*". WCPFC members are required to complete detailed performance reporting of progress against many of these fishery specific WCPFC CMMs and their related objectives, as part of their obligations through Part 2 Annual Country Reporting. The outcomes of this reporting are also used to inform WCPFC assessments of compliance in relation to agreed Conservation and Management Measures. In the case of China, information is scarce. The several assessments consulted seem to indicate that short and long-term objectives are in place in the fishery, although no more information is given about this particular. As a member of the WCPFC the country is required to complete detailed performance reporting of progress against many of these fishery specific WCPFC CMMs and their related objectives. In Taiwan, article 5 of the Distant Water Fisheries Act requires that the Taiwanese Fisheries Act develop arrangements which have regard to the precautionary principle, ecosystem-based approach and the use of the best available scientific advice, all of which are consistent with outcomes expressed by MSC Principles 1 and 2. The Taiwan Fisheries Act (1929, amended in 2018) has a chapter dedicated to the conservation and management policies in place for the flagged fisheries (chapter 5). Within this chapter, regulations on fish catch, sale, fishing gears, fishing areas, habitat disruption, and pollution are explicitly mentioned and disputes following these policies will be mediated by an appointed judicial body. Conservation zones monitored and managed by appointed judicial bodies are also mentioned here as

						well as the prohibition of destructive fishing methods, including toxins, explosives, and/or electricity. In the FSM, NORMA has adopted several short and long-term objectives to improve its abilities to reach the objectives included in the Fisheries Act and the Tuna Management Plan 2015. 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. The **PI meets SG80.**
		3.2.2	Decision making processes	60-79	WCPFC >80 China 60-79 Other national authorities >80	At the WCPFC level, there are established responsive and largely transparent decision-making processes in the Convention, and these are operationalized in the processes of the Scientific Committee and Technical Compliance Committee as well as the commission. Those decision-making processes result in comprehensive set of CMMs and strategies to achieve the specific objectives in the fisheries. Decisions are made by consensus and if necessary, by voting (75% majority) and such decisions are binding on members. Decision-making processes use the precautionary approach and are based on best available information. In China, although the consulted references differ in this particular, how decision-making processes are unclear. China's 2019 regulatory Order of The State Council of the People's Republic of China No. 713 on Interim Regulations on Major Administrative Decision-Making Procedures requires that "*In making major administrative decisions, the principle of democratic decision-making shall be followed, opinions of all parties shall be fully heard and the general public shall be guaranteed to participate in decision-making through various channels and in various forms*". However, it is unclear how responsive China's domestic fishery management systems are in relation to issues that may be identified by domestic stakeholders outside of RFMO processes. It cannot be said that the country has arrangements that are as well-developed or responsive (transparent, timely, adaptive) as regional processes, nor that national measures routinely apply to serious and other important domestic issues.

						In Taiwan, the decision-making policies that respond to serious issues are inclusive of public opinion and engagement. A number of examples include the national plan to reduce the seabird bycatch from Taiwanese longline vessels developed in 2006 in collaboration with scientific authorities, international organisations or the development of the Distant Water Fisheries Act 2016 created as result of the yellow card imposed by the EU to the country. Taiwan has also developed consultation arrangements prior to WCPFC meetings that provide opportunity for interested and affected parties to be consulted (Morgan et al., 2018) and there are arrangements in place to consider comments on amendments to laws and regulations implementing WCPFC CMMs (KT 2022). However, as in the case of China, it is not clear whether the domestic fishery management system respond to serious and other issues in a transparent, timely and adaptive manner outside of the annual WCPFC/IATTC pre-meeting (KT 2022). In the FSM, 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 (KT et al., 2019). 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. Information concerning FSM fishery licensing, key documents and projects is publicly available on the NORMA website (KT et al., 2019). This PI scores between **SG60 -79 for China and Taiwan.**

		3.2.3	Compliance and enforcement	60-79	WCPFC, China and Taiwan 60-79 FSM >80	At the international level, the WCPFC has developed a comprehensive Compliance Monitoring Scheme (CMS) – CMM 2015- 07 that includes a number of measures: catch and effort limits for target species; spatial and temporal closures, and restrictions on the use of fish aggregating devices; authorizations to fish and the Record of Fishing Vessels, observer, VMS coverage, transshipment and the High Seas Boarding and Inspection Scheme; etc. The Forum Fisheries Agency (FFA) is the main service organization providing MCS support for the WCPO. This includes a regional MCS strategy endorsed by Forum Fisheries Committee Ministers, which includes regional operations and cooperation, a regionally agreed benchmark level of observer coverage (100% for the purse seine fishery since 2010), at sea and at port inspections. As other RFMOs, the WCPFC has no enforcement capacity of its own, but it relies on its Contracting Parties to implement management measures domestically and exercise control over its flagged vessels. Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence. The WCPFC has a permanent working group on compliance that reviews and monitors compliance with WCPFC management measures (Medley et al., 2022). However, The Regional Observer program plays an important part in the MCS system, with a range of coverage targets across the different T-RFMO's. Observers provide a suite of important MCS information, including on the application of CMMs relating to both target and by-catch species. There is some significant uncertainty as to the achieved coverage rates regionally. In 2020 compliance report, the WCPFC Compliance Committee noted that it had experienced ongoing difficulty assessing some obligations due to differing interpretations of those obligations and the Regional Observer program, which plays an important part in the MCS system, has not reached coverage rates regionally. There is a MCS in place for Taiwan and has legislation in place to implement CMMs and Resolutions. The Distant Water Fisheries Act (2016) empowers the Coast Guard Administration to inspect fishing vessels, catches and fisheries products, fishing gears, account books, as well as to question operators, employees and data holders under Article 16 (KT 2022).

						As a result of the yellow card given by the EU to the country, it seems that enforcement and control in the country has improved in recent years but some IUU still exists 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. Violations and Penalties are set in the legislation. The Marine Police Enforcement Unit conducts regular dockside inspections on longline vessels to determine whether the vessels are compliant with FSM regulations (KT et al., 2019). This P.I. reaches a **60-79 score for the WCPFC, China and Taiwan**.
		3.2.4	Management performance evaluation	60-79	WCPFC >80 China and Taiwan 60-79 FST >80	At the WCPFC level stock assessments are peer reviewed as well as by members of the SC. Key CMMs are reviewed annually (see WCPFC17 Summary Report). The TCC also provides reviews of compliance issues and individual country reports (review of Part I and Part II reports – may make recommendations) and thus there is a fairly comprehensive review of submitted fishery performance and management system data for fisheries WCPFC. WCPFC is subject to regular internal review as demonstrated by the various committees and working groups that meet regularly and report their findings to the Commission. However, it does not yet have a regular programme of external review, although it has been reviewed occasionally in recent years (Medley et al., 2022) China's General Office of the Ministry of Agriculture and Rural Affairs has recently introduced a national DWFV performance evaluation framework. This is focused on evaluating China's implementation of international fisheries treaties ratified, or acceded to, by China; as well as China's national policies and regulations for DWFV's (Anhalzer et al., 2022). However, there is no evidence of any external reviews of the management system. Across the Taiwanese fisheries, FA-COA regularly reviews the management progress and produces annual reports to reflect on these findings. However, is not clear whether external reviews are conducted on Taiwanese fisheries. In the FSM, 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. NORMA has also been subject to periodic audits by the Office of the National Public Auditor (KT et al., 2019) **P.I scores 60-79 for China and Taiwan.**

Environmental Workplan Results

Result	Related Action on FisheryProgress	Related MSC Performance Indicator	Explanation
Building regional consensus on the need for robust HCRs. No further progress made.	Promote the adoption of harvest strategies	1.2.4, 1.2.2, 1.2.1, 1.2.3, 1.1.2, 1.1.1	Advocacy letters were prepared by the FIP and sent to China and Taiwan on 19th November 2021 to advocate at the upcoming WCPFC Regular Session for a number of measures (not only referred to HCR) (letters can be found at https://fisheryprogress.org/node/11643/actions-progress#overlay=action/11645): 1. Adopt an enforceable tropical tuna conservation and management measure (CMM) for all fleets that limits fishing mortality for bigeye, yellowfin and skipjack that removes ambiguities and exemptions. 2. Adopt a work plan for FADs with a timeframe to transition to FADs without nets and made primarily with biodegradable materials; develop recovery policies, a marking scheme and ownership rules; and require FAD position and acoustic data. 3. In order to meet the June 2023 MSC deadline for harvest strategy conditions, adopt target reference points for bigeye and yellowfin; a list of candidate management procedures for skipjack & albacore; and establish a scientist/manager dialogue group. 4. Adopt a CMM for an Electronic Monitoring Programme and Minimum Standards for the use of electronic monitoring in WCPFC fisheries. 5. Accelerate the remaining work to reform the at-sea transshipment CMM and the Compliance Monitoring Scheme. A positive response was received from TFA indicating that the agency was willing to actively cooperate to discuss these issues. The RFMOs are working towards the development and adoption of HCRs for albacore, bigeye yellowfin tuna. However, there are currently no decision rules or frameworks in place.

Liancheng have got a robust policy and data collection regarding the retention of sharks	Strengthen prohibition of shark finning	2.2.3, 2.2.2	The objective of this action was to demonstrate that Shark finning is not taking place on board the client's vessels (e.g. through observer data or remote onboard monitoring) (ISSF Conservation Measure (CM) 3.1.a, b, c). Liancheng have now a robust policy and data collection regarding the retention of sharks (please, find it at https://fisheryprogress.org/node/11643/actions-progress#overlay=action/11662). It includes better bycatch recording and periodic training courses in shark and Mammal & turtles species identification to improve logbook records, and training to employ best practice handling and release practices for sharks and turtles to increase the probability of their post-release survival.
The objective is to have all crew trained in best practices for releasing unwanted catch. No relevant progress has been made yet.	Following best practices to reduce and release unwanted catch alive (e.g. as in the ISSF Skippers Guidebooks)	2.3.3, 2.3.2, 2.3.1, 2.5.3, 2.2.3, 2.2.2, 2.2.1	Related with the previous activity. So far, the FIP coordinators have met with some agencies (TFA) and visited the agent company offices in Taiwan in order to understand current practices on board. Crew training has not yet been possible due to several problems (Covid-19, lack engagement from the Chinese Fishery Bureau of Ministry of Agriculture, etc).
Achieve observer coverage of at least 5% for the vessels within the FIP, either Electronic or in Person.	Implementing sufficient observer coverage (human or electronic) to support management	1.2.1, 1.2.3, 2.3.3, 2.3.1, 3.2.3	Some vessels have already EM installed on board. The FIP coordinators have been engaging with managers to promote the installation on other vessels. Data on bycatch from observer reports has been collected and analyzed (and shown in different documents). Some management agencies (TFA) agreed that if EM become mandatory at the RFMO level, TFA will comply with that measure.
Collect data to designate species under P2 (primary, secondary, main, ETP) and assess the impact of the fishery on those species	Improve P2 data by obtaining summary observer and logbook data for albacore longline fleets of the 2 flag states	2.1.3, 2.2.3, 2.3.3	The FIPs coordinators engage with flag states to obtain observer data. Observer data was collected by the fishery and supplied to them. The data covered fishing activities in both the EEZs of FSM and RMI and also the WCPO high seas. Given the scale of the data (2016-2019) and its geographical coverage, it was considered representative of the fishery's operations. That data was used to re-score PIs 2.1.1, 2.2.1, 2.3.1. PIs 2.1.1 and 2.2.1 are now scored at SG80 from <60, and PI 2.3.1 is now at SG75, also from <60.
Better understanding of data gaps in the management of the fishery. Principle 3 scores for China and Taiwan have been updated.	Engage with domestic management authorities to fill gaps in information on their management systems for high seas longline fleet	3.2.3, 3.1.2, 3.2.2, 3.2.1, 3.1.3, 3.1.1, 3.2.4	The FIP coordinators have engaged with management authorities to understand the current situation. A review of Chinese management systems was completed in September 2020 to identify gaps in the management. Through TFA engagement and the study of other MSC-certified fisheries for which Taiwan operates on the high seas, a P3 update was also conducted for the management of that country in early 2022.

The objective is to have an improved monitoring, control and surveillance in the fishery. Progress in China and Taiwanese vessels have been scarce.	Increase MCS for Chinese and Taiwanese flagged vessels	3.2.3	The FIP coordinators have engaged with flag states to understand the current MCS system. Principle 3 was reviewed for China in September 2020 and Taiwan in 2022. For both countries P.I. 3.2.3 was still scored as 60-79. The next step would be to advocate to take place and make necessary changes internally which is line with activity 4 above (achieve observer coverage of at least 5% for the vessels within the FIP, either Electronic or in Person). According to NORMA, Electronic Monitoring has been voluntary adopted by Luen Thai/Lian Cheng longline vessels in FSM for commercial purposes, and the client has offered to make the raw EM data available to FSM's fisheries management agency (Gillett 2021) (please find information at https://www.spc.int/updates/blog/2022/02/case-study-luen-thailian-cheng-involvement-in-electronic-monitoring-of-tuna).
Understand and advocate for China and Taiwan to review Fishery Specific Management Systems. No further progress made.	Improved fishery governance	3.2.4	A Principle 3 P.I. review was conducted by Key Traceability for China in 2020 and Taiwan in 2022 (https://fisheryprogress.org/sites/default/files/documents_actions/0066%20Taiwan%20P3%20Analysis%20Update.pdf#overlay-context=node/11643/actions-progress), which resulted in increased scores for the country (although the score for 3.2.4 was maintained due to the lack of external reviews of the management system. No further progress has been made. In general, engagement of the Chinese authorities has been difficult.

Supporting References

Anhalzer, G., DiNardo, G., Bystrom, A. & Bodsworth, A. (2022). Zhejiang Ocean Family CO., LTD Pacific and Indian Ocean Longline Tuna and Swordfish MSC Fishery Assessment Report. Western Pacific Ocean Client and Peer Review Draft Report. SCS Global Services Report, Emeryville, USA. 482pp.

Collinson, K. (2022). MSC Principle 2 fisheries data analysis for the Thai Union and Liancheng Overseas Fishery (Shenzhen) Co. Pacific Ocean albacore, yellowfin, and bigeye tuna longline FIP. Version 1.0. Key traceability. 34 pp.

Ducharme-Barth, N., Vincent, M., Hampton, J., Hamer, P., Williams, P., Pilling, G. 2020. Stock Assessment of Bigeye Tuna in the Western and Central Pacific Ocean. WCPFC-SC16-2020/SA-WP-03 [REV3].

Evans, T., Gilman, E. & Gascoigne, J. (2019). Comprehensive Fishery Improvement Project (FIP) Scoping Document. Liancheng Pacific Longline Tuna FIP. 26 pp.

Gillett, R. (2021). Case Study: Luen Thai/Lian Cheng Involvement in Electronic Monitoring of Tuna Fisheries in the Federated States of Micronesia. Pew Charitable Trusts. SPC Fisheries Newsletter #166 – September–December 2021, pages 20-23.

Gilman E. & Huang, H.W. 2017. Review of effects of pelagic longline hook and bait types on sea turtle catch rate, anatomical hooking position and at-vessel mortality rate. Western and Central Pacific Fisheries Commission Scientific Committee Thirteenth Regular Session. Rarotonga, Cook Islands, 9-17 August 2017. WCPFC-SC13-2017/ EB-IP-01

ISC 2020. Stock Assessment of Albacore Tuna in the North Pacific Ocean in 2020. WCPFC-SC16-2020/SA-WP-05.

Key Traceability, Gilman, E. & Gascoigne, J. (2019). Pre-assessment of Liancheng Overseas Fishery (Shenzhen) Co. Pacific Ocean albacore, yellowfin and bigeye tuna fishery against the Marine Stewardship Council fisheries standard. Version 1.0. 76 pp.

Key Traceability (2020). Chinese Fisheries Management Review. FIP workplan update document. Pacific Ocean tuna – LL (Thai Union) FIP – September 2020. 24 pp.

Key Traceability (2022). Taiwan MSC Principle 3 Analysis and Scoring Update. November 2021. 15 pp.

Kulik et al., (2017). Alternative stock assessments of Pacific saury in the western North Pacific Ocean. NPFC-2017-SSC PS02-WP04.

Medley, P.A.H., Gascoigne, J. & Scarcella, G. (2022). An Evaluation of the Sustainability of Global Tuna Stocks Relative to Marine Stewardship Council Criteria: Principles 1 and 3. ISSF Technical Report 2022-03. January 2022. Version 9.0. 415 pp.

Morgan, S., Morison, A., Meere, F., Humberstone, J. 2018. Western Pacific Sustainable Tuna Alliance (WPSTA) Western and Central Pacific skipjack and yellowfin free school purse seine; MSC full assessment: Final report. SCS Global Services, Emeryville, USA. 375pp.

Peatman, T., Bell, L., Allain, V., Caillot, S., Williams, P., Tuiloma, I., Panizza, A., Tremblay-Boyer, L., Fukofuka, S., Smith, S. 2019. Summary of longline fisheries bycatch at a regional scale, 2003 – 2017. Western and Central Pacific Fisheries Commission. Scientific Committee, Thirteenth Regular Session. Busan, Republic of Korea, 8 – 16 August 2018. WCPFC-SC14-2018/ST-WP-03. Rev 3 (15th April 2019).

Prathibha Rohit, M., Sivadas, E. M., Abdussamad, A. Margaret Muthu Rethinam, K. P. Said Koya, U. Ganga, Shubhadeep Ghosh, K. M. Rajesh, K. Mohammed Koya, Anulekshmi, Chellappan, K. G. Mini, Grinson George, Subal Kumar Roul, S. Surya., Sandhya Sukumaran,E. Vivekanandan, T. B. Retheesh, D.

Prakasan, M. Satish Kumar, S. Mohan, R. Vasu and V. Suprabha. (2018). The Enigmatic Indian Oil Sardine: An Insight. CMFRI Special publication No. 130 p. 156.

Vincent, M., Ducharme-Barth, N., Hamer, P., Hampton, J., Williams, P. and Pilling, G. 2020. Stock assessment of yellowfin tuna in the western and central Pacific Ocean. Sixteenth Regular Session of the Scientific Committee of the WCPFC. (Electronic Meeting), 12–19 August 2020. WCPFC-SC16-2020/SA-WP-04 (Rev.3).